The Moray Council

Elgin STAG Part 2

Report

May 2007

Halcrow Group Limited

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16 Abercromby Place Edinburgh EH3 6LB
Tel +44 (0)131 272 3300 Fax +44 (0)131 272 3301
www.halcrow.com

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16 Abercromby Place Edinburgh EH3 6LB
Tel +44 (0)131 272 3300 Fax +44 (0)131 272 3301
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Contents

Executive Summary

Moray is peripheral within Scotland, and even more so within the UK and Europe. The creation of an effective transport network that promotes efficient local and regional movements is therefore a critical factor for the competitive performance of the Moray economy. This is especially important within Elgin, which is the principal administrative and commercial centre of the Moray area. Elgin provides residence to approximately 23% of Moray's population and a significant share of the areas jobs and employment opportunities are located in the area. The populations of Moray and Elgin are largely dependent on the private car to access work, leisure, community services and activities. The A96 and the A941 are the main strategic routes that connect Elgin to the wider region. The A96 is a trunk road and is therefore managed by Transport Scotland on behalf of the Scottish Executive. The A941 is not designated as a trunk road and is therefore managed an maintained by The Moray Council.

In February 2006, The Moray Council appointed Halcrow Group Limited to provide Professional Transportation Services. As part of this framework, Halcrow was tasked with the development of a micro-simulation transport model of Elgin (VISSIM Transport Model) and to use this model to complete a multi modal study to appraise options to alleviate a number of transport problems facing Elgin. This involved moving through a Pre-appraisal, STAG Part 1 appraisal and a STAG Part 2 appraisal. The methodology adopted is consistent with Scottish Transport Appraisal Guidance (STAG) with no single mode or project preferred prior to analysis. Scottish Transport Appraisal Guidance provides a tool that helps planners arrive at a value for money solution(s) to identified transport problems. This involves moving through a number of complementary phases:

(1) Pre-Appraisal - identifying problems, issues and constraints and defining the planning objectives

(2) Part 1 Appraisal - the identification and sifting of options

(3) Part 2 Appraisal - a comprehensive appraisal of options that emerge from stages (1) and (2).

Adopting this approach provides decision makers with the information and evidence necessary to select a preferred option with a degree of confidence that the investment will help solve the transport problem(s). It is within this context that the Halcrow Group has been working with Moray Council to identify a range of transport options.

The analysis contained in this report, and associated documents, completes the appraisal process. It therefore gives to The Moray Council the necessary detail required to make an informed decision, about how best to respond to the current and future transport issues, problems and constraints facing Elgin identified at the beginning of the appraisal process.

Pre-Appraisal

In order to generate a clear view of the range of problems, issues and constraints, a pre-appraisal workshop was set up with a broad spectrum of stakeholders. This workshop and the views of invitees would play a key role in informing the appraisal process. The workshop participants were asked to identify what they perceived to be the underlying problems relating to the existing transport network in Elgin.

The second stage of the STAG pre-appraisal process involved 'Objective Setting'. Having established a comprehensive list of perceived problems, issues and constraints and the key themes for the area of Elgin, it was agreed that the key themes would be used to determine a key planning objective for the study. The key planning objective was proposed in the following terms:

"to provide a quicker, safer and more reliable transport system in and around Elgin while accommodating future development."

Having established the transport problems, issues and opportunities and a key planning objective, the workshop attendees were invited to suggest possible solutions. The solutions proposed were grouped into the following key themes.

- Public Transport
- Traffic Management
- Link and Junction Improvements
- Travel Planning and Information
- Parking

STAG Part 1 Appraisal

A STAG Part 1 appraisal was completed to identify whether all or some of the 'key themes' should be taken forward for further analysis and option testing. The STAG Part 1 appraisal concluded that the Traffic Management and Link and Junction Improvement themes were complementary to the key planning objective and sub-objectives established by the stakeholders.

The VISSIM microsimulation model was used to test twenty options under the "Traffic Management" and "Link and Junction Improvement" themes to help determine which of the options should be taken forward for more detailed analysis. The quantitative outputs from the VISSIM Model showed which options produced greater impacts on average vehicle speed and the total travel hours across the Elgin road network. The model results were used to identify options that produced positive impacts on vehicle speed and total travel hours and that were consistent with the key planning objective. Seven options 'passed' the Part 1 Appraisal and were taken forward to the STAG Part 2 appraisal stage. A detailed report prepared by Halcrow (***Elgin VISSIM Microsimulation Model STAG Option Testing Report***) sets out the results produced for each of the twenty options tested.

STAG Part 2 Appraisal

The options are appraised against the government's five key transport objectives; **Economy, Environment, Safety, Accessibility & Social Inclusion and Integration** and against a do-minimum scenario. The seven options taken forward to the STAG Part 2 appraisal phase are outlined below:

- Option A - Wittet Drive Link
- Option B - Morriston Road Link
- Option C - Bypass North Alignment
- Option D - Bypass South Alignment (short)
- Option E - Bypass South Alignment (long)
- Option F - Southern Distributor Route + Wittet Drive Link
- Option G - Southern Distributor Route + Morriston Road Link

The **Do-minimum** scenario includes all committed road schemes and committed developments planned in the study area but not yet implemented. The do-minimum scenario reveals a significant increase in traffic and reductions in average vehicle speed over the period 2006-2012. Comparisons between 2006 and 2012 were used to demonstrate the impact of the do-minimum scenario. This showed significant traffic growth in the AM and PM peak periods and during the Saturday peak period with greater levels of congestion emerging in 2012 when compared to 2006. It was clear that the 'do-minimum' option would not mitigate the traffic problems currently being experienced in Elgin. Avoiding this outcome required a number of 'do-something' options to be developed and appraised. When compared to the do-minimum scenario Options A to G improved traffic flow and were consistent with the key planning objectives established by stakeholders. This report therefore appraises, in detail, the seven options that 'passed' the STAG Part 1 Appraisal.

Economy

Appraising the economic costs and benefits of large transport schemes is an essential requirement and helps decision makers select the most economically efficient option. This is expressed as a Benefit to Cost Ratio (BCR). The Benefit-Cost Ratio is a value for money measure, which indicates how much net benefit would be obtained in return for each unit of cost to the public sector. A BCR above the value of one produces economic benefits in excess of economic costs. A value below one produces economic costs that are in excess of economic benefits.

The summary of cost benefit analysis for each scheme option is presented in the table below. This shows two headline figures – the net present value and benefit-cost to government ratio for each of the seven options appraised. The term 'present value' is the value now (in 2002 prices) of all future discounted benefits and costs over the sixty year appraisal period. It therefore represents the economic cost, often

termed the opportunity cost, of investing now measured against the economic benefits that will accrue in the future. This is a standard method of appraising whether the economic benefits of infrastructure investments outweigh the economic costs.

	A	B	C	D	E	F	G
PVB Benefits	£22.6m	£12.1m	£26.4m	£28.6m	£29.7m	£27.1m	£20.3m
PVC	£13.2m	£24.2m	£49.6m	£55.1m	£58.9m	£31.2m	£45.0m
NPV[1]	£9.4m	-£12.1m	-£23.2m	-£26.5m	-£29.2m	-£4.1m	-£24.7m
BCR[2]	1.70	0.50	0.53	0.52	0.50	0.86	0.45

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Option A is the only option of the seven options appraised that provides benefits over costs, with a Net Present Value of £9.4m and BCR of 1.70. The Present Value Cost of implementing this option is significantly lower than any of the remaining six options, reflecting the lower construction cost associated with this option.

The three bypass options (C, D and E) provide benefits in excess of those produced by Option A. However, the magnitudes of the economic benefits accruing from the bypass options do not out-weigh the economic costs of implementing these options. A BCR below one is therefore produced for each of the bypass options.

Option B produces the lowest level of Present Value Benefits (£12.1m), with Present Value Costs of £24.2m. The economic benefits accruing from this option do not out-weigh the economic costs.

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[1] Net Present Value is defined as the discounted sum of all future benefits less the discounted sum of all future costs over the appraisal period.

[2] Benefit-Cost Ratio is a value for money measure, which indicates how much net benefit would be obtained in return for each unit of cost to the public sector, i.e. BCR = 2:1, £2 benefit per £1 cost.

The Present Value Cost (£45m) of implementing Option G is more than three times that of Option A, and produces lower Present Value Benefits than Option A. The economic benefits accruing from this option do not out-weigh the economic costs.

Option F augments elements of Option A to improvements at Glen Moray Drive and Reiket Lane to form a Southern Distributor route. The additional costs of implementing this option when compared to Option A are estimated at £18.7m. In contrast the additional benefits over the appraisal period are £4.5m. The magnitude of additional costs compared to the additional benefits reduces the BCR of this option below one to 0.45.

Environment

The proposals were appraised against the following environmental themes:

- Noise and vibration;
- Air quality - (CO2, PM10, NO2);
- Water quality, drainage and flood defence;
- Geological features;
- Biodiversity;
- Visual amenity;
- Agriculture and soils;
- Cultural heritage;
- Landscape.

Most if not all transport investments and infrastructure improvements produce a certain level of environmental disturbance and adverse impacts. It is important however to consider impacts against improvements to local traffic conditions and the creation of wider economic and social benefits.

Summary of Option A: The appraisal showed the environmental impacts of introducing Option A are likely to be modest, ranging from neutral to minor negative across the nine environmental themes.

Summary of Option B: The appraisal showed the environmental impacts of introducing Option B are likely to be modest, ranging from moderate positive to minor negative across the nine environmental themes.

Summary of Option C: The appraisal showed the environmental impacts of introducing Option C produce contrasting impacts across the environmental themes. Minor to moderate improvements to Air Quality (with the exception of minor negative impacts on PM10 levels) are likely to be derived from this option. However, as this option moves traffic through existing agricultural land a number of environmental costs are likely to be produced. This includes moderate to major adverse impacts on bio-diversity and minor to moderate negative impacts on Agriculture and Soils.

Summary of Option D: The appraisal showed the environmental impacts of introducing Option D are likely to be moderately negative on local water quality, drainage and flood defence. Environmental impacts on visual amenity, agriculture and soils are also likely to be moderately negative with cultural heritage impacts ranging from minor to moderate negative. The remaining impacts range from neutral (Air Quality - Regional CO2) to minor negative.

Summary of Option E: The appraisal showed the environmental impacts of introducing Option E are moderately negative when considered against the following elements: Water Quality, Drainage and Flood Defence, Landscape, Visual Amenity and Agriculture and Soils. The remaining impacts range from minor positive (Air Quality - Regional CO2) to minor negative.

Summary of Option F: The appraisal showed the environmental impacts of introducing Option F are broadly similar to those outlined for Option A. Option F does however produce minor to moderate improvements to Air Quality. This compares favourably to the neutral to minor negative impacts produced from Option A.

Summary of Option G: The appraisal showed the environmental impacts of introducing Option G are broadly similar to those outlined for Option B.

Safety & Security

Safety

The safety objective is defined as having two parts Accidents and Security. The safety objective considers whether the proposal under consideration will have any impact on the number of transport related accidents and/or their severity. The security sub-objective considers the perceived safety of all transport users as well as their vehicles.

All of the seven options being appraised provide additional road-space within the Elgin area. As congestion levels and journey times fall, more road-users are attracted to the network. Improving traffic conditions and the flow of traffic through Elgin can therefore encourage increased road-use. This has the potential to impact on accident and security probabilities. Annual vehicle kilometres travelled during peak periods were considered in the do-minimum scenario and compared to each of the seven options being appraised. The estimated change in vehicle kilometres across the seven options from the do-minimum scenario was minor. The largest increase (+2.45%) accrued from the Northern Bypass route.

The VISSIM Micro-simulation model was used to estimate the combined distance travelled by all vehicles across the network during the AM, PM and Saturday peak periods. These results were factored to provide annual vehicle kilometre estimates. The annual distance travelled by vehicles during peak periods were considered in the do-minimum scenario and compared to each of the seven options being appraised. Although the seven options appraised will increase road-space, within Elgin, an analysis of changes in the

Annual Vehicle Kilometre's suggests that there will be negligible adverse impacts on accidents rates across Elgin.

Although at the Elgin-wide level little change will occur it is important to note some localised safety impacts. Options that promote increased traffic volume moving through residential areas (Wittet Drive, Reiket Lane and Glen Moray Drive) increase the probability of accidents occurring within these areas. Any concern however should also be set within a broader context with figures from Moray Council showing a relatively low number of recorded accidents (51) on Elgin's most used routes (A96 and A941) over the period 1999 to 2004 with the majority (85%) recorded as minor accidents.

Accident / Definitions	**A96**	**A941**	**Total**
Serious	5	3	8
Minor	14	29	43

Improving the Elgin road network will re-route traffic away from areas that currently experience high levels of pedestrian conflict (Main St, The Wards and Alexandra Road) and will therefore impact positively on community safety within these areas. Newly created road layouts would benefit from current design standards that aim to limit accident levels and improve road and community safety. Implementing these design and material changes is more easily achieved on new roads rather than existing roads. Transport appraisal guidance therefore points to a decline in accident rates over-time with improvements to the material and design of the road infrastructure impacting positively on safety, lighting and passenger visibility on the road network. This will help reduce any negative impacts both Elgin-wide and at a more local level.

Security

As the seven options being appraised do not impact directly on improving public transport services there is likely to be minimal impact on the security of users of public transport. Improving the road network will introduce improved materials, signage and lighting. This can impact positively on security. It is anticipated however, that security benefits will be marginal across the seven options and will not differ significantly from the do-minimum scenario. Again it is important to note the potential for some localised impacts. Options that promote increased traffic volume moving through residential areas (Wittet Drive, Reiket Lane and Glen Moray Drive) are likely to impact adversely on local security for cyclists and pedestrian's moving through these areas. The magnitude of any adverse localised impacts are however likely to be low. Option A (Wittet Drive Link) increases local severance levels from slight to moderate. This highlights a trade-off between the economic benefits of this option and wider benefits to Elgin as a whole.

Accessibility and Social Inclusion

Improving accessibility is one of the Government's five key policy objectives, identifying the extent to which proposals help people and businesses access goods, services, people and communities. The government objective of accessibility and social inclusion can be split into two areas, Community Accessibility and Comparative Accessibility.

Community Accessibility

The following aspects of community accessibility have been considered in the appraisal of options for Elgin; these are access to work, education and training, health and shopping. The options do not directly promote new public transport services but could potentially stimulate the creation of new services and the alternative routing of existing services. As each of the options being appraised shares the aim of providing a quicker, safer and more reliable transport system in and around Elgin a certain level of consistency is evident across the seven options.

The addition of a high quality link between Edgar Road and the A96 at Wittet Drive will improve access to and from the Edgar Road Retail Zone, a key employment site that is in the process of expanding. Option A will also improve access to a range of education and training facilities including Elgin High School and, through a reduction of traffic on The Wards, to Moray College. It will also promote improved accessibility to Dr Gray's Hospital and The First Day Hospital for the Elderly. Reducing traffic on The Wards will also provide improved access to Elgin Rail Station and for Grampian Fire and Rescue services.

Option B also promotes improved access to the Edgar Road Retail Zone and will draw traffic from West Road travelling through to central Elgin along Main Street. This will improve access to Dr Gray's hospital and to the centre of Elgin where a range of public, education and leisure services are located.

Option C the Northern Bypass reduces the volume of traffic using the A96 when compared with the do-minimum scenario. This improves access to the centre of Elgin where key employment, education, health and leisure sites are located. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, the preferred location for a new Business Park.

Option D would implement a bypass to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 at Morriston Road. This option will improve access to the key employment sites in the centre of Elgin and at Edgar Rd, including the Edgar Road Retail Zone. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, the preferred location for a new Business Park.

Option E would implement a longer bypass option to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 to the East and West of Elgin. Similar to option D this will promote improved access to key employment sites in the centre of Elgin and at the Edgar Road

Retail Zone. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, the preferred location for a new Business Park.

Option F - The community accessibility impacts of this option are broadly similar to the impacts outlined above for Option A.

Option G - The community accessibility impacts of this option are broadly similar to the impacts outlined above for Option B.

Comparative Accessibility

Comparative accessibility is concerned with the distribution of impacts by location and by social groups relative to the population as a whole. This recognises that investment decisions can discriminate against particular groups in society, and that transport investment decisions should seek to support wider policy aims including social inclusion, regeneration and rural development.

The appraisal of options for Elgin has considered the distribution of impacts by people group e.g. age, income group, car ownership, etc. The current official measure of deprivation in Scotland is the Scottish Index of Multiple Deprivation (SIMD). The Moray Council area does not exhibit widespread deprivation or social exclusion. However, data extracted from the Scottish Index of Multiple Deprivation (2006) highlights that when Elgin, its constituent wards and datazones are compared to the Moray Council area some relative economic and social weaknesses exist.

Elgin has a marginally higher rate of unemployment and economic inactivity rate than the Moray Council average. Two of the Moray Council wards with the highest rates of unemployment are located within the Elgin area. A number of wards within Elgin exhibit qualification rates significantly lower than the Moray Council average. Car ownership in Elgin is lower than the Moray average.

Placing Elgin in a wider context highlights comparatively low levels of deprivation and social exclusion. None of the 28 datazones in Elgin are within the 15% most deprived areas of Scotland. Social inclusion impacts are therefore likely to be modest with widespread deprivation not a significant factor within Elgin.

Integration

Integrating transport investments to support wider policy objectives is a priority. Three aspects to the Integration analysis which have been considered in this appraisal. Transport Integration was considered to assess the degree to which options complement other transport infrastructure and services. Land-use Integration considered the fit between options and established land-use plans and land-use/transport planning guidance. Policy Integration considered the appropriateness of options when considered against wider policies both of central and local government e.g. health or social inclusion.

Transport Integration

An integrated transport system aids accessibility by connecting people to opportunities, and goods to markets with minimal disruption. The approach recommended to, and accepted by, Moray Council has been to adopt an objective-led approach to guide future transport policy and integration that will benefit the Elgin area. It is important to note that a pragmatic approach backed by quantifiable results and qualitative assessments has been adopted to identify a range of options. By identifying options that seek to improve local traffic conditions and encourage the efficient flow of public and private transport services the options appraised within this STAG Part 2 appraisal will have a beneficial impact on transport integration

Land Use Integration

The options appraised within this STAG Part 2 Appraisal are consistent with a broad range of land-use policies and plans. This includes the National Planning Framework (2004), Scottish Executive Planning Policy (SPP17 Transport and Planning), the Moray Structure Plan and the existing and emerging Local Plan for the Moray area. The Moray Local Plan outlines a number of transport options, defined as TSP schemes. These TSP schemes have been appraised within this STAG process.

The National Planning Framework (2004) highlights the need for improvements in transport infrastructure to support economic activity and improve access to social facilities. The framework acknowledges that greater mobility, in particular heavy reliance on the private car, gives rise to congestion that can exacerbate pollution producing adverse environmental impacts. The framework challenges public authorities to influence a shift to more sustainable modes of transport, and more sustainable patterns of transport and land-use planning.

The Scottish Executive Planning Policy (SPP17 Planning for Transport) identifies the importance of improving transport infrastructure. Rather than avoid improvements that encourage increased road-use the Scottish Executive promotes a range of interventions including; delivering improvements to key congestion points on the road network.

The options considered within this STAG Part 2 appraisal are consistent with national land-use planning policy and are complementary to regional and local land-use planning policies. Although national planning policy promotes a shift towards more sustainable transport options, it is clear that this does not mean abandoning improvements to the existing network, particularly, in areas where congestion is impacting or is likely to impact on the future economic development of an area.

Policy Integration

A key theme of Scotland's National Transport Strategy is to improve journey times and connections - making it easier and more reliable for individuals to travel between towns and cities and across global markets. Key challenges outlined in the strategy include making journey times more reliable, ensuring infrastructure supports economic activity and that congestion problems in Scotland's towns and cities are tackled.

Scotland's Framework for Economic Development highlights the need for an efficient transport system for the development of a competitive economy. Among the key transport issues outlined in the framework is the need to relieve traffic congestion through a rigorous appraisal of potential solutions, paying particular attention to how costs and benefits are distributed across different groups and regions in Scotland. The approach adopted by Moray Council is consistent with this view.

Highlands and Islands Strategic Transport Partnership (HITRANS) has established a number of strategic objectives including; improving journey times by investing to improve infrastructure, particularly roads, public transport and the rail network. The aim is to reduce costs to the users of the transport network and reduce costs in the movement of goods and services.

The Moray Local Transport Strategy published in 2001 was developed to complement sustainable development and encompasses economic, social and environmental considerations. The primary objectives of the Moray Local Transport Strategy include improving access to jobs, services and facilities and to promote sustainability and safety.

The options outlined in this report integrate well with wider government, and regional and local policies. This includes the emerging Moray Local Plan which identifies a number of transport options, defined as TSP schemes. The TSP schemes identified within the emerging local plan have been appraised within this STAG process.

The options appraised introduce a range of potential solutions to mitigate against present and future congestion within the Elgin area. The STAG Part 1 and STAG Part 2 methodology adopted by Moray Council ensures that the options that have been appraised are objective-led, and are complementary to existing transport, land-use and wider policy initiatives. This maximises the potential to implement the most efficient transport solution for Moray Council and to meet the Council's aspirations for the sustainable development of Elgin.

1 Introduction

1.1 *Background*

1.1.1 In February 2006, The Moray Council appointed Halcrow Group Limited to provide Professional Transportation Services. As part of this framework, Halcrow was tasked with the development of a micro-simulation transport model of Elgin (VISSIM transport model) and to use this model to complete a multi modal study to appraise options to alleviate a number of transport problems in the West of Elgin. The appraisal was to be carried out in accordance with the Scottish Executive's Scottish Transport Appraisal Guidance (STAG) methodology. The overall aim of the Elgin STAG Study was to arrive at a transport solution or set of transport solutions to solve the evident transport problems, issues and constraints facing west of Elgin. This remit was subsequently widened so that the study would cover the whole of Elgin.[3]

1.2 *Scottish Transport Appraisal Guidance*

1.2.1 This document reports on the work completed for the detailed STAG appraisal. This introductory chapter provides a brief outline of the STAG process. The following chapter provides background and commentary on the economic and social context of Elgin. The pre-appraisal element of STAG is included in Chapter 3. Details of the STAG Part 1 and Part 2 appraisals, including the results, are set out in Chapters 4 and 5 respectively. Chapter 6 includes a commentary on the risk and uncertainty regarding the options and how this is dealt with in the appraisal. Chapter 7 sets out the conclusions of the appraisal.

1.2.2 The STAG led appraisal process is summarised in Figure 1-1 below. Put simply, STAG is a tool to be used to help planners arrive at a value for money solution(s) to identified transport problems. It provides decision makers with the information and evidence necessary to select a preferred option with a degree of confidence that the investment will help solve the transport problem(s). The process is split

[3] At a STAG pre-appraisal workshop of 22 March 2006, stakeholders questioned why the whole of Elgin was not being considered within the study brief. After general discussion, there was group consensus that the study should proceed and consider the whole of Elgin.

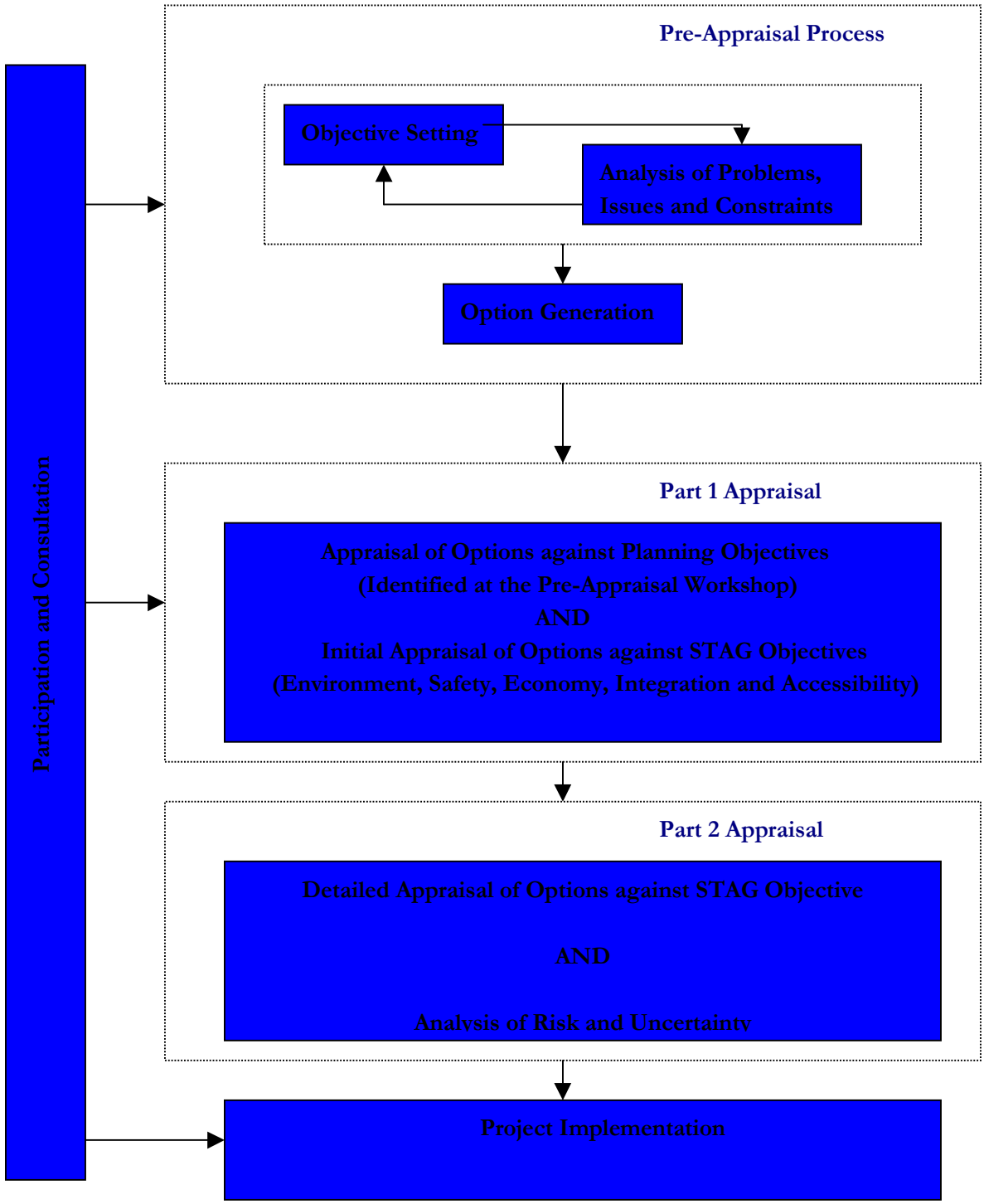
into 3 key elements: pre-appraisal, STAG Part 1 appraisal and STAG Part 2 appraisal.

1.2.3 The pre-appraisal phase firstly involves identifying the transport problems, issues and constraints affecting the area in question. These problems are then used to arrive at a set of objectives that any transport investment must meet i.e. if the proposed option meets the objective then it is likely to solve the problem. The next stage of the pre-appraisal process is to generate a number of potential options that could be introduced to meet the objectives. It should be noted that throughout the pre-appraisal phase an open-mind should be given to potential solutions. It is important that any options generated are supported by a thorough understanding of the problems and opportunities in an area, rather than seeking to fit an existing proposal retrospectively to planning objectives. This ensures that an objective-led approach is applied to the identification of proposed transport solutions.

1.2.4 The pre-appraisal stage is followed by a Part 1 appraisal. The Part 1 STAG appraisal focuses on 3 key areas. The first considers how the options impact against the planning objectives set during the pre-appraisal stage. The next stage involves an investigation of the potential options "Implementability" i.e. their technical feasibility, affordability and likely public acceptability. The final stage includes an initial view of the impacts of the options against the government's five objectives for transport: economy, safety, environment, integration and social inclusion/accessibility. The appraisal is mainly a qualitative exercise at the Part 1 stage, although quantitative information can be used if available.

1.2.5 The options that 'pass' the Part 1 Appraisal are then subjected to a more comprehensive STAG Part 2 appraisal, with the impacts of each option considered in detail against the government's objectives for transport investment, including an analysis of the risks and uncertainties associated with each of the options.

Figure 1-1: Scottish Transport Appraisal Guidance - Planning and Appraisal Process



2 Background

2.1 ***Introduction***

2.1.1 Elgin is the principal administrative and commercial centre of Moray with the most recent figures (2001 Census) revealing a population of almost 21,000. The town has a wider catchment population of close to 100,000. The towns of Buckie, Forres, Keith and Lossiemouth provide Moray's secondary centres with populations in the 4000 – 9000 range. Most people (almost 60%) live in the five main towns of Moray but the overall population density is low at 38 persons per square kilometre (compared to 66 in the whole of Scotland).

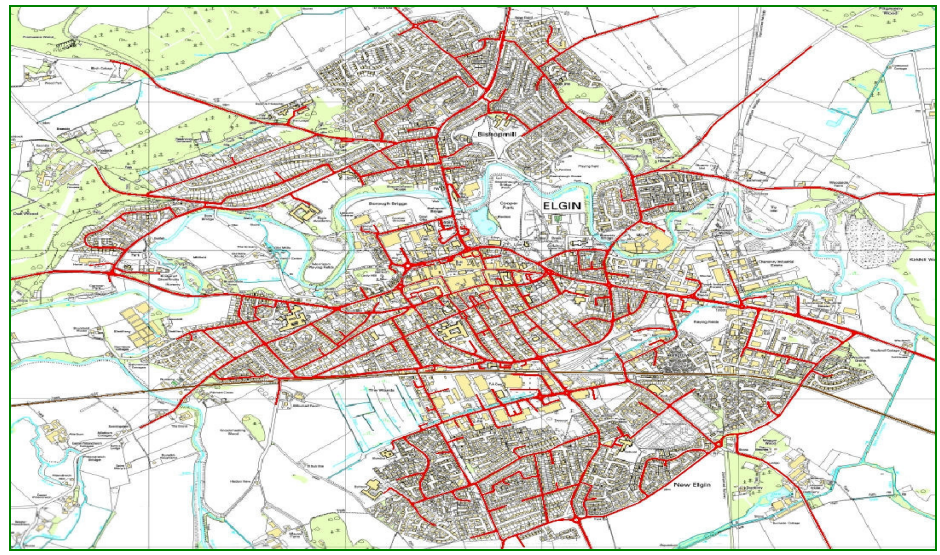
2.1.2 It is evident that transport plays an important economic and social function within the context of Moray. It provides the means by which local communities/settlements can access the opportunities and necessities which can enhance their quality of life. It also connects people from rural communities/settlements to markets, education and employment opportunities, and health and welfare facilities. Moray's peripheral location along with its rural character means that the movement of goods and people is a key consideration for the local council and its partners.

2.1.3 It is widely recognised that transport is the single most important concern of people living in rural areas and that an inefficient transport system can act as a major barrier to social inclusion. The diversity of rural transport needs is considerable, and this is a key challenge for the provision of transport infrastructure in Moray. An efficient transport network which provides links within Moray and connects it to external markets is essential for long term economic and social prosperity. The area depends on efficient road and rail links both out of Moray, and internally, focussed on Elgin where most business and social facilities are concentrated.

2.1.4 The present trunk road network in Moray consists of the A96 to Inverness and Aberdeen (linking to the A9 and A90 respectively) and the A95 from Keith to Aviemore (linking the A96 to the A9). The A941, while not a trunk road, is regarded as a strategic local road in Moray, from Lossiemouth/Elgin to the A95 trunk road at Craigellachie, linking the Elgin area to the A9 and the south. Vehicles using the A96 for East/West journeys and the A941 North/South travel through the centre of Elgin. This is clearly illustrated in Figure 2-1 below. Traffic using

these strategic routes regularly produce adverse impacts within Elgin and adds to local congestion levels, particularly during peak travel periods in the morning, evening and Saturdays.

Figure 2-1 Elgin Road Network



2.1.5 There is clear evidence that the growth in general traffic in recent years has added to increased use of the A96 and A941 strategic routes. The increased vehicular traffic flows in and around Elgin have added pressure to the existing transport network and congestion and journey times are important issues for users of the road network. In addition, further growth in vehicular traffic is anticipated over the next ten to twenty years as both the level of car ownership and car use increases. This will add to pressure on the road network in and around Elgin intensifying existing congestion levels and producing adverse air quality impacts. Similarly, additional trips associated with existing and approved development will add further pressure and create additional issues for traffic management, junctions and links in/around Elgin.

2.1.6 In response to these worsening traffic conditions in and around Elgin, The Moray Council commissioned consultants to carry out an appraisal of options that could be implemented to help alleviate the problems, particularly the increasing level of congestion in the town. The STAG Part 1 and Part 2 appraisals are set within a wider strategic context that includes an emerging Local Development Plan and the development of a Flood Alleviation Scheme. Together these will help shape the future development context for Elgin.

3 Pre-Appraisal

3.1 ***Introduction***

3.1.1 It was explained in Chapter 2 that the first stage of the STAG appraisal process involves the pre-appraisal. This includes identifying the transport problems, setting the planning objectives and agreeing the possible options that could be implemented to meet the objectives and therefore solve the problems. This chapter sets out the details of the pre-appraisal process for the Elgin study.

3.1.2 The pre-appraisal phase is a consultative phase. Consultations are held with local stakeholders to identify local problems, issues and constraints. It is important that an open-mind is given to potential solutions and that the process is objective-led. The outcome of the pre-appraisal process should be a set of options that are consistent with key transport planning objectives established within the consultation phase.

3.1.3 The Halcrow Group facilitated a wide-ranging workshop early in the STAG process. This was the first stage of an ongoing and transparent consultation process that lasted for the whole of the appraisal process and involved informing, listening to and receiving feedback from a wide range of stakeholders and interest groups. The aim of the initial workshop was to identify the range of transport problems, issues and constraints, facing the Elgin area and arrive at a set of planning objectives against which the options would be appraised. The consultations and feedback from the attendees provided an effective platform within which to consider and record the current transport problems, issues and constraints facing the Elgin area.

3.1.4 The workshop participants were asked to identify what they perceived to be the underlying problems relating to the existing transport network in Elgin. A summary of the general responses are presented below (including responses submitted in writing):

- Elgin's transport network is struggling to cope with the increasing demand for travel witnessed over recent years;
- In some cases journey times in and around Elgin have increased by 50% over the last 10 year period;

- Demand during the AM and PM peak periods has spread over the same 10 year period;
- High levels of traffic flows and subsequent delays are observed all day Saturday;
- The volume of traffic on the A96 and A941 roads which pass through Elgin inhibit access onto these key routes and the circulation of traffic in and around Elgin;
- There has been an increase in development and intensity of land use in and around Elgin which has resulted in added traffic volumes;
- Public transport is infrequent and expensive – for both local and inter-city journeys;
- A considerable number of short private car journeys are made in Elgin
- There has been an increase in HGV traffic in, around and through Elgin particularly on the A96 and A941 roads;
- There have been adverse impacts to traffic flows as a result of increased traffic volumes on local distributor roads – this has resulted in the use of "rat runs" with traffic travelling at speed through residential areas;
- The reliance on the A96 means that a major accident or incident on this key route in Elgin causes significant disruption and severance, particularly for the emergency services;
- Pedestrian crossings are clustered in some areas of Elgin (causing delays for traffic) and there is a lack of pedestrian crossing points in other parts (insufficient for pedestrians);
- Parking provision and location has resulted in on street parking in areas of Elgin which inhibits traffic flow by narrowing road widths;
- Insufficient parking opportunities and poor bus services at Dr Gray's Hospital, which is a key generator of journeys in the town.

3.1.5 A number of specific areas were perceived as having particular issues and problems. These are listed below:

<u>A96 Eastbound from West Road</u>

- Delays caused by queuing traffic at the A96 junction with Wittet Drive – right hand turn into and from Wittet Drive;
- Access into and out of Dr Gray's Hospital;
- Generally high volume of traffic is making access onto and off the A96 difficult from both Morriston Road and Sheriffmill Road;

- High traffic volumes from A96 (West Road) through High Street and Alexandra Road;
- Traffic flow is inhibited as traffic builds up as vehicles have difficulty passing cyclists and buses – queues/delays can be worse than normal as a result;
- Perceived safety is poor as there is an increasing volume of HGV traffic using the A96 coming into and through Elgin, particularly lorries travelling Inverness-Aberdeen-Inverness;
- Perceived safety is poor for pedestrians and cyclists;
- Sustainable travel inhibited by HGV and general traffic volumes.

A96 East Road

- Lack of crossings towards the East Road section of the A96;
- The nature of access into and out of the bus station can inhibit traffic flows.

A941

- High proportion of traffic from the south attempting to access A941;
- Sustainable travel inhibited by HGV and traffic volume – perceived safety is poor;
- Delays can occur on Main Street, New Elgin Road and Hay Street as the A941 meets the A96.

Development Impacts

- Additional development near Elgin High School will add to future traffic volumes – this could impact on the Wards Road intersection – issue of railway crossing capacity;
- It is perceived that potential problems could arise for access to the site of the proposed redeveloped school;
- Links from New Elgin to Elgin – it is perceived that there is poor and limited access across the railway line;
- There has been a change in the local economy and underlying development of retail parks – changes in retail behaviour and land use;
- Impacts of commercial development at Edgar Road.

Parking

- Lack of car parking at Dr Gray's hospital;
- The location and capacity of car parking resulting in significant on-street parking which causes delays for traffic flows and nuisance for residents – areas of significance include area between Station Road and Town Centre.

3.2 ***Objective Setting***

3.2.1 The second stage of the STAG pre-appraisal process involves 'Objective Setting'. Having established a comprehensive list of perceived problems, issues and constraints, these were used by the workshop attendees to arrive at a key planning objective and a number of sub-objectives for the study. This is an important element of the study process as it is against these objectives that the options are appraised.

3.3 ***Key Planning Objectives***

3.3.1 The key planning objective[4] was proposed in the following terms:

"To provide a quicker, safer and more reliable transport system in and around Elgin while accommodating future development."

3.3.2 In addition to this key planning objective, the Group also agreed the sub objectives of the study:

- To reduce average junction delay times by introducing junction time improvements on the A96 and A941 for traffic egressing and accessing key junctions from the base year scenario;
- To minimise delay and disruption to all mode users caused by the conflict of modes on key routes in and around Elgin;
- To improve safety for all road users by reducing the number of road accidents in and around Elgin;
- To improve the management of parking in Elgin;

[4] In the STAG study context, "Planning objectives" are those which relate specifically to the transport planning exercise being carried out and should be developed specifically for the exercise. This is the terminology used in STAG and should not be confused with objectives set out in local planning policy documents

- To encourage modal shift from private car to public transport, cycling and walking;
- To mitigate the risks of adverse environmental impacts caused by motorised vehicular traffic in and around Elgin;
- To ensure integration of land use and transport.

3.3.3 This represented the consensus of the workshop group. However, it was agreed by the participants that these could be slightly amended and refined as the appraisal process progressed. Some sharpening of the descriptions is often required to make the objectives more specific and measurable. In particular, the development of the transport model for Elgin has helped inform this process and ensured realistic and achievable objectives were set.

3.4 ***Wider Objectives***

3.4.1 As well as the planning objectives, it is important that options are considered against wider objectives published in policy documents. For example, the Transport White Paper of June 2004, "Scotland's Transport Future", sets out the Scottish Executive's objectives for transport:

"Our overall aim is to promote economic growth, social inclusion, health and protection of our environment through a safe, integrated, effective and efficient transport system".

3.4.2 More specifically, the Scottish Executive objectives are to:

- Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- Protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- Improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff;
- Improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

3.4.3 Scotland's recently published National Transport Strategy formalises the commitments made in the White Paper and commits the Scottish Executive and Transport Scotland to the improvement of journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on high level objectives for economic growth, social inclusion, integration and safety.

3.4.4 More broadly, under the criteria of a STAG assessment, the scheme must also support Government objectives for transport. This requires complementarity with the following themes:

- Environment (maximising the quality of the built and natural environment for enjoyment by all);
- Safety (reducing the risk and incidence of accidents and improving the security of all transport users);
- Economy (saving people's and business's time and money and facilitating desired economic development);
- Integration (fitting the transport network together and ensuring a rational relationship between transport and land-use and wider policy);
- Accessibility (providing everyone (not just users but also non-users) with the means to travel to opportunities of all kinds).

3.5 ***Regional & Local Objectives***

3.5.1 While complementarity to wider policy objectives is welcomed, it is important that the development of potential transport solutions 'fit' local concerns and local strategic priorities. The Moray Local Transport Strategy has been developed to recognise and support linkages to other strategic initiatives including; improving accessibility to jobs, services and facilities within Moray and promoting sustainability and safety. The strategy recognised that successful economic development depends upon efficient transport networks and minimising any adverse impact arising from Moray's peripherality.

3.5.2 The Highlands and Islands Strategic Transport Partnership (HITRANS) have a vision for a regional transport system which provides cost effective access to all regional transport services in pursuit of social inclusion and enables the optimum growth of the regional economy. HITRANS has set a number of objectives including reducing the costs to the users of the transport network and reducing the costs in the movement of goods; improving journey times by ensuring further investment is made in better infrastructure - particularly roads and the rail network.

3.6 ***Option Generation and Sifting***

3.6.1 The aim of option generation and sifting it to identify how the problems identified in the pre-appraisal process might be addressed. Having established the transport problems facing Elgin and setting out the planning objectives to reflect these problems, the next stage was to explore potential options that could be introduced to solve the problem. It was vital to develop a comprehensive and wide range of options that could potentially meet the study's key planning objective.

3.6.2 The Part 1 appraisal produced a substantial list of options. A conclusion from the Part 1 appraisal process was the need to categorise the long list of options into the following "Key Themes".

Public Transport

- Integrated ticketing for public transport;
- Integrated public transport timetable;
- Free bus travel (within and to Elgin);
- Improved bus services to Dr Gray's hospital;
- Bus priority measures.

Traffic Management

- Traffic management options for Elgin;
- Improved signage and warnings;
- Loading restrictions;
- One way system/loop around Elgin;
- Divert traffic from West of Elgin around North Elgin – e.g. use of Morriston Road;
- Opportunities to identify HGV specific routes; and
- Cycle network improvements.

Link and Junction Improvements

- Junction improvements for A96 and A941 routes through Elgin;
- Extension to Edgar Road to Morriston Road Junction;
- New railway line crossings – "New Elgin – Elgin Link";
- Improvements for Wards Road;
- Options to improve North College Street – College Street; and

- Elgin bypass.

Travel Planning and Information

- Improved information flow for travellers including PR and marketing of travel options;
- Car share schemes;
- Encourage the adoption of flexible working hours;

Parking

- Park and Ride;
- Parking Strategy;
- Pay and display parking controls;
- Increase provision of car parking – West/South/Central Elgin.

4 STAG Part 1 Appraisal

4.1 ***STAG Part 1 Appraisal***

4.1.1 A STAG Part 1 appraisal was completed to identify whether all or some of the 'key themes' should be taken forward for further analysis and option testing. A qualitative assessment of the five key themes, in terms of their performance against the key planning objective and sub-objectives was therefore carried out. The findings are summarised in this section but further details are set out in the Elgin STAG Study Part 1 Appraisal Report.

4.2 ***Public Transport***

4.2.1 The STAG Part 1 Appraisal concluded that the provision of enhanced public transport services, on its own, was unlikely to achieve a significant mode shift from private car. It is unlikely that the transport issues/problems facing Elgin would be alleviated unless a sufficiently frequent, fast, reliable public transport service or number of services could be introduced across Moray. This would need to serve everyone accessing Elgin for work, education and commercial services.

4.2.2 With respect to Bus Priority measures, the STAG Part 1 concluded that there is insufficient frequency of service and bus capacity to justify this as an option. There is also limited opportunity for physical expansion of rural road space for this measure due to the constrained nature of the existing road infrastructure in and around Elgin.

4.2.3 Although the STAG Part 1 appraisal discounted the public transport theme from further analysis it did recommend that bus services to Dr Gray's hospital are analysed and opportunities to improve them be explored.

4.3 ***Travel Planning and Information***

4.3.1 Some basic level of information about public transport services is necessary for those who use or plan to use them. In practice, regular travellers rarely make use of formal information systems, and many occasional travellers rely on informal sources such as advice from family or friends.

4.3.2 Most recent research has been on the effect of real time public transport information systems, with digital displays at bus stops or rail/underground stations used to display the predicted arrival times of relevant buses or trains. While this

has been an encouraging development in urban areas, it is likely to have a limited impact within a rural context – an assessment of costs and benefits would not necessarily show this as an optimal solution to encourage mode shift in the rural transport environment.

4.3.3 This type of initiative would generally be undertaken in conjunction with other quality and price initiatives, rather than in isolation. In some cases, efforts have been largely focussed on conventional forms of communication, such as printed timetables, adverts in vehicles and a limited amount of poster and newspaper/other media advertising. Apart from household distribution of timetables, little effort may have been made to communicate directly with non-users.

4.3.4 The STAG Part 1 Appraisal concluded that the provision of enhanced travel planning and information options are unlikely to achieve a significant mode shift from private car. The transport issues/problems facing Elgin would not be alleviated and this key theme would not meet the aim of the key planning objective. The options contained within this theme were therefore discounted from further analysis within the STAG appraisal.

4.4 ***Parking***

4.4.1 There are a number of ways in which parking policy in Elgin could be used as a traffic demand management tool. These include limiting the number of available spaces, increasing the prices paid for parking and changing the mix of short and long term parking spaces available. However, parking policies are not always effective traffic demand management tools. Strict enforcement is required as the tendency for evasion is high. Improved public transport services are required if traffic demand management tools are to be effective.

4.4.2 The parking policies/strategies categorised under this key theme were considered unlikely to achieve a significant mode shift from private car. The STAG Part 1 appraisal therefore concluded that the transport issues/problems facing Elgin would not be alleviated and this key theme would not meet the key planning objective.

4.4.3 The STAG Part 1 appraisal did however recommend that a 'Parking Strategy' is considered as a study in its own right and that a full assessment of formal and informal parking in and around Elgin is undertaken. It concluded that as a

significant trip destination in Moray, Elgin could benefit from a full assessment of parking options and policy.

4.5 ***Traffic Management***

4.5.1 The STAG Part 1 appraisal concluded that this "Key Theme" was complementary to the key planning objective and sub-objectives established by Moray Council. In the context of the Elgin STAG Part 1 appraisal process, it was clear that further investigation of traffic management options were required. A number of distinct options were explored with Moray Council and their impacts modelled using the VISSIM Micro-simulation model.

4.5.2 The model results were detailed in an 'Option Testing Report', which highlighted the relative impacts of the various Traffic Management options. The 'Option Testing Report' was followed by an 'Interim Report'. This summarised the model results and made clear recommendations on the Traffic Management options to be taken forward for STAG Part 2 appraisal. The options were tested against a do/minimum scenario and are outlined below in section 4.8.

4.6 ***Link and Junction Improvements***

4.6.1 The STAG Part 1 appraisal concluded that this "Key Theme" was also consistent with the key planning objective and sub-objectives. A number of options were explored with the council. These were tested using the VISSIM Microsimulation model.

4.6.2 The results from the VISSIM model were detailed in an 'Option Testing Report. This report highlighted the relative impacts of the various Link and Junction Improvements. The 'Option Testing Report' was followed by an interim report which summarised the model results and made clear recommendations on the Link and Junction Improvement options to be taken forward for STAG Part 2 appraisal. The options were tested against a do/minimum scenario.

4.7 ***Do Minimum Scenario***

4.7.1 To understand the impact of investing in the options outlined above, it is first necessary to know what would happen under a scenario without any interventions. The consultants therefore developed a traffic model of Elgin under a 'do-minimum' scenario. The do minimum scenario includes all committed road

schemes and committed developments[5] planned in the study area but not yet implemented (see 4.7.3). Information about committed schemes was provided by Moray Council. The do-minimum model reveals a significant increase in traffic and reductions in average speed over the period 2006-2012. It also identified particular streets and junctions where traffic conditions would deteriorate as congestion levels rise and waiting times increase. Comparisons with the 2006 base model are used to demonstrate the impact of the do-minimum scenario. This shows traffic growth in the AM and PM peak periods and during the Saturday peak period – see Table 4-1 below.

Table 4-1: Total Vehicle Hours 2006 – 2012

	2006 Base	**2012 Do Minimum**	**% Change**
AM Peak	1,076	1,385	28.7%
PM Peak	1,354	1,782	31.6%
Sat Peak	1,477	2,240	51.7%

4.7.2 These increases are particularly significant when compared with the growth in trips which were 10.8%, 11.5% and 14.0% respectively. This suggests that the extra trips in the do-minimum model are causing significant congestion beyond the levels experienced in the base model. The knock-on effect is to slow down the average speed of vehicles moving through, and in and around Elgin – see Table 4-2 below.

Table 4-2: Average Vehicle Speed 2006 – 2012

.	**2006 Base**	**2012 Do Minimum**	**% Change**
AM Peak	24.0	23.1	-3.7%
PM Peak	22.6	21.1	-6.5%
Sat Peak	21.1	17.0	-19.4%

[5] Committed Developments are outlined in Appendix A.

4.7.3 The following committed infrastructure schemes are included in the 2012 do-minimum scenario. Information on committed schemes was supplied by Moray Council.

- Reiket Lane / A96 Roundabout: The Reiket lane priority intersection with the A96 is replaced with a new four arm roundabout.
- Reiket Lane Mini Roundabout: Zone 116 is a new residential development zone between the A96 to the East of the model and Reiket Lane. A new access to this development forms a mini-roundabout with the A96 and the access to Pinefield Industrial Estate.
- Wittet Drive Signals: Signals are introduced at the intersection of Wittet Drive and the A96. This comprises single lane approaches on all three arms.
- Yellow Box at North College Street: A yellow box layout now operates on the eastbound lane of South College Street at the intersection with North College Street.
- Sheriffmill Rd / Morriston Rd: The addition of a Garden Centre to the North of the A96 at Sheriffmill requires improved access from Sheriffmill Road to Morriston Road. An upgraded priority intersection has been coded.
- Edgar Road (Robertson): Changes have been coded to the alignment and access points along Edgar Road (West).
- Alexandra Road Pedestrian Crossing: A pedestrian crossing has been added to Alexandra Road just to the East of the North Street intersection and the exit from the St Giles Centre car park. Cycle times are assumed to be identical to existing pedestrian crossings at Tesco.
- Johnston's (Newmill Road): An improved priority junction with a ghost island has been coded for access to Johnston's on Newmill Road.
- Revised Bus Timetable: The revised public transport data has been coded into the model.
- Lesmurdie Road Mini Roundabout: The mini-roundabout on Lesmurdie Road has been removed and replaced with a standard priority intersection.
- 30mph Zone Extensions: The 30mph zone now extends further South along the A941 towards Rothes (NJ22276093) and along Birnie Road (NJ21776087).
- Reiket Lane Railway Bridge: Railway bridge on Reiket Lane to be replaced with a two way route (currently operates as a single lane with signals).
- Aldi mini-roundabout: A mini-roundabout now provides access for traffic to the ALDI store next to Lossie Green car park.

4.8 **Options tested by VISSIM Microsimulation Model**

4.8.1 The VISSIM microsimulation model was used to test twenty options under the "Traffic Management" and "Link and Junction Improvement" themes to help determine which of the options should be taken forward for more detailed analysis in the STAG Part 2 appraisal. The outputs from each option were compared to the reference do/minimum case. Conclusions were drawn on the performance of the respective options in terms of increasing average speeds and reducing the total travel hours on the road network. The options tested are set out in Table 4 3 below.

Table 4-3: Options Tested

Group	Ref	Modelling Options
Bench-mark	0	Committed Development and Forecast Development
Traffic MGT	1	Gyratory System
	2	HGV Routing Model
	3	Traffic Signals at A96 / Blackfriars Road
Link & Junction Improvements	4	Wittet Drive Link (TSP10-12)
	5	The Wards Link
	6	Morriston Road Link (Part TSP2)
	7	Pansport Road Junction Upgrade
	8	Pansport Road & Cumming Street Junction Upgrades
	9	Partial dualling of Alexandra Road
	10	Morriston Road Junction Upgrade
	11	Boroughbriggs Road Junction Upgrade
	12	Edgar Road Junction Upgrade
	13	Bypass North Alignment (TSP1)
	14	Bypass South (Short) Alignment (TSP2)
	15	Bypass South (Long) Alignment (TSP2)
	16	Southern Distributor + 4
	17	Southern Distributor + Morriston Road Link
	18	Combination 8 + 9
	19	Combination 12 + 4
	20	A941 Railway Bridge Closure

4.8.2 The twenty options outlined above were considered against the key planning objective of providing a quicker, safer and more reliable transport system in and around Elgin while accommodating future development. Central to any sifting process in STAG is the need for transparency and to outline clearly why any options are being discounted or recommended for further analysis. A full description of the impacts of each of the twenty options was outlined in full in a 'STAG Interim Review Report' presented to Moray Council in March 2007. This charted movement from the initial list of twenty options to a final list of seven options.

Options Discounted from STAG Part 2 Appraisal

4.8.3 Table 4-4 and Table 4-5 highlight the options discounted from the STAG Part 2 Appraisal. It is clear from the results that these options were unlikely to impact positively on the key planning objectives and produced a deterioration in the total hours travelled and/or a reduction in average vehicle speed when compared to the do-minimum scenario.

Table 4-4: Discounted Options

AM Peak	Total Travel Hours	Average Vehicle Speed (mph)
Do-minimum	1,385	23.1
Option 1	1,449	22.7
Option 2	N/A	N/A
Option 3	1,424	22.5
Option 5	1,377	23.3
Option 7	1,380	23.2
Option 8	1,374	23.3
Option 9	1,396	22.9
Option 10	1,381	23.2
Option 11	1,408	22.8
Option 12	1,406	22.8
Option 18	1,373	23.3
Option 19	1,300	24.6

Table 4-5: Discounted Options cont

PM Peak	Total Travel Hours	Average Vehicle Speed (mph)
Do-minimum	1,782	21.1
Option 1	1,918	20.2
Option 2	N/A	N/A
Option 3	1,799	20.9
Option 5	1,773	21.2
Option 7	1,781	21.1
Option 8	1,775	21.2
Option 9	1,756	21.4
Option 10	1,807	20.9
Option 11	1,803	20.7
Option 12	1,831	20.6
Option 18	1,761	21.4
Option 19	1,656	22.7
SATURDAY	Total Travel Hours	Average Vehicle Speed (mph)
Do-minimum	2,240	17.0
Option 1	N/A	N/A
Option 2	N/A	N/A
Option 3	2,324	16.4
Option 5	2,135	17.9
Option 7	2,289	16.6
Option 8	2,248	17.0
Option 9	2,204	17.4
Option 10	2,193	17.4
Option 11	2,141	17.9
Option 12	2,165	17.5
Option 18	2,145	17.8
Option 19	1,986	19.3
Option 20	N/A	N/A

Option 2 HGV Routing Model

4.8.4 This option was considered inappropriate for traffic modelling due to the relatively low traffic flow data and HGV flow data extracted from the 2012 Do-minimum model. Table 4 6 below shows the vehicle flows.

Table 4-6: HGV Option Test Result

Peak / Flow	Through Traffic - All Vehicles on A96	Through HGVs on A96	Through HGVs as % of all through Traffic	All Vehicles in Model Matrix	Through HGVs as % of All Vehicles in Model Matrix
AM west to east	174	23	13%	7765	0%
PM west to east	204	32	16%	7764	0%
Sat west to east	148	12	8%	9701	0%
AM east to west	181	40	22%	7765	1%
PM east to west	157	44	28%	7764	1%
Sat east to west	157	5	3%	9701	0%

4.8.5 Table 4-6 shows that through HGV traffic on the A96 represents a small percentage of the total volume of traffic using this route, and when compared to the total number of vehicles in the model matrix, represents an even smaller percentage of the vehicles present on the network. Testing this option with the traffic model would show very little overall difference from the do-minimum scenario.

Option 20 – A941 Railway Bridge Closure

4.8.6 Option 20 was not originally considered under the themes of Traffic Management or Link & Junction Improvements. It was added to the options to be tested in the model to quantify the impact of closure of the A941 Railway Bridge Crossing as the key crossing over the railway. It was clear from model simulations that closure of the railway-bridge would have a catastrophic impact on the road network across Elgin. Removing this critical link would place extreme pressure on other parts of the network. Indeed, in the model testing the impacts were so severe it was not possible to complete all iterations of the model assignment. It was therefore

recommended that this option be discounted from a full STAG part appraisal due to the severe adverse impact it would have on the remainder of the network.

Shortlist of Options for STAG Part 2 Appraisal

4.8.7 The interim review report presented to The Moray Council recommended that seven options be taken forward to the STAG Part 2 appraisal. A summary of the results for the seven options are outlined below in Table 4-7. The Table shows the impact of the seven options under the 3 peak periods tested in the model. Under each of the options it is evident that the total travel hours declines and the average speed on the network increases in all periods.

Table 4-7: Options for STAG Part 2 Appraisal

AM Peak		
	Total Travel Hours	**Average Vehicle Speed (mph)**
Do-minimum	1,385	23.1
Option 4 (A)	1,312	24.4
Option 6 (B)	1,338	24.0
Option 13 (C)	1,306	25.1
Option 14 (D)	1,293	25.4
Option 15 (E)	1,283	25.2
Option 16 (F)	1,322	24.4
Option 17 (G)	1,329	24.2
PM Peak		
	Total Travel Hours	**Average Vehicle Speed (mph)**
Do-minimum	1,782	21.1
Option 4 (A)	1,669	22.5
Option 6 (B)	1,732	21.8
Option 13 (C)	1,609	23.9
Option 14 (D)	1,605	24.0
Option 15 (E)	1,596	23.9
Option 16 (F)	1,621	23.2
Option 17 (G)	1,684	22.5
SATURDAY		
	Total Travel Hours	**Average Vehicle Speed (mph)**
Do-minimum	2,240	17.0
Option 4 (A)	1,987	19.3

Option 6 (B)	2,089	18.4
Option 13 (C)	1,922	20.4
Option 14 (D)	1,908	20.7
Option 15 (E)	1,932	20.1
Option 16 (F)	1,805	21.3
Option 17 (G)	1,882	20.5

Shortlist of Options for STAG Part 2 Appraisal

4.8.8 A brief description of the seven options (A to G) is presented below. A map/picture outlining the infrastructure changes produced by each option is also included.

Option A Wittet Drive Link

4.8.9 Option A (referred to as option 4 in Table 4.4). This option links Edgar Road to the A96 near Wittet Drive. The key features of this network are as follows and are shown in Figure 4-1.

- Extend Edgar Road to a new roundabout approximately 185m beyond the entrance to the primary school. This roundabout to provide access to zones 129 (South of Bilbohall Farm) and 130 (West of Hardhillock Avenue). These zones[6] relate to potential development sites.
- Create a new link from the roundabout to run northbound, parallel with The Wards. This new link would provide access to zones 129 (South of Bilbohall Farm) and 127 (Adjacent to Bilbohall Farm) to the West via priority junctions with ghost islands.
- A new railway bridge to be constructed where the link crosses the rail line and a subsequent priority junction to be designed where this meets Wards Road, Wittet Drive and Fleurs Road.
- Wittet Drive to be diverted slightly west to join the A96 at a roundabout adjacent to Sheriffmill Road.
- The previous alignment of Wittet Drive to be stopped short of the A96 and signals to be replaced by new roundabout junction.

[6] These zones relate to development zones.

- Speed limit on new link to be set at 30mph.
- All links in this option are single carriageway and both roundabouts flare to two lane approaches on all arms from 15-20m back. Roundabouts have two lane circulation.

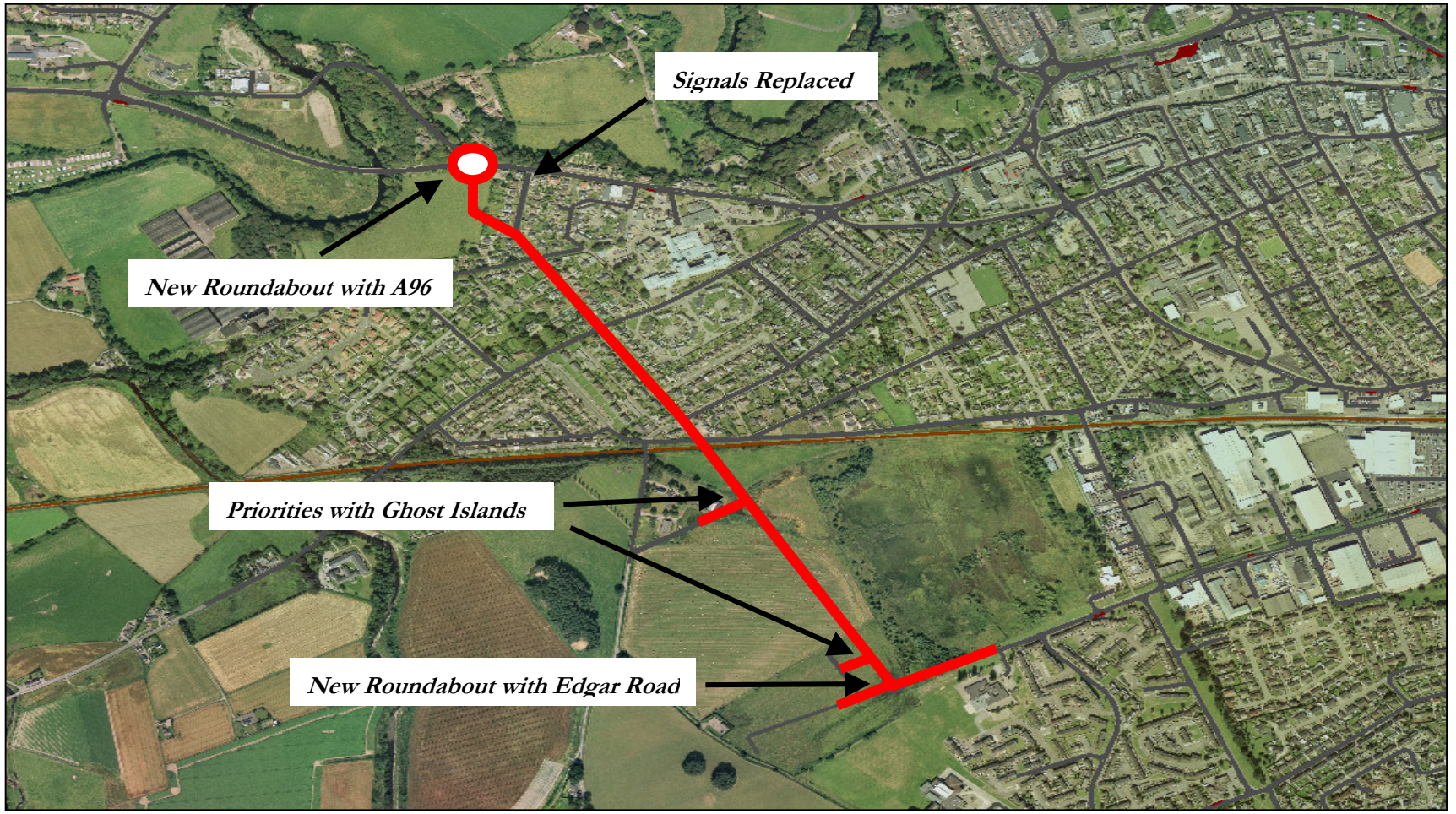


Figure 4-1: Layout of Option A – Wittet Drive Link

Option B – Morriston Road Link

4.8.10 Option B (referred to as option 6 in Table 4.4). This option links Edgar Road with the A96 at Morriston Road by partially following the alignment of the proposed Southern Bypass Route. The key features of this network are as follows and are shown in Figure 4-2

- Extend Edgar Road approximately 650m to the West of the primary school access. Link this extension with Pluscarden Road and on to the A96 at Morriston Road.
- Access to zones 129 (South of Bilbohall Farm) and 130 (West of Hardhillock Avenue) to be provided by priority junctions from Edgar Road extension.
- Access to zone 131 (West of Sheriffmuir Road) to be provided by priority junction approximately 60m South of the A96.
- A new roundabout to be constructed at the junction of the A96, Morriston Road and the new link.
- A new roundabout to be constructed at the junction of Pluscarden Road and the new link.
- Speed limit for new link to be set at 40mph.
- All links in this option are single carriageway and both roundabouts flare to two lane approaches from 15-20m back. The exception is the A96 approaches to the Morriston Road roundabout which have longer flares due to the existing infrastructure being utilised. Roundabouts have two lane circulation.

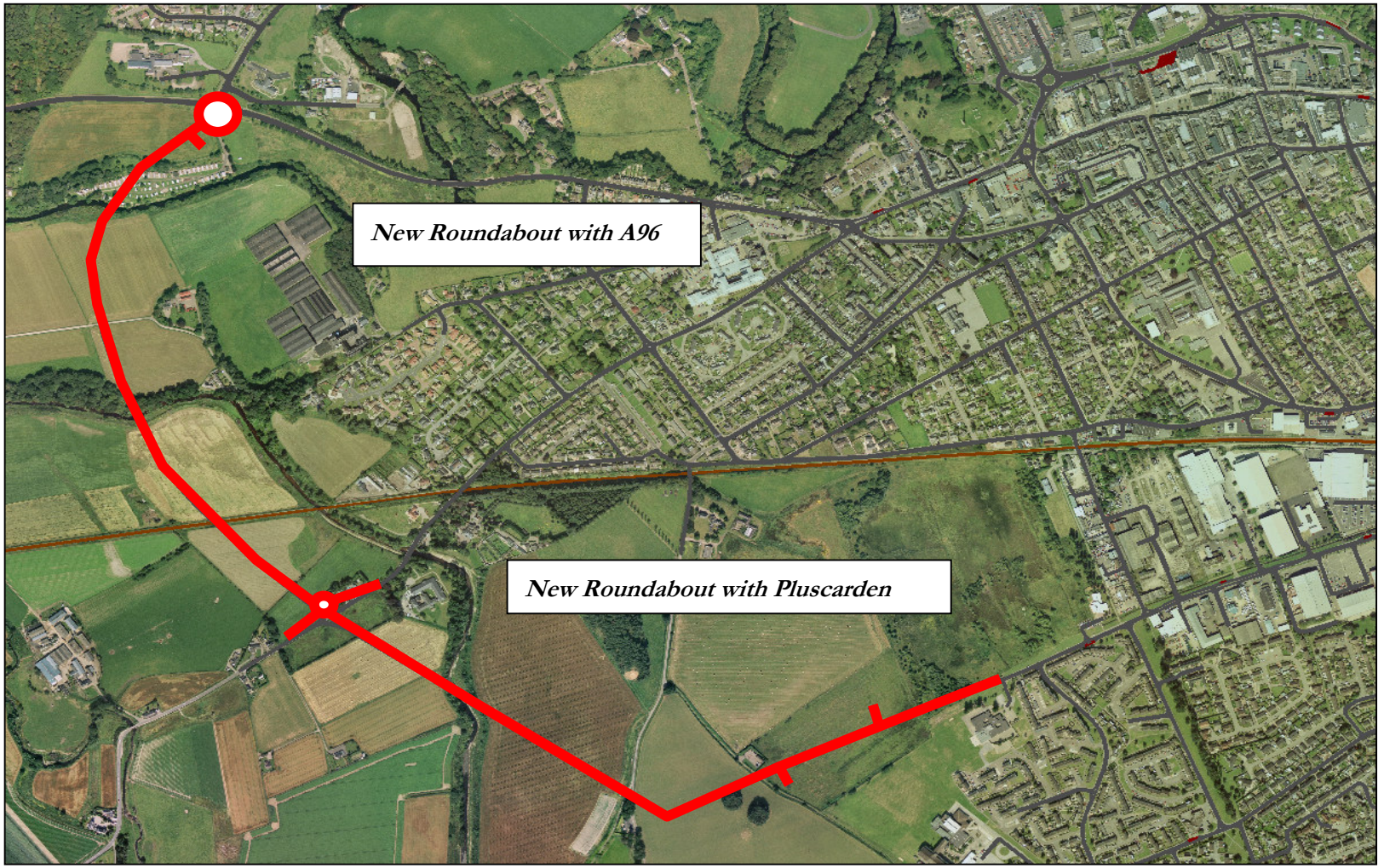


Figure 4-2: Layout of Option B - Morriston Road Link

Option C – Bypass North Alignment

4.8.11 Option C (referred to as option 13 in Table 4.4). This option implements a bypass to the North of Elgin with intersections at Duffus Road and the A941 North of Bishopmill. The key features of this network are as follows and are shown in Figure 4-3

- New roundabout on A96 West of Elgin to allow traffic to access bypass.
- No connection at crossing of Brumley Brae.
- New roundabout at Duffus Road to allow access to bypass in both directions.
- No connection at crossing of Covesea Road.
- New roundabout at A941 North of Bishopmill to allow access to bypass in both directions.
- No connection at crossing of Linksfield Road.
- No connection at crossing of Pitcaveny Road.
- No connection at crossing of Calcots Road.
- New roundabout on A96 East of Elgin to allow traffic to access bypass.
- Bypass modelled as a single 3.5m lane in each direction.
- Roundabouts modelled with two lane flares of 25-30m on all approaches

Figure 4-3: Layout of Option C – Bypass North Alignment

Option D – Bypass South Alignment (Short)

4.8.12 Option D (referred to as option 14 in Table 4.4). This option implements a bypass to the South of Elgin with intersections at the A941 south of Elgin, the Edgar Road extension and the A96 at Morriston Road. The key features of this option are as follows and are shown in Figure 4-4.

- New roundabout on A96 West of Elgin at junction with Morriston Road to allow traffic to access bypass.
- No connection at crossing of Pluscarden Road.
- New roundabout at Edgar Road extension to allow access to bypass in both directions.
- New roundabout at A941 South of Elgin to allow access to bypass in both directions.
- No connection at crossing of Linkwood Road.
- New roundabout on A96 East of Elgin to allow traffic to access bypass and Business Park.
- Bypass modelled as a single 3.5m lane in each direction.
- Roundabouts modelled with two lane flares of 25-30m on most approaches.

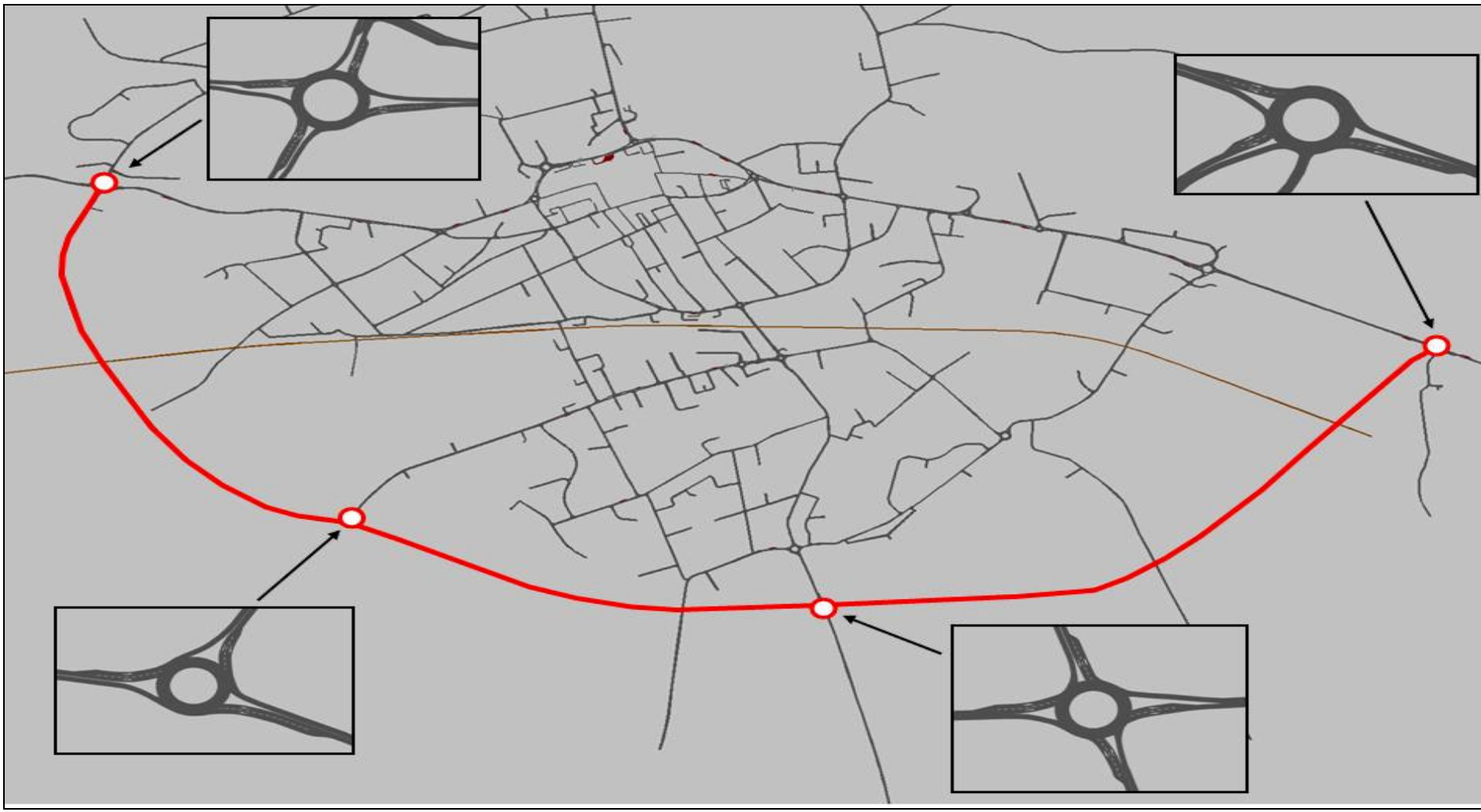


Figure 4-4: Layout of Option D – Bypass South Alignment (short)

Option E – Bypass South Alignment (long)

4.8.13 Option E (referred to as option 15 in Table 4.4). This option implements a bypass to the South of Elgin with intersections at the A941 south of Elgin, the Edgar Road extension and the A96 to the East and West of Elgin. This network differs from option D since there is no connection to Morriston Road, the A96 connection is a further 2.5km to the West. The key features of this network are as follows and are shown in Figure 4-5

- New roundabout on A96 West of Elgin 2.5km West of Morriston Road to allow traffic to access bypass.
- No connection at crossing of Pluscarden Road.
- New roundabout at Edgar Road extension to allow access to bypass in both directions.
- New roundabout at A941 south of Elgin to allow access to bypass in both directions.
- No connection at crossing of Linkwood Road.
- New roundabout on A96 east of Elgin to allow traffic to access bypass and Business Park.
- Bypass modelled as a single 3.5m lane in each direction.
- Roundabouts modelled with two lane flares of 25-30m on most approaches

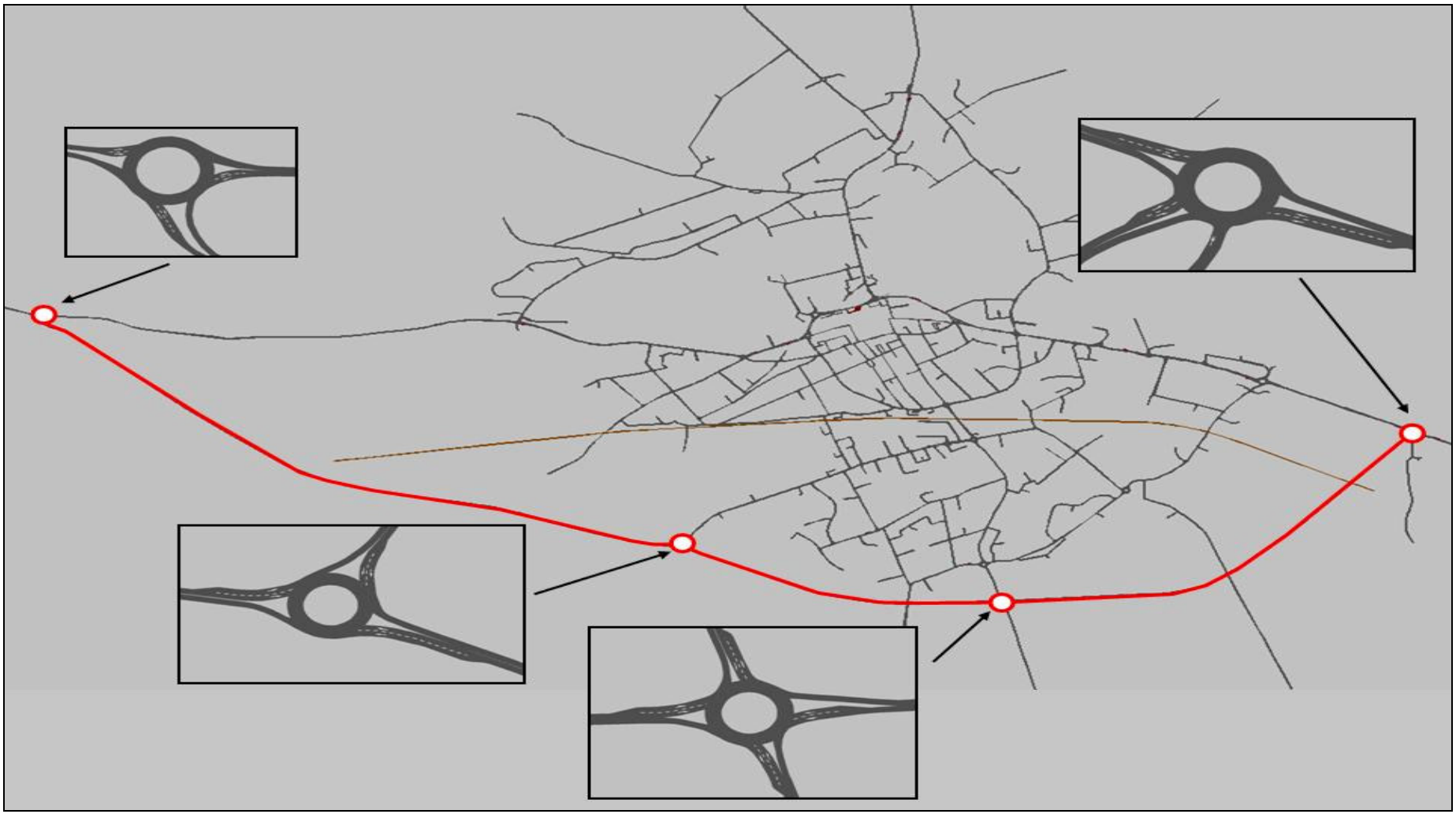


Figure 4-5: Layout of Option E Bypass South Alignment (long)

Option F - Southern Distributor Route + Wittet Drive Link

4.8.14 Option F (referred to as option 16 in Table 4.4). This option essentially combines the Option 4 link road with upgrading a route following Reiket Lane through to Glen Moray Drive to form a southern distributor route. The key features of this network are shown in Figure 4-6 and are as follows:

- Option A as described previously
- Extend Edgar Road to a new roundabout
- Create a new link from the roundabout to run Northbound, parallel with The Wards.
- A new railway bridge to be constructed where the link crosses the rail line and a subsequent priority junction to be designed where this meets Wards Road, Wittet Drive and Fleurs Road.
- The previous alignment of Wittet Drive to be stopped short of the A96 and signals to be removed.
- Speed limit on new link to be set at 30mph.
- All links in this option are single carriageway and both roundabouts flare to two lane approaches on all arms from 15-20m back. Roundabouts have two lane circulation.

And

- Upgrade Sandy Road from Birnie Road to Springfield Road
- Introduction of 3 new roundabouts and link improvements on Sandy Road and Glen Moray Drive
- Upgrade Glen Moray Drive from Springfield Road to Edgar Road.

Figure 4-6: Layout for Option F - Southern Distributor Route + Wittet Drive Link

Option G - Southern Distributor Route + Morriston Road Link

4.8.15 Option G (referred to as option 17 in Table 4.4). This option combines Option B with upgrading a route following Reiket Lane through to Glen Moray Drive to form a Southern distributor route. The key features of this network are shown in Figure 4-7and are as follows:

- Extend Edgar Road West of the primary school access. Link this extension with Pluscarden Road and on to the A96 at Morriston Road.
- Access to zones 129 (South of Bilbohall Farm) and 130 (West of Hardhillock Avenue) to be provided by priority junctions from Edgar Road extension.
- Access to zone 131 (West of Sheriffmuir Rd) to be provided by priority junction approximately 60m South of the A96.
- A new roundabout to be constructed at the junction of the A96, Morriston Road and the new link.
- A roundabout for the junction of Pluscarden Road and the new link.
- Speed limit for new link to be set at 40mph.
- All links in this option are single carriageway and both roundabouts flare to two lane approaches from 15-20m back. The exceptions are the A96 approaches to the Morriston Road.

And

- Introduction of 3 new roundabouts and link improvements on Sandy Road and Glen Moray Drive
- Upgrade Sandy Road from Birnie Road to Springfield Road
- Upgrade Glen Moray Drive from Springfield Road to Edgar Road.

Figure 4-7: Layout of Option G - Southern Distributor Route + Morriston Road Link

5 STAG Part 2 Appraisal

5.1 ***STAG Part 2 Appraisal***

5.1.1 It is the purpose of the remainder of this Report to document the outcome of the detailed STAG Part 2 Appraisal and to look at the performance of the seven options that "passed" the STAG Part 1 appraisal (A to G) against the government's five objectives for transport, namely:

- Environment
- Safety
- Accessibility and Social Inclusion
- Integration
- Economy

5.1.2 The report also documents findings under the headings of:

- Cost to Government;
- Risk and Uncertainty;

5.1.3 The remainder of this chapter follows the structure set out above, firstly setting out the performance of the scheme options against the five government objectives for transport and then reporting the study findings in terms of Cost to Government and Risk and Uncertainty. In contrast to the STAG Part 1 appraisal, this section provides the results of a more detailed and, where possible, quantitative analysis of the impacts.

5.2 ***Environment***

5.2.1 A full Environmental Appraisal has been carried out in accordance with STAG guidance. This assessed the impacts of the seven options on the local environment. A summary of the main environmental issues is provided below. These are taken from the full Environmental Appraisal Report which provides a more detailed commentary of the impacts. It is important to note that the environmental appraisal considers the likely environmental impacts that will occur during the construction and operation of the proposed route options.

5.2.2 Both qualitative and quantitative assessment methods have been used where appropriate and the assessment has focused on those significant impacts that arise as a result of the proposals.

5.2.3 Consultation has been undertaken with a range of Statutory and Non-Statutory agencies including the Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SNH), the Scottish Executive Environment and Rural Affairs Department, the Health and Safety Executive, Historic Scotland and Moray Council's Planning and Development Department.

Principles of Assessing Impacts for STAG

5.2.4 STAG guidance highlights the importance of considering a combination of environmental impacts.

- Direct Impacts – arise as a result of the proposal itself (e.g. – land take to construct new transport infrastructure);
- Indirect Impacts – arise from effects that are associated with measures that are required to accommodate a proposal (e.g. – land take for planting which is required in order to screen a development);
- Secondary/Induced Impacts – arise as a result of a development induced by the proposal;
- Short, Medium, or Long Term Impacts – the duration of effects, with less than a year representing short term, and over 5 years representing long term;
- Permanent or Temporary Impacts – given mitigation measures, is a change reversible or not;
- Positive or Negative Impacts – are the effects beneficial or detrimental to the environmental; resources and receptors;
- Cumulative Impacts – arise as a result of a number of effects; and
- Synergistic Impacts – where the cumulative impact of the combined impact of several proposals exceeds the sum of their individual effects.

5.2.5 The fundamental principles for planners are that they should concentrate on significant impacts and that both qualitative and quantitative measures should be used to determine significance, provided that these measures are understandable and robust. The sub-objectives against which proposals are appraised are as follows:

- Noise and vibration;
- Air quality - (CO_2, PM_{10}, NO_2);
- Water quality, drainage and flood defence;
- Geological features;

- Biodiversity;
- Visual amenity;
- Agriculture and soils;
- Cultural heritage;
- Landscape.

5.2.6 A full assessment of environmental impacts was carried out for each of the environmental categories identified above. A summary of the impacts is set out in the remainder of this section.

5.2.7 Once the magnitudes of impacts are identified, impacts are evaluated so that their significance can be determined. Significance is recorded in the Appraisal Summary Table using a seven point scale:

- No impact;
- Minor impact (positive/negative);
- Moderate impact (positive/negative);
- Major impact (positive/negative).

5.2.8 The focus of the following sections is to highlight the main differences between the options considered.

5.3 ***Air Quality***

5.3.1 Several air pollutants can cause specific local problems if they occur at high concentrations. Substances that potentially have impacts on human health, flora and fauna include CO, volatile organic compounds (VOCs), NO_2, and PM_{10} (particulate matter). At very short distances, heavy metals (e.g. lead and cadmium) may also be significant. Pollutant concentrations exceeding ambient air quality standards are normally only measured directly adjacent to roads and airports. The key pollutants to be considered in STAG are NO_2 and PM_{10} (of primary concern in terms of health), which together are taken to account for local air quality.

5.3.2 Local air quality may occasionally be affected during the construction period, however, this will be minimised by adopting and monitoring recognised 'best practice methods'. From an air quality perspective the alternative option impacts are shown in Table 5-1.

Table 5-1: Air Quality Impacts

	NO_2	PM_{10}	CO_2
Option A	Minor Negative	Minor Negative	Neutral
Option B	Minor Positive	Minor Positive	Moderate Positive
Option C	Minor Positive	Minor Negative	Moderate Positive
Option D	Minor Negative	Minor Negative	Neutral
Option E	Minor Negative	Minor Negative	Neutral
Option F	Minor Positive	Minor Positive	Moderate Positive
Option G	Minor Positive	Neutral	Moderate Positive

5.4 ***Cultural Heritage***

5.4.1 Transport schemes also have the potential to impact on the built environment of cities, towns and villages, which may contain historic buildings and conservation areas. Potential impacts of transport on the historic environment include:

- Physical impacts on buildings or on sites of archaeological interest or potential;
- Increased visual intrusion;
- Increases in noise, vibration, disturbance;
- Severance from other linked features;
- Changes in original landscapes and settings;
- Loss of amenity;
- Changes in conservation factors e.g. dewatering.

5.4.2 The baseline cultural heritage and archaeology for the Elgin area was established through a site visit by Halcrow Group Ltd on 21 March 2007, and a desk based study including the use of the Historic Scotland Pastmap resource, and an online GIS system which shows information of archaeological interest. Within the wider Elgin area the current cultural heritage baseline situation can be set out as follows:

- Listed Buildings (Category A – Cs) – c.348
- Scheduled Ancient Monuments – 6

5.4.3 There are also a significant number of Scottish Sites and Monuments, and National Monuments Record of Scotland Sites located within the Elgin area. Within the

centre of Elgin there is a Conservation Area, however this is located approximately 800m east of the closest proposed option and is therefore unlikely to suffer any direct impacts as a result.

Option A Wittet Drive Link

5.4.4 There are four Scottish Sites and Monuments Records (SMR) located within 300m of the Wittet Drive option, one of which is located directly upon the site of the proposed route. The feature located directly upon the route is a site of possible ring-ditches, thought to be dating from the Iron Age. There is likely to be a major adverse impact upon this site given that it is located directly upon the line of the route. There is one Category B Listed Building that is located within 50m of the route. Given the medium value of this resource it is likely to suffer moderate to major adverse impacts if no mitigation is put in place. There are also Category A and C Listed buildings within 300m of the route, although these features are unlikely to suffer significant impacts as a result of this option. There are no Scheduled Ancient Monuments (SAMs) within 300m of the Wittet Drive road corridor.

Option B - Morriston Road Link

5.4.5 There are seven SMRs located within 300m of the Morriston Drive option, but none of them are located directly upon the site the route is proposed to take. The only SMR feature that is likely to suffer major effects will be Haughland which may be of archaeological significance. The highest value resource near this route option is the Category B Listed Grove Residential Home (Medium value), which is likely to suffer minor adverse effects. There are no Scheduled Ancient Monuments (SAMs) within 300m.

Option C Bypass North Alignment

5.4.6 A number of SMRs are located directly upon the proposed route. This includes Maryfield, Wester Calcots Cropmarks, Wester Calcots Barrow and Kirkhill Cropmarks. These sites are all listed as having possible archaeological significance with features such as cropmarks and ring-ditches recorded. There are 24 National Monument Record of Scotland sites located within 300m of this option; none of them are located on the exact route chosen. Twelve sites are located within 50m of the proposed route. These are likely to suffer major impacts if this option is implemented with no mitigation. However, higher value cultural heritage features are located far enough away from the route and are likely to only suffer minor

impacts, or no impacts at all. There are no Scheduled Ancient Monuments (SAMs) within 300m.

Option D Bypass South Alignment (Short)

5.4.7 This route option impacts upon a number of cultural heritage features in the area with some located directly upon the proposed bypass route. The most significant impacts will be upon SMR sites that are located directly on the proposed route. This includes; Miltonduff, New Elgin, Birkenhill, Linkwood, Broom Bank and Barmuckity. The impacts will depend on the value of each resource. There are no Scheduled Ancient Monuments (SAMs) within 300m. The most significant resources impacted by this route will be the Category B Listed Grove Residential Home Building (LB13), and four medium value National Monument Record of Scotland sites that are located within 50m of this route option.

Option E Bypass South Alignment (long)

5.4.8 This option is similar in direction to the short bypass (Option D), however it departs from the A96 further to the west, and rejoins the A96 approximately 300m further west. Many of the cultural heritage receptors impacted will be the same as above, however there will be some differences to features impacted, and the severity of impacts. The highest value resources lying within 100m of this route corridor are six NMRS sites; Glassgreen Ring Ditch, Remains of Pittendreich Mill, Easter Pittendreich Farmhouse, Mayne Farm House, Mayne House Gardeners Cottage, Mayne House Buildings and Barmuckity Cropmarks. The closest Listed Building lies over 100m away and will therefore only be subject to moderate adverse impacts. The route passes through nine SMR sites that lie directly upon the route section; some of these may be of archaeological significance. There are no Scheduled Ancient Monuments (SAMs) within 300m.

Option F Southern Distributor Route + Wittet Drive Link

5.4.9 A significant part of this option has been analysed above in Option A. Therefore this section will focus upon the southern distributor road which begins on Reiket Lane through to the junction with the A96 to the East side of Elgin. Other than those listed within Option A there are no further Listed Buildings within 300m of the southern distributor route. The closest National Monument Record of Scotland site to this option is located between 101-200m from the proposed option. It is unlikely that there will be any adverse impacts; any that do occur are likely to be minor. There are six SMR sites, in addition to the four identified in

Option 4, that are located within 300m of the southern distributor option; Glassgreen, New Elgin, Reiketlaine, Linkwood Distillery, Elgin/Waukmill/Barmuckity and Glassgreen. The highest value resource to be impacted through this option will be a Category B Listed Building, which is likely to suffer major adverse impacts with the upgrading of Wittet Drive. This is the only resource of medium or higher value which is likely to suffer major adverse impacts. There are no Scheduled Ancient Monuments (SAMs) within 300m.

Option G Southern Distributor Route + Morriston Road Link

5.4.10 The first section of this option has been analysed above in Option B. This section is therefore a summary of the information from these two sections. The only Listed Building that is within the 300m boundary of Option 17 is the Category B Listed Grove Residential Home which is located 110m to the east of the route. There are 14 NMRS located within 300m of this route corridor; none are located within 100m of the route. There are 13 SMR sites within the route boundary with four lying on, or directly adjacent to the proposed road. Even though these are classed as a low value resources, it is likely that these sites will suffer major adverse affects if no mitigation is undertaken. There are no Scheduled Ancient Monuments (SAMs) within 300m.

Cultural Heritage Summary

5.4.11 There are a variety of mitigation measures that can be implemented to minimise the adverse cultural heritage impacts of each option. Mitigation measures are outlined in full in the Environmental Report that accompanies this STAG Part 2 Appraisal. From a cultural heritage perspective the alternative option impacts are summarised in Table 5-2 below.

Table 5-2: Cultural Heritage Impacts

	Cultural Heritage Impacts
Option A	Neutral to Minor Negative
Option B	Minor Positive
Option C	Minor Negative
Option D	Minor to Moderate Negative
Option E	Minor Negative
Option F	Neutral to Minor Negative
Option G	Minor Positive

5.5 ***Nature Conservation – Biodiversity***

5.5.1 Biodiversity, the richness of species, ecosystems and habitats, is now recognised as a key issue that underpins policy making in many countries. The development of transport infrastructure has a number of potential effects on biodiversity, including:

- Direct damage to important nature conservation sites or the habitats of protected species;
- Fragmentation or loss of habitats, thereby reducing species diversity and opening the way for the influx of other species;
- Creation of barriers to the movement and genetic interchange between populations;
- Disturbance of habitats and species due to factors such as noise, light pollution and contaminated run-off which may depress populations and reproduction in some flora and fauna.

5.5.2 The alternative option impacts are outlined below and summarised in Table 5-3

Option A - Wittet Drive Link

5.5.3 One designated site (The Wards Wildlife site) is likely to experience adverse impacts from this option. However, given the value and the location of the site in relation to the proposed route following mitigation it is likely that the impact will be neutral to minor negative.

Option B - Morriston Road Link

5.5.4 The Wards Wildlife Site is 750m from this option. Although impacting on the River Lossie, it is likely following mitigation that there will be neutral impacts upon the local biodiversity.

Option C Bypass North Alignment

5.5.5 There are a large number of biodiversity resources located along this route including Quarry Wood Ancient Woodland and a number of Sites of Special Scientific Interest. These are likely to be directly impacted by the proposed route. Given the proximity and the value of these resources, following mitigation it is likely that there will be moderate to major adverse impacts upon biodiversity in the area.

Option D Bypass South Alignment (Short)

5.5.6 The Mayne Wood Ancient Woodland suffers direct impacts as a result of this route and is one of eight sites impacted by this option. However it is the only site within 250m, mitigation measures are likely to reduce impacts to the minor negative scale.

Option E Bypass South Alignment (long)

5.5.7 The Mayne Wood and Quarry Wood Ancient Woodlands suffer direct impacts as a result of this route option. A number of other designated sites lie within 300m. There are likely to be moderate negative impacts as a result of this option following the implementation of mitigation measures.

Option F - Southern Distributor Route + Wittet Drive Link

5.5.8 The Wards Wildlife Site and Dunkinty Ancient Woodland will both be impacted given their close proximity to the proposed option. It is likely that following mitigation there will be minor negative impacts on biodiversity from this option.

Option G Southern Distributor Route + Morriston Road Link

5.5.9 Dunkinty Woodland is a high value resource that will be directly impacted by the proposed option. The Wards Wildlife Site and River Lossie are also biodiversity features located near this option. Following the implementation of recommended mitigation measures it is likely that there will be a minor negative impact upon the local biodiversity.

Table 5-3: Biodiversity Impacts

	Biodiversity Impacts
Option A	Neutral to Minor Negative
Option B	Neutral
Option C	Moderate to Major Negative
Option D	Minor Negative
Option E	Moderate Negative
Option F	Minor Negative
Option G	Minor Negative

5.6 ***Landscape and Visual Amenity***

5.6.1 The visual appearance of transport infrastructure (both the infrastructure itself and the traffic it carries) can have a major impact on the existing landscape. When improving the physical infrastructure impacts on sensitive visual (cultural and natural) elements and patterns, which are important at the small scale, cannot always be avoided and are easily damaged or fragmented. Changes to elements which are fundamental to the character of the landscape, such as the removal of field boundaries or vegetation or the introduction of alien materials, can affect the sense of place. Inappropriate routing may also conflict with the natural grain of the land. Physical infrastructure changes can also impact on the built environment and townscape character.

5.6.2 The appraisal below was undertaken with reference to the Guidelines for Landscape and Visual Impact Assessment 2nd edition - published in 2002 by The Landscape Institute and the Institute of Environmental Management and Assessment.

Landscape Character

5.6.3 The Elgin area is covered under the Moray and Nairn Landscape Character Assessment produced by Turnbull Jeffrey Partnership [1998] as part of the National Programme of Landscape Character Assessment. The broad landscape of the Elgin area (5km radius of town) has a designated character type of "Coastal Plain". This is described within the Character Assessment document as "flat to gently undulating, large-scale plain, usually rising to no more than 100m, borders the coast and narrows towards the east. Small rolling hills and valleys mark the transition between the Coastal Plain and the Uplands Landscape Character Type".

5.6.4 The significance of landscape impacts is calculated by combining the sensitivity of the landscape receptor with the likely magnitude of the landscape impact. A sensitivity has been allocated to each landscape receptor, depending on whether it is of local, regional or national importance. The magnitude of the impact is based on the extent of likely engineering requirements for the highway proposals (number of river and railway crossings, length of link and the extent to which the link is rural or urban). Table 5-4 below summarises the significance of impacts prior to mitigation.

Table 5-4: Landscape

	Landscape
Option A	Neutral
Option B	Minor Negative
Option C	Minor Negative
Option D	Minor Negative
Option E	Moderate Negative
Option F	Neutral
Option G	Minor Negative

Visual Amenity

5.6.5 The significance of visual impacts is discussed below with Table 5-5 presenting the significance of visual impacts prior to any mitigation measures.

Table 5-5: Visual Amenity

	Visual Amenity
Option A	Neutral
Option B	Minor Negative
Option C	Minor Negative
Option D	Moderate Negative
Option E	Moderate Negative
Option F	Neutral
Option G	Minor Negative

Option A – Wittet Drive Link

5.6.6 Wittet Drive and Edgar Road properties and the adjacent primary school currently experience views of a highway, sensitivity to change is therefore likely to be low. Newer residential developments will be more sensitive to change and the introduction of a through route. Bilbohall Farm has had a recent introduction of residential development to the north and east and therefore will have a low sensitivity to further change. Users of The Wards will experience only a minor impact due to the site currently being bound on 3 sides by development and access routes.

Option B - Morriston Road Link

5.6.7 Residential properties and significant structures over 100m from the proposed route will experience negative impacts of minor significance. Greenacre is significantly closer. Any structures required to cross the rivers or railway are likely to be over 200m away from residential properties. Users of The Wards will experience only a minor impact due to the site currently being bound on 3 sides by development and access routes. The Grove listed building is a sensitive feature and its setting will be impacted. However, the B9010 currently runs past this building although it is likely that a bridge structure would be required for the new highway to cross the River Lossie near this location. Riverside Caravan Park is located on an undulating site next to the River Lossie. The likelihood of large embankments/cuttings and bridge structures near the caravan park is high and would constitute a major impact to this receptor.

Option C Bypass North Alignment

5.6.8 Residential properties and significant structures over 100m from the proposed route will experience negative impacts of minor significance. Muirs of Linksfield and Kirkhill Cottages may be closer to the route than 100m so may experience moderate visual impacts. Users of the Oak Wood trails will only experience minor impacts given the restriction on views through the wood. Users of the cycleway adjacent to the A941 will only experience minor impacts due to the existing road and power infrastructure in the area. The listed St Andrew's Church is located within a tranquil setting and is afforded some existing screening. The proposed road alignment will introduce a new visual element within the setting of this building and may constitute a major visual impact. Spynie Hospital is over 200m south of the proposed route and currently experiences views of high voltage power lines and towers. Views from the hospital will be less sensitive to change due to this existing infrastructure.

Option D Bypass South Alignment (Short)

5.6.9 Residential properties and significant structures over 100m from the proposed route will experience negative impacts of moderate significance. Greenacre is significantly closer, as are Barmuckity Cottages. Properties looking south west on Hardhillock Avenue will have a moderate impact to views as they currently look towards Mayne Wood over farmland, the route will be introduced to this view. The properties overlooking the golf course at Fairway Avenue will have a major visual impact due to the proposals. Any structures required to cross rivers or

railway lines are likely to be over 200m away from residential properties. Views from the path along the Burn of Linkwood will be subject to a major impact due to the need for felling the riverbank, mature planting and the construction of a bridge over the burn. Users of Elgin Golf Course will be subject to moderate impacts while the users of the clubhouse will be subject to minor impacts.

Option E Bypass South Alignment (long)

5.6.10 Residential properties and significant structures over 100m from the proposed route will experience negative impacts of minor significance. Aldroughty Cottages are adjacent to the proposed route and will have immediate views along the length of the route. It is likely that there will be a need for a significant elevated section over the 3 river crossings and railway towards the west end of this route. However there are few residential properties within this vicinity. The renovated Pittendreich Mill will be immediately adjacent to the proposed route and a bridge structure, and will have immediate views along the length of the route. Mayne Farm is adjacent to the proposed route and will have immediate views along the length of the route. The properties overlooking the golf course at Fairway Avenue will have a major visual impact due to the proposals. The introduction of the route would have a minor impact on all listed structures within the vicinity.

Option F Southern Distributor Route + Wittet Drive Link

5.6.11 Option F impacts are broadly similar to those outlined for Option A. All receptors along the Southern Distributor route option currently experience views of a highway and associated traffic uses. There may be minor impacts associated with the development proposals and any associated traffic management systems or highway upgrades. The Magic Roundabout Childcare Centre at Thornhill Rd currently experiences views of a highway and views associated with traffic uses on Thornhill Road.

Option G Southern Distributor Route + Morriston Road Link

5.6.12 Option G impacts are broadly similar to those outlined for Option B. All receptors along the Southern Distributor route option currently experience views of the highway and associated traffic uses. There may be minor impacts associated with the development proposals and any associated traffic management systems or highway upgrades. The Magic Roundabout Childcare Centre at Thornhill Rd currently experiences views of a highway and views associated with traffic uses on Thornhill Road.

5.7 ***Noise and Vibration***

5.7.1 This section considers the likely impacts resulting from road traffic noise during the operation of the proposed route options upon the surrounding area.

5.7.2 The number of residential properties and other noise sensitive receptors in the 0-100m, 100-200m and 200-300m bands around each route option has been estimated in accordance with Design Manual Roads and Bridges (DMRB Volume 11 Section 3 Part 7, 1994) Stage 2.

5.7.3 Road traffic noise level calculations have been carried out at notional receptors located 10m from the edge of carriageway for the existing situation, the do-minimum strategy and each route option. These calculations have been conducted using the method contained within the Calculation of Road Traffic Noise (CRTN) for the opening year 2012 in the absence of the traffic data for the 15th year after opening at the present. The calculations for the existing situation have used 2006 base year traffic flows. A number of key assumptions have been made in the calculations:

- Free-field;
- No screening;
- Impervious bituminous road surface; and
- No correction for road gradient.

5.7.4 The results of the noise calculations are summarised below in Table 5-6.

Table 5-6: Noise and Vibration Impacts

	Noise and Vibration Impacts
Option A	Moderate Negative
Option B	Moderate Negative
Option C	Major Negative
Option D	Major Negative
Option E	Major Negative
Option F	Moderate Negative
Option G	Moderate Negative

5.7.5 The information gathered by a Stage 2 assessment is not sufficiently detailed to specify mitigation measures. However, there are a number of mitigation measures available that could be considered for each option as route designs develop. These measures would include: roadside noise barriers, low noise surfacing or speed restrictions.

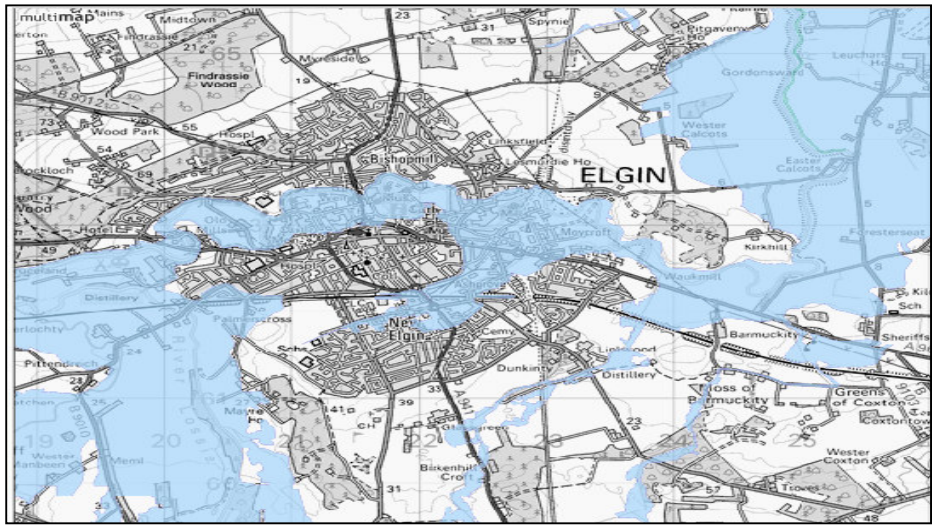
5.8 ***Water Quality***

5.8.1 Water quality is of critical importance to people, biodiversity, agriculture and recreation. The development and operation of new transport infrastructure has the potential to have a significant effect on water quality, for example through entrainment of sediments during construction or runoff containing pollutants once the proposal is in operation. New structures may affect the capacity of flood plains or flood defences. EC Directive 2000/60/EC, the Water Framework Directive, is now implemented in Scotland. This stipulates future water protection mechanisms and quality criteria. Specific impacts may include:

- Direct physical impact on the alignment of a watercourse
- Change in fisheries or conservation value
- Impact on surface water quality and its classification
- Impact on the groundwater classification
- Affect on floodplain capacity

5.8.2 The baseline situation of the water environment for the Elgin area was established through a site visit by Halcrow Group Ltd on 21 March 2007, a desk based study and a review of SEPAs online data. Figure 5 1 illustrates areas estimated by SEPA to be at risk of flooding from rivers and watercourses in the study area.

Figure 5-1: Flood Risk Areas



5.8.3 The need to cross watercourses will lead to potential impacts on the water quality and the hydrodynamics of these resources. The more construction activity within the vicinity of watercourses means a greater risk of contamination and pollution. As a result of crossing these watercourses with a highway there may also be a requirement to realign or culvert sections of water, this will alter the natural flow of water and may alter the morphology of riverbeds and riverbanks. Table 5-7 below indicates the implications of each of the road options in relation to the main water resources.

Table 5-7: Impacts of Options on Water Resource

		No. of watercourse crossings	Approx % within floodplain	Ground water impact
A	Wittet Drive	0	15%	Low
B	Morrison Road	3	68%	Medium
C	Bypass north	5	8%	High
D	Bypass south short	5	33%	High
E	Bypass south long	7	37%	High
F	Wittet Drive/Distributor	1	15%	Low
G	Morrison Road Distributor	3	30%	Medium

Summary - Water Quality

5.8.4 From a water quality perspective the alternative option impacts are shown in Table 5-8.

Table 5-8: Water Quality

	Water Quality Impacts
Option A	Neutral
Option B	Minor Negative
Option C	Minor Negative
Option D	Moderate Negative
Option E	Moderate Negative
Option F	Neutral
Option G	Minor Negative

5.9 ***Geological Features***

5.9.1 The baseline situation of the geology for the Elgin area was established through a site visit by Halcrow Group Ltd on 21 March 2007, a desk based study and geological mapping. The British Geological Survey Groundwater Vulnerability map suggests that the study area has a highly permeable solid geology (consisting of a sandstone sub-strata) which is highly productive in supporting large abstractions. From a geological perspective the alternative option impacts are shown in Table 5-9.

Option A - Wittet Drive Link

5.9.2 Due to the location of this link it is unlikely that there will be any impacts upon any designated sites or other geological resources within the local area. There will therefore be an overall neutral impact, providing there are no impacts upon local contaminated land. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option B - Morriston Road Link

5.9.3 The closest geological resource to this link is the disused Hospital Quarry located within Quarry Wood 850m west of this option. Given the geographical removal of this site from the geological resources of the area it is likely there will be neutral impacts upon the geological resource, providing there are no impacts upon local

contaminated land. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option C Bypass North Alignment

5.9.4 The Northern Bypass option runs close to four highly valued Sites of Special Scientific Interest which are designated for geological importance. There are also a number of disused quarries in the vicinity of the route which will suffer adverse impacts as a result of this option. The overall impact is likely to be neutral to minor negative following mitigation as a result of future extraction potential, although this could change if contaminated land is discovered. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option D Bypass South Alignment (Short)

5.9.5 The disused Hospital Quarry is the closest geological feature to this option but it is not likely to suffer any adverse impacts given its geographical location in relation to the route. Given the geographical removal of this route from the geological resource it is likely there will be neutral to minor negative impacts as a result of future extraction potential, unless contaminated land is discovered. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option E Bypass South Alignment (long)

5.9.6 Although there are a number of low value resources near the western edge of this route impacts are likely to be neutral to minor negative upon the local geology of the region as a result of this option. No high value National designation will be impacted, although the magnitude of impacts could change if contaminated material is discovered along the route. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option F Southern Distributor Route + Wittet Drive Link

5.9.7 Due to the location of this link it is unlikely that there will be any impacts upon the local geology resulting in neutral impacts, providing there are no impacts upon local contaminated land. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Option G Southern Distributor Route + Morriston Road Link

5.9.8 Due to the location of this link it is unlikely that there will be any impacts upon any designated sites or other geological resources within the local area. There will therefore be an overall neutral impact, providing there are no impacts upon local contaminated land. Given that groundbreaking and spoil removal are temporary construction impacts it is unlikely there will be any residual impact as a result of these activities.

Table 5-9: Geological Features Impacts

	Geological Features
Option A	Neutral
Option B	Neutral
Option C	Neutral to Minor Negative
Option D	Neutral to Minor Negative
Option E	Neutral to Minor Negative
Option F	Neutral
Option G	Neutral

5.10 ***Agriculture and Soils (Land Use)***

5.10.1 The viability of agricultural farm holdings are likely to be impacted as a result of some of the options being considered. It is also likely that soils located near to construction will be impacted from run-off and any aerial deposition. Some of the routes that have been selected for appraisal are likely to require land-take from agricultural areas, with routes that move through built-up areas having limited impacts on Agriculture and Soils. From an agriculture and soils perspective the alternative option impacts are shown in Table 5 10.

Option A - Wittet Drive Link

5.10.2 Approximately 600m (41% of the route length) of this route runs through farmland. This equates to 7,380m2 of agricultural land that will be required for this option. There are five fields that are likely to be impacted as a result of Option A, with four of these appearing to be associated with Bilbohall Farm. From the route alignment selected, it is likely that direct land-take will be required, and that a number of fields will suffer severance. This option is also likely to impact upon Tyock Burn which runs from Bilbohall Farm east adjacent to Edgar Road.

Option B - Morriston Road Link

5.10.3 The Morriston Road option runs primarily through farmland on the Western edge of Elgin. The River Lossie and the main train line from Elgin to Inverness both cross the fields in this region as well as minor roads connecting outlying houses to the town itself. Approximately 2,440m (90.4%) of the route length runs through farmland. This option therefore requires approximately 30,012m2 of agricultural land. There are 14 fields that appear to be impacted by the Morriston Road Link, these fields are associated with a number of different farm holdings such as Braceland Farm and Bilbohall Farm. The severance of the smaller fields will mean that only a small area of land is left on either side of the road for farming purposes.

Option C Bypass North Alignment

5.10.4 The northern bypass route impacts upon a large amount of farmland to the North of Elgin and crosses the River Lossie to the East of the town. This option crosses several roads running to and from Elgin town centre, as well as crossing a cycle path running north from Elgin to Lossiemouth. The northern bypass option is 8000m in length, of which approximately 5,525m (69.1%) runs through farmland. This option therefore requires approximately 67,957. 5m2 of agricultural land. A total of 21 fields are likely to be impacted through land-take and severance along the route. Babtie Group prepared a 'Traffic in Elgin' document in 2003 and this made use of data supplied by the Macaulay Institute for Soil Research. In the report the northern route is listed as being 8.3km in length which is longer than the 8km currently proposed. However, given that the lengths are similar, and with no details of the specific route from the Babtie Report these figures will be used as a guide for this assessment. It is estimated that of the 5,525m 90% (4,972.5m) runs through Class 3.2 agricultural land (Medium Value) and 10% (552.5m) through Class 4.2 (Medium Value). Given the Medium Value of the resource, the land-take

and severance that would take place for this option it is likely to produce moderate negative impacts on the agriculture of the area.

Option D Bypass South Alignment (Short)

5.10.5 The southern bypass (short) option runs through a large amount of farmland. In addition to the impacts on farmland this option also runs through Elgin Golf Club, and crosses the River Lossie at three different points. The southern bypass option measures 7,050m in length, and approximately 5,850m (83%) runs directly through farmland. This option therefore requires approximately 71,955m2of agricultural land. Agricultural land likely to be impacted according to the Babtie report can be classified as follows: 45% Class 3.1 (2,632.5m); 48% Class 3.2 (2,808m); and 7% Class 4.1 (409.5m). In total 27 fields are likely to suffer severance and land-take if this Option is implemented. Taking into account the length of this Option there are also likely to be impacts on a number of field drains. The value of agricultural land in the area is medium to high value and therefore the impacts upon this land will be moderate to major negative. With 45% of the route running through 'Prime Quality Land' the impact that this Option would be felt on a national scale.

Option E Bypass South Alignment (long)

5.10.6 This option passes through a large area of farmland, and as with the short bypass it passes through Elgin Golf Club, and Crosses the River Lossie in three places. The total length of this route is approximately 8,550m, this being the longest option that is being appraised. Approximately 7,250m (86%) of the route runs through farmland and will require approximately 89,175m2 of land-take. The Southern Bypass (Long) Option will directly impact upon 32 fields which are associated with farm holdings to the South of Elgin. It is likely that many of these fields will be severed and that land-take will be required. The land classification for this farmland area has not been obtained for the agricultural land in this area; however, given the wide severance and land-take that is required and the value of the land along the shorter option, it is likely that there will be moderate to major negative impacts. These impacts could become more severe if the land is classified as a high value resource.

Option F Southern Distributor Route + Wittet Drive Link

5.10.7 The southern distributor route follows directly on from the Wittet Drive Link. It does not impact on any farmland other than that already discussed for Option 4. This option measures 4,650m in length, of which 600m (12.9%) passes directly

through farmland leading to an agricultural land take of approximately 7,380m2. There are five fields that are likely to be impacted as a result of Option 16 with four of these appearing to be associated with Bilbohall Farm. From the route alignment selected, it is likely that direct land-take will be required, and that all of these fields will suffer severance. The land that is situated directly adjacent to the southern distributor section of this route is likely to be impacted, however no severance will be undertaken, and it is unlikely that any permanent land-take will be required. This option is also likely to impact upon a field drain that is located in the southern area of the land which appears to be associated with Bilbohall Farm. The land classification for this farmland area has not been obtained for the agricultural land in this area; however, given the severance and land-take that is required along the Wittet Drive part of the route, it is likely that there will be a minor negative impact. This impact could become more severe if the land is classified as a high value resource.

Option G Southern Distributor Route + Morriston Road Link

5.10.8 The southern distributor route follows directly on from the Morriston Road Link; it does not impact on any farmland other than that already discussed for Option B. Option G measures 5900m and runs through 2440m of farmland, the same amount of farmland as Option B, which accounts for 41.4% of the route. The area of farmland that will be impacted is approximately 30,012 m2. There are 14 fields that appear to be impacted by Option G, these fields are associated with a number of different farm holdings. The severance of the smaller fields along the route will mean that only a small area of land is left on either side of the road for farming purposes. As with Option F the land that is situated directly adjacent to the southern distributor section of this route is likely to be impacted, however no severance will be undertaken. The agricultural land classification has not been obtained for these agricultural fields, however, given the number of fields and farm holdings that will experience land-take and severance; it is likely that there will be neutral to minor negative impacts. If the agricultural land is valued as a high resource it is likely that the magnitude of the impact will be more severe.

Table 5-10: Agriculture and Soils

	Agriculture and Soils Impacts
Option A	Neutral
Option B	Neutral to Minor Negative
Option C	Minor to Moderate Negative
Option D	Moderate Negative
Option E	Moderate Negative
Option F	Neutral
Option G	Neutral to Minor Negative

5.11 ***Safety***

5.11.1 The safety objective is defined as having two parts:

- Accidents and
- Security

5.11.2 The safety objective considers whether the proposal under consideration will have any impact on the number of transport related accidents and/or their severity.

5.11.3 The security sub-objective considers the perceived safety of all transport users as well as their vehicles, where appropriate.

5.12 ***Accidents***

5.12.1 Transport accidents impose a range of impacts on people and organisations, including:

- Medical and healthcare costs;
- Lost economic output;
- Pain, grief and suffering;
- Material damage;
- Police and fire service costs;
- Insurance administration; and
- Legal and court costs.

5.12.2 The total cost of accidents on a road network is calculated by multiplying the number of accidents predicted to occur on the network by the cost per accident. The cost per accident varies by type and area of road. The number of accidents on

a given length of road is expressed as an accident rate, defined as 'Personal Injury Accidents per million vehicle kilometres'. Increasing the length of, or traffic flow on, a road will, all else being equal, increase the number of accidents. Similarly, if the intervention causes a reduction in the number of vehicle-kms on one type of road but an increase for a second type of road, then the net impact on the number of accidents will depend upon the relative accident rates for the two types of road.

5.12.3 Standard processes exist for forecasting the numbers of accidents and casualties and the accident reduction benefits arising from changes to the road network. The techniques used to measure the change in the number of accidents (with differing degrees of severity) are based on established parameters. This approach has been adopted to appraise changes in accident costs for the seven options being considered for the Elgin area.

5.12.4 Annual vehicle kilometres during peak periods were considered in the do-minimum scenario and compared to each of the seven options being appraised. The estimated change in vehicle kilometres of vehicles on the highway is presented below in Table 5-11

5.12.5 The figures in Table 5 11 show marginal increases across the seven options, with the largest increase (+2.45%) accruing from the Northern Bypass route. As vehicles switch to alternative routes a counterbalancing effect occurs with accident rates falling on existing roads but increasing on new routes. Although this displacement of accidents can produce negative effects at the local level, at the aggregate level there is likely to be negligible impacts on the volume of accidents.

Table 5-11: Annual Vehicle KMs

	Existing Roads	**New Roads**	**All Roads**	**% Change from Do-Minimum**
Do-minimum	32,015,555		32,015,555	
Option A	31,485,012	532,221	32,017,233	0.01%
Option B	31,546,817	634,278	32,181,095	0.52%
Option C	29,008,246	3,792,171	32,800,417	2.45%
Option D	29,080,037	3,522,624	32,602,661	1.83%
Option E	27,943,516	4,666,295	32,609,811	1.86%
Option F	31,461,006	714,517	32,175,523	0.50%
Option G	31,481,413	755,295	32,236,708	0.69%

5.12.6 Although at the aggregate level little change will occur it is important to note some localised impacts. Options that promote increased traffic volume moving through Wittet Drive, Reiket Lane and Glen Moray Drive, which are largely residential areas, are likely to lead to an increase in accident rates within these areas.

5.12.7 Any concern however should also be set within a broader context with figures from Moray Council (Table 5-12) showing a relatively low number of recorded accidents (51) on Elgin's most used routes (A96 and A941) over the period 1999 to 2004 with the majority (85%) recorded as minor accidents.

Table 5-12: Accident Levels

	A96	A941	Total
Serious	5	3	8
Minor	14	29	43
Serious	5	3	8
Minor	14	29	43

5.12.8 Transport appraisal guidance also points to a decline in accident rates over-time with improvements to the material and design of the road infrastructure impacting positively on safety, lighting and passenger visibility on the road network. This will help reduce any negative impacts both at the aggregate and local level.

5.13 ***Security***

5.13.1 The security impacts of options have been considered in terms of the changes in security and changes to perceived security between the do-minimum scenario and the scheme options considered. This appraisal follows a qualitative approach to assess if the scheme options offer significant security benefits to particularly vulnerable sections of the community such as children, the elderly and women travelling alone.

5.13.2 As the seven options being appraised do not impact directly on improving public transport services there is likely to be minimal impact on the security of users of public transport. Improving the road network introduces improved materials, signage and lighting. This can impact positively on security. It is anticipated however, that security benefits will be marginal across the seven options and will not differ significantly from the do-minimum scenario.

5.13.3 Although at the aggregate level little change will occur it is important to note some localised impacts. Options that generate increased traffic volumes moving through

Wittet Drive, Reiket Lane and Glen Moray Drive, which are largely residential areas, are likely to impact adversely on local security for cyclists and pedestrian's moving through these areas.

5.14 ***HGV Impacts***

5.14.1 The volume of HGV traffic moving through Elgin was perceived, within the STAG Part 1 consultations, to be adversely impacting on community safety. An exclusive HGV route was identified as an option to reduce this concern. A number of factors limit the potential benefits of this option. Closer inspection shows that through HGV traffic on the A96 represents a small percentage of the total volume of traffic. Table 5-13 highlights the relative share of HGV traffic.

5.14.2 The HGV route option promoted HGV movement along Morriston Road, a predominantly residential area with on-street parking, and two schools (Elgin Academy and Bishopmill Primary). The creation of an exclusive HGV route would not have prohibited HGV movement on the A96 trunk road, with any re-routing advisory. A number of local firms attract HGV traffic into the centre of Elgin including a number of local distilleries and businesses located at the Edgar Road Retail Zone. Diverting HGV traffic, with relative ease, out of the centre of Elgin will help alleviate perceived safety concerns. However, rather than implement an exclusive HGV route the mitigation of local community safety concerns would be best served by improving traffic conditions for all vehicles moving in and around Elgin.

Table 5-13 HGV Traffic

Peak / Flow	Through Traffic - All Vehicles on A96	Through HGVs on A96	Through HGVs as % of Through Traffic	All Vehicles in Model Matrix	Through HGVs as % of All Vehicles in Model Matrix
AM West to East	174	23	13%	7765	0%
PM West to East	204	32	16%	7764	0%
Sat West to east	148	12	8%	9701	0%
AM East to West	181	40	22%	7765	1%
PM East to west	157	44	28%	7764	1%
Sat East to west	157	5	3%	9701	0%

Sat	East to west	157	5	3%	9701	0%

5.15 ***Accessibility and Social Inclusion***

5.15.1 Improving accessibility is one of the Government's five key policy objectives, identifying the extent to which proposals help people and businesses access goods, services, people and communities. The government objective of accessibility and social inclusion can be split into two areas:

- Community accessibility – access to work, education and training, health, and shopping.
- Comparative accessibility – distribution of impacts by social groups relative to the population as a whole, and social impacts by location.

5.15.2 The creation of an effective transport network that promotes efficient local and regional movements is a critical factor for the competitive performance of the Moray economy. This is especially important within Elgin, which is the principal administrative and commercial centre of the Moray area. Elgin provides residence to approximately 23% of Moray's population and a significant share of the areas jobs and employment opportunities are located in the area. The populations of Moray and Elgin are largely dependent on the private car to access work, leisure, community services and activities. A safe and efficient road network is therefore a priority. Improving the accessibility of Elgin will therefore provide benefits not only to residents of Elgin but also to the wider population of Moray who access Elgin for work, education, leisure and a wide range of activities.

<u>Community Accessibility</u>

5.15.3 The following aspects of community accessibility have been considered in the appraisal of options for Elgin; these are access to work, education and training, health and shopping.

5.15.4 Elgin has two main access roads the A96 and A941 that allow travellers to move through and around the area. These connect surrounding communities to the centre of Elgin, to key employment sites and provide access to a range of public services and recreational opportunities. The seven options being tested do not directly promote the creation of new public transport services. Accessibility impacts are therefore more likely to be captured through improved routes and improved road traffic conditions leading to a reduction in congestion. The main beneficiaries therefore are likely to be car owners. Journey time savings are

however calculated in the Economy section of this report and it is important that the benefits are not double counted in the accessibility section.

5.15.5 The analysis presented below provides an overview of the community accessibility impacts of each option, in relation to work, education and training, health and shopping. As each of the options being tested shares the aim of providing a quicker, safer and more reliable transport system in and around Elgin a certain level of consistency is apparent across the seven options. Commentary is however provided to highlight localised impacts. Figure 5-2 and Figure 5-3 show the location of Elgin's main employers and community services.

Figure 5-2 Key Employment Sites

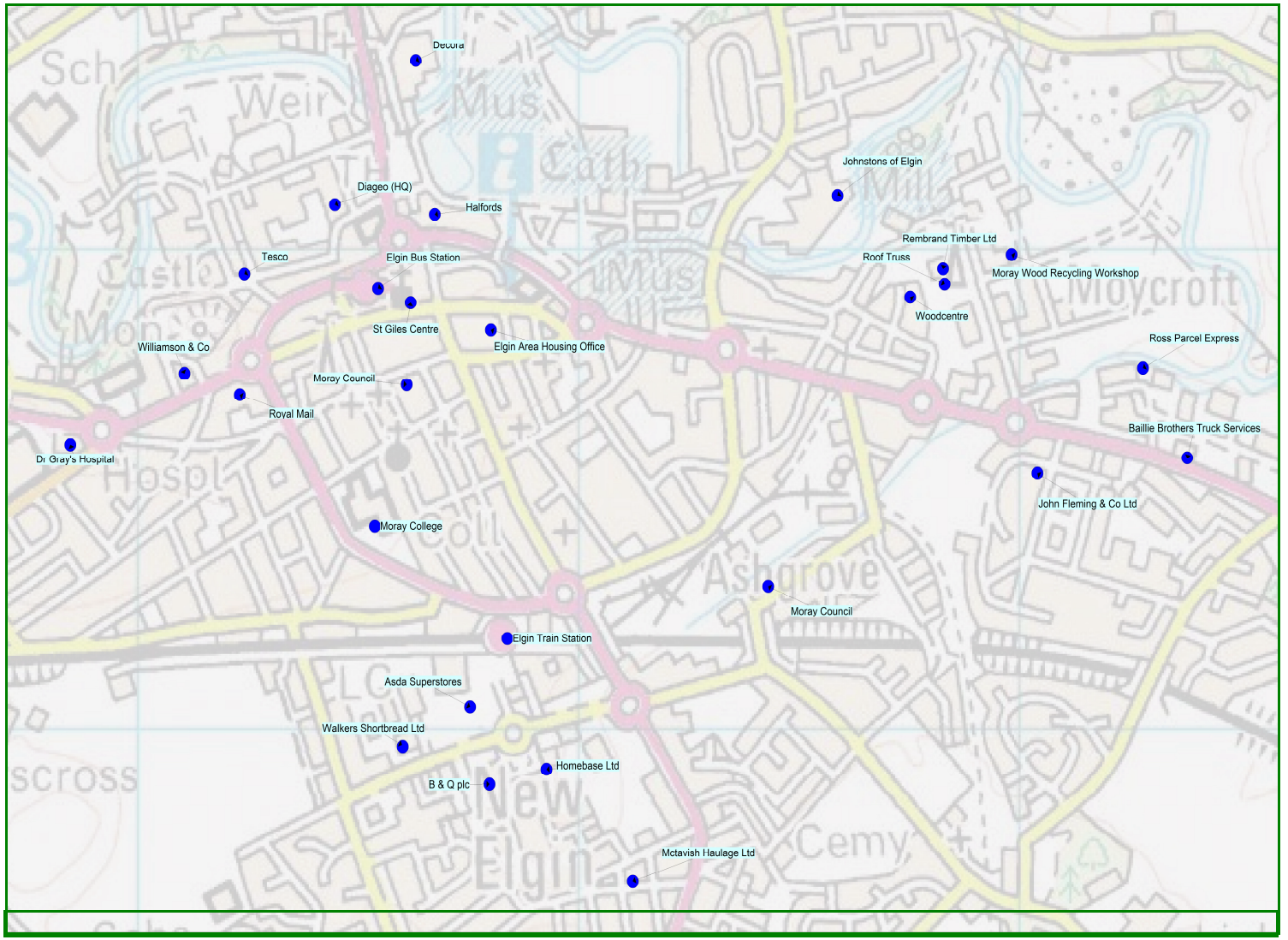
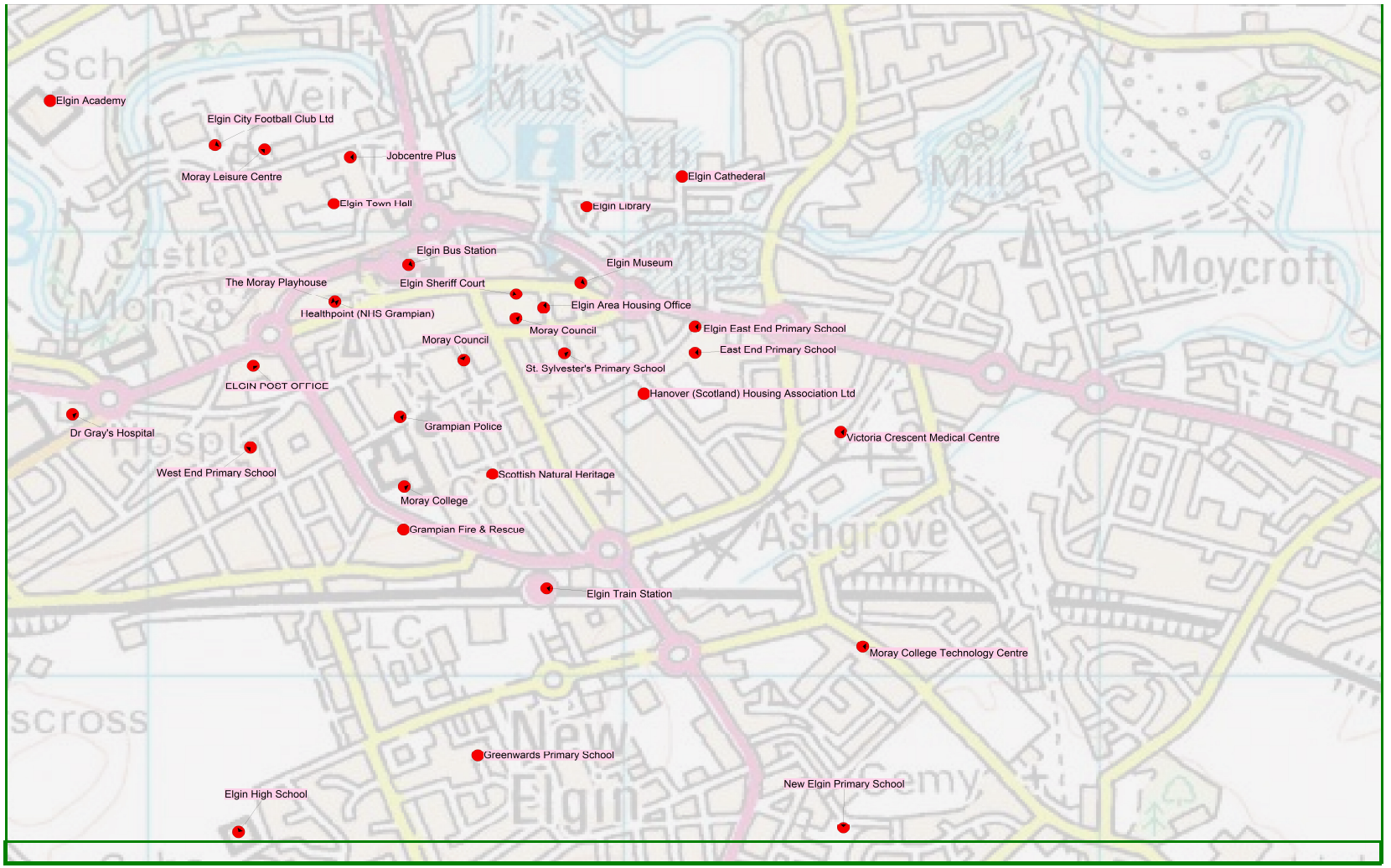


Figure 5-3 Community Services



Option A - Wittet Drive Link

5.15.6 This option links Edgar Road to the A96 near Wittet Drive. The addition of a high quality link between Edgar Road and the A96 at Wittet Drive has the immediate effect of drawing traffic from competing routes to the new link. A key benefit will be improved access to and from the Edgar Road Retail Zone, a key employment site that is in the process of expanding. The option testing results from this option show a significant reduction in traffic movements at The Wards for all three peak periods, particularly the Saturday peak when demand for access to the Edgar Road Retail Zone is at its highest. Table 5-14 and Table 5-15 highlight the relative importance of service sector and retail employment with significant growth over the period 1997 to 2005.

Table 5-14: Proportion of Employee Jobs by Industry 2005

	Moray	**Scotland**
Industrial group	Percentage	Percentage
All industries	100%	100%
Agriculture, forestry & fishing	4%	1%
Production & construction	22%	17%
Energy & Water	1%	1%
Manufacturing	15%	10%
Construction	6%	5%
Services - Total	75%	82%
Retail & wholesale & hotels	25%	22%
Transport & comm	4%	5%
Finance and business	7%	19%
"Other" Services¥	39%	36%
¥ Other services includes Public Admin, Education, Health and Other Services		

Source: Scottish Executive, Analytical Services Division, Moray Economic Profile.

Table 5-15: Change in Employee Jobs 1997 - 2005

	Moray	**Scotland**
Industrial group	1997-2005	1997-2005
All industries	11.7%	15.2%
Agriculture, forestry & fishing	-7.7%	-12.8%
Production & construction	-8.8%	-16.7%
Energy & Water	100.0%	-16.6%
Manufacturing	-19.4%	-28.3%
Construction	23.5%	16.5%
Services	20.9%	25.6%
Retail & wholesale & hotels	10.8%	8.7%
Transport & communications	20.0%	20.2%
Finance and business	31.6%	44.5%
"Other" Services¥	31.4%	31.7%
¥ Other services includes Public Admin, Education, Health and Other Services		

Source: Scottish Executive, Analytical Services Division, Moray Economic Profile.

5.15.7 Option A will also improve access to a range of education and training facilities including Elgin High School and, through a reduction of traffic on The Wards, to Moray College. It will also promote improved accessibility to Dr Gray's Hospital and The First Day Hospital for the Elderly. By reducing traffic on The Wards access to Elgin Rail Station and for Grampian Fire and Rescue services, is also likely to improve.

5.15.8 At the local level New Elgin West, New Elgin East and Elgin Central West are likely to directly benefit through the establishment of a link road that connects Edgar Road and Wittet Drive.

5.15.9 Table 5-16 shows that these wards contain 47% of Elgin's resident population. A similar proportion (47%) of Elgin's employment deprived (SIMD 2006) population lives within datazones that overlap with these wards.

Table 5-16: Population Density for Elgin Wards Using Data from the 2001 Census

Area	All People	Area (Hectares)	Density (no per hectare)
Bishopmill East	3525	93.79	37.58
Bishopmill West	3887	170.65	22.78
Cathedral	3463	207.57	16.68
Central West	3208	175.72	18.26
New Elgin East	3582	95.33	37.57
New Elgin West	3164	85.09	37.18
Elgin	20829	828.14	25.15

Source: Census of Population 2001. Table UV02

5.15.10 In summary the accessibility impacts from Option A are likely to be modest. The option is however consistent with the government's accessibility objective to improve access to employment, education and training and health. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option B - Morriston Road Link

5.15.11 This option links Edgar Road with the A96 at Morriston Road by partially following the alignment of the proposed Southern Bypass Route. This option will promote improved access to the Edgar Road Retail Zone. It will also draw traffic from West Road travelling through to central Elgin along Main Street. This will improve access to Dr Gray's hospital and to the centre of Elgin where a range of public, education and leisure services are located.

5.15.12 At the local level New Elgin West, New Elgin East, Elgin Central West and Bishopmill West are likely to directly benefit through the establishment of a link road between Edgar Road and the A96 at Morriston Road.

Table 5-16 above shows that these wards contain 66% of the population of Elgin. A slightly smaller proportion (63%) of Elgin's employment deprived (SIMD 2006) population lives within datazones that overlap with these wards.

5.15.13 Although the accessibility impacts from Option B are modest, as the scheme does not directly impact on improved public transport provision, the option is consistent with the government's accessibility objective to improve access to employment, education and training and health. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option C Bypass North Alignment

5.15.14 This option implements a bypass to the North of Elgin with intersections at Duffus Road and the A941 North of Bishopmill. This option reduces the volume of traffic using the A96 when compared with the do-minimum scenario. This option will improve access to the centre of Elgin where key employment, education, health and leisure sites are located. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, which is the preferred location for a new Business Park. Although benefits will be produced for households across Elgin it is likely that most of the benefits will be through a reduction in congestion. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option D Bypass South Alignment (Short)

5.15.15 This option implements a bypass to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 at Morriston Road. This option will promote improved access to the key employment sites in the centre of Elgin and at Edgar Rd, including the Edgar Road Retail Zone and Springfield Industrial Estate. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, which is the preferred location for a new Business Park. Benefits will be produced for households across Elgin through a reduction in congestion. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option E Bypass South Alignment (long)

5.15.16 This option implements a bypass to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 to the East and West of Elgin. This network differs from Option D since there is no connection to Morriston Road; the A96 connection is a further 2.5km to the West. Similar to option D this will promote improved access to key employment sites in the centre of Elgin and at Edgar Rd, including the Edgar Rd Retail Park and Springfield Industrial Estate. It will also promote improved access to Barmuckity Farm, to the eastern edge of Elgin, which is the preferred location for a new Business Park. While benefits will be produced for households across Elgin it is likely that most of the benefits can be attributed to a reduction in congestion. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option F Southern Distributor Route + Wittet Drive Link

5.15.17 This option combines the Option 4 link road with upgrading a route following Reiket Lane through to Glen Moray Drive to form a southern distributor route. In addition to the impacts outlined above for Option A this scheme will provide an alternative to Main St for road users travelling east/west through Elgin. This will provide improved access to Elgin Rail Station and Elgin Business Centre at Maisondieu Rd. It will produce benefits to households through a reduction in congestion. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Option G Southern Distributor Route + Morriston Road Link

5.15.18 This option combines Option B with upgrading a route following Reiket Lane through to Glen Moray Drive to form a southern distributor route. In addition to the impacts outlined above for Option B this scheme will provide improved access to Elgin Rail Station and Elgin Business Centre at Maisondieu Rd. This will produce benefits to households through a reduction in congestion. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. The journey time savings are outlined in the Economy section of this report.

Comparative Accessibility

5.15.19 Comparative accessibility, or the distribution of accessibility impacts, has become more central in the appraisal of transport projects in recent years. It is recognised that investment decisions can discriminate against particular groups in society, and that transport investment decisions should seek to support wider policy aims including social inclusion, regeneration and rural development.

People Group

5.15.20 The appraisal of options for Elgin has considered the distribution of impacts by people group e.g. age, income group, car ownership, etc. Understanding who benefits and who loses from an individual transport project and policy is a key objective of transport appraisal. Most objections to transport change are from people who feel that they are not being treated fairly or that their needs are not being met in some way. It is therefore important to consider the impact of change on key groups. For most transport projects this will typically include appraising the impact of change on those who are unemployed and seeking work, and those that do not have access to a car. As the aim of the options being appraised is to provide a quicker, safer and more reliable transport system in and around Elgin benefits will be spread across the Elgin area. A comparative overview of Elgin relative to the Moray Council area is therefore presented prior to an analysis of localised impacts from the seven options.

5.15.21 The current official measure of deprivation in Scotland is the Scottish Index of Multiple Deprivation (SIMD). This is a relative-based measure, which identifies the most deprived areas across Scotland using data from a variety of sources. Data from the 2004 & 2006 SIMD shows that the concentration of deprivation within The Moray Council area is much lower than many other areas of Scotland. None of the 28 datazones in Elgin are within the 15% most deprived areas of Scotland. This does not mean that deprivation does not exist or that unemployment is not a problem within communities in The Moray Council area, it simply means that it is not concentrated in particular areas.

5.15.22 Moray Council has published a report, Scottish Index of Multiple Deprivation and Elgin, to provide an objective analysis of deprivation in a local context. The report compares data from the 2004 and 2006 SIMD. In the SIMD 2004 Elgin had six areas in the 10-50% rankings for geographic access. The SIMD data for 2006 shows that twenty five areas are within the 0-50% rank for Geographic access.

5.15.23 Table 5-17 presents data extracted from the Scottish Index of Multiple Deprivation (2006). This shows the average drive-time and public-transport travel

time to a number of key services. As expected travel times within The Moray Council area are longer when compared to the Scottish average. Although Elgin compares relatively favourably to Moray, travel times to GP services are higher than the national average.

Table 5-17: Average Travel Time - SIMD 2006

	Drive in Minutes			P/T Time in Minutes		
	GP	Primary School	Secondary School	GP	Post Office	Shopping facilities
Elgin	3.53	2.05	4.84	14.49	11.47	10.55
Moray	4.09	2.52	6.84	18.62	12.09	20.13
Scottish	3.40	2.22	5.58	11.40	8.21	16.34

Source: Scottish Executive, 2006 SIMD

5.15.24 Table 5-18 shows that the proportion of those unemployed and permanently sick/disabled is slightly higher in Elgin than the Moray average.

Table 5-18: Economic Activity

	Industrial group	Elgin	Moray
Economically Active	All persons aged 16-74	15,115	63,191
	% Employees - Part time	14.06	13.32
	% Employees - Full time	43.52	41.63
	% Self-employed	5.56	8.09
	% Unemployed[7]	3.7	3.52
	% Full-time student	2.3	1.95
	% Retired	14.44	14.72
Economically Inactive	% Student	2.34	2.94
	% Looking after home/family	5.93	6.17
	% Permanently sick/disabled	5.19	4.57
	% Other	2.96	3.09

Source: Census of Population 2001.

[7] Census data also shows that 8.41% of those who were recorded as unemployed in Elgin have never worked, the figure for the Moray Council area is 5.84%.

5.15.25 Table 5-19 below shows, the age profile of Elgin and the Moray Council area. A similar age profile exists for both geographic levels. Approximately 61% of the population are aged 16 to pensionable age with the remaining population either under the age of 16 or above retirement age.

5.15.26 The dependency ratio for Elgin and the Moray Council area is therefore approximately 63%. The figure for Scotland is marginally lower (60%) than that for Elgin and the Moray Council area.

Table 5-19: Comparative Population Profile

Age	Elgin	Moray
Total resident population	20,829	86,940
- % 0-4 years old	6.37	5.66
- % 5-15 years old	13.83	14.47
- % 16-29 years old	16.67	15.82
- % 30-44 years old	23.97	23.33
- % 45-59 years old	18.05	19.25
- % 60-74 years old	13.88	14.28
- % 75 and over	7.23	7.19
- % under 16	20.2	20.13
- % 16-pensionable age	61.1	60.94
- % pensionable age and over	18.7	18.93

Source: Census of Population 2001.

5.15.27 Table 5-20 shows the percentage of people designated within 'Social Grade E'. This reemphasises the marginally higher share of unemployment and economic inactivity located in Elgin compared to the Moray Council area. The proportion of people classified as 'Social Grade E' within the wards of Bishopmill East and Cathedral are significantly higher than the local authority average of 18.8%. In contrast Bishopmill West compares favourably.

Table 5-20: State Benefit, Unemployed or Lowest Grade Workers (E)

Ward Name	All People[8]	Social Grade 'E'[9]	Social Grade 'E'
Bishopmill East	2772	614	22.2
Bishopmill West	2865	424	14.8
Cathedral	2731	594	21.8
Central West	2671	524	19.6
New Elgin East	2766	545	19.7
New Elgin West	2530	469	18.5
Elgin	16,335	3,170	19.4
Moray Council Area	67,576	12,723	18.8

5.15.28 Table 5-21 shows the percentage number of people who have no, low and higher level qualifications. A polarisation is evident in Elgin with a number of wards characterised by low qualification attainment rates, alongside a number of wards that have high rates of qualification attainment.

Table 5-21: Qualifications

Ward Name	None	Lower Level[10]	Higher Level[11]
Bishopmill East	39.6	43.7	16.7
Bishopmill West	24.2	44.7	31.0
Cathedral	30.2	45.4	24.4
Central West	24.4	37.4	38.2
New Elgin East	35.8	47.3	16.9
New Elgin West	34.7	44.8	20.5
Elgin	31.5	43.9	24.5
Moray Council Area	31.5	43.9	24.6

Source: Census of Population 2001. Table KS13.

5.15.29 Table 5-22 shows levels of car ownership within Elgin at ward level. Approximately one in three households in Bishopmill East and Cathedral has no

8 All people in this table relates to all-people aged 16 or over. In this table people are classified by the Approximated Social Grade of their Household Reference Person.

9 Social Grade E relates to those individuals who are on state benefit, unemployed, or are the lowest grade workers.

10 Lower level skills include Group 1 and 2 qualification levels defined in the Census 2001. Qualifications in these groupings include O' Grade, Standard Grade and Higher Grade qualifications.

11 Higher level skills include Group 3 and 3 qualification levels defined in the Census 2001. Qualifications in these groupings include HND, HNC, SVQ levels 4 or 5, First Degree, Higher Degree or Professional Qualifications.

access to a car. This is a significantly higher rate than the rate for Elgin as a whole, which exceeds the average rate for the Moray Council Area.

Table 5-22: Car Ownership

Ward Name	None	One	Two
Bishopmill East	31.85	51.99	13.38
Bishopmill West	17.61	53.70	24.6
Cathedral	35.76	50.34	11.55
Central West	28.66	47.64	19.43
New Elgin East	28.36	53.44	15.27
New Elgin West	25.47	49.22	20.45
Elgin	28.11	51.05	17.33
Moray Council Area	23.63	50.44	21.15

Source: Census of Population 2001. Table KS17.

5.15.30 Table 5-23 identifies the percentage shares of travel to work or place of study by public transport (PT), car/taxi/van (C/T/V) and walking. The data highlights the dominance of car travel for economic activity. This emphasises the need for an efficient regional and local road network and the need for improved public transport services to encourage modal shift. It is also evident that the number of people who walk to work/study is significantly higher than the rate using public transport in Elgin and in the Moray Council area.

Table 5-23: Travel to Work / Travel to Study

Ward Name	P/T %	C/T/V %	Walk %
Bishopmill East	5.95	62.61	20.72
Bishopmill West	4.12	68.12	14.06
Cathedral	5.47	59.41	23.40
Central West	4.06	50.34	32.49
New Elgin East	7.25	61.89	19.00
New Elgin West	5.97	64.72	20.57
Elgin	5.49	61.38	21.49
Moray Council Area	7.75	59.77	16.32

Source: Census of Population 2001. Table KS15. Data relates to those who are working or studying.

5.15.31 Table 5-24 presents data on the distance travelled to work or full-time education. Residents from the Cathedral ward travel further to work/study compared to other

areas of Elgin. The average distanced travelled within Elgin to work/study is approximately 14km, 5km less than the Moray Council average.

Table 5-24: Distance Travelled to Work / Full Time Education

Ward Name	5km - less than 10km	10 km - less than 20km	40km and over	Average distance travelled (km)
Bishopmill East	5.87%	6.04%	5.71%	13.85
Bishopmill West	15.12%	6.01%	5.24%	14.00
Cathedral	14.15%	8.55%	5.96%	16.58
Central West	6.06%	7.18%	5.86%	13.08
New Elgin East	4.35%	7.34%	5.82%	13.49
New Elgin West	4.35%	6.68%	5.65%	13.53
Elgin	8.36%	6.94%	5.70%	14.11
Moray Council Area	12.48%	11.07%	6.54%	19.02

Source: Census of Population 2001. Table KS15 and UV36. Data relates to those who are working or studying.

5.15.32 Table 5-25 identifies the wards within the Moray Council area with the highest rates of claimant count unemployment. Two of the five wards (Cathedral and New Elgin) are located within the Elgin area. The rate in Cathedral (3.5%) exceeds the national average rate of claimant count unemployment (3.1%).

Table 5-25: Wards with Highest Rate of Unemployment

Wards with highest rate of unemployment		
	Rate	Level
Forres	4.1%	131
Buckie East	3.8%	79
Cathedral	3.5%	93
Findhorn Valley	2.9%	126
New Elgin	2.9%	85
Scotland	3.1%	

Source: Scottish Executive, Economic Profile, Feb 2007.

Localised Impacts

5.15.33 Although the comparative accessibility benefits are likely to be modest it is useful to consider the distribution of impact by people group and location. Data has been extracted from the Scottish Index of Multiple Deprivation 2006 to highlight the distribution of impacts. This index divides Scotland up into 6,505 small geographical areas (called 'data zones'), with a median population size of 769. These are ranked from 1 (most deprived) to 6505 (least deprived) using 37 indicators of deprivation across seven categories or domains: current income, employment, health, education, geographic access to services, housing and crime. The individual rankings for Elgin's datazones are shown in Appendix B. Figure 5-4, provided by Moray Council, shows the location of Elgin's datazones.

Option A - Wittet Drive Link

5.15.34 This option links Edgar Road to the A96 near Wittet Drive. At the local level New Elgin West, New Elgin East and Elgin Central West are likely to directly benefit through the establishment of a link road that connects Edgar Rd and Wittet Dr. Datazones that overlap these wards have been extracted from the SIMD 2006 and are presented below in Table 5-26.

Table 5-26: SIMD 2006 Extract

Data Zone	SIMD Position	Current Income position	Employment position	Health position	Ed-Skills, Training	Geo-Access position
S01004282	0.20	0.23	0.32	0.23	0.06	0.58
S01004299	0.28	0.27	0.27	0.38	0.49	0.94
S01004284	0.35	0.43	0.32	0.30	0.29	0.52
S01004283	0.36	0.45	0.31	0.33	0.37	0.41
S01004289	0.45	0.57	0.48	0.44	0.36	0.21
S01004280	0.56	0.47	0.54	0.51	0.55	0.46
S01004294	0.69	0.78	0.58	0.57	0.89	0.89
S01004255	0.72	0.86	0.70	0.88	0.91	0.05
S01004288	0.73	0.77	0.69	0.56	0.63	0.61
S01004291	0.75	0.70	0.79	0.64	0.49	0.65
S01004277	0.78	0.76	0.70	0.83	0.78	0.32
S01004296	0.82	0.76	0.89	0.70	0.96	0.77
S01004293	0.83	0.81	0.78	0.60	0.93	0.50

Source: Scottish Index of Multiple Deprivation 2006.

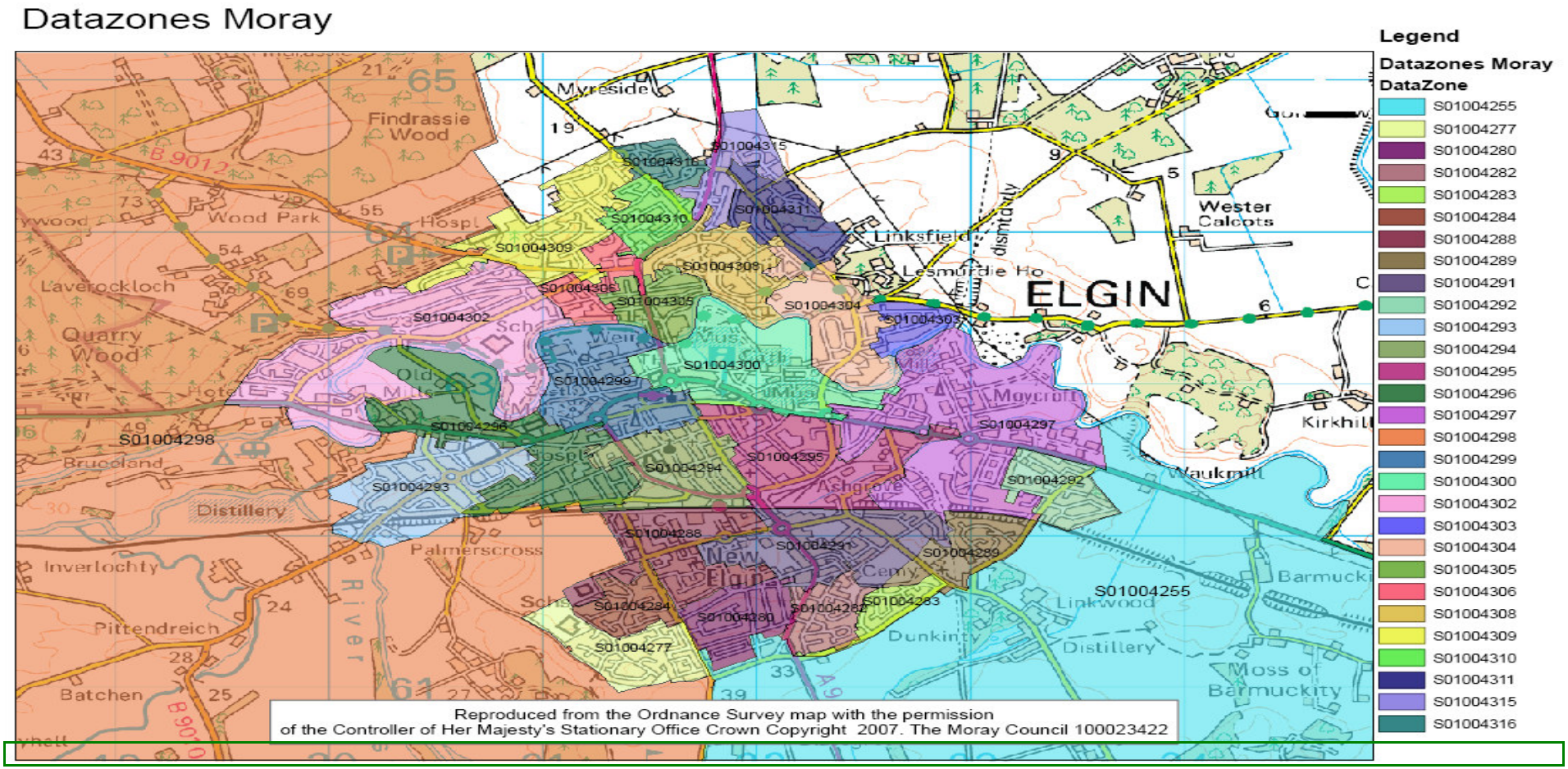
5.15.35 The data shows that five datazones are in the top half (less than 0.5) of the overall SIMD 2006 rank, with five placed in the top half for Current Income and Employment. Six datazones are also in the top half of the index for Education & Skills with an area to the South East of Elgin (S01004282) ranking in the top 6% for Education and Skills deprivation. The figures also show that this option would impact on six areas that are in the top half of the Geographic Access domain when measured at the national level. Datazone S01004255, adjacent to Reiket Lane, is in the highest 5% bracket in Scotland for Geographic Access deprivation. Datazone S01004289 adjacent to Reiket Lane is just outside the 20% band and the area just south of Edgar Rd (S01004277) is just outside the 30% level. Despite exhibiting a certain level of deprivation across a variety of domains, the accessibility benefits are likely to remain modest. Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases.

5.15.36 This option promotes increased traffic volume for the areas around Edgar Road and Wittet Drive in an effort to relieve congestion on the main A96 and A941 arterial routes. Wittet Drive is largely a residential area; any increase in traffic volume passing through this area will have adverse accessibility and environmental impacts for existing residents. These community impacts are defined as changes to local severance. Severance relates to changes in non-motorised travel/pedestrian behaviour. It is classified according to the following four broad levels:

- None – little of no hindrance to pedestrian movement,
- Slight – All people wishing to make a pedestrian movement will be able to do so, but there will probably be some hindrance to movement,
- Moderate – Some people, particularly children and old people, are likely to be dissuaded from making journeys on foot. For others, pedestrian journeys will be longer or less attractive.
- Severe – People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities.

5.15.37 This option will provide an alternative peak and weekend travel route for vehicles accessing the retail and industrial sites adjacent to Edgar Road and for traffic moving East/West and North/South. The promotion of Wittet Drive for increased traffic volumes is likely to move local severance levels from slight to moderate.

Figure 5-4 Elgin Datazones



Option B - Morriston Road Link

5.15.38 This option links Edgar Road with the A96 at Morriston Road by partially following the alignment of the proposed Southern Bypass Route. At the local level New Elgin West, New Elgin East, Elgin Central West and Bishopmill West are likely to directly benefit through the establishment of a link road between Edgar Road and the A96 at Morriston Rd. The distribution of impacts by location and people group will be broadly similar to those produced through Option A. Additional localised impacts will be provided within the ward of Bishopmill West. Datazones that overlap Bishopmill West have been extracted from the SIMD 2006 and are presented below in Table 5-27.

Table 5-27: Scottish Index of Multiple Depravation 2006

Data Zone	SIMD Position	Current Income position	Employment position	Health position	Ed-Skills, Training	Geo-Access position
S01004306	0.37	0.30	0.29	0.35	0.51	0.58
S01004310	0.53	0.49	0.51	0.60	0.45	0.36
S01004302	0.77	0.90	0.62	0.88	0.95	0.22
S01004316	0.92	0.99	0.97	0.95	0.66	0.21
S01004309	0.92	0.88	0.94	0.84	0.90	0.26
S01004305	0.66	0.66	0.67	0.48	0.56	0.69
S01004315	0.67	0.63	0.72	0.66	0.43	0.33

Source: Scottish Index of Multiple Deprivation 2006.

5.15.39 The data shows that impacts will be produced in a further seven datazones that overlap Bishopmill West. Only one of these datazones is in the top half of the overall index of multiple deprivation. Additional impacts are noticeable within the geographic access domain, with five of the additional seven datazones in the top half of the national deprivation index for geographic access. The area to the northern fringe of Bishopmill West (S01004316) Myreside Circle and adjacent to Hamilton Crescent stretching down to McIntosh Drive (S01004302) are narrowly above the 20% most deprived area of deprivation in Scotland for geographic access. The proportion of households without access to a car in Bishopmill West is relatively low (17.61%) and the proportionate number of people in Social Grade E within this ward is the lowest in Elgin (14.8%).

Option C Bypass North Alignment

5.15.40 This option implements a bypass to the North of Elgin with intersections at Duffus Road and the A941 North of Bishopmill. Although benefits will be produced for households across Elgin it is likely that most of the benefits will be through a reduction in congestion. However, these benefits are captured under the economy criterion through journey time savings.

Option D Bypass South Alignment (Short)

5.15.41 This option implements a bypass to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 at Morriston Road. Benefits will be produced for households across Elgin through a reduction in congestion. These benefits are captured under the economy criterion through journey time savings.

Option E Bypass South Alignment (long)

5.15.42 This option implements a bypass to the South of Elgin with intersections at the A941 South of Elgin, the Edgar Road extension and the A96 to the East and West of Elgin. This network differs from option D since there is no connection to Morriston Road, the A96 connection is a further 2.5m to the West. Although benefits will be produced for households across Elgin it is likely that most of the benefits can be attributed to a reduction in congestion. These benefits are captured under the economy criterion through journey time savings.

Option F Southern Distributor Route + Wittet Drive Link

5.15.43 This option combines the Option 4 link road with upgrading a route following Reiket Lane through to Glen Moray Drive to form a southern distributor route. Comparative accessibility impacts for this option will be similar to those outlined for Option A. This option will produce additional benefits for social groups in the vicinity of Reiket Lane, Thornhill Road and Glen Moray Drive. Datazones that overlap these areas have been extracted from SIMD 2006 and are presented below in Table 5-28 . Seven of the nine datazones extracted lie in the top half of the geographic access domain, with the data also showing that four datazones are in the top half for the overall SIMD, and the Health and Employment domains. Road-based improvements from this option will reduce the level of congestion along the route. These benefits are captured under the economy criterion through journey time savings.

5.15.44 This option promotes increased traffic volume within a number of residential areas; Wittet Drive, Reiket Lane and Glen Moray Drive. Any increase in traffic volume passing through these areas will have adverse accessibility and environmental impacts for existing residents. These community impacts are defined as changes to local severance. This option will provide an alternative peak and weekend travel route for vehicles accessing the retail and industrial sites adjacent to Edgar Road and for traffic moving East/West and North/South. The promotion of increased traffic volumes in the residential areas noted above is likely to move local severance levels from slight to moderate.

Table 5-28: SIMD 2006 Extract

Data Zone	SIMD Position	Current Income position	Employment position	Health position	Ed-Skills, Training	Geo-Access position
S01004282	0.20	0.23	0.32	0.23	0.06	0.58
S01004284	0.35	0.43	0.32	0.30	0.29	0.52
S01004283	0.36	0.45	0.31	0.33	0.37	0.41
S01004289	0.45	0.57	0.48	0.44	0.36	0.21
S01004280	0.56	0.47	0.54	0.51	0.55	0.46
S01004255	0.72	0.86	0.70	0.88	0.91	0.05
S01004291	0.75	0.70	0.79	0.64	0.49	0.65
S01004277	0.78	0.76	0.70	0.83	0.78	0.32
S01004292	0.72	0.74	0.89	0.94	0.46	0.14

Option G Southern Distributor Route + Morriston Road Link

5.15.45 This option combines Option B with upgrading a route following Reiket Lane through to Glen Moray Drive to form a Southern distributor route. Comparative accessibility impacts for this option will be similar to those outlined for Option F. The road-based improvements will reduce the level of congestion along the routes contained within this option. These benefits are captured under the economy criterion through journey time savings.

5.15.46 This option promotes increased traffic volume within Reiket Lane and Glen Moray Drive. Any increase in traffic volume passing through these areas will have adverse accessibility and environmental impacts for existing residents. The promotion of increased traffic volumes in the residential areas noted above is likely to move local severance levels from slight to moderate.

Summary

5.15.47 The Moray Council area does not suffer from widespread deprivation or social exclusion. However, it is clear from the data above that when Elgin and its constituent wards and SIMD datazones are compared to the Moray Council area as a whole, some relative economic and social weaknesses exist. Elgin has a marginally higher rate of unemployment and economic inactivity rate than the Moray Council average. Two of the Moray Council wards with the highest rates of unemployment are within the Elgin area. A number of wards within Elgin, particularly Cathedral and Bishopmill East exhibit qualification rates that are much lower than the Moray Council average. The combined effect is a larger share of people within the Social Class Grade 'E' band compared to the Moray Council average.

5.15.48 Car ownership in Elgin is lower than the Moray average rate with the wards of Cathedral and Bishopmill East exhibiting rates significantly lower than the Moray Council average. Despite this the use of public transport is low for those travelling to work or study. Travel times to a number of key services in Moray and to a lesser extent Elgin are higher when compared to the national average.

5.15.49 Although the main beneficiaries will be car owners those travelling by public transport, in the main by local buses (326, 327, 328, 329, 331 and 336) will also experience improved accessibility as traffic flow improves and congestion eases. Journey time savings however are captured in the Economy section of this appraisal. Any additional social inclusion impacts are likely to be modest with widespread deprivation not being a significant factor within Elgin.

5.15.50 Options that promote increased vehicle movements through residential areas will produce adverse accessibility impacts for residents of these areas. The magnitude of adverse impacts is likely to be modest under most options, but higher under options that impact on the residential area of Wittet Drive. In arriving at an assessment of these impacts consideration should be given to improvements to traffic flow and congestion levels throughout Elgin as a whole.

5.15.51 The objective-led process adopted by Moray Council to identify solutions that will benefit all groups and accommodate current and future developments within Elgin that promote sustainable economic development are consistent with the government's accessibility aims.

5.16 ***Integration***

5.16.1 In compliance with STAG guidance, there are three aspects to the Integration analysis which have been considered in this appraisal, namely:

- Transport Integration - the degree to which options complement other transport infrastructure and services;
- Transport Land-use Integration - the fit between options and established land-use plans and land-use/transport planning guidance; and
- Policy Integration - the appropriateness of options when considered against wider policies both of central and local government e.g. health or social inclusion.

Transport Integration

5.16.2 Transport integration has wide implications for the mobility of people and goods. An integrated transport system aids accessibility by connecting people to opportunities and goods to markets with minimal disruption. This free movement of people and goods is the primary objective of transport integration. The creation of an effective transport network that promotes efficient local and regional movements is a critical factor for the competitive performance of the Moray economy. This is especially important within Elgin, which is the principal administrative and commercial centre of the Moray area. The approach recommended to, and accepted by, Moray Council has been to adopt an objective-led approach to guide future transport policy and integration that will benefit the Elgin area.

5.16.3 It is important to note that this approach did not bias any mode or potential transport options. Instead a pragmatic approach backed by quantifiable results and qualitative assessments has been adopted to identify the most efficient solution that will ease the movement of people and goods in, around, and through Elgin.

5.16.4 The STAG Part 1 appraisal considered a range of public transport improvements; these were discounted from further analysis as it was felt that, in isolation, they would not meet the key planning objective and sub-objectives. Although the final options tested will therefore not directly enhance the provision of public transport services it is likely that the routes taken by existing bus-services will be improved. The impacts of journey time savings are outlined within the Transport Economic Efficiency section below.

5.16.5 The options being appraised in this STAG Part 2 will have a minor beneficial impact on transport integration within Elgin by improving local traffic conditions and implementing an option that encourages the efficient flow of public and private transport services.

Land Use Integration

5.16.6 This aspect considers whether the STAG options being tested complement existing land-use planning policies and wider planning objectives.

5.16.7 The National Planning Framework (2004) highlights that in some rural areas, improvements to transport infrastructure are needed to support economic activity and improve access to social facilities. It stresses that much remains to be done to achieve a transport system which matches Scotland's needs and potential.

5.16.8 The framework acknowledges that greater mobility, in particular heavy reliance on the private car, gives rise to congestion that can exacerbate pollution producing adverse environmental impacts. The framework challenges public authorities to influence a shift to more sustainable modes of transport, and more sustainable patterns of transport and land-use planning.

5.16.9 The Moray Development Plan sets out the planning and development framework for the Moray Council area. This plan consists of two key documents, the Moray Structure Plan and the Moray Local Plan. The current Moray Structure Plan was approved by Scottish Ministers in 1999, and the Moray Local Plan adopted by Moray Council in 2000. The Development Plan is currently under a period of review with a finalised Moray Structure Plan submitted for approval to the Scottish Executive, and the Local Plan currently in a period of consultation. When approved these plans will provide the development framework for The Moray Council area to 2025.

5.16.10 The Moray Structure Plan provides the strategic planning context for the next 15 to 20 years for the Moray Local Plan. The strategic priorities of the Structure Plan are to:

- Promote Elgin as the primary centre and second tier towns as the main development areas;
- Focus development on existing settlements;
- Promote the development of new settlements; and
- Promote development out-with settlements.

5.16.11 Improving the physical infrastructure of Elgin is seen as key to the economic success of the wider Moray region. The Structure Plan states that "Elgin is the main commercial and administrative centre within Moray. In order to attract new development and potential inward investment it will be necessary to harness the advantages that Elgin can give to the area. Any alternative to this approach is likely to be ineffective since development will not be diverted to areas of weaker demand".

5.16.12 The aim of the Moray Local Plan is to interpret the strategic direction given by the Moray Structure Plan into detailed policies for the determination of planning applications. In terms of Elgin the aims of the local plan are as follows:

- To identify sites for 950 new houses;
- To identify longer term housing areas;
- To identify land for general industrial/commercial uses;
- To identify land for a Business Park;
- To prepare a strategy to advance the case of a bypass and to monitor progress;
- To promote economic activity and monitor town centre vitality;
- To enhance the appearance of the town from the A96 and the approach from the east;
- To protect the high quality green spaces in the town; and
- To exercise the precautionary principle on land liable to flood until completion of Flood Alleviation Schemes for Elgin.

5.16.13 The Elgin and Moray Partnership, comprising the Council, Local Enterprise Company and Moray Chamber of Commerce commissioned consultants to inform the review of the development plan and link it to wider regeneration and economic development issues. A report 'Moray Towns Promotion and Development' has identified the Barmuckity Farm site, to the eastern edge of Elgin, as a preferred location for the provision of a significant area with potential as a Business Park location. A Northern or Southern bypass would provide access west of Elgin, and beyond, to this new Business Park location and remove the need to travel through Elgin.

5.16.14 Scottish Executive Planning Policy (SPP17 Transport and Planning) identifies the importance of improving transport infrastructure. This highlights that congestion

has a major impact on the economy and environment of Scotland. Rather than avoid improvements that encourage increased road-use the Scottish Executive promotes a range of interventions including; delivering improvements to key congestion points on the road network and developing new public transport infrastructure and services to change people's attitudes to their travel choices.

5.16.15 The options considered within this STAG Part 2 appraisal are therefore consistent with national land-use planning and are complementary to regional and local land-use planning policies. Although national planning policy promotes a shift towards more sustainable transport options, it is clear that this does not mean abandoning improvements to the existing network, particularly, in areas where congestion is impacting or is likely to impact on the future economic development of an area.

5.16.16 The Moray Structure Plan emphasises the primacy of the Elgin economy to the surrounding region and to local employment. The Elgin local plan provides the context for local housing growth and underlines the need for investment in Elgin's physical infrastructure if the area's growth ambitions are to be met. The options being appraised in this STAG Part 2 will have a beneficial impact on land-use planning within Elgin.

Policy Integration

5.16.17 The Policy Integration criterion examines whether the proposed options contribute to, and are consistent with, other Government policies and legislation.

5.16.18 A key theme of Scotland's National Transport Strategy is to improve journey times and connections - making it easier and more reliable for individuals to travel between towns and cities and across global markets. Key challenges outlined in the strategy include making journey times more reliable, ensuring infrastructure supports economic activity and that congestion problems in Scotland's towns and cities are tackled. Although growing the economy is the number one priority the Scottish Executive highlights a trade-off between; increased travel, faster journey times, economic growth, social cohesion, and the minimisation of emissions standards.

5.16.19 Scotland's Framework for Economic Development highlights that an efficient transport system is an essential feature of a competitive economy. The Scottish Executive places a high priority on providing choices for all - whether in rural or island communities, small towns or large urban centres. The approach also requires integration within and between different modes of transport, and integration

between transport and a range of other policies, including wealth creation, the environment and education. Among the key transport issues outlined in the framework is the need to relieve traffic congestion through a rigorous appraisal of potential solutions, paying particular attention to how costs and benefits are distributed across different groups and regions in Scotland. The approach adopted by Moray Council is consistent with this view.

5.16.20 Highlands and Islands Strategic Transport Partnership (HITRANS) have a vision for a regional transport system which:

- Provides cost effective access to all regional transport services in pursuit of social inclusion;
- Enables the optimum growth of the regional economy through a network which secures the efficient import and export of products: facilitates internal and external business travel; and encourages growth in tourism;
- Is safe to use and operate; and
- Is sustainable and has the minimum practical impact on the environment.

5.16.21 To achieve these goals, HITRANS has set the following objectives:

- To improve journey times by ensuring further investment is made in better infrastructure - particularly roads, public transport vehicles and vessels, and the rail network;
- To reduce costs to the users of the transport network and reduce costs in the movement of goods;
- To improve integration in the public transport system to increase choice, reduce delays and waiting periods, and make public transport more attractive. Increase the choice of destinations provided by public transport particularly for movements to centres outside the Region;
- To improve the frequency and flexibility of public transport, particularly for rural areas, with external links to outside the region and to develop the region's air service network as a key priority.

5.16.22 A review of potential transport improvements along the Aberdeen to Inverness corridor was recently commissioned by HITRANS. The study will take a strategic look at the whole A96 transport corridor (road and rail) between Inverness and Aberdeen, identify problems and develop options according to a STAG Pre-Appraisal methodology. Among the options being considered will be a number bypass options at Keith, Nairn and Elgin. This STAG Part 2 appraisal

complements the study commissioned by HITRANS and can help inform this study, particularly the consideration of bypass options for Elgin.

5.16.23 The Moray Local Transport Strategy was published in 2001. It was developed to complement sustainable development and encompasses economic, social and environmental considerations. The strategy highlights that successful economic development depends upon efficient transport networks both within Moray and linking the area to the rest of the UK and Europe. In particular, business needs to be able to minimise any adverse impacts arising from Moray's peripherality.

5.16.24 The Moray Local Transport Strategy has been developed to recognise and support linkages to other strategic initiatives. This includes:

(a) Key Objective 1: to improve accessibility to jobs, services and facilities within Moray by:

- Maintaining and improving the existing road network.
- Improving road, rail, air and sea links to the rest of Scotland, the UK and Europe.
- Realising the potential for public transport, cycling and walking.
- Improving the linkages between different modes of transport.
- Improving the transport infrastructure related to recreation and tourism.

(b) Key Objective 2: to promote sustainability and safety by:

- Reducing the need to travel generally.
- Using land use planning to reduce travel needs.
- Reducing pollution where necessary to meet Government requirements.
- Seeking to continually improve safety.
- Counteracting the additional costs and disbenefits of rurality.

5.16.25 The options outlined in this report integrate well with wider government, and regional and local policies. They introduce a range of potential solutions to mitigate against present and future congestion within the Elgin area. The STAG Part 1 and STAG Part 2 methodology adopted by The Moray Council has ensured that the options identified are objective-led, and are complementary to existing transport, land-use and wider policy initiatives. The adoption of an objective-led approach maximises the potential to implement the most efficient transport solution for The Moray Council and to meet the Council's aspirations for the sustainable development of Elgin.

5.17 ***Economy***

5.17.1 Appraisal under the Economy objective has two components which, between them, aim to summarise the full extent of economic impacts resulting from a transport proposal. The first, Transport Economic Efficiency (TEE), covers the benefits ordinarily captured by standard cost-benefit analysis – the transport impacts of options. The second, Economic Activity and Location Impacts (EALIs), allows the impact of schemes to be expressed in terms of their effects on the local and/or national economy.

Transport Economic Efficiency

5.17.2 Appraisal in this section is designed to make explicit the impact of the proposal on social welfare, as represented by the costs and benefits incurred by users and operators of the transport system. Use has been made of the Department for Transport's Transport User Benefit Appraisal (TUBA) model to identify the costs and benefits of each option. The TUBA model provides a technique that is based on nationally recognised guidance and enables local, regional and national governments to view the costs and benefits of transport projects, whether multi-modal or road-based, in a consistent manner. The TUBA model is based on a 'willingness to pay' method that captures the costs and benefits related to each transport option.

5.17.3 The current (2007) capital cost of each option - inclusive of construction costs, land, supervision and preparation costs are outlined below in Table 5-29. The figures are inclusive of risk allowances, provided by The Moray Council, and an optimism bias uplift of 44% applied to construction costs as recommended in Her Majesty's Treasury guidance. The figures are presented in March 2007 prices. The calculation of the optimism bias adjustment is explained in the following chapter.

Table 5-29: Option Costs (2007 prices)

	A	B	C	D	E	F	G
Total	£13.9m	£26.1m	£51.2m	£57.9m	£61.4m	£32.4m	£47.4m

5.17.4 These costs have been entered into the TUBA model and discounted to 2002 prices to ensure all costs and benefits are based on a constant price base. The economic costs to the public sector of each option are itemised separately and are subsequently discussed in the Section titled 'Cost to Government'.

5.17.5 Transport Economic Efficiency (TEE) appraisal is applied to assess the direct transport benefits deriving from a particular transport option. It is a top down approach to assess specifically, how individual travellers are affected by a proposed scheme. The TEE appraisal addresses the economic welfare impacts of the proposals under consideration.

5.17.6 A key issue for this study was to consider the scope of the TEE appraisal. The following items have been included:

(a) Net consumer user benefits to transport users, comprising:
- Travel time savings
- Vehicle operating cost changes for road vehicles and
- Maintenance delays

(b) Net business user benefits to transport users, comprising:
- Travel time savings
- Vehicle operating cost changes for road vehicles and
- Maintenance delays

User Benefits

5.17.7 As part of the TEE assessment for the detailed STAG Part 2 appraisal of options, the level of user benefits have been estimated for each scheme option. This encompasses the following elements:

- Journey Time savings; and
- Vehicle operating cost savings
- The impact of future maintenance delays.

5.17.8 The user benefits have been estimated using outputs from Department for Transport, Transport User Benefit Appraisal (TUBA) software.

5.17.9 The scheme options appraised for this detailed STAG Part 2 TEE analysis are detailed as follows:

- Option A - Wittet Drive Link
- Option B - Morriston Road Link
- Option C - Bypass North Alignment

- Option D - Bypass South Alignment (Short)
- Option E - Bypass South Alignment (long)
- Option F - Southern Distributor Route + Wittet Drive Link
- Option G- Southern Distributor + Morriston Road Link

Travel Time Savings

5.17.10 The travel time savings estimated across all seven scheme options represent the benefit to travellers for each scheme option under consideration. The figures presented in Table 5-30 show the total travel time savings over the 60 year appraisal period.

Table 5-30: Travel Time Savings

	A	B	C	D	E	F	G
Consumers	£13.3m	£7.7m	£16.0m	£17.4m	£17.4m	£16.8m	£13.0m
Business	£8.7m	£4.9m	£10.0m	£11.4m	£11.8m	£9.5m	£7.3m
Total	£22.0m	£12.6m	£26.0m	£28.8m	£29.2m	£26.3	£20.3m

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Vehicle Operating Costs

5.17.11 The vehicle operating cost changes estimated across all seven scheme options represent the net change in costs which occur due to changes in the volume of car travel, through mode switch and more relevant to Elgin changes in the speed and distance travelled as a result of route changes. Table 5-31 shows the vehicle operating cost savings over the 60 year appraisal period.

Table 5-31: Vehicle Operating Costs

	A	**B**	**C**	**D**	**E**	**F**	**G**
Consumers	£1.3m	£0.5m	£0.2m	£0.6m	£1.2m	£1.5m	£0.9m
Business	£0.4m	£0.2m	£0.3m	£0.3m	£0.4m	£0.4m	£0.3m
Total	**£1.7m**	**£0.7m**	**£0.5m**	**£0.9m**	**£1.6m**	**£1.9m**	**£1.2m**

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Construction Maintenance Delays

5.17.12 As transport appraisal is concerned with evaluating differences in the overall costs of a do-minimum and a range of do-something options it is important to appraise the costs of maintaining public highways and the impacts that this will have on road users. These are shown as dis-benefits and therefore have a negative value in Table 5-32 below. It shows the construction maintenance delay dis-benefits for each option over the 60 year appraisal period.

Table 5-32: Construction Maintenance Delays

	A	B	C	D	E	F	G
Consumers	-£0.07m	-£0.07m	-£0.07m	-£0.07m	-£0.07m	-£0.07m	-£0.07m
Business	-£0.15m	-£0.15m	-£0.15m	-£0.15m	-£0.15m	-£0.15m	-£0.15m
Total	**-£0.22m**	**-£0.22m**	**-£0.22m**	**-£0.22m**	**-£0.22m**	**-£0.22m**	**-£0.22m**

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Carbon Benefits

5.17.13 As part of its Climate Change Programme, the Government is committed to reducing emissions of the gases responsible for climate change. The UK has a legally-binding target known as the Kyoto Protocol, to cut the emissions of a basket of six greenhouse gases to, on average, 12.5% below 1990 levels, between 2008 and 2012. The Government also has a domestic goal to achieve a 20% reduction in emissions of carbon dioxide (CO_2), the most important greenhouse gas, below 1990 levels by 2010. As part of its Climate Change Programme, the Government is committed to reducing emissions of the gases responsible for climate change.

5.17.14 Table 5-33 details the total present value of carbon benefits estimated across options AtoG. These figures represent the total carbon benefits, over the 60 year appraisal period.

Table 5-33: Carbon Benefits

	A	B	C	D	E	F	G
Carbon Benefits	£0.13m	£0.05m	£0.06m	£0.10m	£0.14m	£0.15m	£0.10

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

5.17.15 Although developer contributions reduce public sector costs, they do not lower the cost of a project. These are therefore defined as 'negative grants' and are recorded both as a cost to the private sector and a benefit to the public sector. These additional private sector impacts are therefore given a negative value in Table 5-34. As developer contributions reduce government costs they are given a negative value in the cost to government table, thereby lowering costs. This ensures that the benefits and costs of developer contributions are considered from a public sector and private sector perspective and that the full economic cost/benefits of developer contributions are considered.

Table 5-34 Private Sector Costs (Developer Contributions)

	A	B	C	D	E	F	G
Developer Contributions	-£0.96m	-£0.96m	£0	-£0.96m	-£0.96m	-£0.96m	-£0.96m

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Total Benefits

5.17.16 Table 5-35 details the total present value of benefits estimated across options AtoG. These figures represent the total net user benefits, over the 60 year appraisal period, comprising changes to travel time savings, vehicle operating costs and construction maintenance impacts.

Table 5-35: Total Benefits

	A	B	C	D	E	F	G
Consumers	£14.6m	£8.1m	£16.1m	£17.9m	£18.5m	£18.2m	£13.8m
Business	£8.9m	£4.9m	£10.2m	£11.6m	£12.0m	£9.7m	£7.4m
Carbon Benefits	£0.13m	£0.05m	£0.06m	£0.10m	£0.14m	£0.15m	£0.10
Developer Contributions	**-£0.96m**	**-£0.96m**	**£0**	**-£0.96m**	**-£0.96m**	**-£0.96m**	**-£0.96m**
Total	**£22.6m**	**£12.1m**	**£26.4m**	**£28.6m**	**£29.7m**	**£27.1m**	**£20.3m**

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Summary

5.17.17 Option E, offers the greatest user benefits of £29.7m over the 60 year appraisal period.

Cost to Government

5.17.18 It is essential that the likely net cost of transport proposals, from the public sector's point of view, is clearly identified within STAG appraisals. This enables comparisons to be made between the total benefits and costs of projects, and provides an assessment of the overall value for money for transport projects.

5.17.19 Cost to Government refers to all costs incurred by the public sector as a whole, net of any revenues. The total net cost consists of investment costs, operating and maintenance costs, grant/subsidy payments, revenues, and taxation impacts.

Private Sector Operator Impacts

5.17.20 Many transport projects impact on private sector operators, by increasing their investment costs to operate new or improved public transport services. This includes initial investment costs, maintenance costs, future revenues and grant subsidy payments. It is unlikely that any of the seven options being appraised will impact significantly on private sector operators. The options being appraised will have minimal impact on modal shift and do not, directly, promote the introduction of new publicly provided transport services. The private sector operator impacts have therefore assumed to be zero across all seven options.

Grant/Subsidy Payments

5.17.21 Transport improvements that impact on private sector operators often lead to grant subsidy payments being transferred from central government directly to the private operators. As outlined above it is unlikely that any of the seven options being appraised will produce significant private sector operator impacts. Grant/subsidy impacts are therefore assumed to be zero across all seven options.

Investment Costs

5.17.22 Investment costs include all infrastructure and other capital costs incurred by the public sector which are additional to those incurred in the do-minimum scenario. The investment costs for each of the seven options have been estimated using

current prices. The costs have been converted to 2002 prices and discounted over the 60-year appraisal period to allow a direct comparison with user benefits to be made.

Indirect Tax Revenue

5.17.23 Although largely considered a benefit, reductions in journey times and faster travel times also produce treasury impacts. Faster journey times and improved road-connections can help reduce the volume of fuel used. Impacts on the level of indirect tax receipts collected by the government are therefore presented as a 'cost to government'.

5.17.24 The investment costs, operating costs and indirect taxation impacts, borne by the public sector, are summarised for each scheme option in Table 5-36. It should be noted that each figure in Table 5-36 is presented as a present value amount, as calculated by TUBA.

Operating Costs

5.17.25 The operating costs include annually recurring costs incurred by the public in running and maintaining the options. This provides for the additional maintenance costs, over the appraisal period, of maintaining the improved infrastructure in comparison to the do-minimum scenario.

Table 5-36: Present Value Costs to Government

	A	**B**	**C**	**D**	**E**	**F**	**G**
Investment Costs	£13.0m	£24.4m	£47.8m	£54.1m	£57.4m	£30.3m	£44.3m
Operating Costs	£0.2m	£0.4m	£1.3m	£1.2m	£1.4m	£0.8m	£1.0m
Indirect Tax Costs	£0.9m	£0.36m	£0.47	£0.76m	£1.03m	£1.08m	£0.71m
Developer Contributions	**-£0.96m**	**-£0.96m**	**£0**	**-£0.96m**	**-£0.96m**	**-£0.96m**	**-£0.96m**
Total	**£13.2m**	**£24.2m**	**£49.6m**	**£55.1m**	**£58.9m**	**£31.2m**	**£45.0m**

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Cost Benefit Analyses

5.17.26 It is now possible to show the results of the Transport Economic Efficiency analysis in direct comparison to the expected Cost to Government for all scheme options. The summary of cost benefit analysis for each scheme option in Table 5-37 shows two headline figures – the net present value and benefit-cost to government ratio for each scheme option.

Table 5-37: Monetised Summary

	A	B	C	D	E	F	G
PVB Benefits	£22.6m	£12.1m	£26.4m	£28.6m	£29.7m	£27.1m	£20.3m
PVC	£13.2m	£24.2m	£49.6m	£55.1m	£58.9m	£31.2m	£45.0m
NPV[12]	£9.4m	-£12.1m	-£23.2m	-£26.5m	-£29.2m	-£4.1m	-£24.7m
BCR[13]	1.70	0.50	0.53	0.52	0.50	0.86	0.45

These are present values discounted to 2002, in 2002 prices, extracted from the TUBA model.

Option A – Wittet Drive Link

5.17.27 This option scheme proposal is forecast to achieve a net present value of £9.4million and return a benefit-cost to government ratio of 1.70. The economic benefits of the proposal outweigh the costs.

Option B – Morriston Road Link

5.17.28 This option scheme proposal, is forecast to achieve a net present value of £-12.1million and return a benefit-cost to government ratio of 0.50. The economic costs of the proposal outweigh the benefits.

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[12] Net Present Value is defined as the discounted sum of all future benefits less the discounted sum of all future costs over the appraisal period.

[13] Benefit-Cost Ratio is a value for money measure, which indicates how much net benefit would be obtained in return for each unit of cost to the public sector, i.e. BCR = 2:1, £2 benefit per £1 cost.

Option C – Bypass North Alignment

5.17.29 This option scheme proposal, is forecast to achieve a net present value of £-23.2million and return a benefit-cost to government ratio of 0.53. The economic costs of the proposal outweigh the benefits.

Option D – Bypass South Alignment (short)

5.17.30 This option scheme proposal, is forecast to achieve a net present value of £-26.5million and return a benefit-cost to government ratio of 0.52. The economic costs of the proposal outweigh the benefits.

Option E – Bypass South Alignment (long)

5.17.31 This option scheme proposal, is forecast to achieve a net present value of £-29.2million and return a benefit-cost to government ratio of 0.50. The economic costs of the proposal outweigh the benefits.

Option F – Southern Distributor Route + Wittet Drive Link

5.17.32 This option scheme proposal, is forecast to achieve a net present value of £-4.1million and return a benefit-cost to government ratio of 0.86. The economic costs of the proposal outweigh the benefits. Option F augments elements of Option A to improvements at Glen Moray Drive and Reiket Lane. The additional costs of implementing this option when compared to Option A are estimated at £18m. In contrast the additional benefits over the appraisal period are £4.5m. The magnitude of additional costs compared to the additional benefits reduces the BCR of this option below one.

Option G – Southern Distributor Route + Morriston Road Link

5.17.33 This option scheme proposal, is forecast to achieve a net present value of £-24.7million and return a benefit-cost to government ratio of 0.45. The economic costs of the proposal outweigh the benefits.

5.18 ***Summary***

5.18.1 The benefit-cost ratios were calculated using the latest advice concerning economic appraisal and the application of the Department for Transport, Transport User Benefit Appraisal (TUBA) software. The results therefore adhere fully to the Scottish Transport Appraisal Guidance. An "optimism bias" uplift of 44% was

applied to capital costs. The theory and application of optimism bias is discussed in Chapter 7 titled 'Risk and Uncertainty'.

5.18.2 The benefit-cost ratios presented above show that Option A which links Edgar Road to the A96 near Wittet Drive produces the highest BCR of 1.70. The analysis indicates that this option offers the greatest value for money, in terms of transport economic appraisal. The key features of this option are to:

- Extend Edgar Road to a new roundabout approximately 185m beyond the entrance to the primary school. This roundabout to provide access to zones 129 (South of Bilbohall Farm) and 130 (West of Hardhillock Avenue).
- Create a new link from the roundabout to run Northbound, parallel with The Wards. This new link to provide access to zones 129 (South of Bilbohall Farm) and 127 (Adjacent to Bilbohall Farm) to the West via priority junctions with ghost islands.
- A new railway bridge to be constructed where the link crosses the rail line and a subsequent priority junction to be designed where this meets Wards Road, Wittet Drive and Fleurs Road.
- Wittet Drive to be diverted slightly west to join the A96 at a roundabout adjacent to Sheriffmill Road.
- The previous alignment of Wittet Drive to be stopped up short of the A96 and signals to be removed.
- Speed limit on new link to be set at 30mph.

6 Risk and Uncertainty

6.1 ***Introduction***

6.1.1 All risks and uncertainties associated with transport improvements need to be fully taken into account within the appraisal process. Only after this has been done can robust estimates of the costs and benefits of each option be assessed.

6.1.2 There exists evidence from past transport projects which illustrates that there is a systematic tendency for project appraisers to be overly optimistic when estimating costs and benefits. To redress this tendency, it is necessary to make explicit adjustments for bias when appraising projects. Only after more reliable estimates of relevant costs are built up, risks are explicitly assessed and quantified, and work to minimise project-specific risks is undertaken, can adjustments be made to reduce the level of optimism bias. The main aim of taking account of risks, uncertainties, and optimism bias is to obtain the best possible estimates of the costs and benefits of each option.

6.1.3 In appraisals there is always likely to be some difference between what is expected, and what eventually happens, because of biases unwittingly inherent in the appraisal, and risks and uncertainties that materialise. As a result, it is important to identify and mitigate risks, and make allowances for "optimism bias".

6.1.4 Distinct from optimism bias is the need to account for contingencies and known risks. For the purpose of this appraisal, contingencies and risk allowance adjustments to capital cost estimates have been defined by Moray Council. These range from 33% to 53% of the capital cost estimates.

6.2 ***Optimum Bias***

6.2.1 All seven options considered in this STAG appraisal are road-based that do not require any special design considerations due to space constraints, unusual output specifications or innovative construction methods. The project is therefore classified as a standard civil engineering project. The optimism bias starting values for standard civil engineering projects with no risk mitigation measures are:

- 44% for capital costs and
- 20% for work duration.

6.2.2 Optimism bias has been applied to the capital cost of construction. It is important to note that optimism bias has not been layered on top of the 'option risk allowances' established by Moray Council. This removes the potential of risk being applied to risk and inflating the cost of each option.

6.3 ***Risk Summary***

6.3.1 Option A – Wittet Drive Link. The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option A is estimated to be £13.9m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£2.4m) and Risk Allowances (£3.8m) provided by Moray Council, is 45% of the total estimated cost of this option.

6.3.2 Option B – Morriston Road Link. The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option B is estimated to be £26.1m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£5.7m) and Risk Allowances (£5m) provided by Moray Council, is 41% of the total estimated cost of this option.

6.3.3 Option C – Bypass North Alignment. The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option C is estimated to be £51.2m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£10.7m) and Risk Allowances (£11.6m) provided by Moray Council, is 44% of the total estimated cost of this option.

6.3.4 Option D – Bypass South Alignment (Short). The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option D is estimated to be £57.9m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£11.6m) and Risk Allowances (£15m) provided by Moray Council, is 46% of the total estimated cost of this option.

6.3.5 Option E – Bypass South Alignment (long). The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option E is estimated to be £61.4m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£12m) and Risk Allowances (£17.1m) provided by Moray Council, is 47% of the total estimated cost of this option.

6.3.6 Option F - Southern Distributor Route + Wittet Drive Link. The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option F is estimated to be £32.4m. The proportion of the costs

attributable to risk, inclusive of Optimism Bias (£6m) and Risk Allowances (£9m) provided by Moray Council, is 46% of the total estimated cost of this option.

6.3.7 Option G - Southern Distributor Route + Morriston Road Link. The total cost (2007 prices) inclusive of construction, land, preparation and supervision of implementing Option G is estimated to be £47.4m. The proportion of the costs attributable to risk, inclusive of Optimism Bias (£9.2m) and Risk Allowances (£13.2m) provided by Moray Council, is 47% of the total estimated cost of this option.

6.3.8 The results presented in the economy section of this report, specifically Table 5-37, show the ratio of costs to benefits. It is clear that the options that have returned a BCR less than one would require a consideration reduction in costs for benefits to outweigh costs. It is unreasonable, at this stage in project development, to reduce the level of optimism bias. Furthermore the option risk allowances, provided by Moray Council, have been applied following careful considerations by officials within the council. It is therefore proposed that the risk factors highlighted above are maintained until further detailed design development appraisal has been undertaken.

6.3.9 It should be noted that applying risk adjustments is designed to complement and encourage, rather than replace existing good practice in terms of calculating project specific risk adjustments and contingency allowances. It is also designed to encourage more accurate estimates of costs and the subsequent appraisal outlined in this report. Furthermore, adjustments to risk allowances and optimism bias may be reduced as more reliable estimates of relevant costs are built up, risks are explicitly assessed and quantified, and work to minimise project-specific risk is undertaken.

7 Summary of Main Findings

7.1 ***Introduction***

7.1.1 This section summarises the main findings within the appraisal process for each scheme option under consideration. Careful consideration consistent with Best-Value[14] principles, should be given prior to the implementation of options outlined below.

7.2 ***Option A – Wittet Drive Link***

- Option A performs best in terms of economic performance.
- The Option A scheme proposal is forecast to achieve a Net Present Value of £9.4m and return a Benefit to Cost ratio of 1.70:1. The present value cost of implementing this option is significantly less than the other six options being appraised.
- It achieves the objective of reducing congestion in Elgin.
- The environmental impacts of introducing this option are likely to be modest, ranging from neutral to minor negative.
- Car users will benefit from improved accessibility through a reduction in congestion and improved traffic flows. A number of key employment and service sites in the centre of Elgin would benefit from improved accessibility, particularly the Edgar Road Retail Zone. Social inclusion impacts are likely to be modest, although improvements to traffic flow will also benefit those relying on public transport to access and move around Elgin.
- Option A increases local severance levels from slight to moderate in the vicinity of Wittet Drive. This highlights a trade-off between the economic benefits of this option and wider benefits to Elgin as a whole.

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[14] The objective of Best Value is to ensure that effective management delivers better and more responsive public services. It is about local authorities, balancing the quality of services with cost, achieving sustainable development, being accountable and transparent, by engaging with the local community, ensuring equal opportunities, continuously improving the outcomes of the services they provide. Audit Scotland, Nov 2006. http://www.audit-scotland.gov.uk/accounts/pdfs/Bestvaluebriefingnote.pdf

- Increasing road-space can encourage increased vehicle use as journey times fall. This can impact adversely on accident and security levels. An analysis of annual vehicle kilometres travelled shows little change from the do-minimum scenario, producing negligible impacts on accident and security levels.
- This option integrates well with the key planning objective; to provide a quicker, safer and more reliable transport system in and around Elgin while accommodating future development. It is also complements policies being directed towards efficient land-use and the stimulation of economic development.

7.3 ***Option B – Morriston Road Link***

- The Option B scheme proposal is forecast to achieve a Net Present Value of -£12.1m and return a Benefit to Cost ratio of 0.50:1. The Present Value Costs of this option are significantly higher than the Present Value Benefits.
- While Option B reduces congestion in Elgin it does not perform well in economic terms, e.g. in offering value for money. This is attributable to the low level of benefits and the high level of costs.
- The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative.
- This option also promotes improved access to the centre of Elgin and the Edgar Road Retail Zone. The main beneficiaries will be car-users with modest social inclusion impacts for those relying on public transport.
- An analysis of annual vehicle kilometres travelled shows little change from the do-minimum scenario, producing negligible impacts on accident and security levels.
- This option integrates well with the key planning objective; to provide a quicker, safer and more reliable transport system in and around Elgin while accommodating future development. It is also complements policies being directed towards efficient land-use and the stimulation of economic development. This option is complementary to improving the flow of traffic and meets the key planning objective established for this study.

7.4 ***Options C, D & E (Bypass Options)***

- Similarly to Option B, while Options C, D and E reduce congestion in Elgin they do not perform well in economic terms or offer good value for money.

- The Option C scheme proposal is forecast to achieve a Net Present Value of £-23.2m and return a Benefit to Cost ratio of 0.53:1. The Present Value Costs of this option are significantly higher than the Present Value Benefits.
- The Option D scheme proposal is forecast to achieve a Net Present Value of -£26.5m and return a Benefit to Cost ratio of 0.52:1. The Present Value Costs of this option are significantly higher than the Present Value Benefits.
- The Option E Scheme proposal is forecast to achieve a Net Present Value of -£29.2m and return a Benefit to Cost ratio of 0.50:1. The Present Value Costs of this option are significantly higher than the Present Value Benefits.
- Implementing any of the three bypass option appraised would produce minor to moderate improvements to local air quality. A number of adverse impacts would also be produced including negative impacts on local bio-diversity, water quality, soils and cultural heritage. A separate environmental report outlines a number of approaches that could be used to manage and mitigate the environmental impacts of introducing an Elgin bypass.
- The implementation of an Elgin by-pass would improve access to and within Elgin and improve journey times for those travelling through Elgin. The main beneficiaries are likely to be existing car owners with modest social inclusion impacts for those relying on public transport.
- An analysis of annual vehicle kilometres travelled shows little change from the do-minimum scenario, producing negligible impacts on accident and security levels.
- The bypass options are complementary to improving the flow of traffic and meet the key planning objective established for this study.

7.5 ***Option F - Southern Distributor Route + Wittet Drive Link***

- The Option F scheme proposal is forecast to achieve a Net Present Value of -£4.1m and return a Benefit to Cost ratio of 0.86:1.
- The environmental impacts of introducing this option are broadly similar to those of Option A with minor negative impacts. This option is however likely to produce minor to moderate improvements to local air quality.
- A number of key employment and service sites in the centre of Elgin would benefit from improved accessibility, particularly the Edgar Road Retail Zone. Social inclusion impacts are likely to be modest, although

improvements to traffic flow will also benefit those relying on public transport to access and move around Elgin.

- An analysis of annual vehicle kilometres travelled shows little change from the do-minimum scenario, producing negligible impacts on accident and security levels.
- This option is complementary to improving the flow of traffic and meets the key planning objective established for this study.

7.6 ***Option G - Southern Distributor Route + Morriston Road Link***

- The Option G scheme proposal is forecast to achieve a Net Present Value of -£24.7m and return a Benefit to Cost ratio of 0.45:1. The Present Value Costs of this option are significantly higher than the Present Value Benefits.
- The environmental impacts of introducing this option are broadly similar to those of Option B although negative impacts on Water Quality, Draining and Flood Defence increase from minor to moderate.
- This option promotes improved access to the centre of Elgin and the Edgar Road Retail Zone. The main beneficiaries will be car-users with modest social inclusion impacts for those relying on public transport.
- An analysis of annual vehicle kilometres travelled shows little change from the do-minimum scenario, producing negligible impacts on accident and security levels.
- This option is complementary to improving the flow of traffic and meets the key planning objective established for this study.

Appendix A

Zone	Development	Type
136	Aldi	Discount Supermarket
113	Lidl	Discount Supermarket
73	Springfield Xtn Pets at Home	Non-Food Retail
73	Pizza Hut	Fast Food
100	Tesco Mezzanine	Supermarket
61	ASDA	Supermarket
124	CF4 Neighbourhood Centre	Retail/Office
38	Alan Milne	Car Showroom
63	Robertson's site: non-food retail	Non-Food Retail
94	CD3 garden centre	Garden Centre
127	Bilbohall	Residential
116	R2 Housing	Residential
119	R3 Housing	Residential
123	Housing	Residential
79	R4 Housing Glassgreen	Residential
125	R5 Housing	Residential
129	R7 Housing Bilbohall south	Residential
130	R8 Elgin High School SW	Residential
133	R9 Spynie Hospital	Residential
87	Hattan Hill / Wittet Drive	Residential
117	BP1 + BP2	Business Park
131	BP3	Business Park
115	I6 Linkwood east	Industrial
35	I2 Chanonry	Industrial
49	McDonald Estates – car mart	Car Showroom

Appendix B

Data Zone	Ward	Overall SIMD Rank	Income Rank	Employment Rank	Health Rank	Education/ Skills Rank	Housing Rank	Geographic Access Rank	Crime Rank
S01004303	Bishopmill East' and 'Elgin - Cathedral'	987	1951	1118	661	385	3131	1471	1858
S01004282	New Elgin East	1300	1484	2056.5	1490	381	2355	3776	636
S01004300	Cathedral	1582	1474	1086	1976	3676	4080	5558	211
S01004299	Central West	1853	1787	1766	2455	3170	1988	6104	37
S01004304	Bishopmill East' and 'Elgin - Cathedral'	1884	2055	1962	2761	1569	1286	2174	1291
S01004284	New Elgin West	2279	2827	2087	1969	1879	1948	3385	1980
S01004283	New Elgin East	2322	2953	1985	2177	2396	3726	2686	1243
S01004306	Bishopmill West	2435	1979	1890	2276	3338	4388	3794	4974
S01004289	New Elgin East	2932	3705	3099	2865	2334	2609	1368	2016
S01004311	Bishopmill East	3051	3236	3472	2779	2323	4267	1545	3359
S01004297	Cathedral	3170	3021	2739	3963	2999	1002	3853	2203
S01004308	Bishopmill East	3423	3407.5	3443	3456	2300	3172	2954	3424
S01004310	Bishopmill West	3448	3216.5	3290	3928	2904	3950.5	2345	3514
S01004280	'New Elgin West' and 'New Elgin East'	3654	3065	3526	3289	3586	3994	2989	4648
S01004295	Cathedral' and 'Elgin - Central West'	4222	2868	3948	3251	5522	5247.5	5514	3621
S01004305	Bishopmill West' and Bishopmill East'	4296	4264	4336	3126	3632	4094.5	4489	1830
S01004298	'Heldon and Laich' and 'Lhanbryde and Birnie'	4325	4720	5065	5259	5459	4344	249	4307
S01004315	Bishopmill West' and 'Elgin - Bishopmill East'	4373	4099.5	4709.5	4270	2781	5288	2167	5804
S01004294	Central West	4485	5081	3756	3724	5817	5018	5762	245
S01004292	Cathedral	4663	4795	5788	6094	3007	5672	899	3264
S01004255	'New Elgin East' and 'Lhanbryde and Birnie'	4674	5602	4541.5	5725	5928	5298	299	5629
S01004288	New Elgin West	4753	5038	4505.5	3634	4104	4938	3936	1961
S01004291	New Elgin East	4864	4527	5137.5	4174	3214	4614	4201	3467
S01004302	Elgin - Bishopmill West	5039	5846	4029.5	5753	6163	6238	1449	2437
S01004277	New Elgin West	5062	4935	4563	5367	5074	6110	2083	3861
S01004296	Central West	5314	4972	5781	4559	6240	5904	4989	391
S01004293	Elgin - Central West	5372	5239	5043	3921	6065	6258	3270	2934
S01004316	Bishopmill West	5992	6461	6315	6154	4262	6487	1372	6418
S01004309	Bishopmill West	5999	5742	6087	5471	5870	6368	1719	6109

Appendix C Appraisal Summary Tables