

Transport for Development

Dumfries to A74 Fastlink

Report for SWestrans

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Executive Summary

Introduction

SWestrans are considering options for improved transport links between Dumfries and the A74(M). To assist this, an appraisal consistent with the Scottish Transport Appraisal Guidance (STAG) has been undertaken.

Proposals for enhanced links between Dumfries and the motorway network have been under consideration for a number of years and have enabled a detailed assessment of the benefits and disbenefits to be carried out.

This study focused purely on road-based interventions carried forward from the initial STAG Part 1 appraisal, and highlighted in the SWestrans Regional Transport Strategy (RTS). Other projects may complement road-based schemes to provide a multi-modal package, however these are the subject of separate projects and analysis.

The study area is bounded to the east by the A74(M) motorway, to the south by the A75(T) and to the north by the A701(T). Dumfries itself marks the western extent of the area. Between the A701 and the A75 lies the A709 multi purpose road between Dumfries and Lockerbie, which is also a key consideration in the Study. Figure 1 below shows the study area routes.

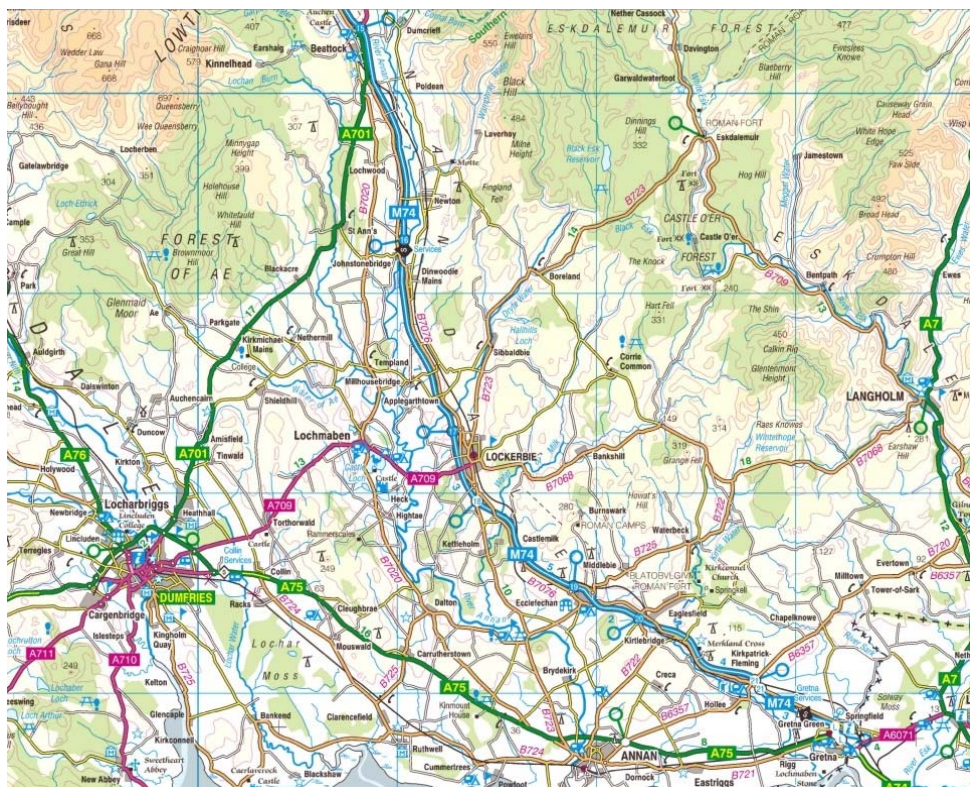


Figure 1 Study Area Routes

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Summary

Following discussions with stakeholders, a number of problems which the study had to address were identified. Journey times and reliability were key concerns, while accidents/safety, local economic prosperity and the impact of traffic on local communities were also identified as salient issues.

STAG Appraisal

STAG has a defined set of key criteria against which proposals must be assessed. These are:

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

The appraisal is carried out in two parts. An initial Part 1 appraisal where impacts are assessed at a high level has been undertaken previously. A more detailed assessment is carried out through the Part 2 appraisal.

Four possible route corridors were identified in the Part 1 appraisal following preliminary traffic and economic appraisal, and engineering and environmental scoping exercises. These corridors are highlighted in Figure 2 below.

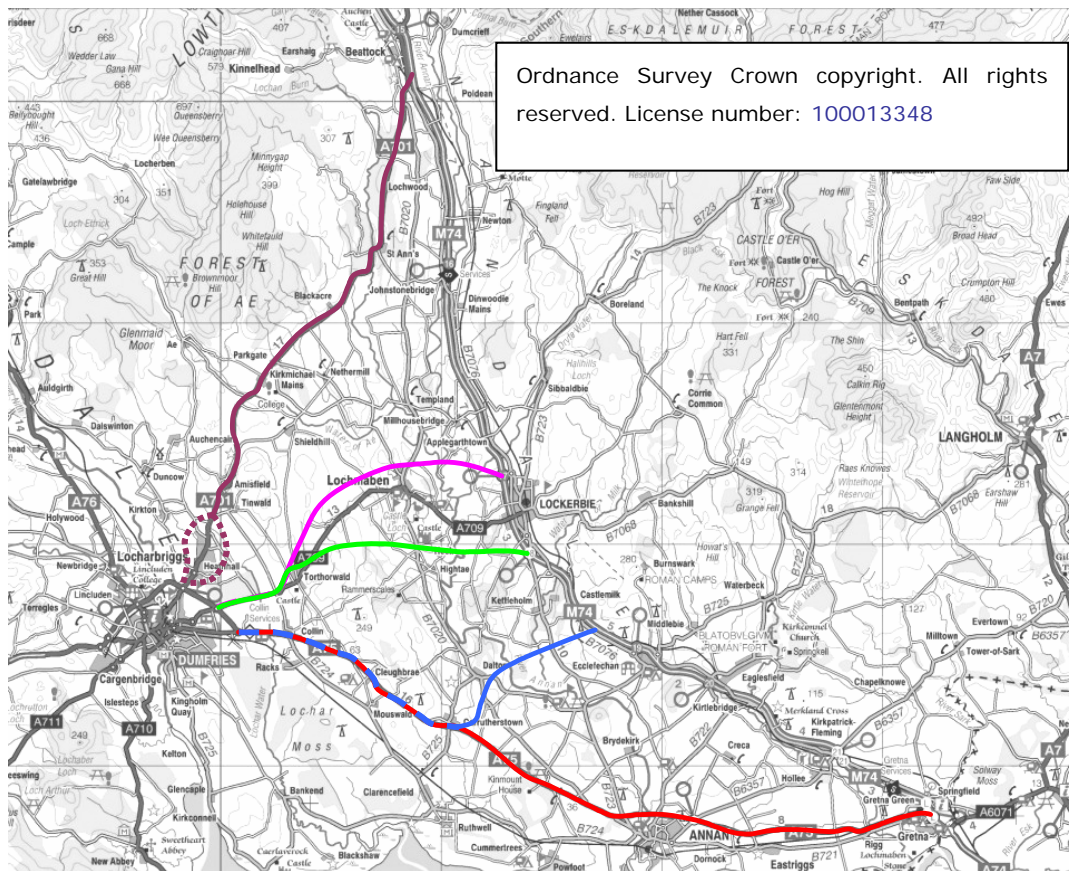


Figure 2 Road Corridor Options within the Study Area

Summary

The sifting of options identified a preference for two corridor options:

- **Option 1 - A75(T) Gretna to Dumfries** - involves online dualling (widening) of the existing A75 road between Dumfries and Gretna; and
- **Option 3 - Lockerbie to Dumfries (South) Corridor** - involves construction of a new offline road between Dumfries and Lockerbie.

Taking the original STAG Part 1 appraisal into consideration, both options were subjected to the more detailed STAG Part 2 appraisal. The findings from this work are outlined below.

Environment

Both options have been assessed for their potential impacts against the environmental sub-criteria in order to ensure that environmental implications are considered during the decision making process. The main points from the assessment are outlined below.

The A709 (southern option) is offline and therefore has greater overall potential for environmental impacts than the proposed dualling of the existing A75(T).

The A709 corridor is environmentally more sensitive and will require significant survey and assessment. The major issues have been identified as being:

- ecology and nature conservation;
- landscape and visual quality; and
- water quality

Both schemes would likely require Statutory EIA under the Environmental Impact Assessment (Scotland) Regulations 1999, as amended.

Both schemes would likely require Appropriate Assessment under the Conservation (Natural Habitats &c) Regulations 2004.

The results of the environmental appraisal are summarised in Table 1.

Table 1 Summary of Environmental Appraisal for Both A74 (M) Fastlink Options

Environmental Criteria	Potential Environmental Impact Significance	
	Lockerbie to Dumfries (South) A709	A75 (T) Dualling
Noise & Vibration	Moderate/ Substantial Adverse	Negligible
Air Quality	Slight Positive	Negligible/ Neutral
Water Quality, Drainage and Flood Defence	Moderate/ Major Adverse	Minor/ Negligible Adverse
Geology	Moderate Adverse	Minor Adverse
Ecology, Biodiversity and Nature Conservation	Major Adverse	Minor/ Moderate Adverse
Landscape and Visual Amenity	Major Adverse	Minor Adverse
Land Use, Agriculture and Soils	Major Adverse	Minor/ Moderate Adverse
Cultural Heritage	Moderate Adverse	Minor Adverse

Safety

Analysis has shown that the accident severity ratio for the A75 (T) exceeds the “benchmark” figure for similar roads in the whole of Scotland. However, the severity ration for the A709 is well below the average figure for similar roads in Scotland.

The following table summarises the overall appraisal for safety.

Option	Accidents	Security	Overall Appraisal for Safety
Option 1: A75(T) Gretna to Dumfries	✓✓	0	✓✓
Option 3: Lockerbie to Dumfries (South)	✓	0	✓

Both options will impact positively on future accident rates; however, the poor record of the A75(T) between Gretna and Dumfries gives the greatest scope for improvement. There are no direct implications in terms of security.

Economy

Both options have positive Present Value of Benefits (ie total economic benefits outweigh any possible economic disbenefits). However potential travel time savings are much greater through proposed improvements on the A75(T) than those achievable through the Dumfries – Lockerbie option, and when the necessary investment costs are also taken into account only the A75(T) option has a positive Benefit:Cost Ratio (2.75).

We considered any potential Wider Economic Benefits which either option could deliver, but concluded that in this case all likely economic benefits were already captured through the cost/benefit analysis undertaken.

We also looked closely at potential economic activity and location impacts (EALIs) to identify any ways in which the options would support or develop the regional economy. Many of the industrial sectors in the region depend on good connectivity to their wider markets, and hence would clearly benefit from both the options under consideration. The A75 option is predicted to realise more benefits than the A709 due to the greater journey time savings that it offers. There may also be some redistribution of economic activity from England into Dumfries and Galloway as a result of the improved connectivity.

Table 1 TEE Appraisal Summary

	£k, in 2002 Prices	
	A75	A709
Consumer Benefits/Disbenefits		
Travel Time	205717	19427
Vehicle Operating Costs	-7874	-6516
Net Consumer Benefits	197843	12911
Business Benefits/Disbenefits		
Travel Time	231161	23362
Vehicle Operating Costs	3706	-1501
Private Sector Provider Impacts	Nil	Nil
Other Business Impacts	Nil	Nil
Net Business Impacts	234867	21861
Carbon Benefits	-1393	-210
Present Value of TEE Benefits (PVB)	431317	34562

Summary

The economic appraisal can be summarised as follows.

Option	Transport Economic Efficiency (TEE)	Wider Economic Benefits (WEBs)	Economic Activity and Location Impacts (EALIs)	Overall Appraisal for Economy
A75(T) Gretna to Dumfries	✓✓	No impacts	✓	✓✓
Lockerbie to Dumfries (South)	xx	No impacts	✓	x

Integration

We considered in some detail the relationship between such documents as the Structure Plan, Local Plan and Scottish Planning Policy statements/National Planning Policy Guidelines on the one hand, and the intervention being appraised.

Both options have elements which fit with policies in the Dumfries and Galloway Structure Plan. However, while the A75(T) option has at worst a neutral affect on policies, the Lockerbie to Dumfries (South) option is contrary to the Structure Plan's environmental policies.

According to the Structure Plan it would only be appropriate to develop the Lockerbie to Dumfries (South) option if there is no other suitable location for the development, and the development does not compromise the reason for which the area is protected.

Both of the options presented here support local and national access and economic growth objectives.

Overall, it can be seen that the policy context is mixed for the options for an improved link between Dumfries and the A74(M). While the A75(T) option generally complements national and regional transport polices, whilst the Lockerbie to Dumfries (South) option clearly conflicts with environmental policies.

The table below summarises the overall assessment against Government objectives for integration.

Summary

Option	Transport Integration	Transport Land-Use Integration	Policy Integration	Overall Appraisal for Integration
Option 1: A75(T) Gretna to Dumfries	No impacts	Mixture of compliance/non-compliance. Overall ✓	Mixture of compliance/non-compliance. Overall ✗	0
Option 3: Lockerbie to Dumfries (South)	No impacts	Some compliance, but very significant areas of non-compliance. Overall ✗✗	Some compliance, but very significant areas of non-compliance. Overall ✗✗	✗✗

Accessibility and Social Inclusion

An accessibility assessment of proposed improvements to the Lockerbie to Dumfries Corridor was carried out using the Dumfries and Galloway ACCESSION model.

Access to public transport is unlikely to be improved by implementation of either of the proposals however reliability and efficiency of existing public transport services using either option would be significantly improved as a result of the appraised schemes.

The new route to the south of the A709 has been designed to avoid severance along its route whilst the proposed improvements to the A75 should have no impact on this at all.

The proposals will have a beneficial effect for car users as accessibility to the motorway network from Dumfries will be significantly improved through greater reliability. This will in turn allow for better access on local routes, with particular benefits for the east of Dumfries which will exhibit reduced traffic levels.

The table below summarises the overall assessment against Government objectives for accessibility and social inclusion.

	Community Accessibility		Comparative Accessibility		Overall Appraisal for Accessibility/Social Inclusion
	PT Network Coverage	Local Accessibility	People Groups	Locations	
A709	0	0	✓	✓✓	✓
A75(T)	0	0	tba	tba	tba

Cost to Government

- **Option 1 (Dualling A75)** - significant Net Present Value, exceeding £432 million over 60 years, and a Benefit:Cost Ratio of 2.753; and
- **Option 3 (Dumfries – Lockerbie)** - there are Net Present Value benefits exceeding £34 million over 60 years, but a Benefit:Cost Ratio of 0.64.

Implementability

In terms of technical issues, both options under consideration are based around improvements to the road network. Option 1 concentrates on improving the A75(T) and would feature some on-line enhancements and newly built roads in close proximity to the existing alignment. In contrast Option 3 involves a significant amount of newly constructed roads, including the bypassing of Torthorwald, and the existing A709 would be retained for local traffic.

In both cases the construction involved would be well within the bounds of standard civil engineering experience for similar road schemes, and it is not anticipated that major technical issues would be presented by either option.

There are no known operational disbenefits associated with proposals for improving the A75. An improved A75 will produce particular benefits, improving the existing reliability problems. Similarly, there are no operational problems associated with the construction of a new fast link to the motorway south of the A709.

From a financial perspective, the capital cost associated with either option will be high, and it is certain that central government funding would be required to secure either scheme. It should be noted that the A75 is classed as a trunk road on the national strategic network, therefore any improvements should be carried out/jointly funded by Transport Scotland.

We anticipate the public would generally be in favour of any improvements linking Dumfries to the motorway network. The current routes have a history of traffic congestion and accident problems which would in part be relieved by any improvements, while capacity would be significantly improved.

It seems likely that a robust and convincing case will need to be made, particularly for the Lockerbie to Dumfries (South) option, in order to overcome the current presumption by the Scottish Government against such a scheme.

Conclusions and Recommendations

The discussion and appraisal undertaken to date is summarised in the table below from which flows the set of recommendations for further action.

		Option 1: A75(T) Gretna to Dumfries	Option 3: Lockerbie to Dumfries (South)
Transport Planning Objectives	Env1: To safeguard the environment and heritage of the study area	x	xx
	Env2: To reduce the impacts of traffic on local communities	○	✓✓
	S1: To improve safety for all road users by reducing road traffic accidents on the routes linking Dumfries to the A74(M)	✓✓	✓
	Ec1: To increase the reliability of journey times for all vehicles travelling between Dumfries and the A74(M)	✓✓✓	✓✓
	Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs between Dumfries and the A74(M)	✓✓	✓
STAG Criteria	Environment	x	xx
	Safety	✓✓	✓
	Economy	✓✓	x
	Integration	○	xx
	Accessibility/Social Inclusion		✓
Implementability		xx	xxx
✓✓✓	Major Benefit	x	Minor Disbenefit/impact
✓✓	Moderate Benefit	xx	Moderate Disbenefit/impact
✓	Minor Benefit	xxx	Major Disbenefit/impact
○	No Benefit/Impact		

Recommendations

Although both options present environmental challenges – not unusual for road schemes of this type – those relating to the Lockerbie – Dumfries option are particularly challenging, will require considerable mitigation measures (the extent of which cannot yet be foreseen), will require more detailed environmental appraisal, and will be generally more difficult to deliver.

These challenges might be worth addressing if the benefits gained under other headings were more worthwhile than those obtainable through upgrading of the A75(T) between Dumfries and

Summary

Gretna. However, as has been shown the A75(T) option generally has greater benefits than the alternative considered, most notably a strongly positive BCR.

We would therefore recommend that improved accessibility between Dumfries and the national motorway network would be best delivered through dualling of the A75(T) between Dumfries and Gretna, drawing on the outline plans developed in the course of this Detailed Appraisal.

Next Steps and Challenges to be Overcome

Once this report has been considered, if our recommendations are adopted then the following next steps should be considered:

- undertake appropriate targeted **consultation** to enhance the evidence base set out in this report, and assist future engagement with central government and others;
- engage with **Transport Scotland** regarding how best to take forward improvements to the A75(T) as this is a Trunk Road;
- engage with **potential funders** (eg European Union) regarding sources of finance to deliver the programme for the A75(T); and
- undertake a **Design Development Appraisal** to optimise plans for the A75(T).

1 Introduction and Summary of STAG Part 1

1.1 Introduction

- 1.1.1 SWestrans is considering options for improved transport links between Dumfries and the A74(M). The background for this is provided by the SWestrans Regional Transport Strategy (RTS), approved by the Scottish Ministers last year. As a key input to the RTS, improved links between Dumfries and the national motorway network were the subject of an initial study and appraisal in 2005. Following that initial work, the proposed new transport links will now be appraised in more detail against the five main criteria of Environment, Safety, Economy, Integration, and Accessibility and Social Inclusion. This Report documents this STAG Part 2 Appraisal. It has been prepared in accordance with the latest Guidance.
- 1.1.2 The original Part 1 appraisal looked at multi-modal opportunities for improved connectivity, but concluded that in a predominantly rural area of dispersed populations, with relatively high car availability, the widest spread of benefits could be obtained by a road-based intervention. In addition, when the scheme was subsumed within the RTS, it was clear that other projects would complement this road-based scheme to provide a multi-modal package which would be co-ordinated through the RTS Delivery Plan.
- 1.1.3 Therefore this study focused purely on the road-based interventions carried forward from initial appraisal – this is not to say that SWestrans and Dumfries and Galloway Council are turning their back on alternative options – simply that these are the subject of separate analysis and other projects.

1.2 Background

- 1.2.1 The study area is bounded to the east by the A74(M) motorway, to the south by the A75(T) and to the north by the A701(T). Dumfries itself marks the western extent of the area. Between the A701 and the A75 lies the A709 multi purpose road between Dumfries and Lockerbie, which is also a key consideration in the Study. Figure 1.1 below shows the study area routes.

Figure 1.1 Study Area Routes



Evolution of the Study

- 1.2.2 The improvement of transport links between Dumfries and the national motorway network has been under consideration since at least the early 1980s, and in 1997 four corridors were considered in greater detail. However the recommendations of that report were not taken forward. Since that time, pressures for improved links have grown, particularly with regard to maintaining the competitiveness of the Loch Ryan ports and providing effective links through to Northern Ireland. The Loch Ryan – motorway corridor is one of the European Community’s TEN-T priority transport routes.

Economy of the Study Area

- 1.2.3 Declining agricultural incomes since 1996 have resulted in the income generated per head of population in Dumfries and Galloway falling to 22% below the Scottish average, and average gross weekly earnings in 2003 were 13% below the Scottish level. The Loch Ryan ports and associated transport movements are of considerable importance to Dumfries and Galloway, and there are a number of large road haulage distribution depots based in Dumfries.

1.3 Previous Studies

- 1.3.1 In the early 1980s there was some limited consideration of a possible Link Road between Dumfries and the A74 at Lockerbie by Dumfries and Galloway Regional Council and the Scottish Office as an alternative strategy to the construction of the A75 Annan Bypass.
- 1.3.2 The Scottish Office’s Trunk and Key Principal Road Network Review (1993) identified the Dumfries to Gretna section of the A75 as being unlikely to meet the traffic demands being placed on it over the coming 15 years. At around the same time, in its policy document Roads, Traffic and Safety: 1992, the Scottish Office stated that the possibility of a link from the new A74(M) to Dumfries should be investigated.
- 1.3.3 A feasibility study into a Dumfries to Lockerbie A74(M) Link Road was ultimately commissioned by the Scottish Office in 1995. The Study was undertaken by Halcrow Fox and Ironside Farrar and reported in March 1997.
- 1.3.4 The 1997 Study considered in detail, four corridors between Dumfries and the A74(M). In each case, the provision of a dual carriageway link was assessed as either an on-line upgrade or greenfield route. The 1997 Study recommended that improvements in two corridors be carried forward for preliminary further analysis prior to identifying a single corridor for more detailed study. The routes in question were:

- an off-line route to the south of the A709; and
- an on-line upgrade of the A75.

1 Introduction and Summary of STAG Part 1

1.3.5 The additional work recommended was as follows:

- **Environmental risk** – expand the environmental assessment to identify and quantify the risk of construction through the sensitive ecological area south of Lochmaben;
- **Strategic issues** – relationship to the Euroroute network, the trunk road network and the views of the new unitary authority, Dumfries and Galloway Council;
- **Promotability risk** – comparative assessment of the likelihood of attracting objections from statutory agencies, special interest groups, and the local population and the need for a Public Local Inquiry; and
- **Funding** – examine the potential to optimise carriageway provision/phasing with a view to minimising capital expenditure.

1.3.6 This additional work was not progressed and, ultimately, further on-line local improvements to the A75 were recommended by the Scottish Office. Issues on the A75 were considered further in a subsequent A75 Route Action Plan Study (1999), which covered the entire length of the A75 between the A74(M) at Gretna and Stranraer, and was focussed on junction improvements, the provision of overtaking facilities and other safety measures.

1.3.7 The incremental improvements which have been made over the years since 1999 have focussed on the A75 west of Dumfries. Although a few small safety improvement schemes have been implemented east of Dumfries, the A75 continues to offer poor and unreliable journey times, and there is now a growing case to consider the need for improved transport links between Dumfries and the motorway network.

1.4 Existing and Future Problems, Constraints, and Opportunities

1.4.1 Following discussions with stakeholders, four key problems which the Study had to address were identified:

- journey times and reliability;
- accidents and safety;
- local economic prosperity; and
- impact of traffic on the local communities.

Journey Times and Reliability

1.4.2 Road network reliability is an aspect of quality. It describes a network's propensity to fulfil its function for a certain period of time without interruption. On the A75 in particular, and on the A701 and A709 to a lesser extent, the frequency of slow moving HGVs and platoons of traffic caused by slow moving heavy vehicles and agricultural traffic results in journey times being slower than expected for such important routes and, more importantly, unpredictable leading to the routes being viewed as unreliable.

1.4.3 Figure 1.2 summarises the “variability” of the journey times on the three roads. These results suggest the greatest variation in journey times occurs on the A75, and that journey times on the A709 are the most predictable of the three routes surveyed.

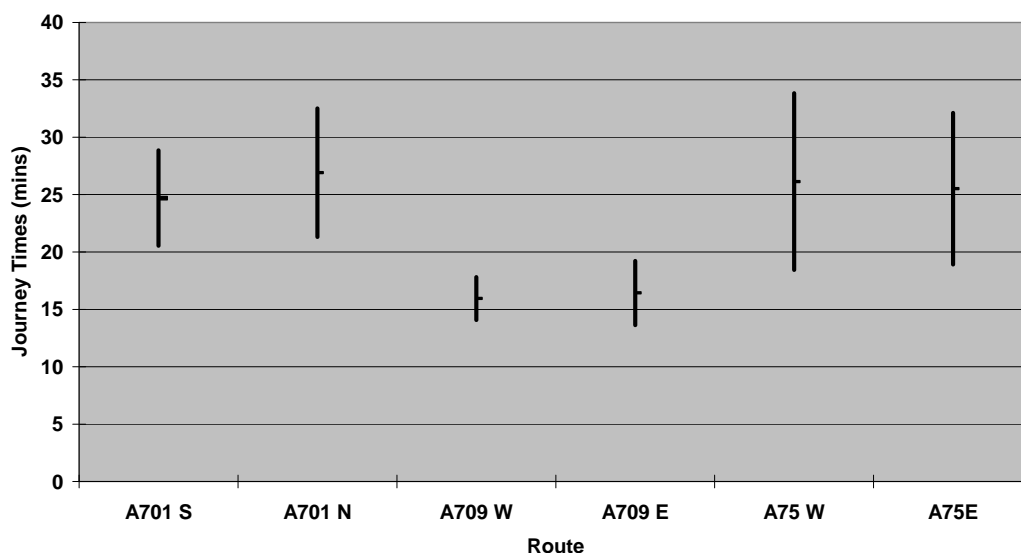


Figure 1.2 Journey Time Variability

Accident Rates

1.4.4 A Severity Ratio has been calculated for 1999-2003, expressing Fatal and Serious accidents as a percentage of the total injury accidents for each road, and comparing them in Table 1.1 with statistics for similar roads in Scotland and the rest of Britain.

Table 1.1 Accident Severity Ratios 1999-2003

Route	Severity Ratio
A75(T)	27.2%
A709	25.0%
A701(T)	21.9%
Scotland (non built-up trunk roads)	20.1%
Scotland (non built-up principal roads)	22.0%
Great Britain (non built up A roads)	21.0%

1.4.5 This shows that the severity ratio in each case exceeds the “benchmark” figure for similar roads in the whole of Scotland. Using the AADT data already presented indicative accident rates were calculated for selected road sections, and again compared to accident rates on similar roads across Britain. The comparison is set out in Table 1.2 below.

1.4.6 As can be seen both the A75(T) and the A701(T) north of Locharbriggs exhibit a lower accident rate than comparable trunk roads in Scotland although, as shown by Table 1.1, when an accident does occur it is likely to be of greater than usual severity. The A75(T) between Dumfries and Annan has a significantly higher accident rate than the section east of Annan, reflecting the positive impact of local road upgrading schemes on the eastern section.

Table 1.2 Indicative Accident Rates, 1999-2005

Route	Accidents	Length (km)	AADT	Accident Rates*
A75(T) east of Annan	25	13	10069	8.1
A75(T) west of Annan	82	19	13455	13.5
A709 between Dumfries Bypass and Lockerbie	59	17	6860	21.3
A701(T) north of Locharbriggs	45	22	4678	18.4
Dumfries and Galloway (non built-up trunk roads)				16.7
Dumfries and Galloway (non built-up principal roads)				32.4
Scotland (non built-up trunk roads)				16.3
Scotland (non built-up principal roads)				25.3
Great Britain (non built up A roads)				27.5

*Expressed in Accidents per 100 million vehicle kilometres

Local Economic Prosperity

- 1.4.7 The Region’s economy is performing relatively poorly, compared to the national picture; gross value added is low, average earnings are low and there are relatively few firms within those sectors that, nationally, have experienced the highest rates of growth over the past few years. Whilst the continued recovery of the farming and tourism sectors, following the problems associated with the outbreak of Foot and Mouth Disease, may serve to narrow the gap between the local and national Economic performance, there remain a number of underlying problems that will need to be addressed.
- 1.4.8 The area is relatively isolated, with considerable journey times between the Region’s main towns and the principal Scottish and English economic centres. Much of the economic activity within the region serves the needs of the local population.
- 1.4.9 The ferry operators in the west of the Region provide a key route to Ireland. Their presence and the spin-offs, in terms of support services etc., are an important part of the economy in the Wigtown district. The operators have faced increased competition, during the past few years as other ports and ferry operators have invested and increased their competitiveness.

West Coast Main Line

- 1.5.5 The main electrified rail line between Glasgow and Southern England, the West Coast Main Line, has a single passenger stop in South West Scotland at Lockerbie. There are two running lines within Dumfries and Galloway with existing freight sidings at Lockerbie and Beattock, currently unused. The line has recently been upgraded to allow for the operation of 125mph tilting trains on the majority of the line. Speed restrictions are in place at Beattock summit within Dumfries and Galloway.
- 1.5.6 A feasibility study into reintroducing local passenger services is currently being finalised, considering the provision of a local train service between Glasgow and Carlisle, stopping at Lockerbie, and with an option of reopening some or all of the intermediate stations closed in the 1960s.
- 1.5.7 There are current aspirations to provide new freight sidings at Beattock and at Stevens Croft, north of Lockerbie.

A74(M) Gretna to Beattock

- 1.5.8 The A74(M) is the only motorway link between Scotland and England and passes north-south through Dumfries and Galloway in the east of the region. Major road connections to A74(M) include A75(T), A701(T) and the A709. Further road connections are the B7020 All Purpose Road (APR), running north-south through the study area from Gretna to Beattock, the B725 from Ecclefechan to Carrutherstown, the B6357 from Kirkpatrick Fleming, the B722 from Eaglesfield and the B723 from south of Lockerbie.

A75(T) (Euroroute E18) Gretna to Stranraer

- 1.5.9 The A75 is the main transport artery in Dumfries and Galloway connecting the majority of towns and smaller settlements as it traverses east-west through the region. The A75 also provides a strategic link to Northern Ireland via the ports at Cairnryan and Stranraer and the motorway networks in Scotland and England. The importance of the A75 is reflected in its status as a Euroroute and it is included in the European Union priority projects as the TEN-T Priority Project No.13, the Ireland-UK-Benelux upgrade.
- 1.5.10 Major improvements of some £80m have been invested on this route between 1970 and 1990, with bypasses provided for most settlements along the route apart for Crocketford, Springholm and Dunragit. Since 1990, the only major improvement scheme on the route was the dualling of the Glen to the west of Dumfries in the mid 1990s. Further road improvements are programmed for six schemes between Gretna and Stranraer to increase the opportunity for overtaking. However, all but one of these (Hardgrove to Kinmount) is located west of Dumfries.
- 1.5.11 The road is constructed to varying design standards with dualling at the Glen, Collin Bypass and at the link to the A74(M) at Gretna. A number of climbing lanes have been provided with dedicated overtaking opportunities. However, it is generally recognised that the road geometry at present restricts overtaking.

A701(T) Dumfries to Beattock

- 1.5.12 The A701 provides a northern link to the motorway network from Dumfries to Glasgow/Edinburgh. The road also provides an important local link for the main settlements of Moffat, Beattock and Parkgate. A major constraint on this route is the signalised crossing over the Kinnel Water at St Ann's Bridge. The road comprises long sections of both restricted and good overtaking opportunities. Traffic flows increase significantly as the road approaches Dumfries with traffic from Locharbriggs and Heathhall adding to longer distance travellers.

A709 Principal Road Dumfries to Lockerbie

- 1.5.13 This road connects Lockerbie and the A74(M) to Dumfries via Lochmaben and Torthorwald. The A709 is the most heavily trafficked non-trunk road in Dumfries and Galloway.
- 1.5.14 There are major constraints at the signalised bridge over the River Annan at Shillahill and in the centre of Lochmaben. There are potential benefits in providing a Bypass to Lochmaben and Torthorwald in terms of reduced delays and reduced accident risk along with environmental gains in the communities. The road provides the shortest route to the motorway network from Dumfries.

1.6 Study Objectives

- 1.6.1 Following a review of the current and future problems surrounding access to the national motorway network, and scrutiny of existing planning policies five **transport planning objectives** were identified, viz:

Safety

- S1: To improve safety for all road users by reducing total accidents by 25% on the routes linking Dumfries to the A74(M).

Economy

- Ec1: To increase the reliability of journey times by 50% for all vehicles travelling between Dumfries and the A74(M); and
- Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs by 25% between Dumfries and the A74(M).

Environment

- Env1: To safeguard the environment and heritage of the study area; and
- Env2: To reduce the impacts of traffic on local communities.

1.7 Option Generation and Sifting

1.7.1 Following preliminary traffic and economic appraisal, engineering and environmental scoping exercises, four possible route corridors, shown in Figure 1.4, were identified:

- Option 1 A75(T) Gretna to Dumfries;
- Option 2 Ecclefechan to Dumfries Corridor;
- Option 3 Lockerbie to Dumfries (South) Corridor; and
- Option 4 Lockerbie to Dumfries (North) Corridor.

1.7.2 During the exercise, other options were considered, but were ruled out after an initial analysis.

- Option 5 A701(T) Beattock to Dumfries Corridor;
- Option 6 Rail service improvements;
- Option 7 Bus service improvements; and
- Option 8 A Do Minimum.

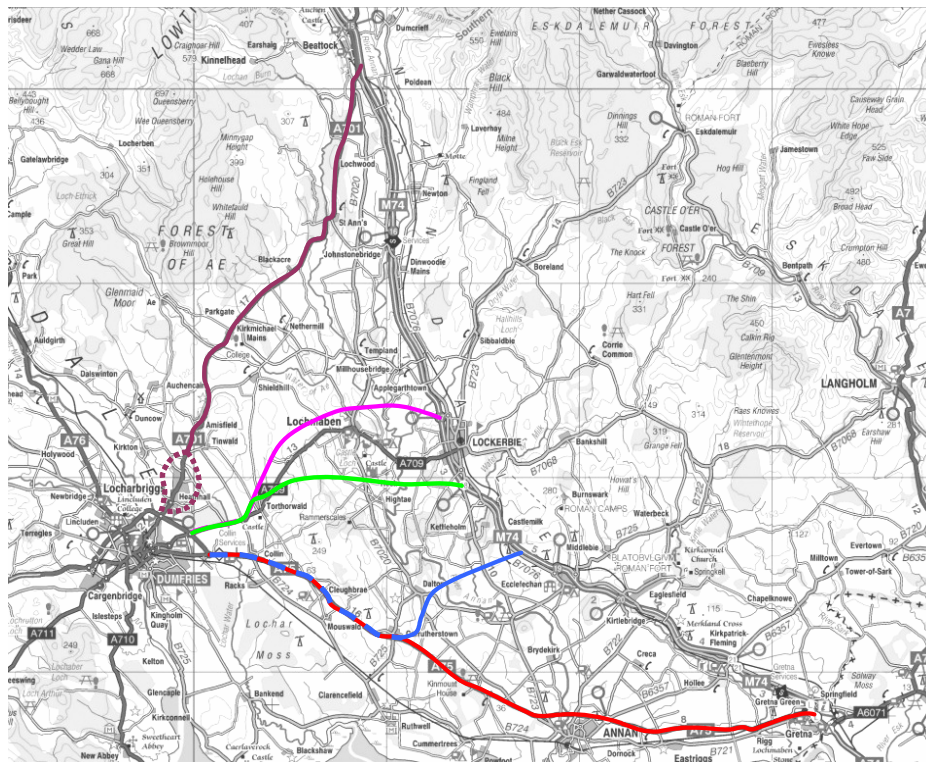


Figure 1.4 Road Corridor Options within the Study Area

1.7.3 Table 1.3 summarises the four road options against the objectives. A 'High' rating indicates a considerable success in addressing the objective; 'Low' signifies little or no success; whilst 'Medium' represents an intermediate degree of success.

Table 1.3 Initial Sifting of Road Options

Objective	Option 1	Option 2	Option 3	Option 4
To protect the built and natural environment, especially the environment of people	Medium	Low	Medium	Low
Env1: To safeguard the environment and heritage of the study area	Medium	Low	Low	Low
Env2: To reduce the impacts of traffic on local communities	Medium	Medium	High	High
To improve safety	High	High	High	High
S1: To improve safety for all road users by reducing road traffic accidents on the routes linking Dumfries to the A74(M)	High	High	High	High
To support sustainable economic activity and seek good value for money (economy)	High	High	High	High
Ec1: To increase the reliability of journey times for all vehicles travelling between Dumfries and the A74(M)	High	High	High	High
Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs between Dumfries and the A74(M)	High	High	High	High
To improve access to facilities for those without a car and to reduce severance (accessibility)	Low	Medium	Medium	Low
To ensure that all decisions are taken in the context of the Executive's integrated transport policy (integration)	Low	Low	Low	Low

1.7.4 The sifting of Options identified a preference for two corridor options:

- Option 1 A75(T) Gretna to Dumfries; and
- Option 3 Lockerbie to Dumfries (South) Corridor.

1.8 Compliance with STAG Philosophy

- 1.8.1 The introduction of STAG was intended to renew the emphasis on objectivity throughout the transport planning and appraisal process – and in particular ensure that a wide range of multi-modal solutions were identified for the transport problems of a particular area.
- 1.8.2 The STAG philosophy is also used to help fine-tune particular proposals which have emerged from an over-arching multi-modal investigation. This general approach is illustrated in the following figure. This report complies fully with the STAG philosophy – it is the result of a multi-modal investigation which culminated in the Regional Transport Strategy, and it has appraised the emerging options against appropriate transport planning objectives and the five STAG criteria.

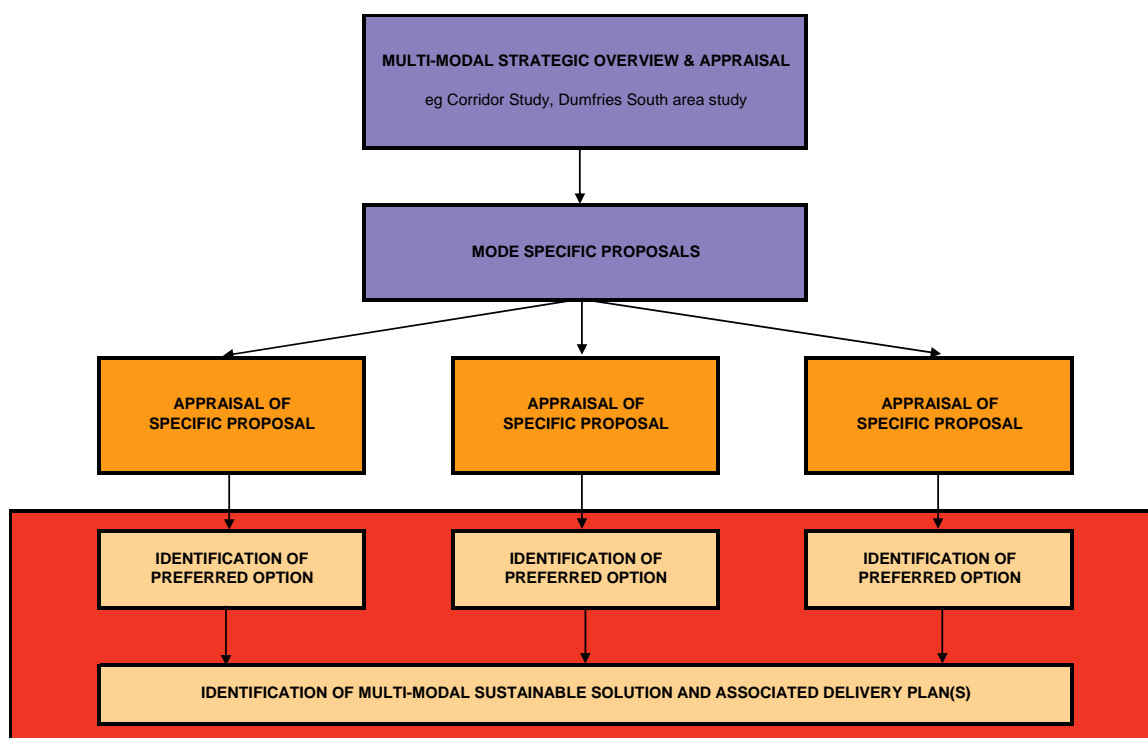


Figure 1.2 Application of STAG in the Project Development Cycle

1.9 STAG 1 Appraisal

- 1.9.1 This took place following the framework provided by the five over-arching Government Objectives for transport:

- environment;
- safety;
- economy;
- integration; and
- accessibility/social inclusion.

Environment

1.9.2 Following a broadbrush environmental appraisal comparing the two remaining options (upgrading the A75 or building a new route to the south of the existing A709) it was concluded that there were particular challenges surrounding the new build option with particularly adverse impacts on local water quality, biodiversity, the landscape/visual amenity, local agriculture, and cultural heritage. It should be noted that construction of a new road along the proposed alignment is likely to impact on the Hightae Mill Loch and Castle Loch SSSI, the latter now designated a Special Protection Area and a Natura 2000 site under European legislation.

1.9.3 Whilst these issues might not be “show stoppers” in terms of a STAG Part 1 appraisal they would need very careful appraisal at the Part 2 level, and sensitive handling in the event that a road on such an alignment was built.

Safety

1.9.4 Replacing the existing road links to the motorway network with a dual carriageway using either alignment would be likely to have a positive impact on accident rates and on average numbers of casualties per accident.

Economy

1.9.5 The impact of each option on journey times between Dumfries and the A74(M) is illustrated by Figure 1.5. If the A75(T) is upgraded to dual carriageway then journey times on the A75(T) are significantly improved but there is no impact on the A709.

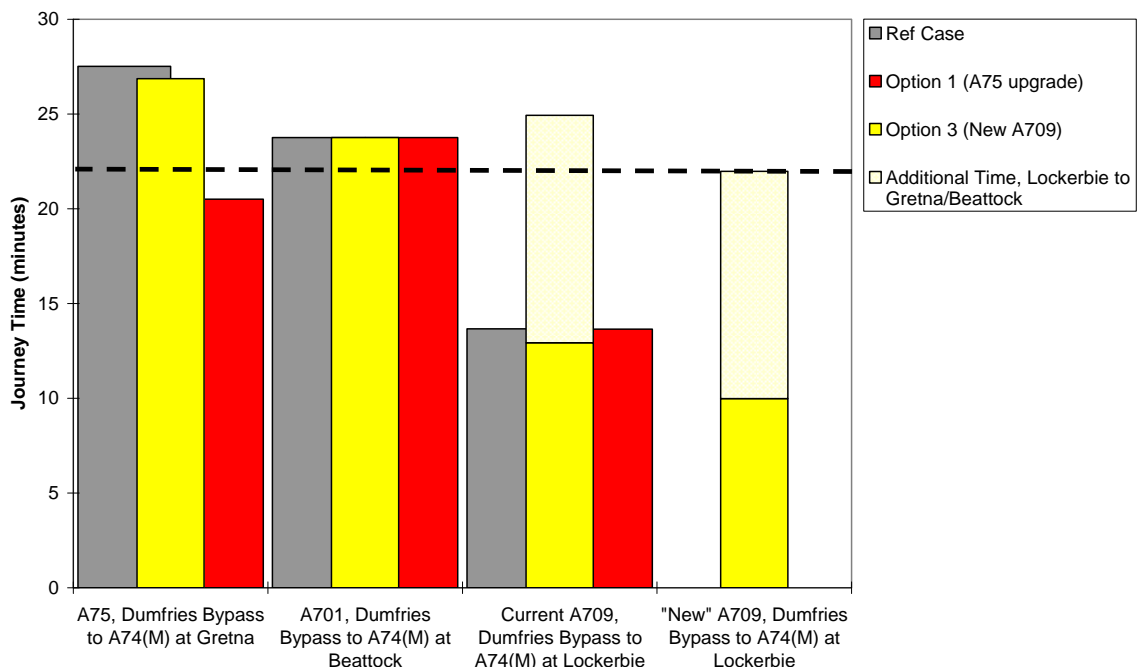


Figure 1.5 Comparison of Journey Times under Different Options

1.9.6 A new road south of the A709 offers improved journey times between Dumfries and Lockerbie by both the “old” and the “new” A709 routes; however when the additional time to reach Gretna (or Beattock) from Lockerbie is included, upgrading the A75(T) would still offer

1 Introduction and Summary of STAG Part 1

a faster journey time between Dumfries and Gretna than building a “new” A709. There are no benefits for the A701(T) under either of the options.

1.9.7 Providing a dual carriageway link to the A74(M), whether via a “new” A709 alignment or by upgrading the A75(T), will also have the affect of improving the predictability of journey times and this will be of particular benefit to the A75(T) which is currently the least predictable route to the motorway network.

1.9.8 In Cost Benefit terms both options had a positive Net Present Value (ie the benefits exceeded the estimated costs), with a Benefit to Cost Ratio (BCR) of:

- upgraded A75(T) BCR = 1.109; and
- new road south of the A709 BCR = 1.452.

Integration with Land Use Plans and Wider Policies

1.9.9 Reference to relevant Structure and Local Plans together with Scottish Planning Policies, National Planning Policy Guidelines and Planning Advice Notes identified that upgrading the A75(T) is more compliant with established land use planning than a new road south of the A709. Both options exhibited a mixture of compliance and non-compliance with wider policies, but generally upgrading the A75(T) had less areas of non-compliance than building a new road south of the A709.

Accessibility and Social Inclusion

1.9.10 Local Accessibility (or Severance) will be greater with a newly constructed road than would be the case for an upgraded A75(T). There are no disbenefits for particular people groups, although there are also no benefits for non-car owners who are generally regarded as being amongst the most vulnerable people groups. It is likely that both options could offer positive impacts by location.

Risk, Uncertainty, Evaluation and Implementability

1.9.11 In line with STAG recommendations an overview of these issues was carried out, although they would be explored in more depth during the Part 2 appraisal process. Regarding implementability it would appear that although there are issues facing both options, the A75(T) improvements may be marginally easier to implement than building a new road south of the A709, particularly taking into account the shorter potential timescales available for on-line road improvements compared to newly constructed roads that are likely to prove controversial to promote through the planning process.

1.10 Conclusions and Recommendations

1.10.1 Because the environmental disbenefits of constructing a largely new road to the south of the existing A709) are so significant that they cannot be outweighed by other positive benefits, most of which can be delivered equally well by upgrading the A75(T), we originally recommended that the A709 option should be set aside at the conclusion of the STAG Part 1 appraisal process.

1 Introduction and Summary of STAG Part 1

- 1.10.2 We considered the A709 option to be challenging to fund and to implement particularly in comparison with continued upgrading of A75. Transport links can be greatly enhanced by upgrading A75 (Dumfries to Gretna) to dual carriageway and at the time of initial appraisal, we believed this to potentially be far more achievable than progressing the A709 option.
- 1.10.3 The original STAG Part 1 report recommended that proposals to construct a new A709 to the south of the current route, be set aside due to environmental disbenefits which were not sufficiently offset by other STAG appraisal criteria.
- 1.10.4 During the intervening time however, various potential mitigating measures have arisen along the A709 route and within Lockerbie itself to make revisiting the A709 option worthwhile, particularly given a shift in emphasis between economic development and environmental protection.
- 1.10.5 During STAG Part 2 appraisal, project inception, additional pieces of information were brought to our attention which are relevant to any appraisal regarding the A709. These issues were unknown at the time of the initial appraisal but should be investigated now:
- proposals for the construction and development of a large scale data farm and eco-village within Lockerbie;
 - proposals emerging from the RTS for the introduction of a Quality Bus Corridor on the A709 between Dumfries and Lockerbie; and
 - advancing nature of STAG 2 appraisals for the Dumfries Southern Bypass mean it may now be feasible to propose a link, connecting the Southern Bypass with any new A709 fast route to Lockerbie.
- 1.10.6 The A75(T) option does have sufficient benefits to make a more detailed examination worthwhile, to identify the role it can play in addressing the communications problems of Dumfries and Galloway summarised by this study's Planning Objectives. In particular it has the clear benefit of providing the current, established major link from Dumfries and Galloway to the national motorway network at Gretna, and offers relatively few environmental impacts relative to other major road improvement schemes across Scotland.
- 1.10.7 Taking the original STAG part 1 appraisal and additional information regarding the A709 into consideration, both options will be subjected to the more detailed STAG part 2 appraisal.

1.11 Structure of this Document

- 1.11.1 This report follows on from the previously circulated STAG Pre-Appraisal and Part 1 report dated October 2005, the conclusions of which are set out above.
- 1.11.2 This STAG Part 2 appraisal report generally follows the order set out in the latest ScoTag guidance, although we may have moved the discussion of implementability forward in the order so that it immediately precedes our discussion of Risk and Uncertainty, as this appears a more logical position. STAG rightly emphasises the importance of consultation throughout the appraisal process, and accordingly we open this reporting with a brief overview of the approach to consultation adopted, before moving on to each of the five STAG criteria in turn.

2 Participation and Consultation

2.1 Introduction

- 2.1.1 As per government guidance, consultation plays a key role within the STAG process and underpins the legitimacy of transport appraisal. Development of options for providing fast links from Dumfries to the motorway network, is the subject of consultation across the study area, and has included opportunities for key stakeholders to influence the emerging recommendations and decisions.
- 2.1.2 As both transport options have been included within the SWestrans RTS which was subject to detailed public and stakeholder consultation, we were keen to avoid unnecessary duplication of work. As such, it was agreed that the public consultation undertaken as part of the RTS work would be sufficient to cover the requirements of this study. We noted the risks of 'over consultation' with the public.

2.2 Consultees

- 2.2.1 After discussions with the client, it was considered appropriate to undertake consultation with key stakeholders.
- 2.2.2 SWestrans provided a list of key stakeholders, both statutory and (standard) the following organisations were contacted and invited to participate in the consultation:

- | | |
|---|--|
| ■ Scottish Natural Heritage; | ■ Crichton Development Company; |
| ■ Scottish Environmental Protection Agency; | ■ BNFL; |
| ■ Historic Scotland; | ■ Scottish Enterprise; |
| ■ RSPB; | ■ Forest Enterprise; |
| ■ Scottish Wildlife Trust; | ■ Historic Scotland; |
| ■ DGC Strategic Planning; | ■ NFU; |
| ■ Health and Safety Executive; | ■ Public Utilities; |
| ■ Solway River Purification Board; | ■ Scottish Gov: Agriculture and Fisheries; |
| ■ Transport Scotland; | ■ NHS; and |
| ■ British Geo Survey; | ■ Emergency Services (FIRE). |

- 2.2.3 Invitations to consult were issued on 18 March 2009. At the time of writing (May 2009), 5 responses had been received from the following organisations:

- | | |
|----------------------|------------------------|
| ■ SNH; | ■ RSPB; and |
| ■ SEPA; | ■ Scottish Enterprise. |
| ■ Historic Scotland; | |

- 2.2.4 The first four respondents are environmentally based, as such we have included the analysis of their views within chapter 3 – Environment.

Scottish Enterprise

- 2.2.5 Scottish Enterprise notes that links to the motorway network are strategically important to Dumfries and Galloway and that the A75 currently suffers from unreliable journey times and safety concerns stemming from the volumes of freight traffic travelling to and from the ports. Scottish Enterprise point out that Stenna Line is currently planning investment in new port facilities at Loch Ryan which could result in higher levels of freight traffic exacerbating these issues.
- 2.2.6 Scottish Enterprise believe that the A75 route would provide benefits which include:
- Support for growth of business;
 - Support for tourism, and;
 - Enhancement of the area as a location for inward investment.
- 2.2.7 Additionally, the A75 option would improve connectivity of the Chapelcross site earmarked for development, but would provide no benefit to traffic travelling to and from the north which would continue to use the A701.
- 2.2.8 The arguments regarding business competitiveness are also valid for the A709 option, Scottish Enterprise does however note that this option has the potential for negative environmental impacts.
- 2.2.9 As additional responses are received, these will be passed to SWestrans.

3 Environment

Government Objective

To 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.

3.1 Introduction

3.1.1 Ironside Farrar were commissioned as part of the MVA Team to undertake environmental assessment under STAG Part 2 for the Dumfries to A74 Motorway Fastlink.

3.1.2 This section of the STAG Part 2 report presents the findings of a detailed environmental assessment of the two options for the Dumfries to A74 (M) Fastlink:

- A709 (South) Option – involves construction of a new offline road between Dumfries and Lockerbie; and
- A75 Dualling Option – involves online dualling (widening) of the existing A75 road between Dumfries and Gretna.

3.1.3 The STAG Part 2 aims to integrate environmental considerations into the decision making and selection process. It assesses the potential environmental effects of both the route options and identifies opportunities to mitigate any adverse environmental effects.

3.2 Work Undertaken to Date

3.2.1 Stage 1 – Preliminary Assessment Report - A preliminary assessment report, undertaken by Halcrow and Ironside Farrar, in December 1995 identified five route options for improving transport links between Dumfries and the A74 (M). Contained within this report was an initial assessment of the environmental context in which each of the route options were situated.

3.2.2 The STAG Part 1 appraisal was completed in October 2005. The STAG Part 1 Report is intended to act like a scoping report to identify the likely issues against the STAG criteria (Environment, Safety, Economy, Integration and Accessibility & Social Inclusion) and inform the options appraisal process.

3.3 Environmental Assessment Methodology

3.3.1 The assessment of environmental impacts within a STAG appraisal should follow the process outlined below:

- Baseline information - collation of relevant background information;
- STAG Part 1 – to filter out unsuitable proposals by identifying any major adverse environmental impacts. The outcome is summarised in the Part 1 Appraisal Summary Table (AST); and
- STAG Part 2 – a more in-depth environmental assessment of those proposals which have passed through the Part 1 successfully, including the identification of appropriate mitigation measures. The outcome is summarised in the Part 2 AST

3.3.2 The STAG 2 assessment focuses on the significant beneficial and adverse impacts that may arise as a consequence of the proposal. The assessment considers the following:

- reference to environmental objectives at National, Regional and Local levels;
- knowledge and experience of the assessment team and project experts;
- use of standard checklists for determining impact significance;
- desk studies and review of published information;
- consultations;
- ecological survey/walkover to establish issues; and
- comparison with other similar transport projects.

3.3.3 The options for the Dumfries to A74 (M) Fastlink have been assessed against the STAG Environmental Sub-Criteria:

- Noise & Vibration;
- Air Quality (Global and Local);
- Water Quality, Drainage and Flood Defence;
- Geology;
- Ecology, Biodiversity and Nature Conservation;
- Landscape and Visual Amenity;
- Land Use, Agriculture and Soils; and
- Cultural Heritage.

3.3.4 A complete and detailed appraisal of the Dumfries A74 (M) Fastlink proposals is contained within Appendix B - Environmental Appraisal Report.

3 Environment

3.3.5 The detailed report contains the following information:

- summary of the findings of the STAG Part 1 report;
- description of the STAG Part 2 assessment methodology;
- relationship between STAG assessment and EIA/other environmental assessment methods;
- details of the consultation process undertaken to date;
- description of the Environmental Baseline i.e. current environmental issues and opportunities within the study area;
- detailed assessment of the proposed route options against the environmental sub-criteria;
- details of mitigation and further assessment required; and
- Appraisal Summary Tables for each of the environmental sub-criteria.

3.4 Summary of Environmental Appraisal

3.4.1 As described in the STAG guidance, both proposals have been assessed for their potential impacts against the environmental sub-criteria in order to ensure that environmental implications are considered during the decision making process.

3 Environment

3.4.2 In order to assist the decision making process, the environmental appraisal, post mitigation, of the Dumfries to A74 (M) Fastlink options is summarised in Table 3.1 below:

Table 3.1 Summary of Environmental Appraisal for Both A74 (M) Fastlink Options

Environmental Criteria	Potential Environmental Impact Significance	
	Lockerbie to Dumfries (South) A709	A75 (T) Dualling
Noise & Vibration	Moderate/ Substantial Adverse	Negligible
Air Quality	Slight Positive	Negligible/ Neutral
Water Quality, Drainage and Flood Defence	Moderate/ Major Adverse	Minor/ Negligible Adverse
Geology	Moderate Adverse	Minor Adverse
Ecology, Biodiversity and Nature Conservation	Major Adverse	Minor/ Moderate Adverse
Landscape and Visual Amenity	Major Adverse	Minor Adverse
Land Use, Agriculture and Soils	Major Adverse	Minor/ Moderate Adverse
Cultural Heritage	Moderate Adverse	Minor Adverse

3.4.3 The main points from the assessment are as follows:

- the A709 (southern option) is offline and therefore has greater overall potential for environmental impacts than the proposed dualling of the existing A75(T);
- the A709 corridor is environmentally more sensitive and will required significant survey and assessment – the major issues being ecology and nature conservation, landscape and visual and water quality;
- both schemes would likely require Statutory EIA under the Environmental Impact Assessment (Scotland) Regulations 1999, as amended; and
- both schemes would likely require Appropriate Assessment under the Conservation (Natural Habitats &c) Regulations 2004.

Government Objective

To improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff.

4.1 Introduction

Nesting of Objectives

4.1.1 STAG requires appraisal of safety impacts under two sub-headings:

- accidents; and
- security.

4.1.2 We discuss each in turn below.

4.2 Accidents

4.2.1 Latest road accident statistics for the last three year period ending 31st December 2008 have been collected and are set out in Appendix. Table 4.1 illustrates the latest available accident statistics on both the A709 and the A75 (T) between Dumfries and the A74 (M) over a 3 year period.

Table 4.1 Accident Statistics for the 1st January 2006 to 31st December 2008

	Accident Severity			Casualties		
	Fatal	Serious	Slight	Fatal	Serious	Slight
A75(T)	8	11	38	10	22	58
A709	0	11	30	0	12	33

4.2.2 To place this data in context, a Severity Ratio has been calculated for the same period, expressing fatal and serious accidents as a percentage of the total injury accidents for each road, and comparing them in Table 4.2 with statistics for similar roads in Scotland and the rest of Britain.

4.2.3 The calculated accident severity ratios have been compared with the 2006 figure for Scotland and 2007 figure for the whole of Great Britain. The 2006 figure is the latest available for Scotland.

Table 4.2 Accident Severity Ratios

Route	Severity Ratio
A75 (T)	33.3%
A709	26.9%
Scotland (non built-up trunk roads)	22.1%**
Scotland (non built-up principal roads)	31.2%**
Great Britain (non built up A roads)	30.0%

** 2006 figure was used

- 4.2.4 This shows that the severity ratio for the A75 (T) exceeds the “benchmark” figure for similar roads in the whole of Scotland. However, the severity ration for the A709 is well below the average figure for similar roads in Scotland.
- 4.2.5 Using the annual average daily traffic (AADT) data presented in the table below, indicative accident rates were calculated for both the A709 and the A75 (T) between Dumfries and the A74 (M). The results of the calculations are shown in Table 4.3 below.

Table 4.3 Calculation of the Accident Rates on the A709 and the A75 (T) - Accident Rate (per 100 million veh km)

Route	AADT	Slight	Serious	Fatal	Total PIA
A75 (T)	11,762	9.22	2.67	1.94	13.83
A709 between Dumfries Bypass and Lockerbie	6,860	23.49	8.61	0	32.11

- 4.2.6 Although more accidents were recorded on the A75 (T) [57 personal injury accidents (PIAs)] than on the A709 [41] the A709 exhibits a higher accident rate. This is mainly due to the shorter length of the A709 compared to the A75. An accident rate of 32.11 accidents per 100 million vehicle kilometres was recorded compared to a figure of 13.83 accidents per 100 million vehicle kilometres on the A75 (T).
- 4.2.7 This should be qualified by noting the lack of fatalities recorded on the A709. Indeed it is clear that the vast majority of accidents which occur on the A709 (73%) are slight, compared with 67% on the A75. 14% of personal injury accidents recorded on the A75 in the 3 year time period were fatalities.
- 4.2.8 Comparison of calculated accident rates was then made to accident rates on similar roads across Britain. The comparison is set out in Table 4.4 below.

Table 4.4 Comparison of Accident Rates Expressed as Accidents per 100 million vehicle kilometres

Route	Slight	Serious	Fatal	Total Accident Rate *
A75 (T)	9.22	2.67	1.94	13.83
A709	23.49	8.61	0	32.11
Scotland (non built-up trunk roads)	11.02	3.22	0.78	15.02
Scotland (non built-up principal roads)	17.44	5.29	0.95	23.68
Great Britain (non built up A roads)				24**

* Expressed in Accidents per 100 million vehicle kilometres

** 2006 figure was used however GB breakdown by severity unavailable

- 4.2.9 As can be seen from Table 4.4 the A75 (T) exhibits a total accident rate slightly lower than the average rate recorded on similar non built-up trunk roads in Scotland. This could be attributed to the positive impact of local road upgrading schemes which have been implemented on the A75 (T) especially on the section east of Annan.
- 4.2.10 The analysis does however suggest that both routes currently display specific accident related issues.
- 4.2.11 The A75 route has a higher fatality rate than the average Trunk road statistics, whilst incidences of less serious accidents are lower than can be expected. Implications are that accidents which would fall under slight and serious on an average trunk route, result in fatalities on the A75.
- 4.2.12 The A709 however has a proliferation of slight and serious accidents which exceeds the national average road but records no fatalities. This could be due to localised problems on the route which may cause repeated accidents.
- 4.2.13 However, the observed accident rate on the A709 exceeds both the Scottish and British averages on similar roads.
- 4.2.14 The accident rates and the accident severity ratios for the A709 and the A75 (T) from Dumfries to the A74 (M) for the period 1999 to 2008 are shown in Table 4.5. Figure 4.1 shows the graphical representation of the total personal injury accidents that occurred on the two roads for the same time frame.

Table 4.5 Comparison of Accident Statistics, 1994 - 2008

Route	Accident Rates			Severity Ratio		
	1992-1994	1999-2005	2006-2008	1992-1994	1999-2005	2006-2008
A75(T)	19.3	10.9	13.83	37.8%	25.7%	33.3%
A709	24.6	21.3	32.11	26.7%	25.4%	26.9%

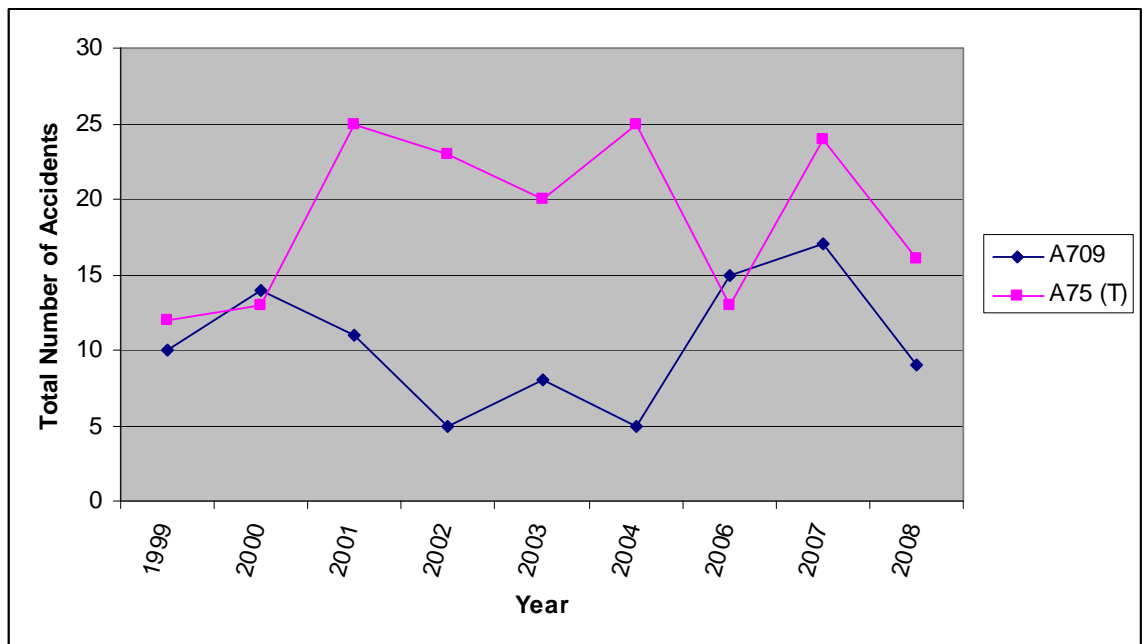


Figure 4.1 Total Personal Injury Accidents on A75 (T) and A709 (1999 – 2008)

- 4.2.15 Table 4.5 shows that although the accident rates on the A75 (T) drastically fell by almost half in the early years although it has slightly increased for the last three year period to 2008. The accident severity ratio also exhibits the same tendency.
- 4.2.16 Table 4.5 also shows that the accident rates on the A709 have largely remained high and have increased between the 1992-1994 to 2006-2008 period. However, the accident severity ratio for the A709 has almost remained constant over the same period.
- 4.2.17 Figure 4.1 shows that there has not been any characteristic trend in the total number of accidents recorded on the A75 (T) and the A709. The number of PIAs recorded on the A709 has largely oscillated between 5 and 17 and the number of PIAs on the A75 (T) has largely been trendless. The only relief is that the absolute numbers of PIAs have largely been constrained within a constant spectrum despite the fact that traffic volumes have increased on both roads over the years.

4.2.18 Although the data presented above has concentrated on “injury accidents”, it should be noted that it is likely that any accident on a single carriageway road will result in some level of disruption to traffic flows, potentially in both directions, and will hence have an adverse impact on journey time reliability. It follows, therefore, that dual carriageways, with their increased opportunities for minimising disruption due to accidents, will offer more predictable journey times than single carriageways.

Accident Locations

4.2.19 Figure 4.2 shows the number of serious and slight accidents along the A709 and A75 for the three year period until December 31st 2008. It also shows the locations of fatal accidents during this period.

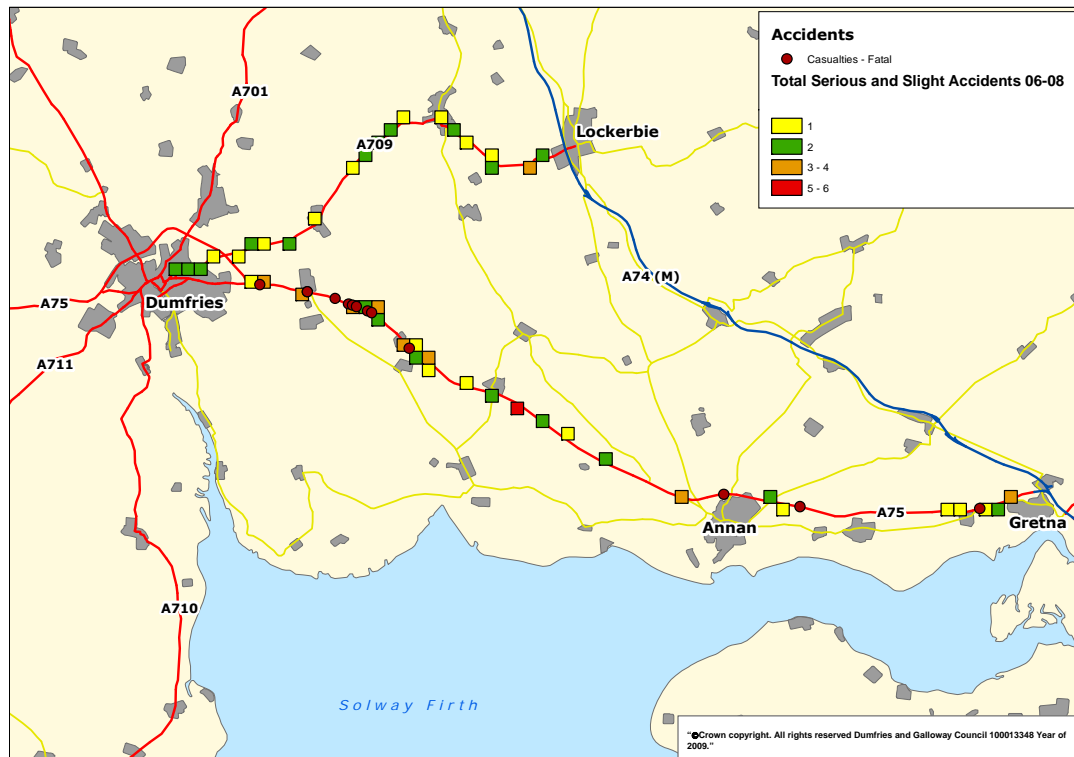


Figure 4.2 Accidents over 3 year period

4.2.20 During the three year period there have been no fatal accidents on the A709, whilst there is only one location, west of Lockerbie, which has experienced more than 2 accidents.

4.2.21 Fatal accidents on the A75 over this period are concentrated on the stretch of road between Mouswald and Collin, to the east of Dumfries.

4.2.22 The largest concentration of slight or serious accidents is located to the east of Carrutherstown. It should be noted, that this area between Carrutherstown and Upper Mains farm has been ear marked for upgrade by Transport Scotland. Plans are well advanced to introduce a 3.6km section of realigned wider single carriageway, including short alternating overtaking sections on either side of the road (2 + 1).

4.2.23 Figure 4.3 illustrates the number of serious and slight accidents on the A709 and A75 over a ten year period until the 31st December 2008. It also highlights the locations of fatal accidents during this period.

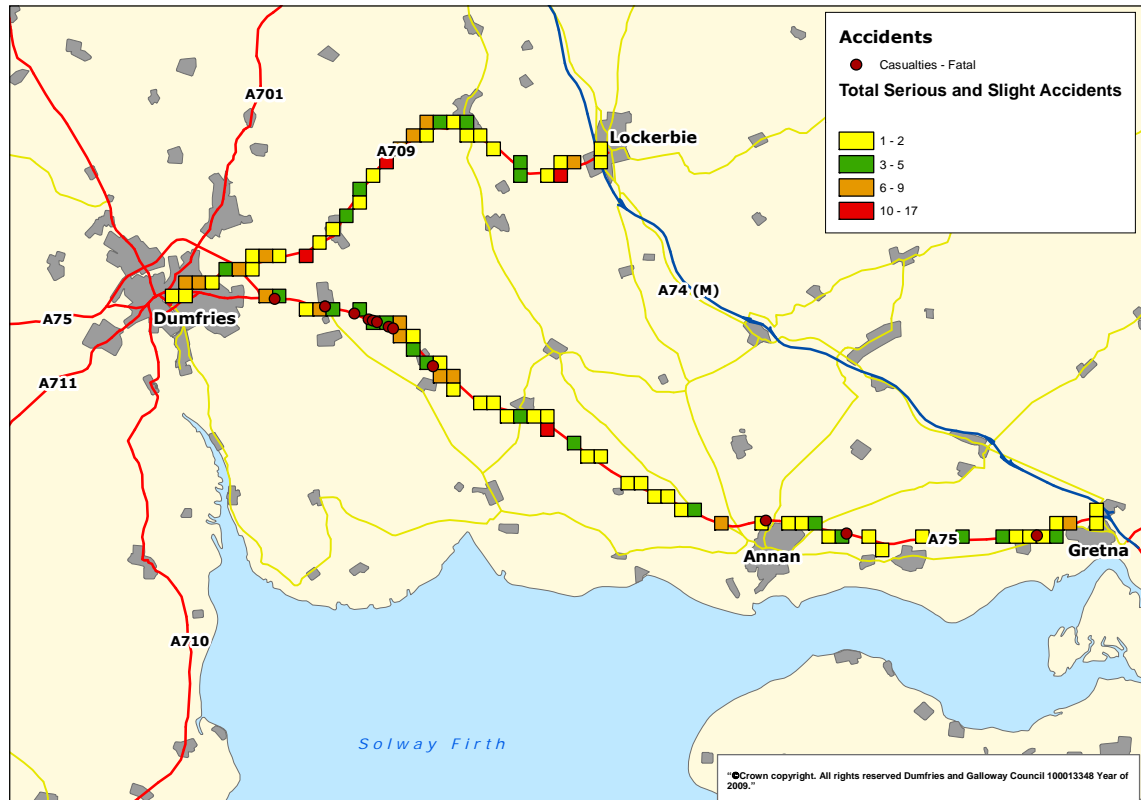


Figure 4.3 Accidents over 10 year period

4.2.24 Again, although there have been no fatal accidents on the A709, it can be seen that there are three specific locations where there have been 10 or more slight or serious accidents.

4.2.25 Fatal accidents on the A75 over this period are also concentrated on the stretch of road between Mouswald and Collin, to the east of Dumfries. While the area with the highest number of slight or serious accidents is again to the east of Carrutherstown. It is expected that accident rates in this location will reduce when Transport Scotland’s Hardgrove to Kinmount improvement scheme goes ahead.

4.3 Security

4.3.1 For the STAG Part 1 appraisal we argued that when considering schemes of this nature, there are no particular security concerns which require further consideration - based principally on the fact that the options incorporate new construction and there is:

- no pre-existing benchmark to compare them against; and
- an excellent opportunity to deliver best practice infrastructure of the highest quality.

4 Safety

- 4.3.2 One of the uses of the STAG Part 1 appraisal is to “scope out” the value of more detailed work during Part 2. The advice in ScoTAG is to refer to WebTAG for more detailed guidance on Part 2 appraisal for security. Investigation of WebTAG unit 3.4.2 shows that the approach revolves around “before and after” comparisons of facilities and the impact of proposed changes on personal security.
- 4.3.3 Therefore we concluded that there was little value in undertaking a more detailed appraisal of security, because:
- the Part 1 conclusion suggested no significant emphasis on security as a justification for the proposed interventions; and, in any case
 - there was no obvious methodology to be adopted for a more detailed appraisal.
- 4.3.4 WebTAG does, however, set out a useful table for public transport passengers which we have adapted for application to road users and which could form the basis of best practice identification as detailed design gets under way.
- 4.3.5 Most of the security indicators that apply to road users mainly apply to situations where vehicles travel at slow speeds or in congested conditions, such as approaches to junctions, service areas or lay-bys. Consequently, no service areas or lay-bys are planned within this scheme so security indicators such as formal surveillance, site perimeters and landscaping are not as important in this context.
- 4.3.6 Lighting and informal surveillance from other road users will act as a deterrent to crime on the approaches to the junctions where vehicles will be travelling more slowly.

Table 4.6 Security Indicators for Road Users

Security Indicator	Poor	Moderate	High
Informal surveillance	Poor use of materials (fencing etc) and design. Poor visibility from site surrounds. Very isolated from other human activity.	Unfavourable use of materials (fencing etc) but reasonable proximity of other activity.	Positive use of materials (fencing etc) and design to encourage open visibility from site surrounds. Proximity of other activity.
Lighting and visibility	Poor design including, obstructions etc which hinder view. Poor or no lighting at lay-bys, junctions etc. No or poor lighting on any signing, information or help points.	Design is not problematical to view. Lighting provided at some, but not all appropriate locations. Lighting not to standard. Attention to lighting on signing, information and help points.	Good design to facilitate view. Lighting to standard at appropriate locations. Attention to lighting on signing, information and help points.
Emergency call	No or very poor provision of emergency phones. Little provision or information on emergency help procedures.	Basic provision of emergency phones. Improvements to these and on emergency help procedures needed.	Good provision of emergency phones and information on emergency help procedure.

Source: WebTAG unit 3.4.2 – Table 1

- 4.3.7 Our conclusion is that we should continue to expect a neutral impact on security for either option, subject to the adoption of high standards for security indicators along the route.

4.4 Conclusion Regarding Safety Benefits

4.4.1 The following table summarises the overall appraisal for safety.

Table 4.7 Summary of Safety Appraisal for STAG2

Option	Accidents	Security	Overall Appraisal for Safety
Option 1: A75(T) Gretna to Dumfries	✓	0	✓
Option 3: Lockerbie to Dumfries (South)	✓✓	0	✓✓

Overall Safety Assessment

4.4.2 Both options will impact positively on future accident rates; however, the poor record of the A75(T) between Gretna and Dumfries gives the greatest scope for improvement. There are no direct implications in terms of security.

5.1 Introduction

5.1.1 STAG requires appraisal of economic impacts under three sub-headings:

- **Transport Economic Efficiency (TEE)** – what will the proposal cost compared to monetisable benefits such as reductions in travel time;
- **Wider Economic Benefits (WEBs)** – will there be productivity benefits through agglomeration produced by the proposal; and
- **Economic Activity and Location Impacts (EALIs)** – what net effects will the proposal have in terms of the national and/or local economy?

5.2 Transport Economic Efficiency (TEE)

5.2.1 In order to identify inputs to the TEE process, it was necessary to undertake some analysis using a bespoke local area journey time analysis tool; this is described below. This also provided high level information on the operational performance of the proposed interventions, which is also discussed below.

Journey Time Analysis

5.2.2 We initially intended to utilise Transport Scotland's Land Use and Transport Integration in Scotland (LATIS) model. Due to the nature of the study however we believed this model to be unsuitable for such a localised area with quite specific characteristics. As such, we developed a strategic tool to represent flows from D&G to the rest of Scotland and England. This includes a skeletal representation of the road network to which traffic is assigned using speed flow curves. This used LATIS highway demand forecasts to provide strategic future year traffic projections and journey times and an indication how these would change with the introduction of either of the road schemes.

5.2.3 Analysis indicates that significant journey time savings can be obtained on each route. Option 1, dualling the A75, shows journey time improvements in the region of **10 minutes**. This is due to both improvements in reliability, and average speeds being improved.

5.2.4 The second option – construction of a new route south of the A709 brings journey time benefits of in the region of **4 minutes** on the new route when compared with the current A709. This option also serves to attract traffic from the A75 which consequently shows journey time improvements of roughly **3 minutes**, which can be attributed to vehicle re-assignment.

5.3 Economic Benefits of Options for Further Consideration

Option 1 A75 Dualling

- 5.3.1 An economic assessment has been undertaken using the journey time analysis outputs. This has looked at the Transport Economic Efficiency (TEE) of the proposed options over a 60-year appraisal period.
- 5.3.2 This has indicated that the travel time savings gained from a dualling the A75 can be estimated at **£433 Million**.

Table 5.1 TEE Summary A75 Dualling

£ Thousand, in 2002 Prices	Total
Consumer Benefits/Disbenefits*	
Travel Time	205717
Vehicle Operating Costs	-7874
Net Consumer Benefits	197843
Business Benefits/Disbenefits*	
Travel Time	231161
Vehicle Operating Costs	3706
Net Business Impacts	234867
Present Value of TEE Benefits (PVB)	432710

* - Disbenefits shown as negative figures

Option 2 – New Purpose Built A709

- 5.3.3 A similar exercise was carried out testing Option 2.
- 5.3.4 This has indicated that the travel time savings gained from a new purpose built route to the south of the current A709 can be estimated at **£35 Million**.

Table 5.2 TEE Summary – New A709 route

£ Thousand, in 2002 Prices	Total
Consumer Benefits/Disbenefits*	
Travel Time	19427
Vehicle Operating Costs	-6516
Net Consumer Benefits	12911
Business Benefits/Disbenefits*	
Travel Time	23362
Vehicle Operating Costs	-1501
Net Business Impacts	21861
Present Value of TEE Benefits (PVB)	34772

* - Disbenefits shown as negative figures

5.4 Wider Economic Benefits (WEBs)

- 5.4.1 There has been extensive debate amongst transport practitioners about whether traditional transport appraisal techniques capture all the economic impacts generated by transport investment. In the presence of imperfect markets, there is potential that wider economic impacts are excluded from conventional transport user benefit appraisal and must therefore be estimated separately.
- 5.4.2 In recent years there has been debate that some transport investments in particular areas give rise to wider welfare impacts which are additional to the direct time and money savings captured in transport economic efficiency analysis and reported in cost benefit analysis. The Department for Transport (DfT) have recently released wider impacts guidance for consultation and following the Scottish Transport Appraisal Guidance (STAG) Refresh launch in May 2008, Transport Scotland released WEBs guidance through the Scot-TAG portal.
- 5.4.3 The four areas of wider economic benefits which are set out in Transport Scotland's STAG Technical Database include:
- WB1: Agglomeration economies;
 - WB2: Increased competition as a result of better transport;
 - WB3: Increased output in imperfectly competitive markets; and
 - WB4: Wider benefits arising from improved labour supply.

5 Economy

- 5.4.4 The current position of Transport Scotland is that WEBs should not be included in the standard calculation of the Net Present Value (NPV) and Benefit Cost Ratio (BCR). It is recommended that where appropriate, the WEBs calculations can be presented as an additional sensitivity to the TEE results.
- 5.4.5 However, having thoroughly reviewed the anticipated impacts of both options considered within this STAG Part 2 appraisal (A75 Dualling and New Purpose Built A709), we have found insufficient evidence to suggest that the options under consideration will result in materially significant or 'additional' WEBs which should be included within this detailed appraisal.
- 5.4.6 It is anticipated that in this particular study context (and do-something scenario tests), the conventional TEE analysis captures the appropriate likely impacts associated with these options within the study area under consideration.
- 5.4.7 In line with best practice proportionate appraisal, it is suggested that impacts related to the observed correlation between density of employment and productivity using the potential zonal calculation method or the Agglomeration Productivity Aggregate Response (APARC) approach, would yield insufficiently significant agglomeration impacts under these do-something test scenarios.
- 5.4.8 Similarly, our analysis suggests that the recommended methodology for the calculation of impacts relating to increased output in imperfectly competitive markets would result in double counting and therefore due to the absence of a robust method of isolating significant impacts which display 'additionality', these have been similarly excluded from this Part 2 appraisal.

5.5 Economic Activity and Location Impacts (EALIS)

- 5.5.1 We undertook a qualitative appraisal of potential EALI impacts as part of the initial Part 1 appraisal of the options. The purpose of that exercise was to scope the extent to which EALIs are likely to be a prominent feature and also to ascertain which sectors the detailed analysis should focus upon in the Part 2 appraisal. The findings from this analysis are set out in Table 5.3 below. This has utilised a seven-step approach (neutral with three positive and three negative steps either side).

Table 5.3 Summary of Scoping Assessment of EALIs

Year of Assessment	Summary of Impacts			
<i>(year): 2005</i>	Local		National	
Sector	Gains / Gainers	Losses / Losers	Gains / Gainers	Losses / Losers
Manufacturing and Processing	✓ ✓ ✓	0	✓	- -
Locally Traded Services	✓ ✓ ✓	0	✓	0
Externally Traded Services	✓ ✓	- -	0	0
Inward/Mobile Investment	✓ ✓ ✓	0	✓ ✓	-
Tourism	✓ ✓ ✓	0	0	- -
Day Trips/ Shoppers	✓ ✓ ✓	- -	✓	0
Residents	✓ ✓ ✓	0	0	0
Sector Interactions/ Synergies	0	0	0	0
Transport and Communications (including ferry operators)	✓ ✓ ✓	0	✓ ✓ ✓	0

5.5.2 Drawing upon these findings we have consequently used this assessment to refine the more detailed assessment undertaken through the Part 2 appraisal. However, to allow an assessment of the impacts of the options to be undertaken it is first necessary to understand the baseline situation.

Baseline - the Economy of the Study Area

5.5.3 This overview of the economy is based upon an analysis of officially published statistics of the General Register Office for Scotland, Scottish Government, the 2001 Census and Scottish Enterprise's Economic Review of Dumfries and Galloway 2007.

5.5.4 The business base in Dumfries & Galloway has some diversity, with no over exposure to any one industry. This has resulted from the process of industrial restructuring in Dumfries & Galloway whereby manufacturing job losses and closures have been replaced by jobs and firms in the service sector. This has increased economic sustainability, in terms of reducing the reliance on manufacturing and jobs growth (mainly in the public sector), but has done little to reduce the productivity gap which exists with Scotland at a national level. In addition, Dumfries & Galloway has been hit by the recent global economic downturn with the

unemployment rate standing at 3.8% in February 2009 (up 54% relative to February 2008) although this compares reasonably with the national average of 4.1% (up 60% compared to February 2008)¹.

- 5.5.5 There are some niche industries in Dumfries & Galloway, such as chemicals, that have a sufficient market to generate scale economies (and hence higher productivity), but much local economic output supplies local needs (e.g. construction, retail, business services). Local markets are relatively small and diffuse in Dumfries & Galloway, limiting opportunities for investment, specialisation and hence productivity growth.
- 5.5.6 Much of Dumfries & Galloway's productivity gap with Scotland is a result of location, peripherality and rurality. Therefore, initiatives that better connect Dumfries & Galloway to other markets, such as Cairnryan sea link investment and the M74 logistics hub development, will generate more value added for the economy. In particular, there are key niches in the Dumfries & Galloway economy that could benefit from better connections, thereby accessing larger markets and increasing productivity which include:
 - tourism;
 - food & drink;
 - agriculture; and
 - forestry.
- 5.5.7 In 2006, Gross Value Added (GVA) in Dumfries & Galloway was £2.03 billion compared to £1.37 billion in 1995. Based upon an estimated population of 148,300 (mid 2007) this represents income generated of around £13,682 per head. In 1995 GVA from Dumfries & Galloway accounted for 2.5% of the Scottish total whilst this had declined to 2.2% by 2006. This illustrates the increasing gap between productivity at a national and local level.
- 5.5.8 The broad composition of GVA in Dumfries & Galloway by sector is shown in Table 5.4.

Table 5.4 GVA at basic prices (£m) in 2006

Manufacturing	Tourism	Service Sector	Other	Total
320	90	690	929	2,029

Source: *Scottish Economic Statistics, Scottish Government*

- 5.5.9 Sea freight movement at Stranraer and Cairnryan was some 2.31 million tonnes export and 2.09 million tonnes import to and from foreign and domestic markets in 2007. This is up a total of 0.37 million tonnes from 1997 (approximately 8%). The ferry operations at the Stranraer and Cairnryan ports require good transport links to maintain their current level of operation in a competitive marketplace and to continue these growth trends.
- 5.5.10 Figure 5.1 shows the employment by sector in Dumfries and Galloway compared with the national average.

¹ Scottish Government Labour Market Statistics, 2009

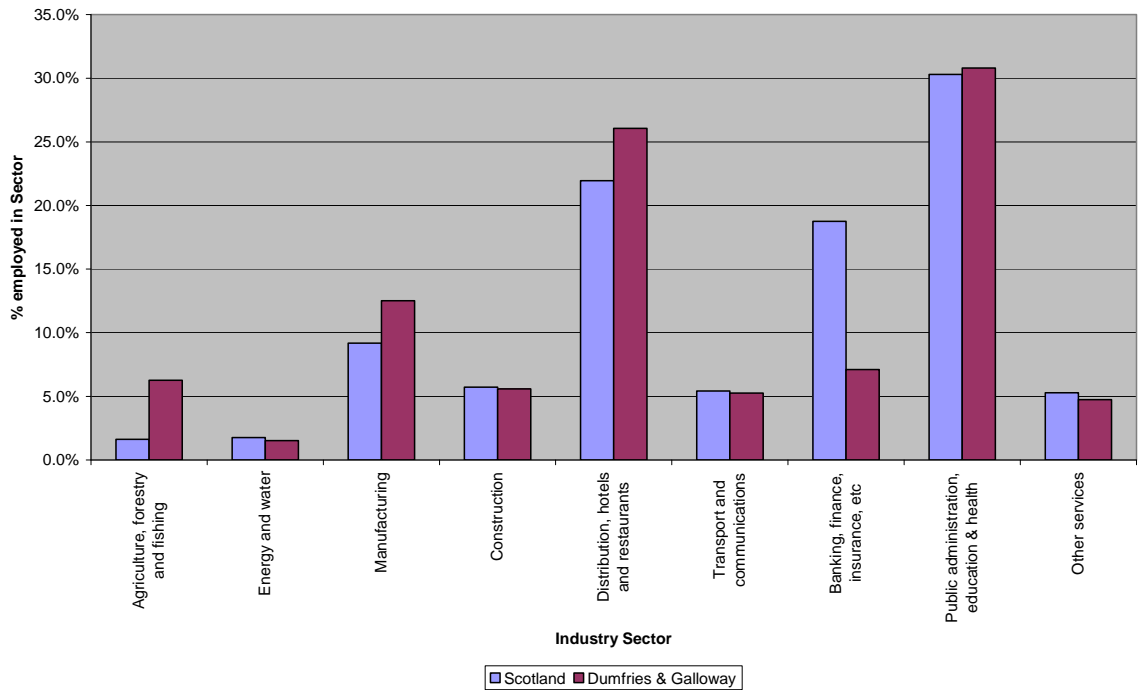


Figure 5.1 Comparison of Employment by Sector in 2007

Source: Labour Market Statistics, Scottish Government

- 5.5.11 Dumfries & Galloway has a higher proportion of people employed in agriculture and manufacturing than the national average whilst the proportion employed in banking and finance is less. Industries like agriculture and manufacturing are more dependent upon good transport links than many service industries and are therefore likely to benefit more from improvements in connectivity.
- 5.5.12 The approximate number of people employed across the different industry sectors in Dumfries & Galloway in 2007 is shown in Table 5.5.

Table 5.5 Employees by Industry Sector in Dumfries & Galloway (2007)

Industry Sector	Number of Employees
Agriculture, forestry and fishing	3,700
Energy and water	900
Manufacturing	7,400
Construction	3,300
Distribution, hotels and restaurants	15,400
Transport and communications	3,100
Banking, finance, insurance, etc	4,200
Public administration, education & health	18,200
Other services	2,800
TOTAL	59,000

Source: Labour Market Statistics, Scottish Government

- 5.5.13 The total number of people employed in production and construction industries in Dumfries & Galloway is equivalent to around 20% of the workforce whilst employment in service industries is around 74%.
- 5.5.14 Table 5.6 shows road freight to and from Dumfries and Galloway. It shows that whilst much of the road freight traffic is contained within Dumfries and Galloway that there are also strong trade links with Strathclyde and locations elsewhere in the UK. There are a number of large road haulage distribution depots based in Dumfries and good transport links are consequently essential to serve the established markets as well as growing new ones.

Table 5.6 Road Freight Imported and Exported to Dumfries & Galloway by Location (Average 2003 – 2007) (Thousand Tonnes)

Origin/Destination	Imported	Exported
Borders	46	43
Central	347	331
Dumfries & Galloway	5,539	
Fife	53	35
Grampian	93	100
Highlands	3	9
Islands	1	-
Lothian	91	53
Strathclyde	1,065	988
Tayside	98	70
Elsewhere in UK	2,246	1,799
TOTAL	9,582	8,967

Source: Scottish Transport Statistics, Scottish Government

5.5.15 The European Union has recognised the importance of road, rail and sea links to re-generating the economy of the region with the following transport links included in the European Union priority projects:

- **A75 Trunk Road** – Part of Priority Project 13 (Gretna to Stranraer);
- **A77 Trunk Road (Stranraer to Glasgow)** – Part of a proposed project of European interest on Atlantic Arc input into the review of the TENS;
- **Glasgow and South Western Rail Line (Nith Valley Line)** – Part of a proposed project of European interest in Atlantic Arc input into the review of the TENS;
- **West Coast Main Rail Line** – Priority Project 14; and
- **Ayr to Stranraer Rail Line** – Part of a proposed project of European interest in Atlantic Arc input into the review of the TENS.

- 5.5.16 In addition, it is important to bear in mind the local context and, in particular, the following four factors:
- **the relatively small population size:** Dumfries and Galloway has a population of around 148,000, representing 2.9% of the Scottish population. There are 69,000 economically active people within the Region (source 2001 Census).
 - **the remoteness of the Region from other centres of population and activity:** there are few competing centres within commuting distance. Only 4% of people in employment that reside in Dumfries and Galloway commute to workplaces outside of the Region. The 2001 Census revealed 3,100 who travel to England and 2,350 who travel to other parts of Scotland. Most of those who commute to England reside in the far east of the Region.
 - **the structural problems of the local economy:** previous analysis has identified that the economic challenges in the area revolve around:
 - the decline of the traditional sectors upon which the local economy was based;
 - the reluctance of indigenous businesses to adapt business models both in terms of modernising ethos but also investment;
 - failure to attract the 'modern' growth sectors; and
 - the migration of talent and potential talent.
- 5.5.17 **the role of the Region in relation to the North Channel Link to Ireland:** The ferry operations around Loch Ryan represent an important part of the regional economy. They also have a wider strategic role, providing the shortest crossing to Northern Ireland.
- 5.5.18 In conclusion, the area is relatively isolated, with considerable journey times between the Region's main towns and the principal Scottish and English economic centres. Much of the economic activity within the region serves the needs of the local population. Therefore, the economic impacts arising from interventions will be largely limited to Dumfries & Galloway and, particularly, the immediate vicinity of Dumfries.

Assessment of EALIs

- 5.5.19 In carrying out a detailed assessment of EALIs resources were not available for extensive surveys of businesses to ascertain the extent to which they would benefit from the options. We therefore undertook an assessment based upon the journey time savings accrued by the options and their resultant impacts upon productivity in the economy.
- 5.5.20 Both options under consideration would lead to improvements in journey times between Dumfries and the M74. This will offer businesses in Dumfries a competitive advantage by improving their access to local and wider markets and allowing more competition within the economy. In addition, there will also be benefits for businesses in other areas although these will be less pronounced due to not being geographically adjacent to the improvements.
- 5.5.21 The analysis in the previous section has identified that the economy of Dumfries & Galloway still maintains a strong manufacturing, agricultural and tourism base and that it is less reliant on the banking and finance sector than the national economy. We have also highlighted that transport tends to play a more prominent role for industries like these which underlines the importance of connectivity to the economy of Dumfries & Galloway.

5 Economy

- 5.5.22 Given this prominence of connectivity we have sub-divided the main economic sectors into those where transport is of particular importance and those where it is less important. This is set out in Table 5.7 below.

Table 5.7 Importance of Transport by Industry Sector

Transport is Important	Transport is Less Important
Agriculture, forestry and fishing	Energy and water
Manufacturing	Banking, finance, insurance, etc.
Construction	Public administration, education & health
Distribution, hotels and restaurants	Other services
Transport and communications	

5.5.23 Drawing on the scoping analysis undertaken in the Part 1 appraisal and summarised at the start of this section we have assigned scores to each of these industry sectors in the local economy using a seven point scale (neutral with three positive and three negative steps either side). The results of this analysis are shown in Table 5.8 below.

Table 5.8 Broad Assessment of EALIs by Industry Sector in Dumfries & Galloway

Year of Assessment	Summary of Impacts	
<i>(year): 2009</i>	Local	
Sector	Gains / Gainers	Losses / Losers
Agriculture, forestry and fishing	✓ ✓ ✓	-
Energy and water	0	0
Manufacturing	✓ ✓ ✓	-
Construction	✓ ✓	-
Distribution, hotels and restaurants	✓ ✓ ✓	--
Transport and communications	✓ ✓ ✓	-
Banking, finance, insurance, etc	✓	0
Public administration, education & health	✓	0
Other services	✓	0

5.5.24 Using this assessment we have then calculated the likely impacts upon employment that would result from each of the options. In undertaking these calculations we made a number of assumptions which include:

- any journey time savings that are realised by the options translate to additional productivity in the economy and therefore jobs;
- that the benefits are greater for the industry sectors where it was identified that transport is important;
- that the benefits are greater in Dumfries than the rest of Dumfries & Galloway due to their closer proximity to the improvements;
- that employment is distributed pro rata in relation to population;
- the actual benefits that will be accrued will be less than those that are theoretically possible due to imperfect market conditions – assumed 80%;
- that many of the benefits have been realised through the TEE analysis and that only a small proportion of these will translate into jobs and GVA benefits – assumed 20%;
- capacity for growth in the local area is constrained by the number of people seeking employment;
- multiplier effects related to consumer spending should be excluded to reduce the likelihood of overestimating the benefits; and
- that the net impacts (i.e. those accruing at a national level) are a very small proportion of gross impacts (i.e. those at a local level – Dumfries & Galloway) due to the largely self contained economy in the area. However, these net impacts are inflated slightly by the location of Dumfries & Galloway close to the border with England increasing the potential for redistribution of economic activity between England and Scotland as a result of these improvements.

5.5.25 The journey time savings used are as reported in the TEE section. It should be noted that the saving on the A75 realised through improvement to the A709 has been included in the overall journey time saving for this option.

5.5.26 At a local level (i.e. Dumfries & Galloway) the estimated net impacts on employment and GVA from each of the options are set out in Table 5.9. The calculation of GVA is based upon the GVA per head of population figure for Dumfries & Galloway that we identified previously (£13,682) which has then been applied to the change in jobs.

Table 5.9 Employment and GVA Impacts in Dumfries & Galloway

	Net Difference	
	Jobs	GVA (2009 Prices)
A709	270	£3.7M
A75	380	£5.2M

5.5.27

5.5.28 We then assessed the extent to which these gross local impacts translated to net impacts at a national level. In carrying out the assessment of GVA we have assumed that the net jobs created at a Scottish level would generate GVA at the national average rate per head of population calculated at £18,149. The results are set out in Table 5.10.

Table 5.10 Employment and GVA Impacts in Scotland

	Net Difference	
	Jobs	GVA (2009 Prices)
A709	20	£0.4M
A75	30	£0.5M

Conclusions Regarding EALIs

5.5.29 From this analysis it can be seen that both options are predicted to realise benefits in terms of employment and GVA increases. The A75 option is predicted to realise more benefits than the A709 due to the greater journey time savings that it offers.

5.5.30 Benefits at a local level are likely to be geographically distributed slightly differently under each of the options as the two routes under consideration serve slightly different markets.

5.5.31 At a national level the benefits are likely to be small and largely attributable to redistribution of economic activity from England rather than significant new economic activity being generated.

5.5.32 However, it is important to note that these figures are a high level estimate of the gross and net impacts and are therefore likely to be subject to a degree of variability. As such, they should be treated with the appropriate degree of caution applicable to high level assessments like these.

5.6 Summary of Economic Appraisal

5.6.1 After taking account of the comparative Benefit:Cost Ratios (BCRs) presented in Chapter 8, the economic appraisal can be summarised as follows.

Option	Transport Economic Efficiency (TEE)	Wider Economic Benefits (WEBs)	Economic Activity and Location Impacts (EALIs)	Overall Appraisal for Economy
A75(T) Gretna to Dumfries	✓✓	No impacts	✓	✓✓
Lockerbie to Dumfries (South)	xx	No impacts	✓	x

6 Integration

Government Objective Improve journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on our high level objectives for economic growth, social inclusion, integration, and safety

6.1 Summary of Position after STAG Part 1

6.1.1 During the STAG Part 1 appraisal we undertook a detailed scoping exercise of integration impacts for the proposed interventions, under the three STAG sub-headings:

- transport integration;
- transport land-use integration; and
- policy integration.

6.2 Transport Integration

6.2.1 As outlined in the initial STAG Part 1 Appraisal, the guidance recognises that most of the assessment of this sub-objective will be captured by TEE. Transport integration should only be appraised if both of the following justifications apply:

- there is an identifiable impact on transport interchange; and
- aspects of this impact are not captured elsewhere in the appraisal (eg TEE)².

6.2.2 Transport integration as it affects people is subdivided by STAG into:

- services and ticketing; and
- infrastructure and information.

6.2.3 Given the nature of the two options being appraised in this chapter, it is not considered likely that these requirements will be met, and therefore no appraisal of transport integration has been carried out.

6.3 Transport Land Use Integration

6.3.1 For Initial (ie Part 1) Appraisal, STAG is specifically aimed at determining whether any land required is preserved for uses that are entirely incompatible with transport, although there is also a need to ensure that proposals fit with transport land-use policies of the local authority and the Scottish Executive.

² STAG, section 4.5.12

6 Integration

6.3.2 We therefore considered in some detail at this initial stage the relationship between such documents as Structure Plans, Local Plans and Scottish Planning Policy statements/National Planning Policy Guidelines on the one hand, and the intervention being appraised. Because of the depth of appraisal already undertaken, our work in this more detailed phase was simply to ensure that we took cognisance of any recent changes to land-use plans in the area – for the most part this was reflected in the EALI analysis reported in the previous chapter. The remainder of this section therefore simply reprises our analysis from the initial appraisal phase to present a full picture of the benefits of a Dumfries link to the A74(M).

6.3.3 The following documents were consulted as part of this sub-heading:

- Dumfries and Galloway Structure Plan, 1999;
- SPP17 – Planning for Transport
- SPP2 – Economic Development
- NPPG14 – Natural Heritage
- SPP15 – Planning for Rural Development
- PAN75 – Planning for Transport
- PAN59 – Improving Town Centres
- PAN66 – Best Practice in Handling Planning Applications Affecting Trunk Roads
- SPP3 – Planning for Homes
- SPP8 – Town Centres and Retailing

6.3.4 Appendix C – Land use and policy integration (Table 1) provides information on the assessment of transport land-use integration undertaken. Reference to the appraisal set out in the appendix shows that whilst both options exhibit a variety of compliance and non-compliance with land use policies, overall Option 1 (upgrading the A75) is significantly more compliant than Option 3 (based around the A709).

Dumfries and Galloway Structure Plan

6.3.5 In light of declining population forecasts, employment concentrated in a few key industries, and general economic decline, the Structure Plan aims to establish policies to promote the development of sustainable communities.

6.3.6 The A75 is a key transport corridor from a local to an international level. The large level of freight transport along the route to and from Stranraer, combined with local traffic, results in inconsistent journey times and often slow moving traffic. Several studies have recognised these issues, summarised below. To date, however, very little has been done to correct the problems.

6 Integration

6.3.7 The A75 Gretna to Stranraer Route Action Plan Study, 1999 identified significant constraints, which affected the performance and level of service along the whole of the route. These included:

- sub-standard road geometry;
- insufficient and infrequent overtaking opportunities;
- platooning effects from ferry traffic;
- accident 'problem' areas; and
- environmentally and scenically sensitive areas.

6.3.8 In November 2001, the findings of the A75/A77 Port Approach Study were reported. The main findings from the A75 route questionnaire indicated that:

- the A75 was considered by most road users to require extensive investment and improvement in the form of a dual carriageway or motorway standard;
- many hauliers have transferred business to ferries using English ports due to the problems experienced on A75;
- the 40mph speed limit for lorries poses problems on the route because lorries are unable to travel at reasonable speed, even during off-peak periods; and
- many hauliers are working on a "just in time" delivery basis, but the unreliability of the route is leading to the transfer of business to English ports.

6.3.9 The Structure Plan commits to continuing to press the Scottish Government regarding the need to upgrade this route, and Option 1 of this report strongly supports this policy.

6.3.10 The Dumfries Travel-to-Work-Area accounts for over 50% of all employment within the region. Dumfries is the main service and administrative centre, serving the whole of the region.

6.3.11 The Structure Plan establishes a commitment to sustainable economic development and along with the Joint Economic Strategy works to support proposals which promote key industry sectors. The ability to transport goods to markets is an important part of developing industries, particularly in rural environments. Both of the options presented here support industry development by providing faster and more reliable transport links to major markets throughout Scotland, England, and Europe.

6.3.12 The natural environment in Dumfries and Galloway has been recognised as unique both in the scenery itself as well as the variety of species which inhabit it. There are a number of regulatory obligations regarding the natural environment which are considered in detail in Chapter 3. The Structure Plan attempts to balance environmental obligations with the need for development to grow the economy.

6.3.13 As the A75 does not run through any Regional Scenic Areas (RSAs), upgrading the section from Dumfries to Gretna (Option1) has an overall neutral environmental impact.

6.3.14 Construction of a route from Dumfries to Lockerbie south of the A709 (Option 3), however, would run directly through environmentally protected and sensitive areas. The route corridor passes between Hightae Mill Loch and Castle Loch SSSI, the latter of which is now a Special Protection Area (SPA) and a Natura 2000 site.

- 6.3.15 According to Structure Plan guidelines it would only be appropriate to develop Option 3 if there is no other suitable location for the development, and the development does not compromise the reason for which the area is protected.
- 6.3.16 Both options have elements which fit with policies in the Structure Plan. However, while Option 1 has at worst a neutral affect on policies, Option 3 is contrary to the Structure Plan's environmental policies.

The Rural Issue

- 6.3.17 The Government has expressed a preference for avoiding new motorway or trunk road junctions, and more generally, policies tend to favour project which promote sustainable modes of transport.
- 6.3.18 While upgrading the A75(T) does not require any new junctions, it also does nothing to promote sustainability. In fact, it will almost certainly increase the convenience of car travel. Constructing a new road south of the A709 (Option 3) conflicts even more with sustainable policies. Environmental policies, however, do not exist in a vacuum; and economic growth tends to follow on from improved transport connections.
- 6.3.19 It should be noted, that while Option 3 is more environmentally sensitive, it is also the more economically viable option. The Transport Economic Efficiency (TEE) Analysis in the Part 1 Appraisal show Option 3 is both cheaper to build and generates more indirect taxation revenue than Option 1, resulting in a stronger BCR and significantly lower Net Present Cost to Government.
- 6.3.20 The Government recognises this dynamic interaction, particularly in rural environments. There is a balance to strike in providing adequate access to services and opportunities for rural residents and promoting more sustainable modes of transport in areas where often public transport provision is infrequent and inadequate.
- 6.3.21 Scottish Planning Policy (SPP) guidance sets forth objectives which attempt to discourage increased use of the personal car whilst recognising its benefits in certain circumstances – particularly in rural areas.
- 6.3.22 Given the rural nature of Dumfries and Galloway, and recognising Dumfries' strategic importance to the region, it is appropriate to work under the less stringent environmental policies in order to support increased access to key services and urban areas, and to support key economic objectives. Both of the options presented here support local and national access and economic growth objectives.

6.4 Policy Integration

6.4.1 This has been approached in two parts; firstly “a simple check to see if the proposal is in harmony with the aims of wider government policies and national transport targets”³ ; secondly to briefly assess the intervention against transport policies, such as the Local Transport Strategy and central government policies/targets, before then turning to non-transport policies including:

- disability;
- health;
- rural affairs; and
- social exclusion.

6.4.2 The Disability and Social Exclusion issues are dealt with in the next chapter, and thus only Health and Rural Affairs need to be assessed separately in terms of integration with wider government policy.

Transport Policies

6.4.3 Reference was made to the following documents:

- Dumfries and Galloway Regional Transport Strategy;
- Scotland’s National Transport Strategy;
- Scotland’s Transport Future – Scottish Executive White Paper; and
- Trans-European Transport Network – European Community, 2002.

6.4.4 The Regional Transport Strategy states: “A key strategic regional issue is the quality of the connection from Dumfries to the A74 (M)⁴ .” Improving the transport links between Dumfries and the A74(M) allows for decreased journey times between Dumfries and other urban centres (either Carlisle to the south, or the Central Belt to the north).

6.4.5 The RTS also recognises the importance of improved transport connections between the ferry ports at Stranraer and the motorway network, allowing for decreased journey times and improved reliability. Better connections also allow for increased economic activity and growth through infrastructure supporting increased inward investment.

6.4.6 Each option analysed in this document contributes in one way or another to the policies identified in the RTS. Upgrading the A75 (Option 1) provides improved access to Carlisle and Cumbria and provides for increased journey reliability along a nationally and internationally significant route. The construction of a new road south of the A709 (Option 3) promotes better connectivity between Dumfries and the central belt while also providing a better environment for communities along the existing A709.

³ STAG, section 9.4.2

⁴ Regional Transport Strategy (*SWestrans*, June 2008), section 3.1 ‘A74(M)’

6.4.7 Consequently, we believe that there is synergy between the contents of RTS document and the proposals we have brought forward in this report and are consistent with the following key policies outlined in the RTS , viz⁵:

- Policy 1 – The Partnership will promote schemes which will not only benefit Dumfries and Galloway but will add value to the broader Scottish economy and underpin national economic growth, aligning to local and national policy objectives.
- Policy 2 - Transport interventions promoted through the Regional Transport Strategy will support the regional economy in relation to local jobs and also facilitate sustainable connectivity internally as well as externally to key business centres in the central belt and other locations such as Ayrshire and Cumbria.
- Policy 3 - The Regional Transport Strategy seeks to improve quality of life by promoting vibrant places which provide access for all to employment, healthcare, education and other services.
- Policy 4 - Transport interventions incorporated in the Regional Transport Strategy seek to address peripherality between the region's main settlements and outlying areas, and between the region and its external markets.
- Policy 6 - The Partnership will seek to assist the Scottish Executive in delivering on its five high level national objectives and the National Transport Strategy. A presumption will be given in favour of transport improvements linked to the strategic vision based on well defined economic, social and environmental objectives.

6.4.8 Overall, it can be seen that the policy context is mixed for the options for an improved link between Dumfries and the A74(M). While Option 1 generally complements national and regional transport policies, Option 3 clearly digresses from environmental policies but is more economically viable.

6.4.9 In addition, as recommended by STAG, a check was undertaken comparing the identified options against national transport targets⁶ and wider, non-transport government policies.

6.4.10 A summary of the issues identified is set out in Appendix C – Land use and policy integration (Table 2). This shows that as both options are road-based they are not particularly in line with latest government policies on sustainable transport.

Non Transport Policies

Health

6.4.11 The recent transport White Paper acknowledges: "How we choose to travel has an impact on our health ... Good travel habits can contribute to a healthier lifestyle ... The health improvement challenge sets out a framework for action and emphasises the importance of physical activity⁷"

⁵ Regional Transport Strategy (*SWestrans*, March 2007), sections 9.2 and 9.3

⁶ Scotland's Transport: Delivering Improvements – Transport Indicators for Scotland (*Scottish Executive*, 2002), Annex A

⁷ Scotland's Transport Future (*Scottish Executive*, June 2004), paragraphs 4.59, 4.60 & 4.61

6 Integration

- 6.4.12 The Scottish Executive has set out its aspirations for improving Scotland's health⁸ and it is clear that measures which promote physical activity over inactivity will contribute to furthering these aims – the promotion of so-called "active travel". In this regard modal shift to public transport will generally be favoured, particularly where access to the/from the public transport network is either by walking or cycling.
- 6.4.13 Looking at the two options under appraisal, whilst neither scheme aims to achieve some degree of modal shift towards public transport, it can be argued that there may be some small secondary effects with the introduction of either option.
- 6.4.14 Both options would help to create more reliable journey times – for buses as well as other vehicle modes, which may increase the appeal of public transport journeys through the area. Option 3 in particular may have stronger secondary effects through reducing through-traffic in the communities along the existing A709. By moving traffic, particularly lorries and larger vehicles, to the new road, the existing road is made safer for cyclists and pedestrians, potentially encouraging more use of these modes.

Rural Affairs

- 6.4.15 As emphasised on its website, the Scottish Executive *"is committed to supporting rural life, rural communities and the rural economy. To do so it has 'mainstreamed' the needs of rural Scotland within all its policies."*
- 6.4.16 The contribution that an improved link from Dumfries to the A74(M) can make to supporting rural life is not obvious, however given that Dumfries and Galloway due to its geographical location is essentially a car dependant community, better transport routes can only enhance life for the rural community who are dependant on their vehicles.

6.5 Overall Assessment Against Government Objectives for Integration

Option	Transport Integration	Transport Land-Use Integration	Policy Integration	Overall Appraisal for Integration
Option 1: A75(T) Gretna to Dumfries	No impacts	Mixture of compliance/non-compliance. Overall ✓	Mixture of compliance/non-compliance. Overall ✗	0
Option 3: Lockerbie to Dumfries (South)	No impacts	Some compliance, but very significant areas of non-compliance. Overall ✗✗	Some compliance, but very significant areas of non-compliance. Overall ✗✗	✗✗

⁸ Improving Health in Scotland (*Scottish Executive*, March 2003)

7 Accessibility and Social Inclusion

7.1 Introduction

7.1.1 An accessibility assessment of proposed improvements to the Lockerbie to Dumfries Corridor was carried out using the Dumfries and Galloway ACCESSION model. This chapter consists of four sections:

- Accession model development;
- changes to access to key destinations (eg Crichton Hospital and Gretna);
- changes to access to employment; and
- impact on social inclusion.

7.2 ACCESSION Model Development

7.2.1 We developed an Accession model to examine accessibility to key destinations and employment opportunities. The following data were imported into the Dumfries and Galloway Accession model:

- road network details – the NavTeq GIS mapping layer has been used, ensuring inclusion of every road in the study area;
- origins – Codepoint (full postcodes) and SNS Datazones;
- destinations – TMFS05a planning data (2012 employment estimates); key destinations (eg hospitals); and
- 2001 Census Data – geo-demographics eg population.

Road Network Details

7.2.2 Accession calculates journey times using road speeds assigned to the digitised road network. ITIS road speeds were added to the model.

7.2.3 ITIS has developed and operates a unique system to collect and analyse traffic information using Floating vehicle data (FVD) to provide journey time information as well as real-time traffic updates. FVD underpins the process and technology for the collection, analysis and forecasting of journey times using speed and location data from probe vehicles. Using GPS and GSM technology, the Data Collection Unit in the vehicle supplies real-time and historic information on the probe's speed and position at any given time. The data from probe vehicles is aggregated to determine the average speed for a given stretch of road. Figure 7.1 illustrates the floating vehicle data collection method.

7.2.4 In addition to collecting from fixed-sensor systems, ITIS can provide highly accurate traffic data from information available from cell phones. By sampling the location of a mobile phone over a period of time, the route and velocity at which the phone is travelling can be determined. While an individual record of a mobile phone's position is typically less accurate than that of a corresponding GPS record, this is compensated for by the large number of mobile phones on any road, knowledge of the underlying road network, and the application of statistical techniques

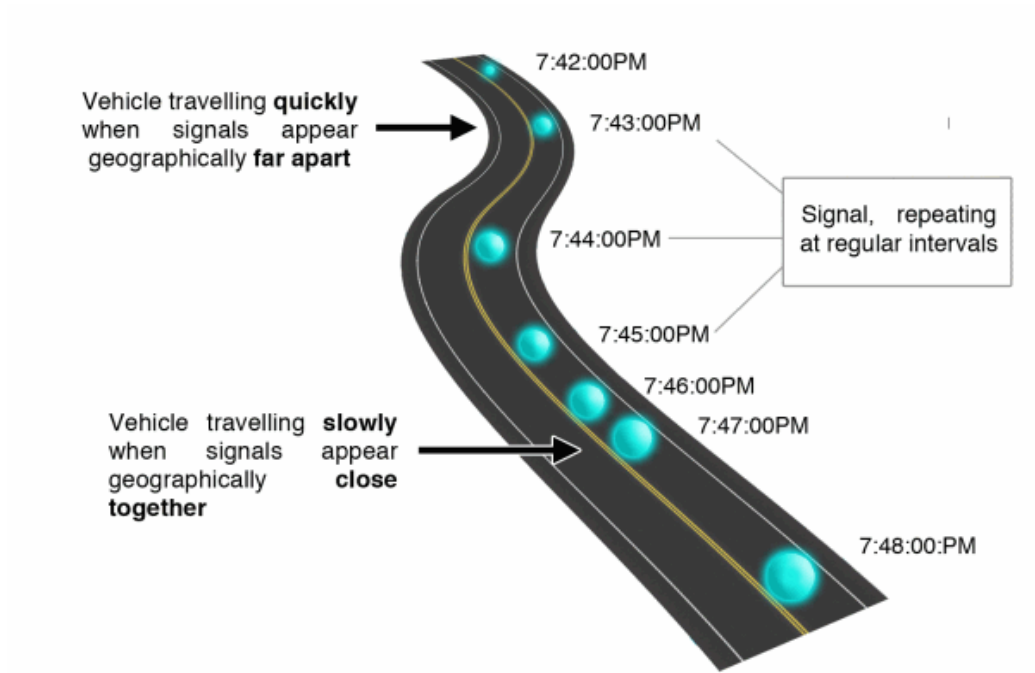


Figure 7.1 ITIS FVD technology (Source: <http://www.itisholdings.com>)

7.2.5 MVA Consultancy obtained FVD data from two sources (ITIS Holdings and MapMechanics) details are provided in Table 7.1. The road network created for the accessibility model involved combining ITIS Holdings and MapMechanics data.

Table 7.1 Scottish Road Speed Data

Data Set	ITIS Holdings: Motorways and A Roads	MapMechanics: Roads and Minor Roads
Day of Week	Tuesday, Wednesday and Thursday	Weekday
Time Period	AM Peak (0800 to 0900) IP (Average 1000 to 1600) PM Peak (1700 to 1800)	Off peak (9:00 to 16:00); 'rush hour' 7:00 to 9:00 am & 16:00 to 19:00 pm,
Month	Neutral' Months - February, March, May, September & November	Annual
Road Type	Motorways, A Roads and some B Roads	Motorway, A roads, B roads, Minor Roads and local streets.
Data Quality (1) Direction of Travel	Data split by direction of travel and time period	speeds are not split by direction of travel and 'rush hour' is not split by am and pm; and
Data Quality (2) Sample Size	Sample sizes high (but note coverage does not extend to minor roads)	there may be some quality issues on road links where there are low numbers of vehicles; (eg rural areas)
Other		Where there are no readings for roads average speeds have been calculated based on road name, road type, urban flag, postal sector, district or area the road link falls in. When speed-readings have exceeded reasonable driving speed thresholds, speeds have been reduced. In addition, a lower threshold of 5kph is assigned to any speed between 1kph and 5kph.

7.3 Assessments

Initial Accessibility assessment

7.3.1 The initial accessibility assessment compared drive times before and after improvements to the road network (either a new road south of the A709 or upgrading the A75 to dual carriageway). Access to Gretna and the Crichton Hospital in the AM period were considered.

Crichton Hospital

7.3.2 Figure 7.2, Figure 7.3 and Figure 7.4 show the distribution of journey times to Crichton Hospital by postcode area before and after improvements to the road network, respectively.

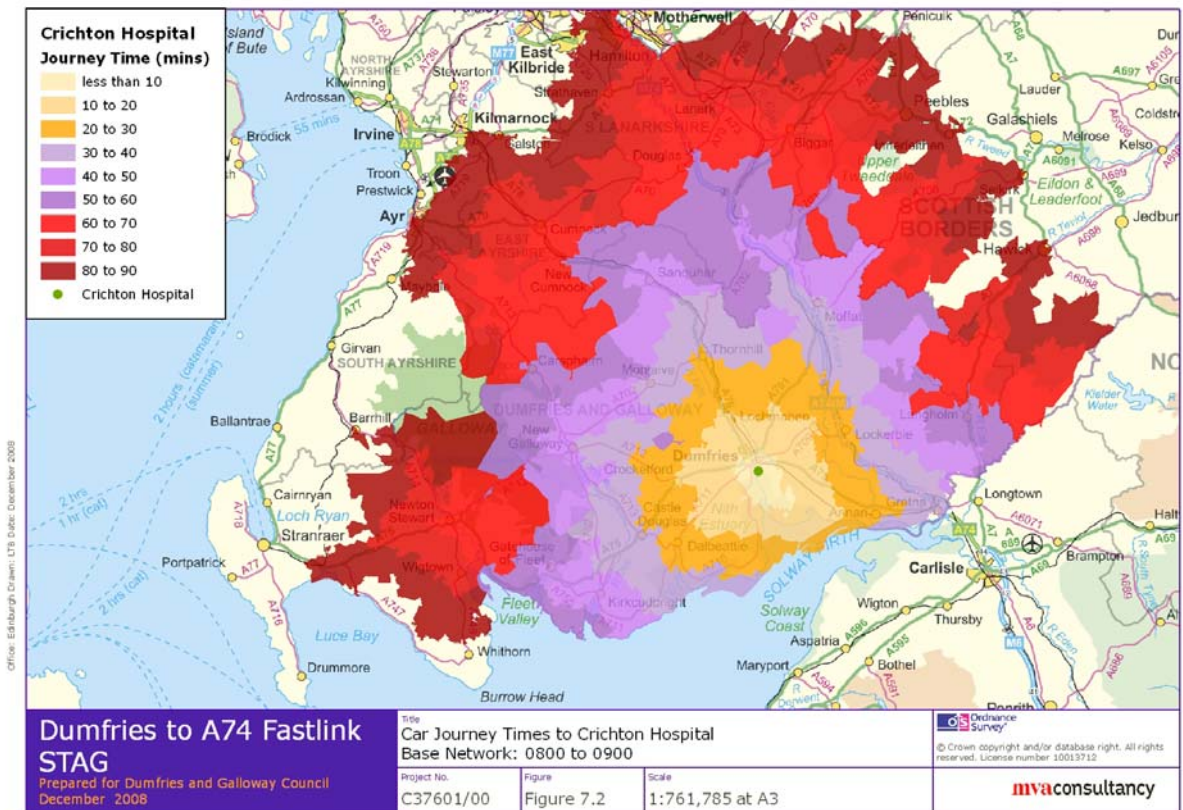


Figure 7.2 Car Journey Times to Crichton Hospital (Base Network – before improvement)

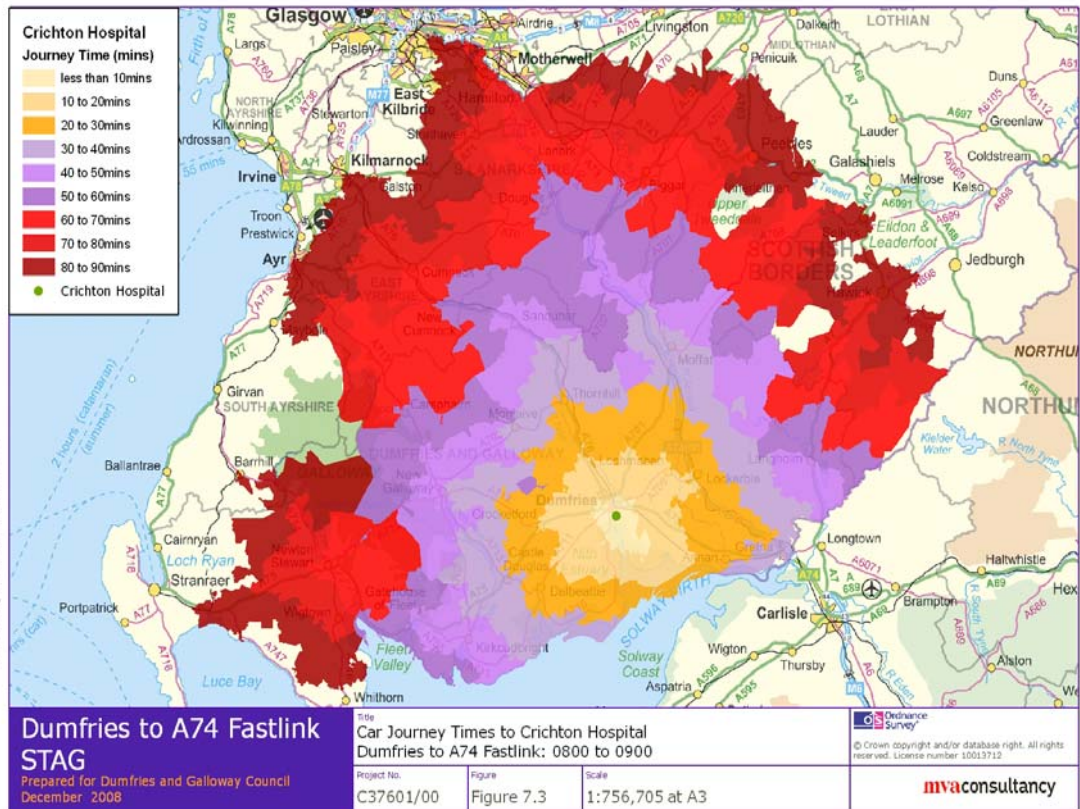


Figure 7.3 Car Journey Times to Crichton Hospital (with new road south of existing A709)

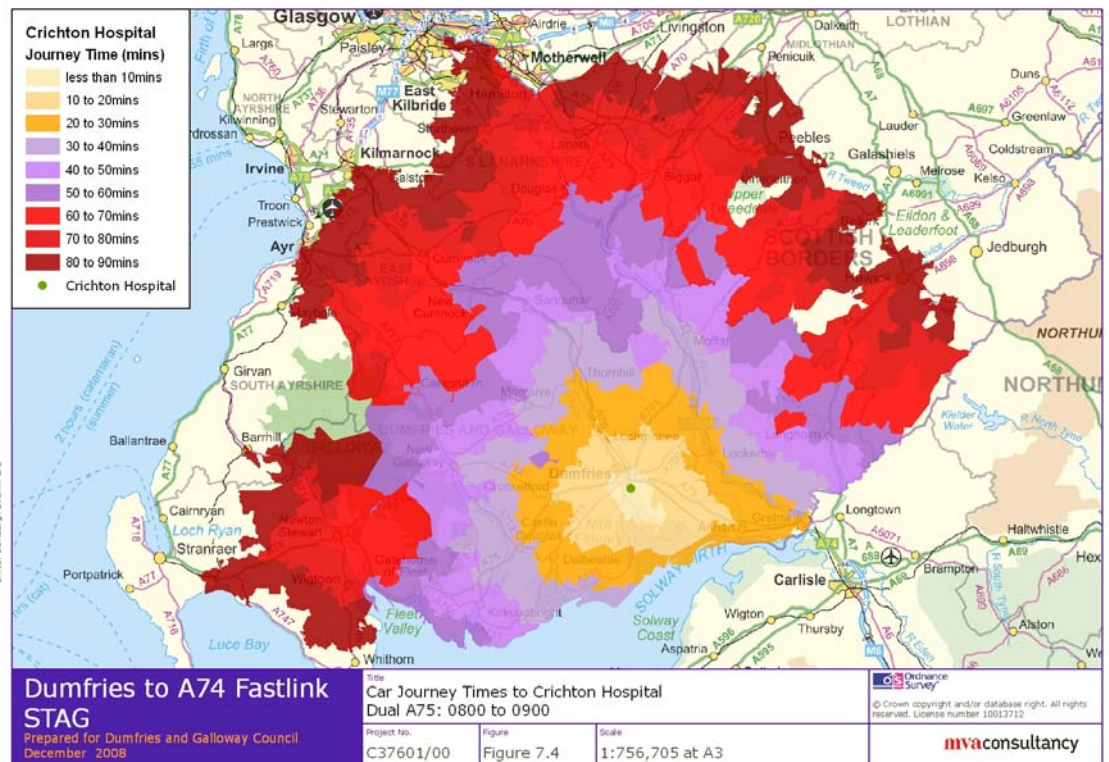


Figure 7.4 Car Journey Times to Crichton Hospital (A75 Dual Carriageway)

7 Accessibility and Social Inclusion

7.3.3 The proportion of households within various categories of travel time by car have been calculated for Crichton Hospital and detailed in Table 7.2. It can be seen from the table that the proportion able to access the hospital within 90 minutes increases from 56% to 65% following the new road south of the A709. In contrast, upgrading the A75 does not increase the proportion able to access the hospital within 90 minutes.

Table 7.2 Percentage of Population within reach of Crichton Hospital (Study Area*)

Journey Time	Dumfries and Galloway ²			Study Area ¹		
	Base	A709	A75	Base	A709	A75
less than 15mins	28%	28%	28%	5%	5%	5%
15 to 30mins	24%	25%	28%	4%	5%	5%
30 to 45mins	20%	19%	15%	4%	4%	3%
45 to 60mins	8%	8%	8%	2%	2%	2%
60 to 90mins	7%	7%	7%	41%	49%	41%
greater than 90mins	13%	13%	13%	44%	35%	43%
TOTAL	100%	100%	100%	100%	100%	100%

¹ Study Area includes 5 local authorities: Dumfries & Galloway; East Ayrshire; Scottish Borders; South Ayrshire and South Lanarkshire

² Dumfries N = 71,747; Study Area N=377,348

7.3.4 It is worth noting that the improvements in accessibility are principally generated outwith Dumfries and Galloway. Figure 7.5 illustrates the difference between the journey times to Crichton Hospital before and after the construction of the new A709 roadlink.

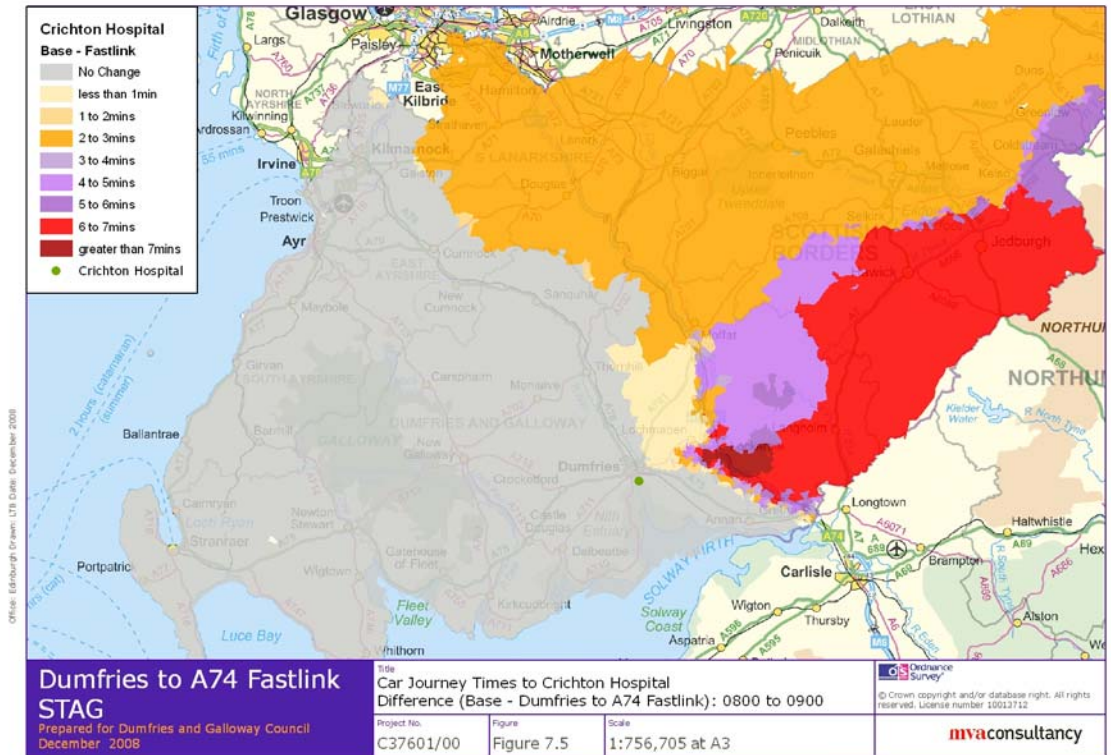


Figure 7.4 Difference in Car Journey Times after Dumfries to A74 Fastlink

7.3.5 Figure 7.6 illustrates the difference between the journey times to Crichton Hospital before and after upgrading the A75 to dual carriageway, highlighting the much smaller geographic spread of improved accessibility with this option.

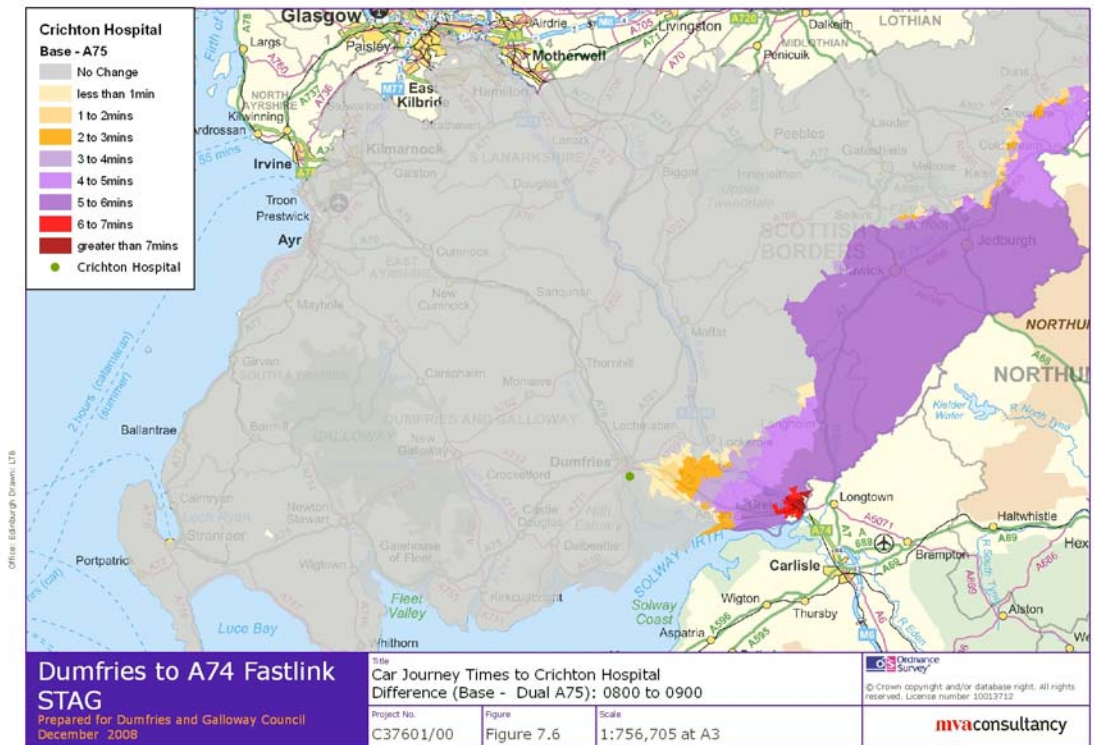


Figure 7.5 Difference in Car Journey Times after new Dumfries A75 Dual Carriageway

7.3.6 Table 7.3 sets out the proportion of households that would benefit from a reduction in their car journey time to hospital. It may be seen from the table that over a half (56%) of the Study Area households would experience a decrease in their journey times following the construction of a new road near the A709. Only 9% would experience quicker journey times after upgrading the A75. Again it should be emphasised that much of this improvement is outwith Dumfries and Galloway, and hence outwith the usual catchment area of the Crichton.

Table 7.3 Changes in Journey Time to Crichton Hospital

Journey Time Savings	Dumfries and Galloway		Study Area ¹	
	A709	A75	A709	A75
No Change	81%	83%	44%	91%
Less than 1min	4%	1%	1%	0%
1 to 2mins	1%	0%	0%	0%
2 to 3mins	3%	1%	48%	0%
3 to 4mins	1%	1%	0%	1%
4 to 5mins	3%	7%	1%	2%
Greater than 5mins	6%	7%	6%	5%
TOTAL²	100%	100%	100%	100%

¹ Study Area includes 5 local authorities: Dumfries & Galloway; East Ayrshire; Scottish Borders; South Ayrshire and South Lanarkshire

² Dumfries N = 71,747; Study Area N=377,348

Gretna

- 7.3.7 We then repeated the exercise looking at improvements in access to Gretna as a proxy for other key locations in the region. Figure 7.7 and Figure 7.8 show the distribution of journey times to Gretna by postcode area before and after the construction of the new road south of the A709. Figure 7.9 shows the distribution of journey times after upgrading the A75 to dual carriageway. Table 7.4 then gives a comparison of the relative impacts on travel time to Gretna. Figure 7.10 and Figure 7.11 illustrate the difference between the journey times to Gretna before and after road improvements.
- 7.3.8 As can be seen, after constructing a new road south of the A709, the impacts for travel to Gretna are less marked but there are some improvements to accessibility, most notably when looking at the wider study area outwith Dumfries and Galloway. Upgrading the A75 to dual carriageway results in slightly more improvements in accessibility to Gretna, and most notably a much wider geographic distribution of the benefits.

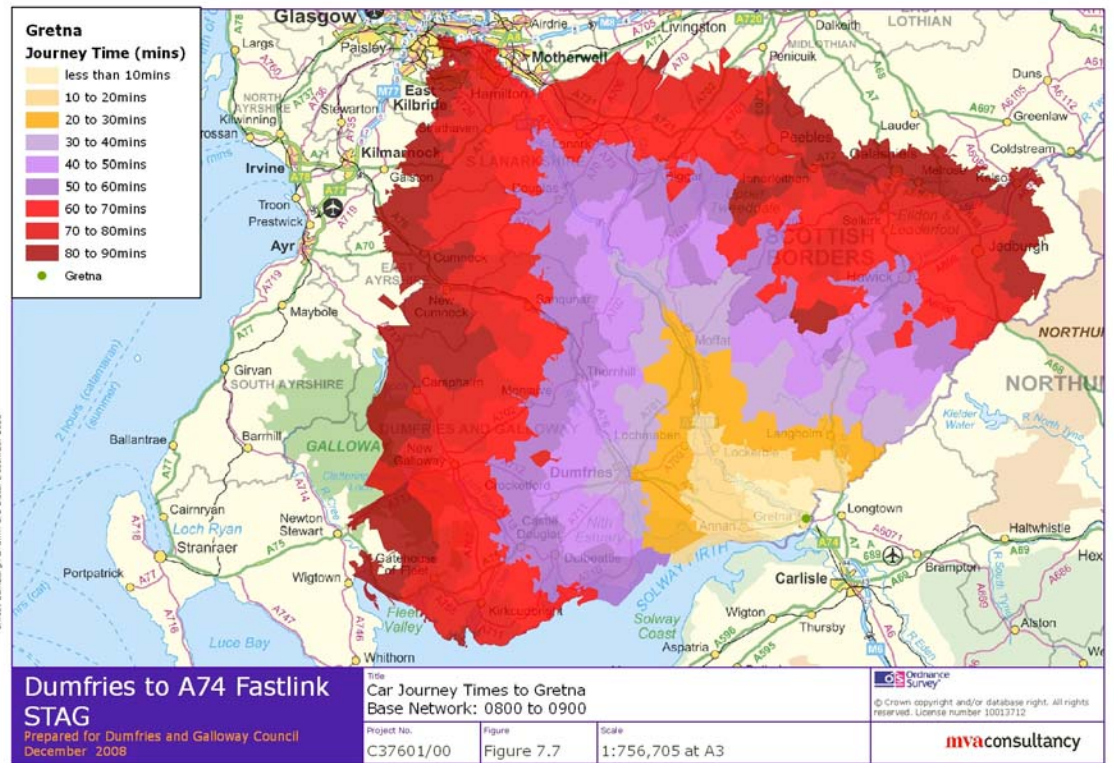


Figure 7.6 Car Journey Times to Gretna (Base)

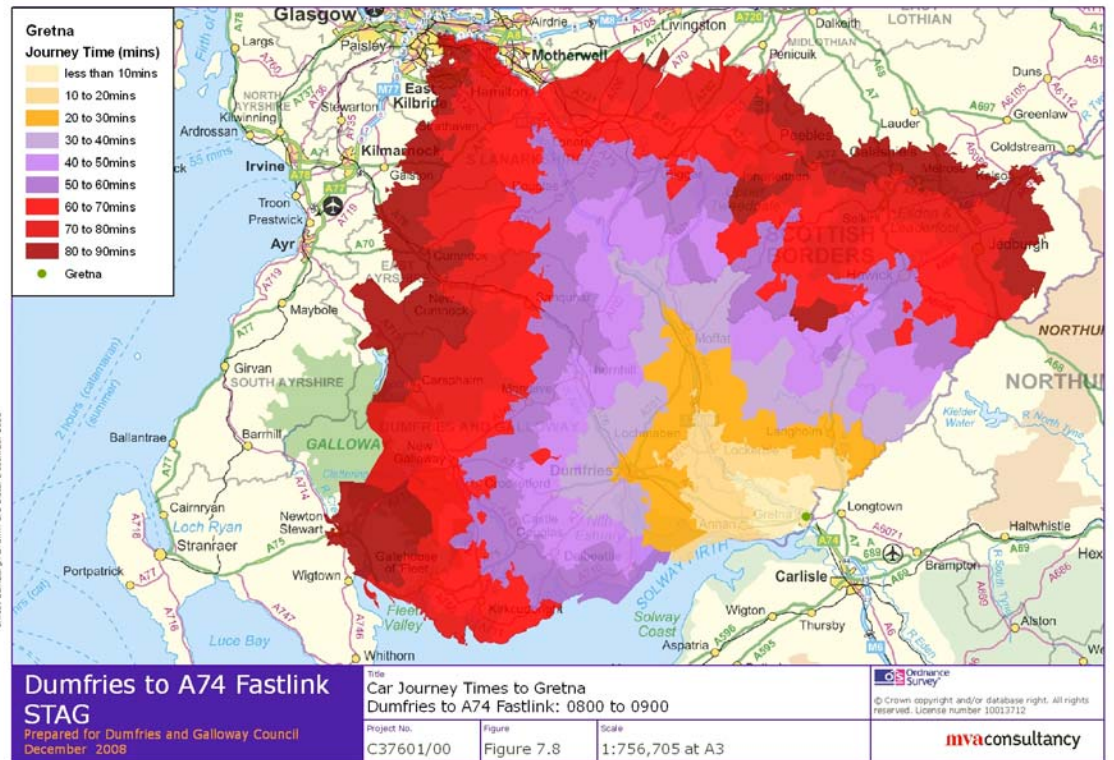


Figure 7.7 Car Journey Times to Gretna (Dumfries A74 Fastlink)

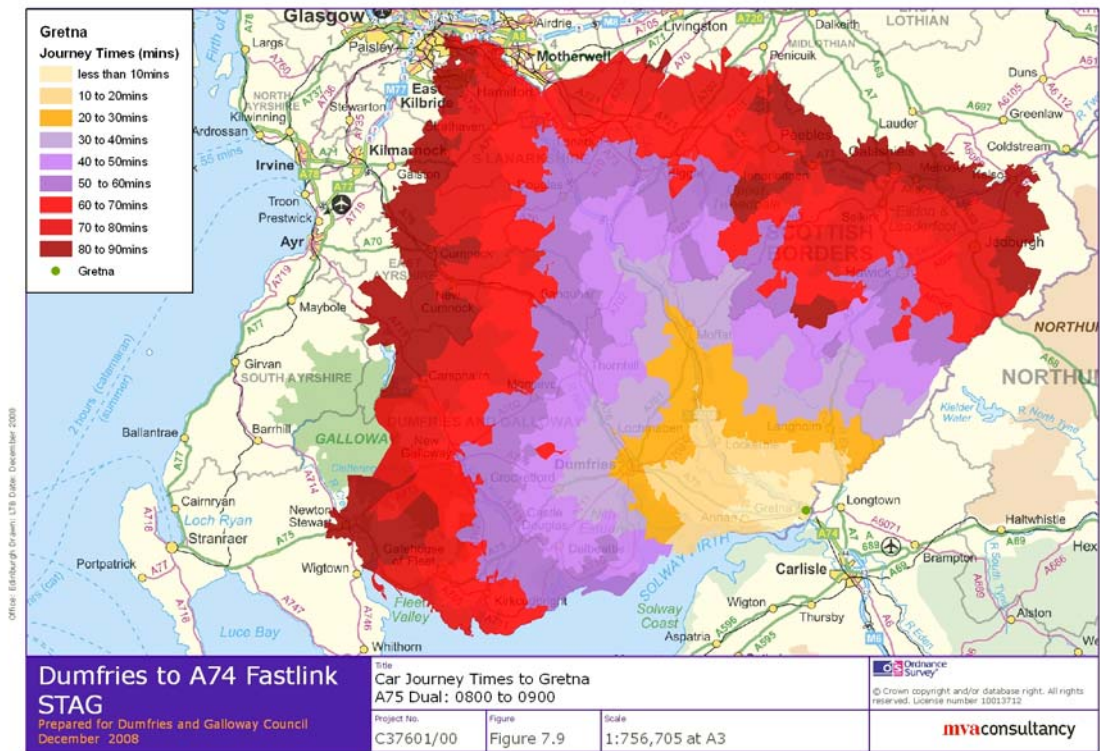


Figure 7.8 Car Journey Times to Gretna (Dumfries A75 Dual)

Table 7.4 Percentage of Population within reach of Gretna

Journey Time	Dumfries and Galloway ²			Study Area ¹		
	Base	A709	A75	Base	A709	A75
less than 15mins	14%	14%	14%	3%	3%	3%
15 to 30mins	16%	34%	38%	3%	6%	7%
30 to 45mins	26%	10%	7%	5%	2%	2%
45 to 60mins	13%	13%	13%	7%	7%	7%
60 to 90mins	12%	13%	12%	50%	51%	51%
greater than 90mins	20%	17%	17%	32%	31%	31%
TOTAL	100%	100%	100%	100%	100%	100%

¹ Study Area includes 5 local authorities: Dumfries & Galloway; East Ayrshire; Scottish Borders; South Ayrshire and South Lanarkshire

² Dumfries N = 71,747; Study Area N=377,348

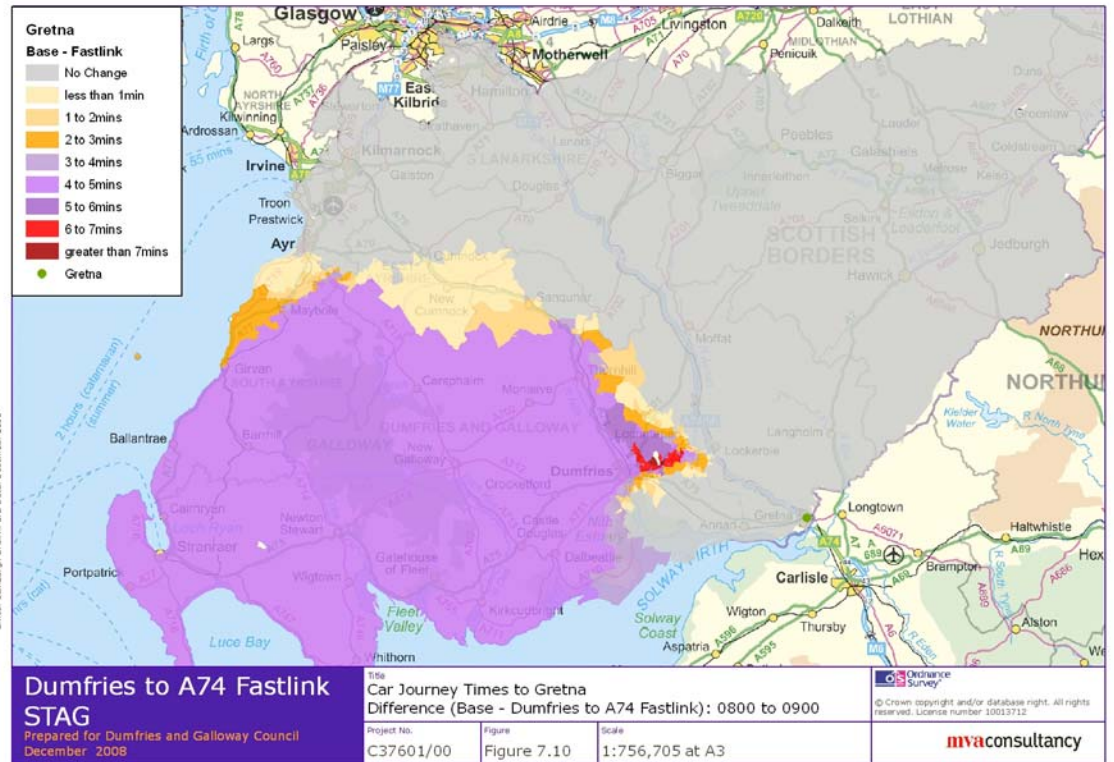


Figure 7.9 Difference in Car Journey Times After New Road South of the A709

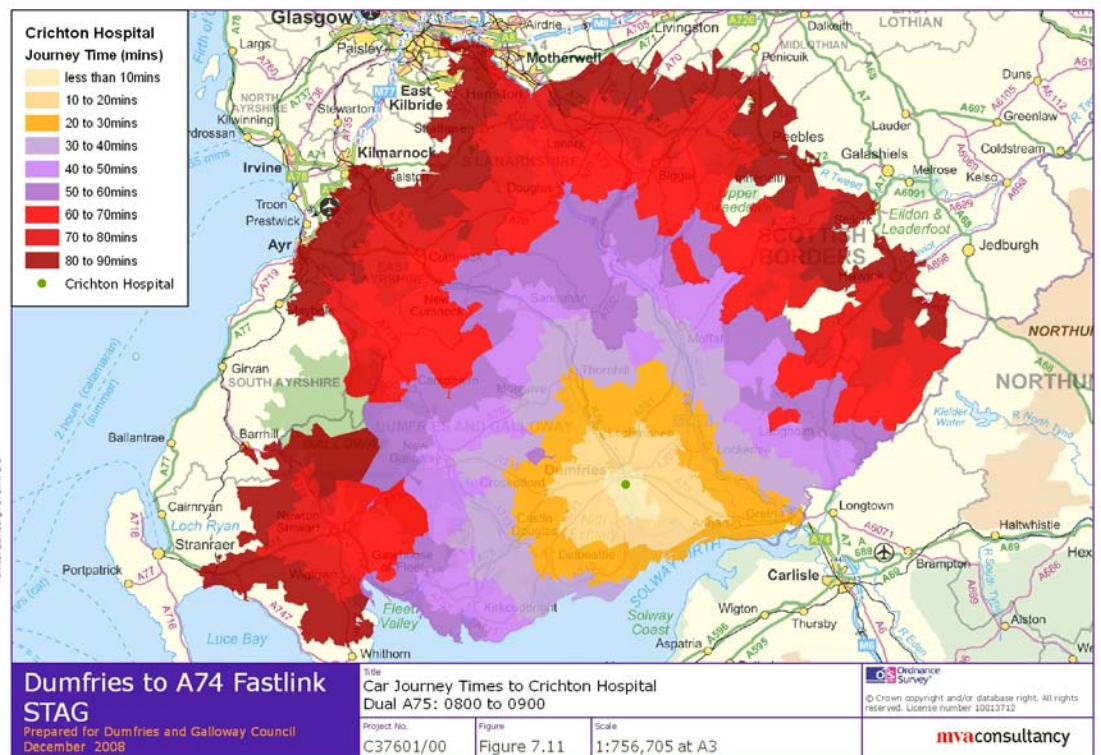


Figure 7.10 Difference in Car Journey Times Before and After Dual A75

7.3.9 Table 7.5 sets out the proportion of households that would benefit from a reduced car journey time to Gretna. It may be seen from the Table that with improvements to the A709,

over three quarters (76%) of Dumfries and Galloway households would benefit from a decrease in their journey times (4% would experience a journey time savings greater than 5minutes). After upgrading the A75, 83% of Dumfries and Galloway households would benefit from quicker journey times to Gretna – 70% would experience a journey time savings greater than 5minutes.

Table 7.5 Difference in Car Journey Times After Road Improvements - Gretna

Journey Time Savings	Dumfries and Galloway		Study Area	
	A709	A75	A709	A75
No Change	24%	17%	44%	78%
Less than 1min	2%	1%	1%	1%
1 to 2mins	2%	8%	0%	4%
2 to 3mins	6%	1%	48%	0%
3 to 4mins	7%	2%	0%	1%
4 to 5mins	55%	1%	1%	1%
Greater than 5mins	4%	70%	6%	15%
TOTAL	100%	100%	100%	100%

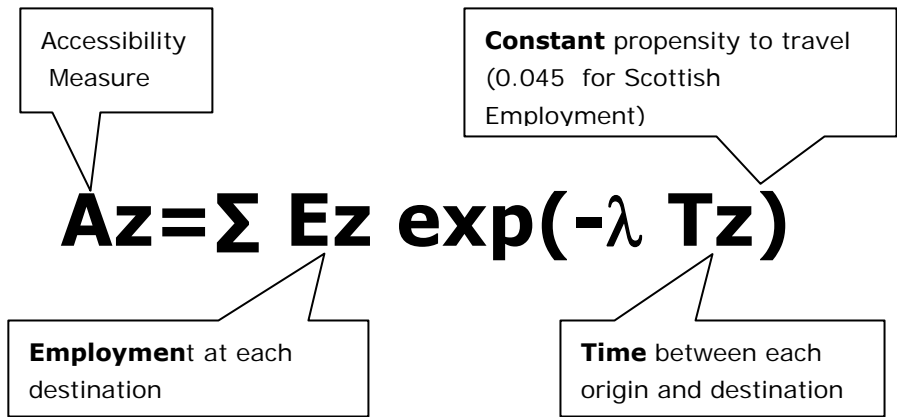
¹ Study Area includes 5 local authorities: Dumfries & Galloway; East Ayrshire; Scottish Borders; South Ayrshire and South Lanarkshire

² Dumfries N = 71,747; Study Area N=377,348

7.4 Access to Employment

Accessibility Measures – Hansen Measures

- 7.4.1 The measure of accessibility used (known as ‘Hansen’ indicators) gives an accessibility value for each zone in the model. The value reflects the cost of travelling to all the other zones in the modelled area. For travel to work, the indicator is a function of travel times from each zone to all employment, weighted by the number of jobs in each zone.
- 7.4.2 The following figure details the deterrence function used to create the accessibility indicators. In order to achieve the correct sensitivity of the indices to travel time, the deterrence function is calibrated using the lamda value. A very high lamda value indicates that travel time is constrained, whereas lower lamdas are apparent when people are prepared to spend longer travelling such as for leisure or work trips. The Dumfries and Galloway Accession model was updated to include lamda value of 0.045 for car access to employment (recommended within the Scottish Government 2005 Scottish Household Survey Analytical Topic Report: Accessibility and Transport).



Hansen Accessibility Indicators - Deterrence Function

7.4.3 TMfS05A planning data was used to estimate the number of jobs and per zone. The model uses predicted employment figures for 2012 to ensure that future employment levels have been included. Employment opportunities within the following Local Authorities were added to the model: Dumfries & Galloway; The Borders; East Lothian; Midlothian; City of Edinburgh; West Lothian; South Lanarkshire; East Ayrshire; South Ayrshire; North Ayrshire; East Renfrewshire; City of Glasgow; North Lanarkshire; Falkirk; East Dunbartonshire; Renfrewshire; Inverclyde and West Dunbartonshire. Figure 7.12 shows 2012 employment density within the modelled area.

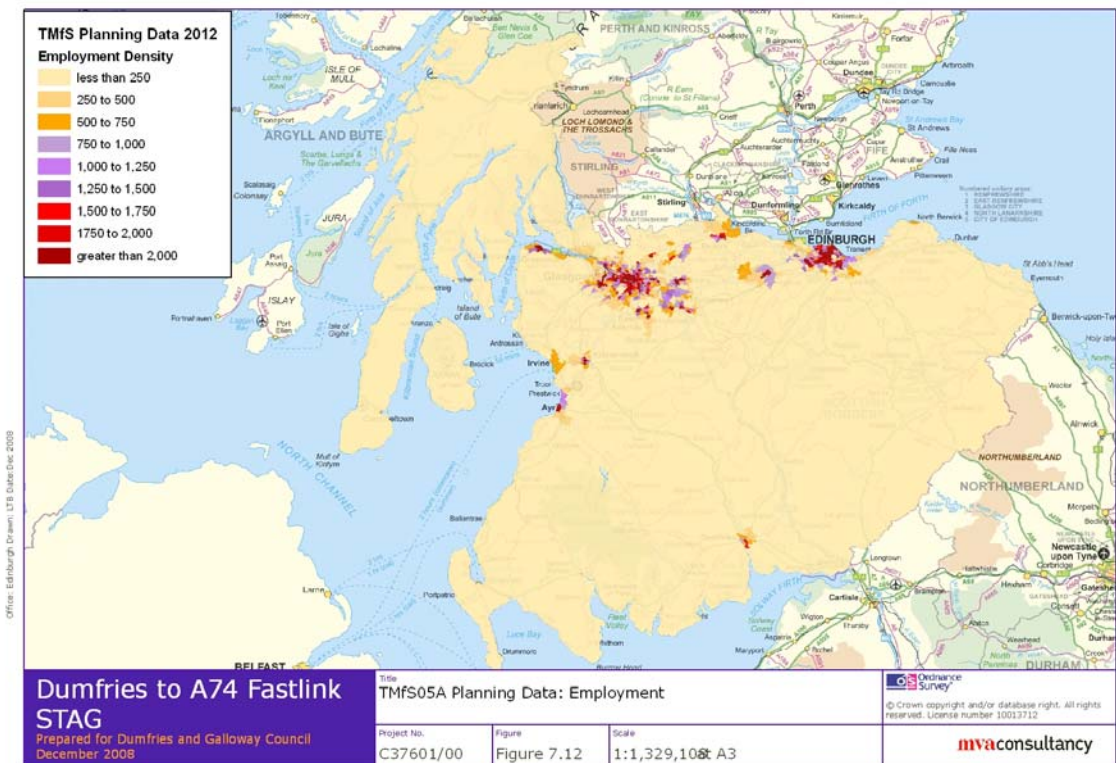


Figure 7.12 Study Area Employment Density

7.4.4 Figure 7.13 shows 'Hansen' measures of accessibility to all employment. Purple areas have the best access to employment, red have poor access to employment. The 'Hansen' measure is a function of travel times from each zone to all employment zones, weighted by

the number of jobs in each zone. A zone with short travel times to employment scores better (ie lower) than a zone separated from the major employment opportunities by long journey times.

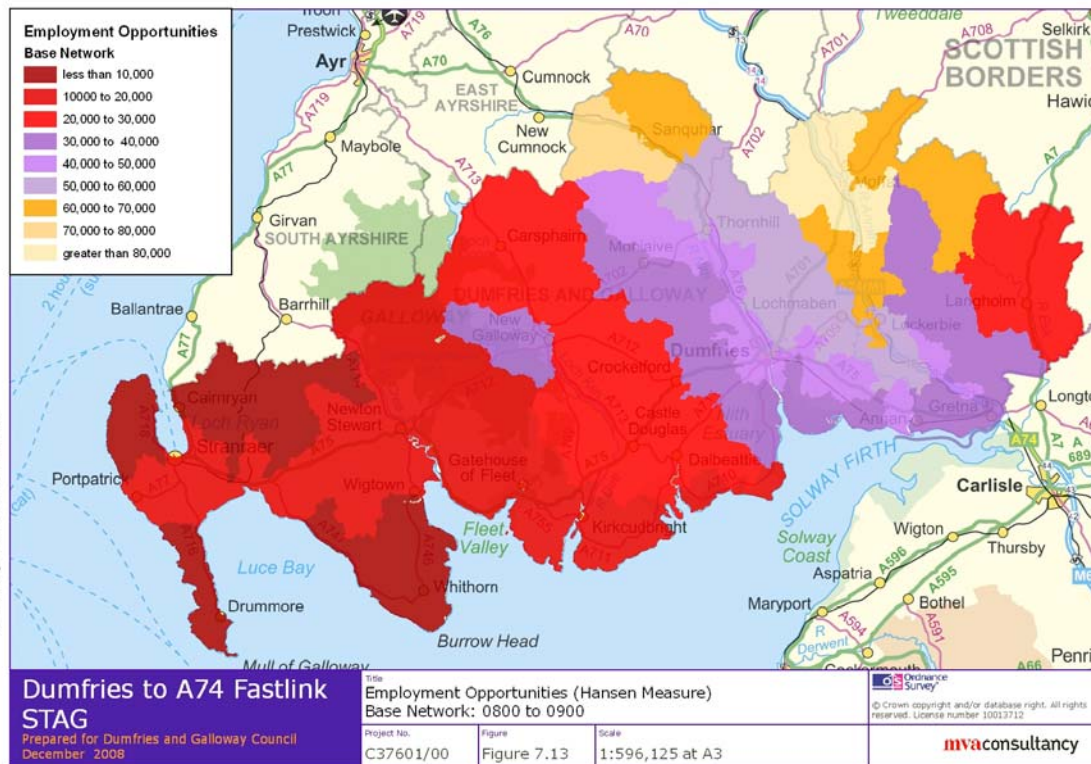


Figure 7.13 'Hansen' measures of accessibility to all employment (Base Network – before A709 road improvements)

- 7.4.5 The picture which emerges is as anticipated, with a gradual reduction in accessibility moving further away from opportunities in Dumfries and the Central belt (note the model does not extend to Carlisle). Dumfries has the highest accessibility – concentration of a large number of jobs accessible by short car travel times. Areas around the north of the Local Authority area are also in the high band of accessibility to employment. It may be seen that Stranraer and Portpatrick residents have relatively poor accessibility to jobs by car. This reflects long travel times to the main centres of employment and relatively fewer local employment opportunities.
- 7.4.6 Figure 7.14 illustrates accessibility after opening of A709 Fastlink, and Figure 7.15 highlights the changes to accessibility delivered by the improvement. It can be seen from Figure 7.15, that Dumfries residents experience a high level of improvement in access to employment opportunities (ie greater than 4%).

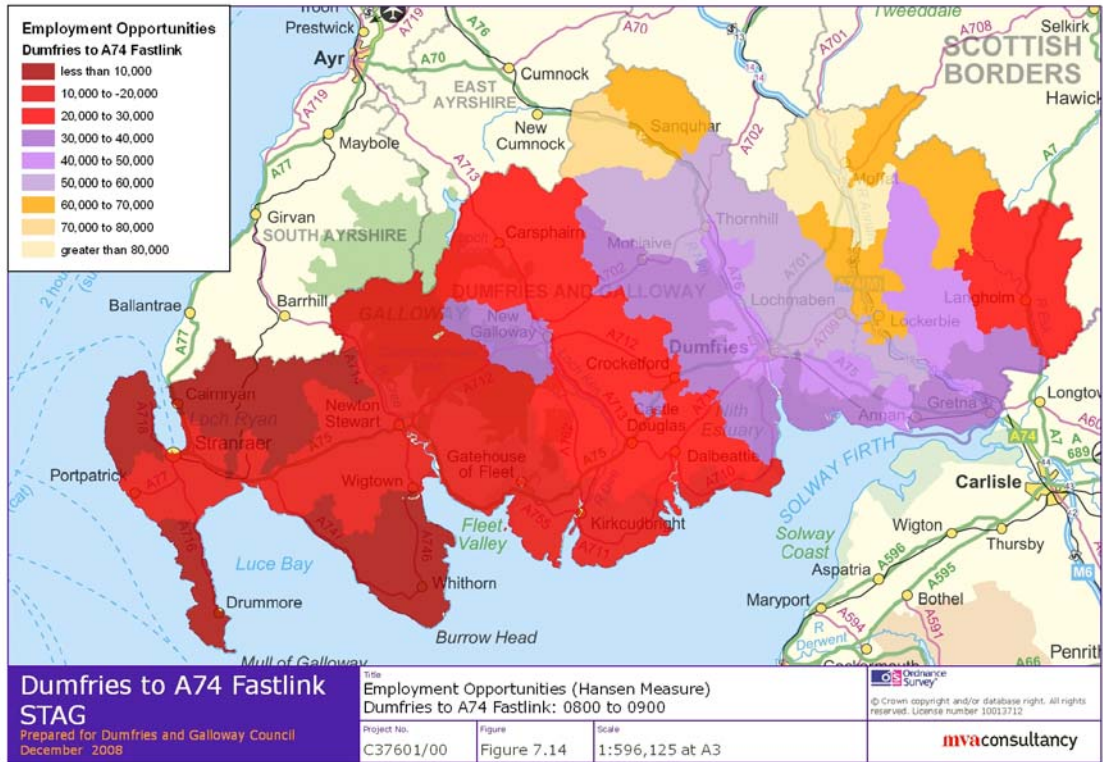


Figure 7.14 'Hansen' measures of accessibility to all employment (new road south of A709)

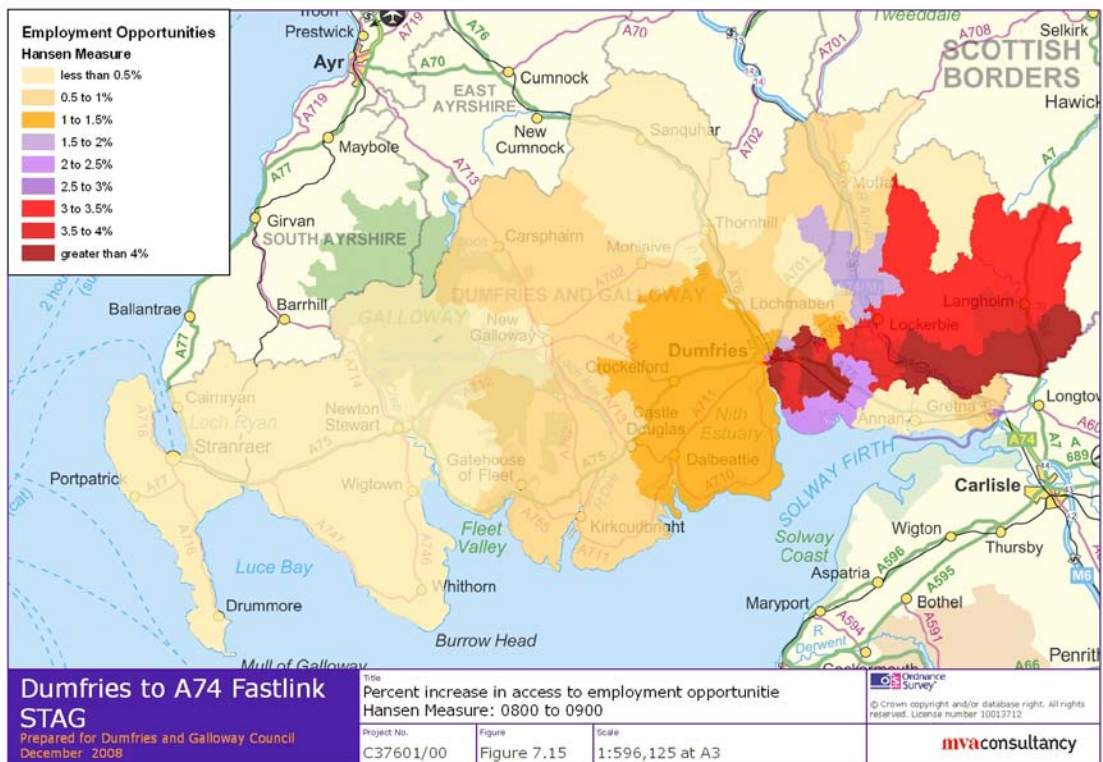


Figure 7.15 'Hansen' measures of accessibility to all employment (percentage improvement after new road south of the A709)

7 Accessibility and Social Inclusion

7.4.7 Figure 7.16 illustrates accessibility after upgrading the A75, and Figure 7.17 highlights the changes to accessibility delivered by the improvement. It can be seen from Figure 7.17 that residents the South East of the Local Authority area experience a high level of improvement in access to employment opportunities (ie greater than 4%).

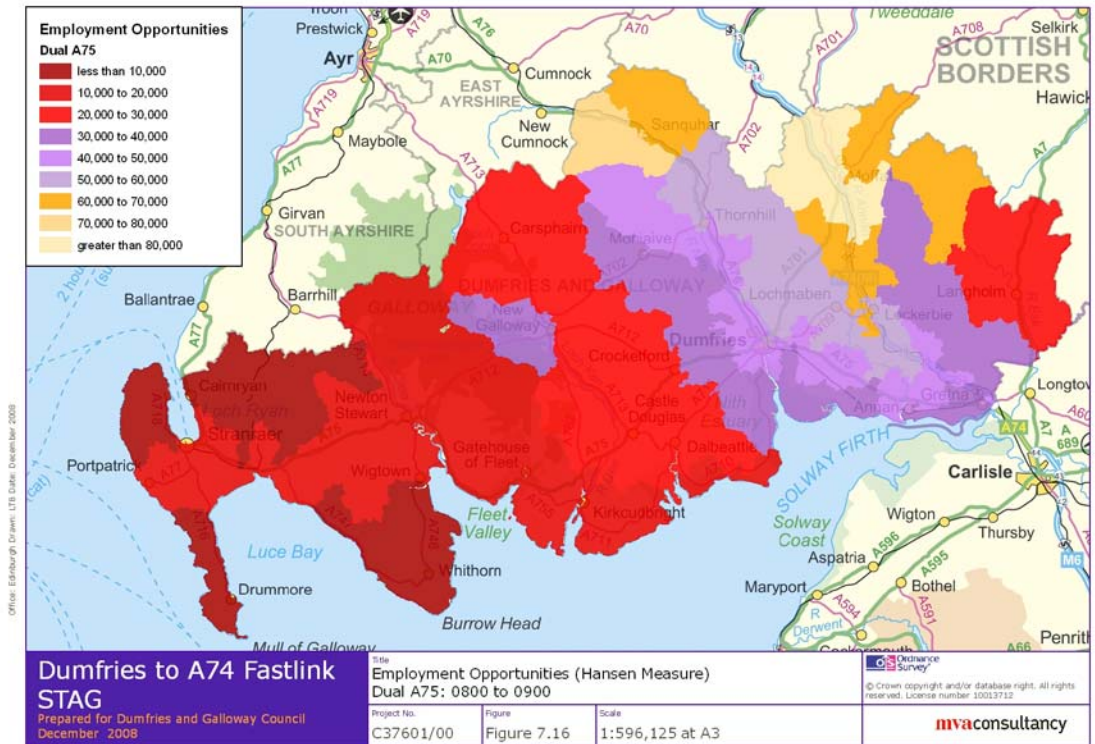
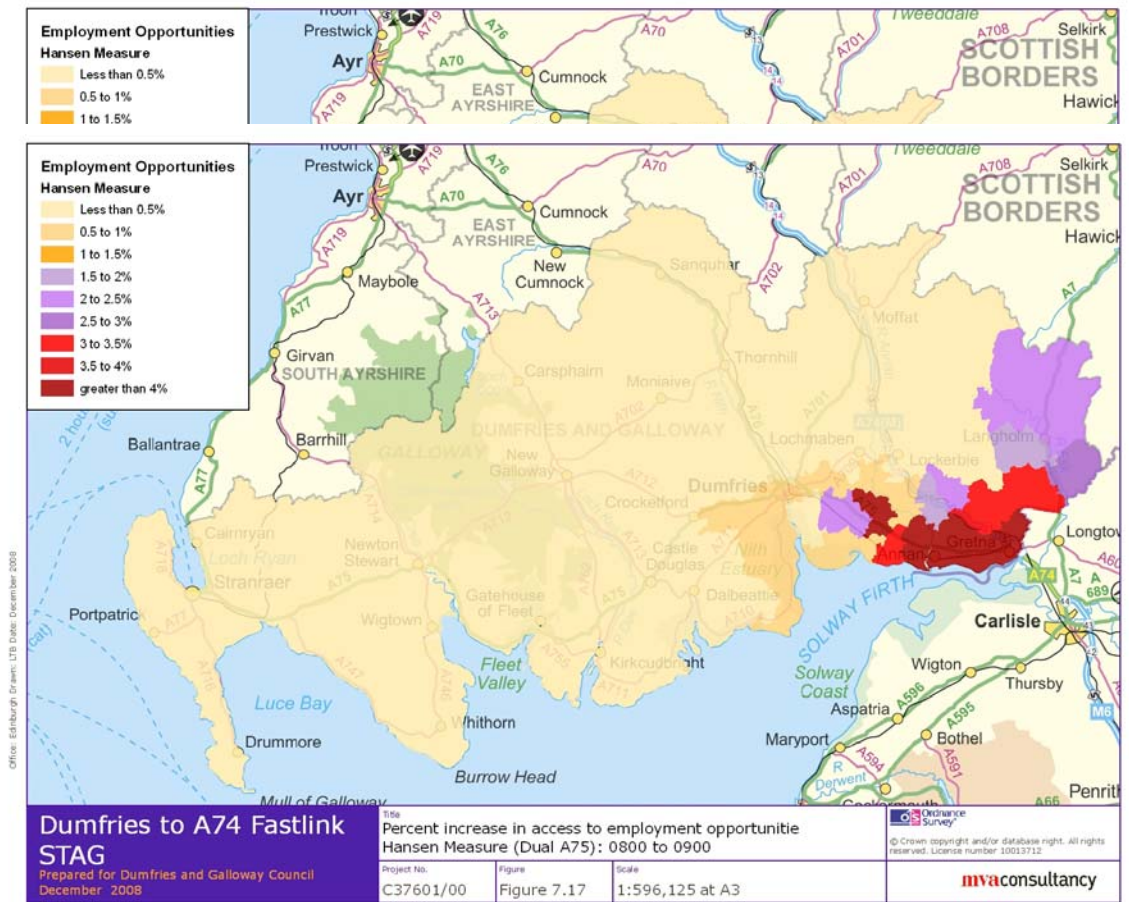


Figure 7.11 'Hansen' measures of accessibility to all employment (A75 dual)



7.5 Social Inclusion

Scottish Index of Multiple Deprivation

- 7.5.1 Consideration of deprived areas involves identifying the most access-deprived data zones in Dumfries and Galloway. Data zones which are both classified as deprived and experiencing improvements in accessibility following either the new road south of the A709 or upgrading the A75 can then be identified.
- 7.5.2 The Scottish Index of Multiple Deprivation (SIMD) 2006 defines small area concentrations of multiple deprivation across all of Scotland. It consists of seven different groups: Current Income; Employment; Health; Education; Skills and Training; Geographic Access to Services; Housing and Crime.
- 7.5.3 Figure 7.18, Figure 7.19 and Figure 7.20 detail zones that are classified as deprived and experiencing improvements in accessibility to the Crichton and Gretna respectively.

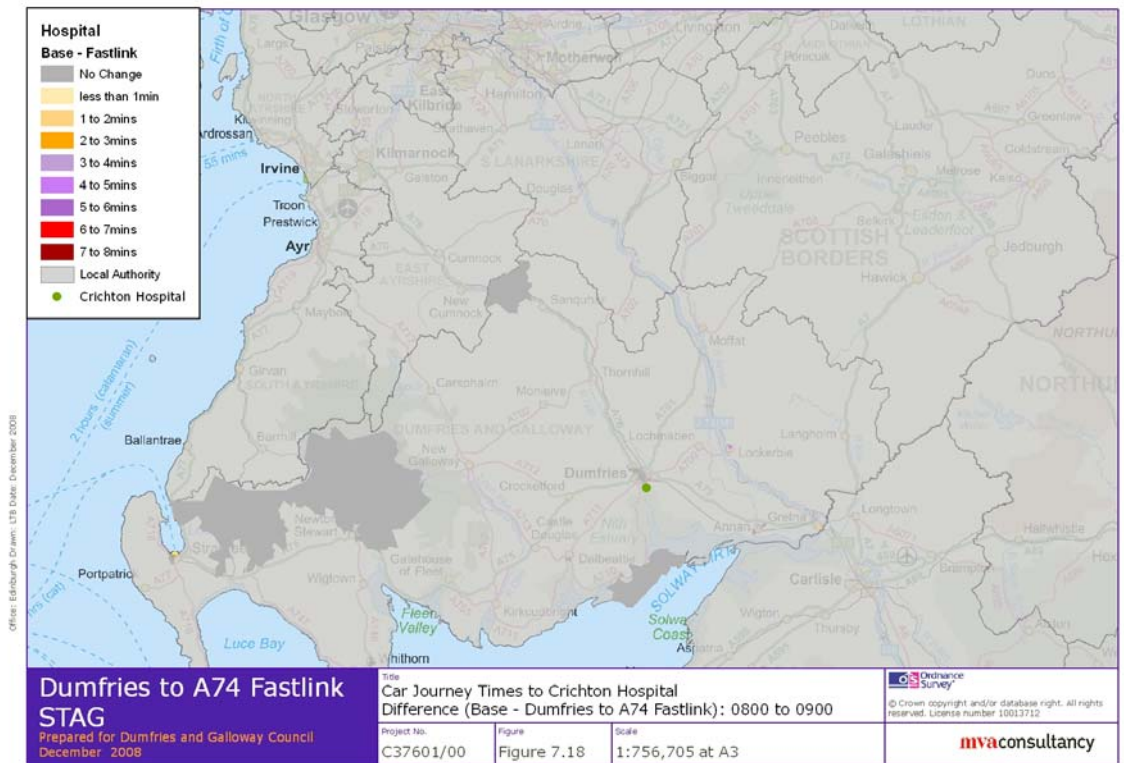


Figure 7.13 Data zones which are classified as deprived and which experience improvements in accessibility to Crichton Hospital (A74 Fastlink)

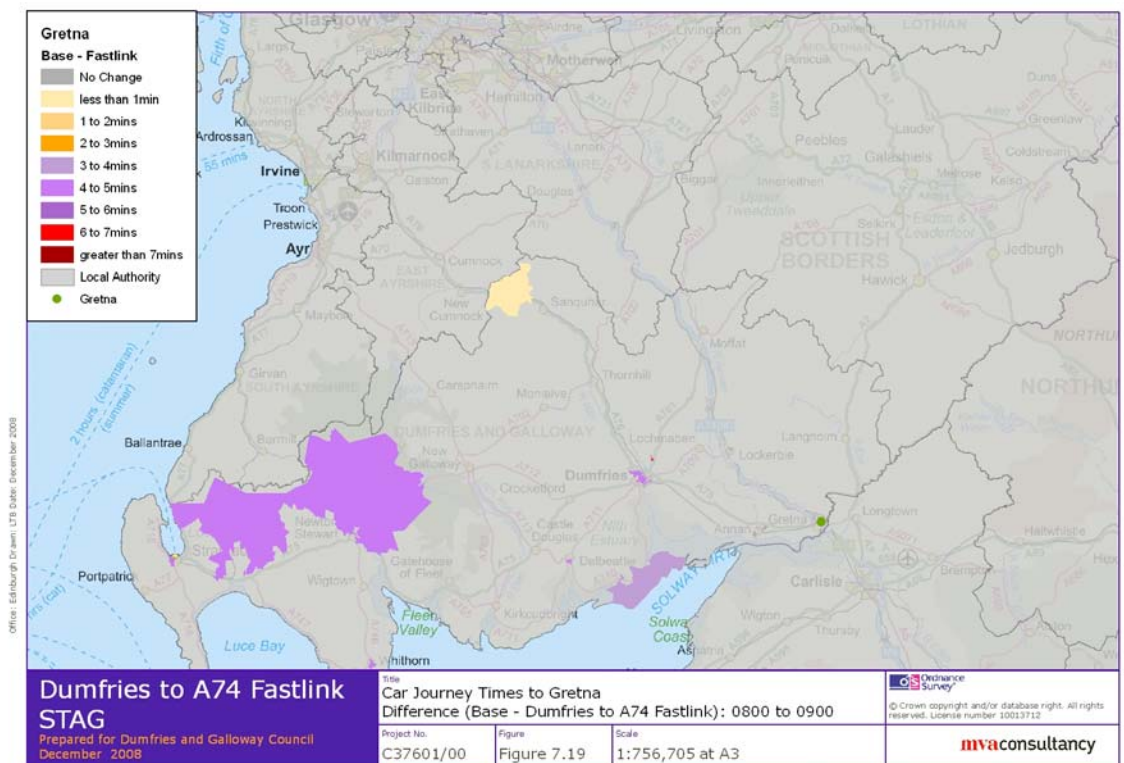


Figure 7.14 Data zones which are both classified as deprived and experiencing improvements in accessibility to Gretna (A74 Fastlink)

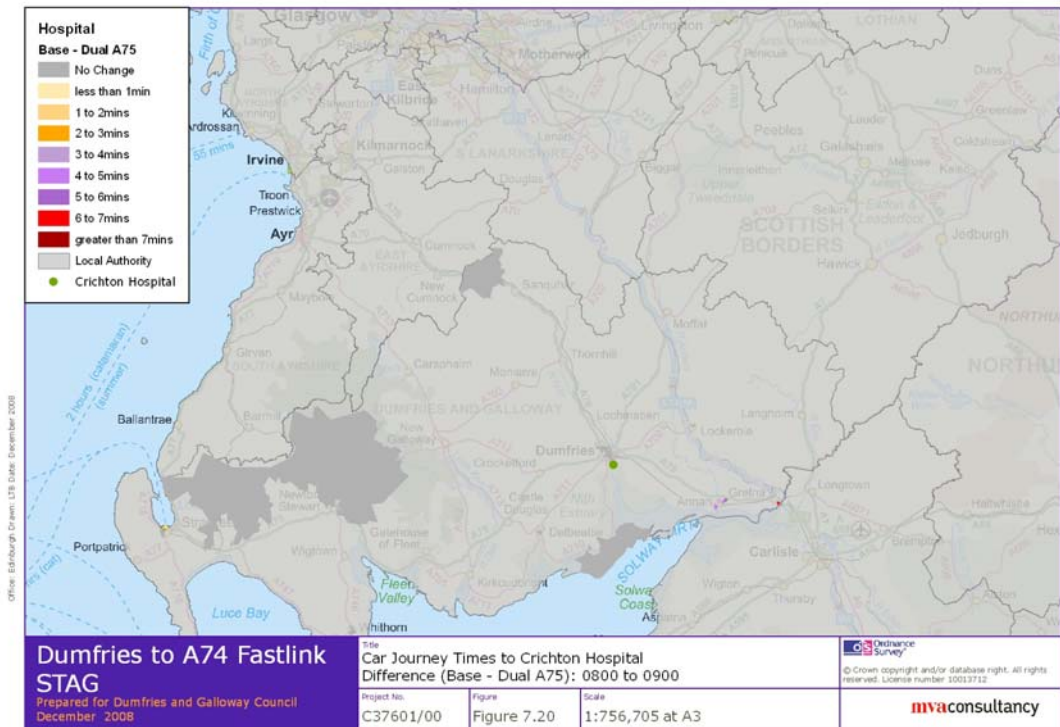


Figure 7.15 Data zones which are classified as deprived and which experience improvements in accessibility to Crichton Hospital (A75 Dual)

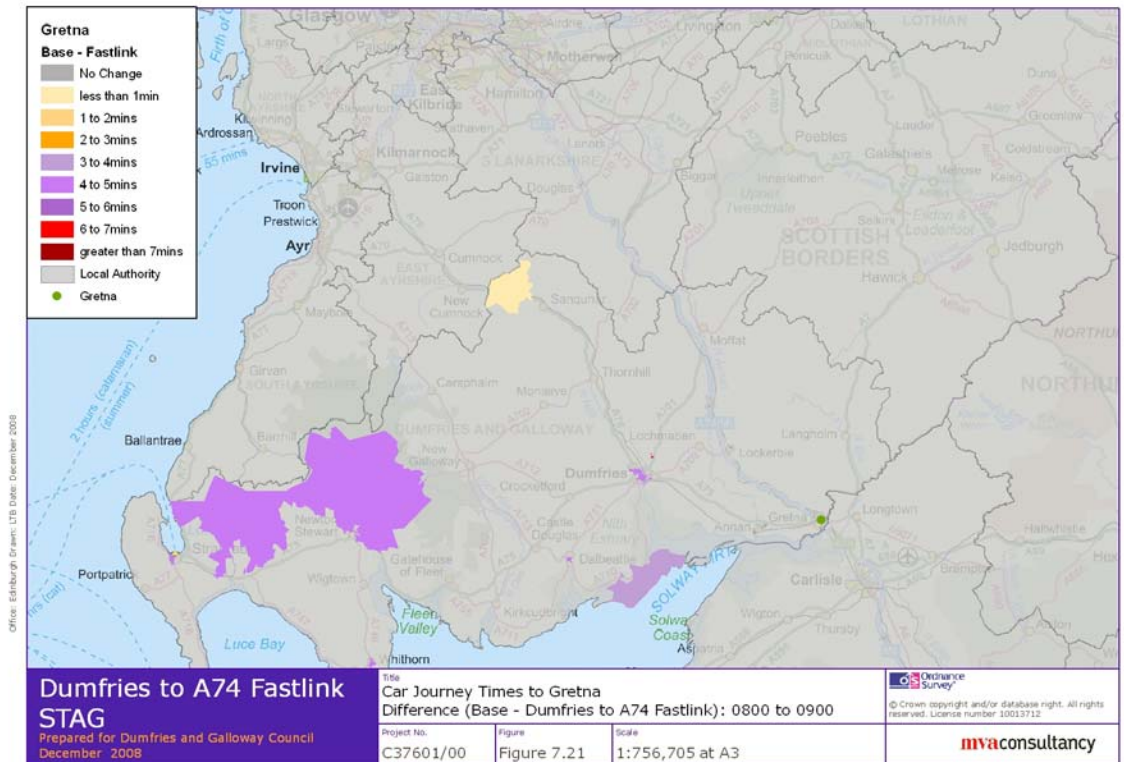


Figure 7.21 Data zones which are both classified as deprived and experiencing improvements in accessibility to Gretna (A75 Dual)

Unemployment

- 7.5.4 Scottish National Statistics publish details on the number of working age people claiming job seekers allowance per datazone.
- 7.5.5 Figure 7.22 details those datazones with the high rates of job seekers claimants (ie greater than 3%) compared to improvements increase in access to employment opportunities after the new A709 route. As can be seen there are some key areas of high unemployment which are offered improved accessibility once the road improvements are delivered. Figure 7.23 shows the results following upgrading the A75.

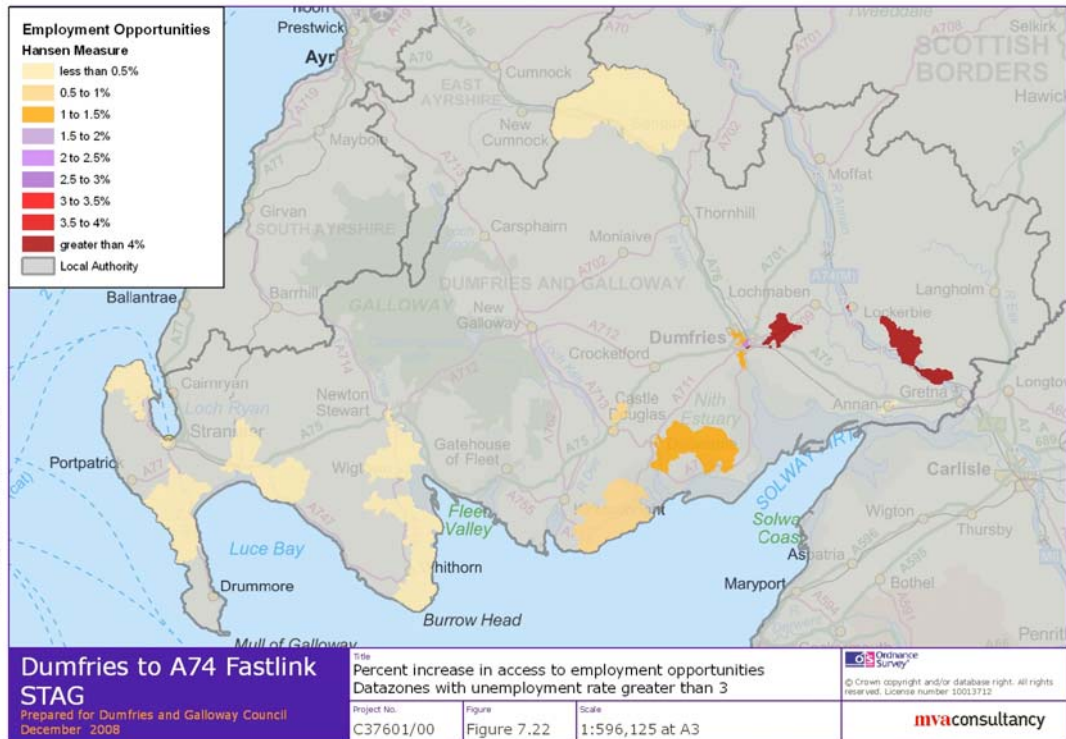


Figure 7.16 Data zones with high levels of unemployment which experience improvements in access to job opportunities (A709 Fastlink)

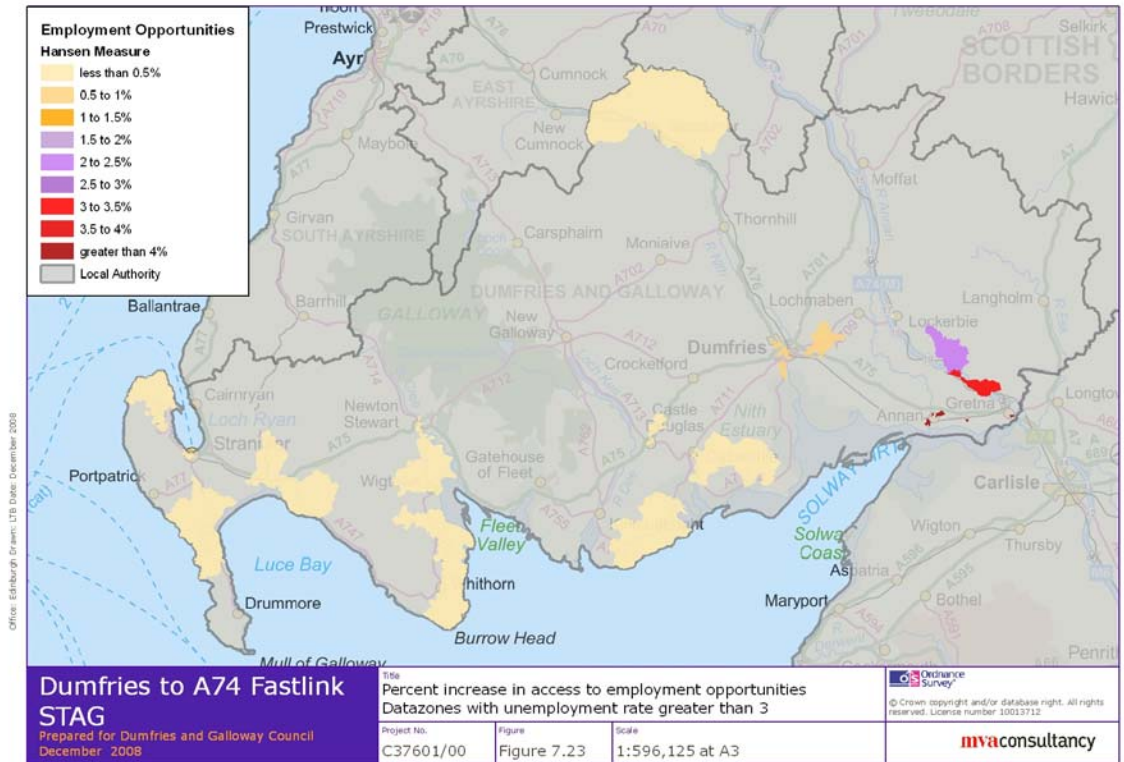


Figure 7.17 Data zones with high levels of unemployment which experience improvements in access to job opportunities (A75 Dual)

7.6 Overall Assessment for Accessibility/Social Inclusion

	Community Accessibility		Comparative Accessibility		Overall Appraisal for Accessibility/Social Inclusion
	PT Network Coverage	Local Accessibility	People Groups	Locations	
A709	O	O	✓	✓✓	✓
A75(T)	O	O	✓	✓✓✓	✓✓

8 Cost to Government

8.1 Introduction

8.1.1 As required by STAG we present the outcome of the Cost/Benefit Analysis in the standard TEE table. Rather than recommend either of the options, we provide a detailed analysis of the likely benefits to be gained from each

Option 1 A75 Dualling

8.1.2 As will be seen, there are significant Net Present Value, exceeding £432 million over 60 years, and a Benefit:Cost Ratio of 2.753.

Table 8.1 Cost to Government Option 1 – A75 test

	£ Thousand, in 2002 Prices
Local Government Funding	0
Central Government Funding	166557
Indirect Tax Revenues	-9874
Present Value of Costs (PVC)	156683

Table 8.2 Monetised Summary – Option 1 – A75 test

	£ Thousand, in 2002 Prices
Present Value of TEE Benefits (PVB)	432710
Present Value of Costs (PVC)	156683
Net Present Value (NPV)	274634
Benefit Cost Ratio (BCR)	2.753

Option 2 Construction of new route south of A709

8.1.3 Although not of the same magnitude, option 2 also shows a number of benefits, there are Net Present Value benefits exceeding £34 million over 60 years, and a Benefit:Cost Ratio of 0.64.

Table 8.3 Cost to Government Option 2 – A709 test

	£ Thousand, in 2002 Prices
Local Government Funding	0
Central Government Funding	55360
Indirect Tax Revenues	-1374
Present Value of Costs (PVC)	53986

Table 8.4 Monetised Summary – Option 2 – A709 test

	£ Thousand, in 2002 Prices
Present Value of TEE Benefits (PVB)	34772
Present Value of Costs (PVC)	53986
Net Present Value (NPV)	-19424
Benefit Cost Ratio (BCR)	0.640

8.2 Sensitivities

- 8.2.1 For prudence we have excluded any monetised accident or environmental benefits at this stage, as we believe these require more detailed examination than has been possible in a study of this scope – they would, however, be likely to strengthen even further the NPV and BCR reported above.

9 Implementability

9.1 Introduction

9.1.1 STAG Section 5.3 requires planners to consider the implementability of the options under assessment, a summary of which is included in the Appraisal Summary Tables (ASTs). This implementability assessment is required under four sub-headings:

- Technical Issues;
- Operational Issues;
- Financial Issues; and
- Public Issues.

9.2 Technical Issues

9.2.1 Both options under consideration are based around improvements to the road network. Option 1 concentrates on improving the A75(T) and would feature some on-line enhancements and newly built roads in close proximity to the existing alignment. In contrast Option 2 involves a significant amount of newly constructed roads, including the by-passing of Torthorwald, and the existing A709 would be retained for local traffic.

9.2.2 In both cases the construction involved would be well within the bounds of standard civil engineering experience for similar road schemes, and it is not anticipated that major technical issues would be presented by either option. Accordingly, as discussed with regard to Optimism Bias, any cost or time over-runs are likely to be within anticipated margins and will not present significant challenges to the scheme.

9.2.3 In terms of the route infrastructure for the A709, the alignment does traverse aspects of challenging terrain however all aspects would be feasible to implement using existing design standards and technology and any particular challenges for road infrastructure are already well-known. Whilst it is possible that site-specific difficulties might emerge during detailed design and subsequent construction, these are not foreseen at this stage.

9.2.4 The preferred alignment has been chosen to take account of known geographical and topographical features and so navigate these with known engineering solutions.

9.3 Operational Issues

9.3.1 Option 1 involves improvement of a trunk road, responsibility for which currently rests with the Scottish Executive. Option 2 would involve partial reconstruction of the A709 and some newly constructed roads.

9.3.2 In either case the new works would be the subject of the usual statutory procedures for road schemes in Scotland. In the case of Option 1 the promoter would be the Scottish Executive. Subject to following the correct procedures both the Scottish Executive and Dumfries and Galloway have the necessary powers to promote the schemes.

9 Implementability

- 9.3.3 There are no known operational disbenefits associated with proposals for improving the A75. An improved A75 will produce particular benefits, improving the reliability problems caused by traffic from the Loch Ryan ports heading to the motorway network on the current single carriageway road, as well as local agricultural vehicles. Duelling the route will allow improved access to the A74 by providing bi-directional 2 lane capacity which will solve the majority of the current problems whilst enhancing safety. The route will continue to remain a European TENS route and retain its strategic importance, but function to a safer and more appropriate standard for the volume of traffic which uses the route.
- 9.3.4 There are no operational problems associated with the construction of a new fast link to the motorway south of the A709. A new, purpose built route will bypass villages and other settlements, helping relieve congestion on both the A75 and A701 by providing an alternative route to the national motorway network.
- 9.3.5 Operationally, it is assumed that Option 1 would remain the responsibility of the Scottish Executive, but any increases in the cost of routine maintenance would be minimal compared to those currently associated with this section of the A75(T). In contrast routine maintenance of Option 2 is assumed to be the responsibility of the Council, and as there would be no significant closures of roads to offset the newly built sections, it is likely that operating costs will be higher than at present, imposing either an additional budgetary burden for the Council or the need for additional central funding.

9.4 Financial Issues

- 9.4.1 The capital cost associated with either option will be high, and regardless of the responsibilities discussed in the previous section it is certain that central government funding would be required to secure either scheme.
- 9.4.2 However, funding of either of the options, improvements to the A75 or construction of a new route south of the existing A709, subject to a sufficiently robust business case, is unlikely to pose any impediment to proceeding with the development. Avenues to explore include:
- opportunities for developer contributions towards parts of the bypass; and
 - funding from SWestrans using finance secured from Transport Scotland/Scottish Executive or European sources.
- 9.4.3 It should also be noted that the A75 is classed as a trunk road on the national strategic network, therefore any improvements should be carried out/jointly funded by Transport Scotland.
- 9.4.4 The ongoing maintenance costs have been discussed already, and are unlikely to be onerous subject to support for the scheme by the Executive.

9.5 Public Issues

- 9.5.1 Given the propensity for car ownership and use in the area, and the general preference of the travelling public for road-based transport improvements over those based on public transport, it seems reasonable to conclude that any option offering the prospect of faster and more reliable transport links from Dumfries and Galloway to the national motorway network will have the support of the majority of the general public.
- 9.5.2 There will, of course, be isolated public objections to any adverse impacts of the option pursued, and these are likely to be greatest for the A709 option with its significant proportion of newly built roads, whereas Option 1 concentrates any disbenefits within a corridor already perceived to some extent as “blighted” by the A75(T).
- 9.5.3 There will also be dissent from the green lobby which may consider that any road-based improvements, however justified, should be opposed on principle, in favour of public transport-based solutions. Such a campaign may carry significant weight.
- 9.5.4 Although there are no references in either Structure Plan or Local Plan to “green belts” as such, there is a general policy to constrain development within existing settlement boundaries if possible, and the public may well be expected to express concern if these boundaries are modified or eroded by transport developments such as the road improvements under consideration.
- 9.5.5 Taking these factors into account, we anticipate the public would generally be in favour of any improvements linking Dumfries to the motorway network. The current routes have a history of traffic congestion and accident problems which would in part be relieved by any improvements, while capacity would be significantly improved.
- 9.5.6 A new, 10 mile purpose built route, south of the A709, designed to modern standards and bypassing local settlements would be broadly supported by the public. The route would also solve current accident and reliability problems endemic in the area.
- 9.5.7 Likewise, any improvements to the A75 would directly improve the current problems noted on the route.
- 9.5.8 It is probable that a Public Inquiry will be necessary before proceeding with construction of any new route to the south of the A709. A Public Inquiry would not however be required in order to undertake improvements to the current A75.
- 9.5.9 With regards to the A75, it is entirely likely that there would be some form of environmental opposition as is common with any road building schemes in the country, and consequently the supporting appraisal – particularly of environmental impacts and their proposed mitigation – will be of crucial importance.
- 9.5.10 The A709 option will be met with significant environmental opposition due to the areas in which the proposed alignment passes through. The supporting environmental appraisal and proposed mitigation measures will be of crucial importance.

- 9.5.11 The general public may have specific concerns regarding adverse impacts during construction. These are likely to be greatest for existing travellers under Option 1, where work on and around the existing carriageways will result in temporary delays and disruption. In contrast the A709 option, with its greater proportion of off-line construction, will minimise adverse impacts on existing travellers. The A75(T) also carries higher traffic volumes than the A709, and as such any disruption caused by Option 1 will affect a greater number of travellers.
- 9.5.12 It is also informative to widen the consideration of public issues to include the likelihood of political support for either option. Local councillors are likely to see the potential benefits as a positive point in favour of promoting the road-based improvements, and in general their approach can be expected to mirror that of the general public – ie generally supportive, but with some possible local issues that will require to be addressed. There has been strong cross-party support for improved transport links throughout the lobbying carried out since 1999 and discussed in greater detail in Chapter 1.
- 9.5.13 On a national level it will be necessary for SWestrans to demonstrate the relative importance of the proposed improvements vis-à-vis other competing demands for funding across the whole of Scotland. National politicians will take a wider view than local councillors and will need to be assured that channelling scarce funds to either option will fit with established national policies and be an acceptable use of funds. They will also need to be reassured regarding possible cost over-runs and their ongoing commitments to operational costs.
- 9.5.14 In this regard it is worth emphasising that the Scottish Executive would not previously support the inclusion of a road-based transport improvement policy within the Dumfries and Galloway Structure Plan (see section 2.2), and there are currently no indications that their position has changed regarding this.
- 9.5.15 In brief it seems likely that a robust and convincing case will need to be made, particularly for Option 3, in order to overcome the current presumption by the Scottish Executive against such a scheme.

10 Risk and Uncertainty

10.1 Context

10.1.1 In April 2003, the Treasury published its Green Book on Transport Project Appraisal. The aim of the Green Book is to ensure at the outline business case stage a better estimate is made of the capital costs that will eventually be incurred. To mitigate optimism, the Green Book recommends that uplifts of estimates should be applied to ensure that decision-makers have a more realistic idea of the likely outlay at the earliest opportunity in the appraisal process. The theory behind the approach is that as the scheme is developed, the scope of the project becomes more defined and risks are more easily identified and hence, the level of optimism bias can be reduced. The guidance requires capital projects to:

- include an 'optimism bias' factor; and
- be assessed using a discount rate of 3.5% rather than the previous figure of 6%.

10.1.2 Three subsequent changes have taken place: firstly, in June 2004, the Department for Transport (DfT) published Procedures for Dealing with Optimism Bias in Transport Planning which updated the April 2003 Treasury advice. Secondly, the DfT has advised that the discounting period for transport projects should extend to 60 years with the last 30 years using a discount rate of 3% and thirdly, the price base for economic appraisal is now 2002 and not 1998 as previously.

10.2 Optimism Bias

10.2.1 An appropriate optimism bias factor has to be determined. Using the terminology of the Green Book, a typical road construction project would be categorised as either Standard or Non Standard Civil Engineering. The Green Book provides ranges of optimism bias factors under these categories for both Works Duration, i.e. the time taken on site to build the project, and Capital Expenditure, the cost of building the project. Here, we are concerned with Capital Expenditure and the relevant Green Book ranges are therefore:

- Standard Civil Engineering 3% to 44%; and
- Non Standard Civil Engineering 6% to 66%.

10.2.2 These values were derived following the publication in July 2002 of Mott MacDonald's Review of Large Public Procurement in the UK. The review compared supply estimates data for 282 capital projects built between 1981 and 1998 with a budget of more than £10m at 2001 prices. The review identified a range of sources of budget estimate error associated with various areas of risk. A methodology was suggested for estimating optimism bias for new projects based on the risk associated with different components.

10.2.3 Following the guidance given in the Green Book, we conclude that, at this stage, the project is Standard Civil Engineering and therefore the upper bound for optimism bias is 44%.

10 Risk and Uncertainty

10.2.4 However, the main aims of the published Procedures for Dealing with Optimism Bias in Transport Planning are to:

- provide empirically based optimism bias up-lifts for selected reference classes of transport infrastructure projects; and
- provide guidance on using the established optimism bias uplifts to produce more realistic forecasts for the individual project's capital expenditures.

10.2.5 The types of transport scheme under the direct and indirect responsibility of the DfT have been divided into a number of distinct groups where the risk of cost overruns within each of the groups can be treated as statistically similar. For each of the groups, a reference class of completed transport infrastructure projects has been used to establish probability distributions for cost overruns for new projects similar in scope and risks to the projects in the reference class. Based on this, the necessary uplifts to ensure that the risk of cost overrun is below certain pre-defined levels have been established. These up-lifts are reflected in Table 10.1 below, with the relevant stages highlighted.

10.3 Using the Established Uplifts

10.3.1 The Guidance requires that the established uplifts for optimism bias should be applied to estimated budgets at the time of decision to build a project.

10.3.2 Given the high-level strategic nature of the design work undertaken to date, we have applied Optimism Bias at the "upper bound" of 44%.

10.3.3 Chapter 6 reported an economic assessment undertaken by applying a 44% optimism bias factor to the costs and extending the assessment period to 60 years; the first 30 at 3.5% discount rate and the last 30 at 3%. The price base is now 2002.

Table 10.1 Applicable Capital Expenditure Optimism Bias Uplifts

Category		Stage 1	Stage 2	Stage 3
Local Authority and Public Transport Schemes		Programme Entry	Conditional Approval	Full Approval
Highways Agency Schemes		TPI entry/ Preferred Route Decision	Order Publication/Works Commitment	Works Commitment
Railways		Grip Stage 1: Pre-feasibility	Grip Stage 3: Option selection	Grip Stage 5: Design development

Category	Types of Projects	Stage 1	Stage 2	Stage 3
Roads	Motorway Trunk roads <u>Local roads</u> Bicycle facilities Pedestrian facilities Park and ride Bus lane schemes Guided buses on wheels	44%	15%	3%
Rail	Metro Light rail Guided buses on tracks Conventional rail High speed rail	66%	40%	6%
Fixed Links	Bridges and Tunnels	66%	23%	6%
Building Projects	Stations and Terminal buildings	51%	-	4%
IT Projects	IT system development	200%	-	10%

Based on WebTAG Unit 3.5.9, Tables 8 and 9

11 Monitoring and Evaluation

11.1 Introduction

- 11.1.1 Monitoring and Evaluation is a key aspect of the STAG process. The goal is to evaluate the success of the project against the set planning objectives identified in the initial stages of the STAG process.
- 11.1.2 The goal of monitoring should be to measure the outcomes of the projects rather than the activities or improvements put in place by the planning authorities. Monitoring should identify the levels of change and the likely reasons for change. In order to do this, Key Performance Indicators should be identified which are used to evaluate the projects success against the planning objectives.

“The Monitoring Plan should form an integral part of the development and implementation of projects. Selecting measurable indicators of progress towards meeting the Transport Planning Objectives, performance against the STAG criteria and evaluating the impacts of the project on established policy directives should be seen as a priority. Key performance indicators (KPIs) must however be set early in the development process.”⁹

11.2 Objectives Targets and Key Performance Indicators

- 11.2.1 To effectively monitor the impacts of the scheme, it is essential to identify indicators of change. These indicators should relate directly to the planning objectives set out in the initial stages of STAG.
- 11.2.2 The planning objectives set out within the original STAG part 1 report have been maintained within the detailed appraisal. These objectives have been found to be SMART whilst accurately nesting within the Regional Transport Objectives.
- 11.2.3 Planning objectives for the original appraisal of fast routes to the motorway network from Dumfries and Galloway were identified as:

Safety

- S1: To improve safety for all road users by reducing total accidents by 25% on the routes linking Dumfries to the A74M.

Economy

- Ec1: To increase the reliability of journey times by 50% for all vehicles travelling between Dumfries and the A74M; and
- Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs by 25% between Dumfries and the A74(M).

Environment

- Env1: To safeguard the environment and heritage of the study area; and
- Env2: To reduce the impacts of traffic on local communities.

⁹ STAG REFRESH Section 6.1.4

Regional Transport Objectives

11.2.4 The Regional Transport Strategy for the South West of Scotland Transport Partnership defined its transport objectives within a framework of broader economic, social and environmental objectives.

11.2.5 Planning objectives for the SWestrans Regional Transport Strategy were identified as follows:

- [RTS1] Improve transport links within Dumfries and Galloway, providing fast and reliable journey times to significant markets, including the national economic centres of Glasgow and Edinburgh, as well as Northern England and Ireland;
- [RTS2] Contribute to improved economic growth whilst minimising social exclusion and environmental impacts;
- [RTS3] Support the National transport target of road traffic stabilisation;
- [RTS4] Add value to the broader Scottish economy and underpin national economic growth;
- [RTS5] Assist in getting visitors/tourists to the region from other parts of Scotland, England, Ireland and beyond;
- [RTS6] Making it possible for more people to do business in and from Dumfries and Galloway by providing sustainable connections to key business centres in the central belt and other locations such as Ayrshire and Cumbria;
- [RTS7] Support vibrant places that provide employment, healthcare, educational and other services that people need and want, so that their quality of life is maximised;
- [RTS8] Reduce the constraint of peripherality, both between the region's main settlements and its outlying areas, and between the region and its external markets;
- [RTS9] Capitalise on improvements to critical long distance corridors to create new transport services, nodes and development opportunities for Dumfries and Galloway;
- [RTS10] Pursue certain transport schemes in the context of local and national economic development, while at the same time recognising wider context of economic, social and environmental imperatives.

11.2.6 KPIs must be SMART (see adjacent box), and it is important that they can be adequately measured as part of the monitoring process.

Specific – saying in precise terms what is sought;
Measurable – quantifiable wherever possible;
Attainable – with general agreement that the objective can be reached;
Relevant – a sensible indicator or proxy for the change sought; and
Timed – having an agreed future point by which it will have been met.

Nesting of Objectives within RTS Objectives

11.2.7 In order to achieve regional consistency, identified planning objectives have been nested within the agreed objectives set out within the regional transport strategy. The following table illustrates the synergies between the objectives and how the planning objectives fit with the established Regional Objectives.

Table 11.1 Nesting of Planning Objectives

Regional Transport Strategy Objective	S1	Ec1	Ec2	Env1	Env2
RTS 1 - Improve transport links within Dumfries and Galloway, providing fast and reliable journey times to significant markets, including the national economic centres of Glasgow and Edinburgh, as well as Northern England and Ireland	✓	✓	✓		
RTS 2 - Contribute to improved economic growth whilst minimising social exclusion and environmental impacts			✓		
RTS 4 - Add value to the broader Scottish economy and underpin national economic growth			✓		
RTS 5 - Assist in getting visitors/tourists to the region from other parts of Scotland, England, Ireland and beyond		✓	✓		
RTS 6 - Making it possible for more people to do business in and from Dumfries and Galloway by providing sustainable connections to key business centres in the central belt and other locations such as Ayrshire and Cumbria		✓	✓		
RTS 7 - Support vibrant places that provide employment, healthcare, educational and other services that people need and want, so that their quality of life is maximised			✓	✓	✓
RTS 8 - Reduce the constraint of peripherality, both between the region's main settlements and its outlying areas, and between the region and its external markets		✓	✓		
RTS 9 - Capitalise on improvements to critical long distance corridors to create new transport services, nodes and development opportunities for Dumfries and Galloway		✓	✓		
RTS 10 - Pursue certain transport schemes in the context of local and national economic development, while at the same time recognising wider context of economic, social and environmental imperatives				✓	✓

11 Monitoring and Evaluation

- 11.2.8 It is important to note that RTS objectives 1, 5, 6, 8 and 9 all support the wider aims of the project in general. Whilst this is the case, it is clear that the RTS will be very supportive of improvements in connectivity between Dumfries and the national motorway network.

11.3 Reporting

- 11.3.1 Monitoring reports should be produced at appropriate intervals; it is suggested that a new report should be produced every 6 months to detail progress towards objective goals.
- 11.3.2 Monitoring reports should not be large documents, but instead a short summary containing findings and trends in an accessible manner and similar to a non-technical summary. Charts, diagrams and statistics should be used where possible to present the data in a succinct accessible manner.

11.4 Evaluation

- 11.4.1 Evaluation is necessary to demonstrate how effectively the scheme has met its objectives. Evaluation is carried out after the final stage of monitoring, after the scheme has been completed and in full operation for some time.

“Evaluation is a specific post-implementation event designed to identify whether or not a project is performing as originally intended, whether, and to what extent, it is contributing to established policy directives and whether the implemented project continues to represent value for money. An evaluation will use information gathered for monitoring purposes but will also involve data gathering, analysis and detailed interpretation that is particular to the evaluation itself.”¹⁰

- 11.4.2 The evaluation should be a summation of the work and the monitoring reports, it should take into account:

- whether scheme objectives have been met;
- reasons for any failures to meet objectives;
- analysis of performance measure indicators; and
- interpretation using criteria of economy, efficiency, effectiveness and equity.

11.5 Conclusion

- 11.5.1 A monitoring and evaluation programme has been suggested which could be implemented as the scheme goes forward through construction. This would ensure that the success of the project against its set objectives is evaluated. Key Performance Indicators (KPIs) have been identified that could be used to monitor the scheme and how it meets the planning objectives in the short, medium and longer term. Table 11.1 outlines the KPIs that will be used to track the success of the scheme in terms of the planning objectives.

¹⁰ STAG REFRESH SECTION 6.2.1

Table 11.2 Monitoring Method

Objective	Indicator	Monitoring Method	Timescale
S1: To improve safety for all road users by reducing total accidents by 25% on the routes linking Dumfries to the A74M	Accidents	Accident Counts (STATS 19)	Annually for a period of 5 years
Ec1: To increase the reliability of journey times by 50% for all vehicles travelling between Dumfries and the A74M	Journey Time Reliability	Journey Time Surveys using ANPR or GPS transponder technology	Bi-monthly in year of opening
Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs by 25% between Dumfries and the A74(M).	Accessibility	Travel Surveys Desk and Timetable research Accessibility package	Bi-annually for a period of 3 years
Env1: To safeguard the environment and heritage of the study area	Emissions	As developed for Council SOA	As developed for Council SOA
Env2: To reduce the impacts of traffic on local communities	Traffic Flows	Traffic Count Surveys	Bi-annually for a period of 3 years

12 Conclusions and Recommendations

12.1 Introduction

- 12.1.1 Based on the information presented throughout this appraisal report, we have drawn together the following conclusions, from which flow the set of recommendations for further action.
- 12.1.2 To assist decision makers in considering these recommendations we present various summaries in the following section.

12.2 Option Summary Tables and Appraisal Summary Tables

- 12.2.1 We present the Option Summary Tables below. Appraisal Summary Tables are provided in Appendix A – Appraisal Summary Tables.
- 12.2.2 As a succinct summary, Table 12.1 draws together the overall appraisals for comparison.

Option Summary Table

Study Title

A75 Option

Option description: Enhancement of the existing alignment to provide a better link between Dumfries and Gretna

Capital Costs/grant (2002 Prices)
Annual Revenue Support (2002 Prices)
Present Value (PV) of Cost to Government

£167 million
 N/A
 £157 million

Summary of impact on the five STAG criteria

Impacts (Monetary and Non-Monetary)							
---	--	-	0	+	++	+++	
Accessibility and Social Inclusion					✓		
Environment	✓						
Integration	✓						
Safety					✓		
Economy					✓		

Monetary only (£m)

Monetary impact ratio (if relevant)

NPV: £274.6 BCR: 2.753
 Including Wider Economic Benefits NPV(WEB): £274.6 BCR(WEB): 2.753

Assessment against Transport Planning Objectives

	---	--	-	0	+	++	+++
TPO Target 1:			✓				
TPO Target 2:				✓			
TPO Target 3:						✓	
TPO Target 4:							✓
TPO Target 5:						✓	

Contribution toward the Government Purpose:

Improved road links between the region's capital (Dumfries) and the national motorway network will help make the region (and hence Scotland) more successful economically and socially, with improved connectivity, greater reliability and faster journey times. This specific option particularly helps to improve safety of users of the A75, significantly improves reliability of journey times, and will help stimulate/support the regional economy.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
Accessibility & Social Inclusion	Severance will be minimal.	Technical	No major technical challenges, assuming suitable alignment and mitigation is within tolerable levels.
Safety	The proposal will improve safety on the A75 corridor –this road currently has an accident severity ratio considerably above the Scottish average for similar roads, therefore benefits are significant.	Operational	None anticipated.
Economy	There will be significant travel time and reliability benefits, reflected in a BCR is below 2.5 as shown above. No WEBS anticipated, but modest EALIs possible.	Financial	Capital cost will be high, and sources of funding will need to be clearly identified at an early stage. A75 is part of the TENS-T European strategic programme.
Integration	Generally in line with other existing policies.	Public Acceptability	Generally expected to be in favour, although obviously local issues may cause concerns.
Environment	<i>This section identifies key impacts and tensions across the sub-criteria</i>		
	<p>Dualling of the A75 will be a major environmental intervention, however it takes place along a corridor which already has a high concentration of transport uses, and where environmental sensitivity is relatively low.</p> <p>Likely to require Statutory EIA under the Environmental Impact Assessment (Scotland) Regulations 1999, as amended, and Appropriate Assessment under the Conservation (Natural Habitats &c) Regulations 2004.</p>		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
TPO 1:	Env1: To safeguard the environment and heritage of the study area	TPO 4:	Ec1: To increase the reliability of journey times for all vehicles travelling between Dumfries and the A74(M)
TPO 2:	Env2: To reduce the impacts of traffic on local communities	TPO 5:	Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs between Dumfries and the A74(M)
TPO 3:	S1: To improve safety for all road users by reducing road traffic accidents on the routes linking Dumfries to the A74(M)		

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
Accessibility & Social Inclusion	Severance should be minimised, and will have positive impacts for socially excluded areas.	Technical	No major technical challenges, assuming suitable alignment and mitigation is within tolerable levels.
Safety	The proposal will improve safety on the A709 corridor – however this road currently has an accident severity ratio below the Scottish average for similar roads, therefore benefits are limited.	Operational	None anticipated.
Economy	There would be travel time and reliability benefits, but the BCR is below 1.0 as shown above. No WEBS anticipated, but modest EALIs possible.	Financial	Capital cost will be high, and sources of funding will need to be clearly identified at an early stage.
Integration	Integration with land use policy may be poor, given the need to build in green belt and on agricultural land.	Public Acceptability	Generally expected to be in favour, although obviously local issues may cause concerns.
	<i>This section identifies key impacts and tensions across the sub-criteria</i>		
Environment	<p>The A709 (southern option) is offline and therefore has greater overall potential for environmental impacts than the proposed dualling of the existing A75(T). The A709 corridor is environmentally more sensitive and will require significant survey and assessment. The major issues have been identified as being:</p> <ul style="list-style-type: none"> ■ ecology and nature conservation; ■ landscape and visual quality; and ■ water quality. <p>Likely to require Statutory EIA under the Environmental Impact Assessment (Scotland) Regulations 1999, as amended, and Appropriate Assessment under the Conservation (Natural Habitats &c) Regulations 2004.</p>		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
TPO 1:	Env1: To safeguard the environment and heritage of the study area	TPO 4:	Ec1: To increase the reliability of journey times for all vehicles travelling between Dumfries and the A74(M)
TPO 2:	Env2: To reduce the impacts of traffic on local communities	TPO 5:	Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs between Dumfries and the A74(M)
TPO 3:	S1: To improve safety for all road users by reducing road traffic accidents on the routes linking Dumfries to the A74(M)		

Table 12.1 Summary of STAG2 Conclusions

		Option 1: A75(T) Gretna to Dumfries	Option 3: Lockerbie to Dumfries (South)
Transport Planning Objectives	Env1: To safeguard the environment and heritage of the study area	x	xx
	Env2: To reduce the impacts of traffic on local communities	○	✓✓
	S1: To improve safety for all road users by reducing road traffic accidents on the routes linking Dumfries to the A74(M)	✓✓	✓
	Ec1: To increase the reliability of journey times for all vehicles travelling between Dumfries and the A74(M)	✓✓✓	✓✓
	Ec2: To aid economic prosperity and area regeneration by improving accessibility and reducing travel costs between Dumfries and the A74(M)	✓✓	✓
STAG Criteria	Environment	x	xx
	Safety	✓✓	✓
	Economy	✓✓	x
	Integration	○	xx
	Accessibility/Social Inclusion		✓
Implementability		xx	xxx
✓✓✓ Major Benefit	x Minor Disbenefit/impact		
✓✓ Moderate Benefit	xx Moderate Disbenefit/impact		
✓ Minor Benefit	xxx Major Disbenefit/impact		
○ No Benefit/Impact			

12.3 Recommendations

- 12.3.1 Although both options present environmental challenges – not unusual for road schemes of this type – those relating to the Lockerbie – Dumfries option are particularly challenging, will require considerable mitigation measures (the extent of which cannot yet be foreseen), will require more detailed environmental appraisal, and will be generally more difficult to deliver.
- 12.3.2 These challenges might be worth addressing if the benefits gained under other headings were more worthwhile than those obtainable through upgrading of the A75(T) between Dumfries and Gretna. However, as has been shown the A75(T) option generally has greater benefits than the alternative considered, most notably a strongly positive BCR.
- 12.3.3 We would therefore recommend that improved accessibility between Dumfries and the national motorway network would be best delivered through dualling of the A75(T) between Dumfries and Gretna, drawing on the outline plans developed in the course of this Detailed Appraisal.

12.4 Next Steps and Challenges to be Overcome

- 12.4.1 Once this report has been considered, if our recommendations are adopted then the following next steps should be considered:

- undertake appropriate targeted **consultation** to enhance the evidence base set out in this report, and assist future engagement with central government and others;
- engage with **Transport Scotland** regarding how best to take forward improvements to the A75(T) as this is a Trunk Road;
- engage with **potential funders** (eg European Union) regarding sources of finance to deliver the programme for the A75(T); and
- undertake a **Design Development Appraisal** to optimise plans for the A75(T).