AYRSHIRE – TRANSPORT & THE ECONOMY
AYRSHIRE – TRANSPORT & THE ECONOMY
THE SCOPE FOR IMPROVING CONNECTIVITY
BETWEEN AYRSHIRE AND THE CENTRAL BELT

Scott Leitham & Stephen Canning, MVA

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EXECUTIVE SUMMARY

1. It is widely acknowledged in many policy contexts that the Ayrshire economy has been less successful than some other areas of Scotland in making the transition from an economy based on traditional manufacturing industries to one driven by knowledge based service industries. The quality of transport links within Ayrshire and between Ayrshire and the rest of Scotland / UK have been identified as contributory factors to this.

2. This Research Study, led by MVA, was commissioned to analyse, at a ‘Scoping Study’ level, the role which investment in new transport infrastructure and services can play in the economic regeneration of Ayrshire. The main elements of the work undertaken are now outlined.

3. A review of the current understanding of the relationship between new transport schemes and economic development demonstrated that the understanding of this relationship is not well developed. The literature identifies a range of ways in which the travel time and cost savings brought about by a new scheme would affect economic performance in an area. However, empirical evidence which would unambiguously confirm this is very hard to find. This may be due to the complexity in identifying the effects of a transport scheme once ‘on the ground’. The anticipated and forecast economic benefits associated with any transport scheme do however remain a principal element in the decision to progress a scheme, ie anticipated economic benefits (time savings, vehicle operating costs) are fundamental to the decision to proceed. The uncertainty is in how or if these measurable time and cost savings translate into impacts in the wider economy.

4. In recent years, the scope of the appraisal of transport schemes has been expanded from social welfare cost benefit analysis to incorporate aspects of the distributional effect of the scheme (eg STAGE ALI). Most recently, the Department for Transport has initiated a new process which seeks to identify the wider effects of transport on GDP, ie additional impacts to those calculated in social welfare cost benefit analysis. The Scottish Executive may wish to consider adopting this approach in the future.

5. An economic overview of Ayrshire has established the main ways in which the Ayrshire economy differs from other areas of Scotland. This can be summarised as follows:

   • it has not yet created a firm place for itself in the knowledge and enterprise economy of the 21st century, and is lagging behind Scotland in economic growth and employment creation

   • exports are still higher per capita than the Scottish average, but have recently grown much more slowly than the rest of Scotland

   • business services, post-telecoms & financial services are all under-represented in Ayrshire, textiles and other manufacturing are over represented

   • employment levels have been going down in Ayrshire whilst increasing in Scotland in recent years

   • office-based industries (private sector) are significantly under-represented
fewer new business starts per capita than rest of Scotland
GDP per head is significantly lower than rest of Scotland
unemployment rates are consistently higher than the rest of Scotland, with some localities suffering exceptionally high rates of unemployment
skills gaps exist in some areas
there is a lack of high quality business premises compared to some other areas

6. Recent publicity has also highlighted the over-reliance of Ayrshire on the public sector, with public sector spending accounting for a far higher proportion of the local economy than in other areas. In addition, there remain significant pockets of deprivation (as defined by the Scottish Index of Multiple Deprivation - SIMD).

7. The characteristics of the transport system in Ayrshire and between Ayrshire and the rest of Scotland have also been summarised. An analysis was undertaken looking at travel times within and outwith Ayrshire. Best use has been made of the available material to analyse accessibility at a local and local authority level, relative to the rest of Scotland. Census data has been used to document travel to work patterns for Ayrshire residents and Ayrshire based jobs. A comprehensive picture of the transport system in Ayrshire has therefore been established.

8. A programme of consultation with key stakeholders highlighted the main issues regarding connectivity within Ayrshire and between Ayrshire and the rest of the country. The consultations were focused on the following main themes, from the perspective of the consultee: (i) present day constraints imposed on business and economic activity in Ayrshire, as a result of difficulties associated with transport or location; (ii) key connectivity requirements for business in Ayrshire; (iii) ideas for possible improvements to Ayrshire’s transport which would assist in local or regional economic development; and (iv) the causal mechanisms by which improvements in transport provision assist in economic performance, at the company, local, or regional level. This consultation therefore established the views of the key stakeholders regarding Ayrshire’s transport, present and future, and the local economy.

9. Existing literature and stakeholder consultation allowed a comprehensive list of transport projects to be established, representing the aspirations of stakeholders for future transport investment in Ayrshire. The WESTRANS Joint Transport Strategy (2005) also provides a comprehensive list of Ayrshire’s transport aspirations.

10. The Scottish Executive’s TELMoS (Transport Economic Land Use Model of Scotland) was run in a simplified fashion to give indicative results for the potential effects of some of these transport improvements in terms of employment, GVA and population (at the zonal level). This work focused on 4 of the emerging schemes and the results of the illustrative modelling showed that the road schemes had a far greater impact on these key measures than the public transport improvements. Of the schemes tested, upgrades to the A737 appeared the most beneficial. These tests were necessarily implemented in a simplified way however, and further work would be required to come to definitive conclusions based on this initial modelling.
11. In the light of the preceding analysis, a set of ten detailed STAG ‘planning objectives’ was developed which encompassed the main issues raised in the study, in addition to the 5 government objectives. A ‘long list’ of schemes was developed, based again on consultation but also on a wider view of schemes which could be beneficial to the Ayrshire economy. Each of these schemes was then appraised against the planning objectives, in an informed, although qualitative way. A simple ‘scoring’ system was used to provide an indicative ranking of the schemes.

12. The schemes which came out at the top of the indicative ranking were strategic schemes which primarily improved connectivity to the Glasgow City-Region – improvements to the Glasgow-Ayr rail service, the further extension of the M77 to Ayr, and the A737 upgrade. There was little to choose between the top 6 schemes in the ‘ranking’, although there are also cost / implementability issues to be taken into account. As suggested above, each scheme already features in the WESTRANS future programme and the outcome of this Scoping Study could assist in the early prioritisation of this programme. The next steps would be to undertake a STAG Part 1 and STAG Part 2 appraisal. These appraisals would move the analysis from the qualitative to the quantitative, and provide a basis for a funding application.

13. The TELMoS runs in this study were indicative. An interesting follow up to this study would be to run the key schemes fully in the TMfS / TELMoS models. This would provide a more accurate estimate of the effects of the schemes on regional GVA, employment and population. Given the current policy focus on economic development in Ayrshire, these new model runs should be incorporated within a more detailed STAG EALI Study.

14. There are 2 main growth initiatives in Ayrshire – Hunterston deep water port and Prestwick Airport. Hunterston in particular has specific requirements for improvements to rail infrastructure within Ayrshire and the wider rail network, which will be essential in the medium term if the port is to develop as anticipated. The requirements for Hunterston are worthy of further detailed study, given its central role as a major potential investment in Ayrshire.
CHAPTER ONE INTRODUCTION

1.1 Background

1.1.1 MVA, together with David Simmonds Consultancy, Nick Wright Planning and Natural Capital were appointed by the Scottish Executive to undertake a Research Study entitled ‘Ayrshire – Transport and the Economy: The Scope for Improving Connectivity between Ayrshire and the Central Belt’. A copy of the Research Brief is contained in Appendix A for reference.

1.1.2 It is recognised that Ayrshire has been less successful than other areas of Scotland in moving away from traditional manufacturing industries into the service sectors, and knowledge based economy more generally. Poor connectivity within Ayrshire and between Ayrshire and the rest of Scotland / UK is frequently cited as a constraint on the development of Ayrshire and hence on this transition.

1.1.3 The National Planning Framework (NPF) and Ayrshire Joint Structure Plan 2025 (AJSP) both emphasise the need for improved transport links if Ayrshire is to be economically successful. In these and other documents, the themes on which the need for improved connectivity centred are as follows

- connectivity outwards towards Ireland and further afield from Glasgow Prestwick International Airport (GPIA) and the ports
- connectivity to the central belt and the national motorway network
- interconnectivity between and around the settlements of Ayrshire
- the promotion of the idea of Ayrshire as a ‘gateway’

1.1.4 Ayrshire was perhaps unique in Scotland in being heavily industrialised, yet being located some distance from both of the main centres of population. As traditional industries have declined, other previously industrial areas, such as Lanarkshire have been better placed, in terms of their geography (and financial situation), to attract the investment necessary to take the place of traditional industries.

1.1.5 This ‘scoping study’ examines different options for investment in transport in Ayrshire, in terms of their potential impacts on the ‘re-positioning’ of Ayrshire. It also seeks to inform national and strategic planning policy development for the area.

1.2 Study Aim

1.2.1 The Research Brief set out the following clear aim of the study – ‘to identify the key features of the Ayrshire economy and identify what scope there may be for improving connectivity within and beyond Ayrshire which will support economic development and regeneration’.
1.3 Report Structure

1.3.1 Chapter 2 considers the evolution of the understanding of the relationship between investment in improved transport and economic performance. This is a complex area and despite a formidable research effort, the identification of clear cause and effect relationships has proved elusive.

1.3.2 Chapter 3 contains a profile of Ayrshire, focussing on the key aspects of the Ayrshire economy. In particular, the aspects of the economy where Ayrshire is seen to be ‘lagging’ behind other areas of Scotland are highlighted.

1.3.3 In Chapter 4, we provide a description of the transport network in Ayrshire in 2006. This includes a resume of the road, rail, bus and ferry networks, recent developments in transport in Ayrshire and key trends in transport for Ayrshire.

1.3.4 Chapter 5 reports an ‘inventory’ of travel times for Ayrshire, then Chapter 6 reports on the accessibility analysis and analysis of the Census Travel to Work data undertaken for the study.

1.3.5 Chapter 7 summarises the key themes emerging from the consultation with key stakeholders. In Chapter 8, the ‘emerging schemes’ from both the consultation and the various policy documents are collated.

1.3.6 Chapter 9 details the STAG based appraisal undertaken against the Study Planning Objectives, also discussed in this Chapter.

1.4 Key Documents

1.4.1 Amongst the key documents referenced for the study are

- Finalised Ayrshire Joint Structure Plan
- WESTRAN – A Joint Transport Strategy for Western Scotland to 2025, Consultative Draft (August 2005)
- SLIMS Labour Market Statements (various)
- Local Transport Strategies for each local authority
- ‘Ayrshire Transport Data Record’ (AJSP & Transportation committee (Draft))
- Local Plans for each local authority
- ‘Access to Ayrshire’ (Babtie) study
- Prestwick Airport Rail Study (MVA)
CHAPTER TWO TRANSPORT AND ECONOMIC DEVELOPMENT

2.1 Introduction

“That there is a link between good infrastructure and the economy is taken as self-evident by most businesses and professionals, but despite a mountain of academic analysis, the nature of the relationship remains somewhat opaque. The Standing Advisory Committee on Trunk Road Assessment’s (SACTRA) 1999 Report, ‘Transport and the Economy’ looked at the issue in some detail but failed to establish any simple, clear rules.’ - taken from Local Transport Today (8/12/2005), from a report into the on-going Eddington Review which is examining the links between good transport and a strong economy.”

2.1.1 The above quote illustrates the difficulties faced in addressing the question of the links between improved transport and economic performance. It is indeed self-evident that a modern economy requires effective communication links - most people would acknowledge for example that Scotland would not function as effectively, without its motorway network, but the quantification of these effects has proved extremely difficult. In addition, determining the economic impact of a single scheme in a country like the UK, which even if significant, is generally making only a marginal change to a highly developed transport system, is problematic.

2.1.2 Undoubtedly the most authoritative work on the relationship between transport and the economy published in recent years is the SACTRA report of 1999 referred to above. The main mechanisms identified by SACTRA through which improved transport could lead to improved economic performance were

- reorganisation or rationalisation of production, distribution and land use
- effects on labour market catchment areas and hence on labour costs
- increases in output resulting from lower costs of production
- stimulation of inward investment
- unlocking inaccessible sites for development
- triggering growth which in turn stimulates further growth

2.1.3 This list provides a useful context in which to consider the potential economic effects of transport schemes.

2.2 Appraisal and Economic Impact

2.2.1 There have been well established appraisal methods for over 30 years which estimate the ‘benefits’ of a transport proposal by placing a monetary value on reductions in travel times and savings in vehicle operating costs, from a social welfare perspective.

2.2.2 However, establishing statistical causal links between improved transport and economic performance (measured by eg GDP, productivity or employment) has proved elusive to researchers – ie how, if at all, do the travel time savings identified appear as other economic indicators ‘on the ground’ once the project is in place?
2.2.3 This question has led to a large volume of literature addressing the question of the links between transport and economic development from an *ex post* perspective (ie economic impact). It is this literature which proves most inconclusive. In part because of this lack of empirical evidence, appraisal methods which extend beyond social welfare explicitly into economic impact have not, until recently existed, and the methods which are now being advanced are largely theoretical and at an early stage of application.

2.2.4 Early outputs from the Eddington Review touched on above have established the following list of ‘micro-economic’ drivers by which transport may impact on growth and productivity (similar to the SACTRA list)

- mobility of people and goods
- enhancing agglomeration
- labour markets and migration
- boosting intra- and inter-regional trade and competition
- boosting international trade
- enhancing the attractiveness of the UK for foreign investment

2.3 **Breaking the question down**

2.3.1 It is helpful to consider the relationship between transport and economic development from a few distinct perspectives.

*National (UK) Level*

2.3.2 At the national level, appraisal methods currently use a measure of social welfare benefits and costs. ‘Welfare’ or ‘Social Welfare’ is the total well-being of society. It reflects the ‘utility’ of people within society. Although the level of welfare is impossible to measure, it is possible to assess the changes resulting from a project or policy. Social cost-benefit analysis is based on assessments of welfare benefits and costs. Social welfare benefits arise primarily from reductions in travel time and accidents (both converted into a monetary value), and vehicle operating costs.

2.3.3 Most proposed transport schemes are appraised in this way – combined with a range of appraisals against other criteria. Schemes which produce a significantly large social welfare benefit relative to their cost of construction or implementation are deemed ‘good’ projects from this perspective.

2.3.4 Until recently, this social welfare measure has been deemed a comprehensive measure of the economic value of a scheme to the national economy (ie GDP), given the key assumption of perfect competition. This means that changes in transport costs resulting from a scheme are converted into wider economic effects, such as reduced wage costs or increased property values. At a national level, further ‘economic development’ benefits have not been accepted as ‘valid’ in appraisal terms.
2.3.5 However, new guidance was produced by the Department for Transport in July 2005 concerning ‘Transport, Wider Economic Benefits, and Impacts on GDP’\(^1\). ‘Wider’ economic benefits contribute to the impact of transport on productivity and GDP, and are caused by market imperfections in transport-using industries. This new guidance suggests that although many of the welfare gains currently calculated during the appraisal of a transport scheme appear as increases in GDP, there can be substantial additional benefits to GDP which are not currently captured. This marks a significant departure from conventional thinking, whereby the schemes will be appraised perhaps in terms of both their welfare and GDP impacts.

2.3.6 The areas where wider ‘welfare’ benefits arise are

- agglomeration economies – some firms gain productivity benefits from proximity to other firms, improved transport can bring these firms ‘closer’ together (also a GDP benefit)
- increased competition as a result of better transport – competition between firms in the economy drives down prices and improves efficiency, improved transport increases the ‘reach’ of firms, and therefore increases competition
- increased outputs in imperfectly competitive markets – in most sectors, competition is not ‘perfect’ eg buyers are not equipped with all the necessary information to make an informed choice. Improved transport can induce firms to increase production and the value of this increased production is greater than the cost of producing it, ie the marginal benefit of this new production is likely to exceed the marginal cost (also a GDP benefit)
- economic welfare benefits from improved labour supply – improved transport can give people access to higher paid jobs resulting in extra tax revenue that is not currently captured in the appraisal

2.3.7 The areas where wider ‘GDP’ benefits arise are

- increased labour force participation – more people choose to work as a result of a transport improvement
- people working longer hours – as a result of reduced commuting time
- move to more productive jobs – a relocation of jobs to higher productivity locations

2.3.8 The new methodology, which has been demonstrated to significantly increase the identified benefits of a scheme, is being piloted in submissions for the DfT Transport Innovation Fund (TIF), in England. The DfT, via the TIF is currently asking Regional Development Agencies (RDAs) to compile lists of schemes which could qualify for TIF ‘national productivity funding’. The DfT has specified that the type of schemes which may be eligible for funding include road or rail access to ports or airports and inter-urban connections that reduce business costs. This gives a clear steer regarding the nature of the schemes which are envisaged to have the greatest effects on GDP.

2.3.9 Table 2.1 below summarises the above discussion in terms of whether benefits are picked up in welfare or GDP appraisal.

\(^1\) Note that this new guidance is not yet applicable in Scotland.
Table 2.1 ‘Wider Economic Effects’ summary

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Welfare</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business travel time savings</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Commuting time savings</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Leisure time savings</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Increase in labour force participation</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>People working longer</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Move to more productive jobs</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Agglomeration benefits</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Increased competition</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Imperfect competition</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Exchequer benefits of increased GDP</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

**Regional Level**

2.3.10 As touched on above, until relatively recently, the view of government was that a comprehensive calculation of the welfare benefits of a proposed scheme gave an exhaustive measure of the value to the country of a transport scheme. Anything additional to this was regarded as double-counting of benefits.

2.3.11 In July 2003, the Department for Transport (DfT) published ‘Guidance on Preparing an Economic Impact Report (EIR)’, in response to the recommendation made by SACTRA. The EIR fits within the NATa appraisal framework under the heading of ‘Economy: Wider Economic Impacts’. It provides guidance on how to measure the economic impact, in the form of employment effects, of transport schemes. However, a key element of the EIR is that it is primarily concerned with the effects of a scheme on the *distribution* of economic activity, and is only relevant if the scheme is affecting a pre-defined ‘Regeneration Area’. The EIR therefore recognised that schemes which addressed regional imbalance and assisted ‘Regeneration Areas’ were better than schemes which did not, given an equivalent Benefit Cost Ratio, ie re-distributional effects were now seen as a positive impact.
2.3.12 In Scotland, the Executive published the Scottish Transport Appraisal Guidance (STAG) in September 2003. A new element of appraisal required by STAG is Economic Activity and Location Impacts (EALI) analysis. The aim of EALI analysis is to describe the impacts of a transport investment on the economy, using income and / or employment as key measures. It is recommended that the EALI analysis is presented in terms of

- the net impact at the Scotland level (beyond that calculated in the welfare based cost benefit analysis)
- gross components, which distinguish impacts on particular areas and / or on particular groups in society

2.3.13 It is recognised however that ‘net’ impacts will occur in only a ‘very few’ cases (for the largest schemes), and in practice the analysis focuses on the local and distributional impacts of the scheme. Unlike the EIR however, the analysis is not restricted to ‘regeneration areas’, but projects which impact positively on areas defined as socially excluded will be viewed favourably as they are supporting other Executive policies.

Summary of Appraisal

2.3.14 The evolution of the appraisal of the economic benefits of transport schemes can be thought of as occurring in 3 main stages

- originally welfare benefits calculated from cost-benefit analysis were regarded as comprehensive with anything else deemed double-counting, assuming perfect competition in the economy
- it was then acknowledged that distributional effects can be of benefit to lagging areas
- most recently, a new view has emerged that schemes should also be appraised in terms of their impact on GDP explicitly, recognising that market imperfections give rise to additional benefits (both in GDP and welfare terms)

Relevance to Ayrshire

2.3.15 The previous section has outlined the various ways in which transport proposals have been appraised in terms of their economic impact. From a national economic perspective, if comparing transport schemes, the key measures are

- Net Present Value (NPV) – ie the absolute difference between the costs and the benefits of the scheme, a measure of the magnitude of the new benefits of the scheme
- Benefit Cost Ratio (BCR) – value of benefits / value of costs, ie what is the ‘return’ on investment of the scheme?

2.3.16 Clearly the scheme with the highest NPV or BCR would be regarded as the best value for money from the national perspective.

2.3.17 From an Ayrshire perspective, the issue is the distribution of the impacts of a scheme. For example, an internal-Ayrshire scheme which generated a high NPV and where the bulk of the benefits accrue specifically to businesses and population in Ayrshire would be deemed good for the national and Ayrshire economy.
2.3.18 A scheme which improved links between Ayrshire and another area of Scotland creates a rather more ambiguous picture. It is recognised that there is no guarantee that transport investments will benefit the local or regional economy at only one end of the route-transport operates in both directions, and improving links to peripheral areas can expose their economies to competition from more powerful, centrally located economies.

2.4 Empirical Evidence

2.4.1 As was highlighted at the outset of this Chapter there has been a large volume of academic work over many years which has attempted to identify clear links between transport provision and economic development. Appendix B contains a comprehensive set of tables, which lists a wide range of empirical studies of this nature.

2.4.2 Many authors have contributed to the debate on the relationship between transport and economic development by reviewing the available evidence, often in the light of a policy objective, without conducting an original study. Selected papers of this nature are considered in Table 2.2 below to determine the ranges of thought concerning the understanding of the relationship between transport and economic development (these are extracted from the full list in Appendix B).

Table 2.2 Summary of studies which review available evidence

<table>
<thead>
<tr>
<th>Author</th>
<th>Approaches Considered</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arnott (1987)</td>
<td>Business and local economic development, land and property development, labour market and access to work</td>
<td>Developer attitudes to the marketing of sites and premises is significantly more sensitive to accessibility than the actual experience of business and transport operators, transport can be a potentially important economic development and planning tool</td>
</tr>
<tr>
<td>Button (1994)</td>
<td>Use of meta-analysis on previous work, values of time, impact studies</td>
<td>The best use is not made of previous studies when estimating the effects of a new project, previous studies are not used collectively for statistical analysis</td>
</tr>
<tr>
<td>Button and Rietveld (1996)</td>
<td>Use of meta-analysis</td>
<td>Caution should be exercised in hoping that large scale infrastructure investment programmes will stimulate rapid and more even economic development within the pan-European region.</td>
</tr>
<tr>
<td>Dickens (1991)</td>
<td>Land-use - transport planning, location decisions, company costs, light rail transit and land development</td>
<td>Evidence of cause and effect between light rapid transit and development is rather mixed, authors call for more integrated land-use and transport planning</td>
</tr>
<tr>
<td>Drew (1990)</td>
<td>Methodologies: Urban and regional growth, effects of traffic changes, impact evaluation, economic base, input-output, regional economic models</td>
<td>Direct effects of infrastructure spending can be modelled using input-output analysis, its significance as a catalyst to economic growth depends on the socio-economic nature of the region</td>
</tr>
<tr>
<td>Author</td>
<td>Approaches Considered</td>
<td>Conclusions</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Drew (1990)</td>
<td>Economic impact methodology, modelling impacts of transport, economic impacts of modal investments, case studies and state planning issues</td>
<td>There is no single causal-based policy sensitive methodology applicable to all modes for all levels of analysis. Results from impact studies are meagre, measurable, causative relationships between transport and economic development are currently impossible to estimate.</td>
</tr>
<tr>
<td>Eno Foundation (1983)</td>
<td>US transport costs, location decisions, policy objectives</td>
<td>Complexity and unpredictably of the economy undermines the economic model as a tool to be used in selecting promising transport schemes, communities that allow transport facilities to deteriorate may find new investments going elsewhere.</td>
</tr>
<tr>
<td>Ernst (1981)</td>
<td>Incremental evaluation, strategic evaluation, industrial location analysis, US</td>
<td>Understanding of the interactions between transport investment and economic development is too sketchy to allow for deriving any firm performance criteria from economic policy goals.</td>
</tr>
<tr>
<td>Gwilliam (1979)</td>
<td>Transport costs, location theory, land-use - transport models, inter-regional freight flows, impact studies</td>
<td>Relevant areas of theory are ambiguous and their related hypotheses are impossible to test empirically, transport investment has a limited impact on regional activity.</td>
</tr>
<tr>
<td>Hamer (1990)</td>
<td>Effect of roads on UK inner cities / transport costs</td>
<td>Public expenditure on new roads is inefficient and of little value in terms of helping the inner cities.</td>
</tr>
<tr>
<td>Hardle (1992)</td>
<td>Railways, road building, inner cities, light rapid transit, regional economic development</td>
<td>The argument for transport investment achieving national economic growth is weak and transport investments are unlikely to have a major impact on the distribution of economic activity.</td>
</tr>
<tr>
<td>Knight and Trygg (1977)</td>
<td>Development effects of US light rapid transit</td>
<td>LRT can have a significant revitalising effect on cities in terms of planning focus where the political will is present.</td>
</tr>
<tr>
<td>Lee (1981)</td>
<td>US light rapid transit urban revitalisation, local economic development, efficient development patterns</td>
<td>Quantitative estimates of benefits are likely to be very imprecise, political involvement is more important than lengthy scientific analysis.</td>
</tr>
<tr>
<td>McQuaid &amp; Greig (2002)</td>
<td>Transport &amp; the Scottish Economy - Key Issues</td>
<td>Little is known about the real links between transport and economic development. Much policy is supported by anecdote, ignoring displacement, and expectation of links, rather than real evidence. Key research issues suggested included ex post empirical studies of wider impacts, and further investigation of micro-level behavioural impacts.</td>
</tr>
<tr>
<td>Parkinson (1981)</td>
<td>COBA freight benefits, before and after studies, econometric evidence, surveys of firms, industrial rents, international evidence, labour market</td>
<td>It is implausible that road schemes will lead to significant increases in GDP, some schemes will assist localised relocation, it is probable that the road programme has had a small effect on the distribution of employment in the long term.</td>
</tr>
<tr>
<td>Rietveld (1994)</td>
<td>Multi-regional models: Land-use - transport models, production function, transport cost, location models, interviews with entrepreneurs</td>
<td>Production function and interview approaches suggest the greatest impact, need to consider the perceptions of new infrastructure, identification of data deficiencies.</td>
</tr>
<tr>
<td>Author</td>
<td>Approaches Considered</td>
<td>Conclusions</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SACTRA (1999)</td>
<td>Wide ranging review</td>
<td>Direct statistical and case study evidence on the size and nature of the effects of transport cost changes is limited. The state of the art in this important field is poorly developed and the results do not offer convincing general evidence of the size, nature or direction of local economic impacts.</td>
</tr>
<tr>
<td>Sharp (1980)</td>
<td>UK transport costs, inter-regional commodity flows</td>
<td>Transport investment unlikely to cause significant new activity in less prosperous regions, transport must be provided to supplement government regional policies</td>
</tr>
<tr>
<td>Whitelegg (1985)</td>
<td>Previous general studies, economic indicators</td>
<td>Road construction is of no benefit to depressed regions and a disbenefit to urban areas</td>
</tr>
<tr>
<td>Wilson (1986)</td>
<td>25 year survey of US practice in transport economics</td>
<td>Cause and effect in the relationship of transport to urban or national economic growth are easy to mix up, call to include distributional effects in cost-benefit analysis</td>
</tr>
</tbody>
</table>

2.4.3 The conclusions summarised in Table 2.2 highlight the range of views on the topic, demonstrating the lack of consensus amongst academics and practitioners. A more recent study by DTZ Pieda for the Welsh Office (Economic Impact of Road Infrastructure Investment – Stage 3 Report, 2004) concluded

“The existing body of evidence is more compatible with the view that transport can affect the distribution of economic activity than with the claim that transport investment materially affects growth at the UK levels” and “the evidence on even regional and local impacts is poorly developed. Individual studies have produced reasonably convincing evidence of particular projects but it is difficult to draw very general conclusions from the evidence.”

2.4.4 The DTZ Pieda report is worth considering in a little more detail. The brief literature review covered the following areas.

**Costs of Production**

2.4.5 A study by Cardiff Business School (1996) found that almost 30% of businesses believed that improvements to the A55 had reduced their production costs either by reducing delivery costs or by new suppliers entering the market forcing local suppliers to reduce prices. However, there was no evidence that the catchment area for the businesses products had expanded as a result, although it was argued that delivery costs to customers were now lower which had a positive impact on competitiveness. Cambridge Economic Consultants (1987) argued that the opening of the first Severn Bridge could potentially change South Wales from being a high cost transport location to an average cost transport location.

**Widening Labour Catchment Areas**

2.4.6 It was noted that the potential of road improvements to widen labour catchment areas is dependent on specific geographical areas and the circumstances surrounding each project. An example of the above point is illustrated by a Welsh Office study in 1981 concerning the improvements that were proposed to the A55 in North Wales. The study found that 35% of manufacturing firms and 34% of distribution firms surveyed believed that the A55...
improvements could influence travel-to-work patterns and the extent of the labour catchment area of their plants. Of the companies surveyed, 50% were located in an area of relatively low unemployment with an area of higher unemployment to the east. As the road improvement promised significant journey time reductions, companies in the low unemployment area were expecting an increase in the number of people now prepared to travel to their area for employment.

2.4.7 Cleary and Thomas (1973) observed a somewhat different result in one of the first studies of the impact of the first Severn Bridge. While the bridge had a significant impact on business travel in terms of staff being able to operate from the one base and cover both sides of the estuary, there was expected to be little impact on commuting because there was very little industrial activity within ten miles of the bridge. As such, only highly paid executives would consider opportunities on the other side of the bridge. However, it must be noted that this information is now 33 years old and may not be as applicable in today’s more mobile society with its higher level of car ownership.

2.4.8 Pieda (1992) found that levels of commuting across the Second Severn Crossing were low and that the benefits were not likely to be sufficient to deepen the labour pool on either side of the crossing. A good example of the potential ‘two-way’ effects of transport schemes is highlighted by the study of a new road link from the Kristiansund to the mainland of Norway. While commuting did increase, there was also significant business relocation from the island to the mainland. In essence, many people were now commuting to the relocated jobs. In short, while road improvements can undermine the competitive position of local economies, the long-term impacts may be positive due to lower costs of production, lower prices and an enlarged labour market.

Increased Competition

2.4.9 A study by Pieda (1999) analysed the socio-economic impact of the Skye Bridge. It found that construction sector businesses working in the local Skye and Lochalsh market had become more exposed to competition from firms elsewhere in Scotland who were now able to access the Skye market more easily. However, it is likely that the consumers of construction services in this market benefited from lower prices as a result of increased competition.

2.4.10 It can however be argued that the above evidence is not particularly applicable to Ayrshire as Skye remains an outlying rural area even with the construction of the Skye Bridge. Before the construction of the bridge, Skye was particularly peripheral with the only access to the island being via ferry. As such, the bridge had the potential to bring a marked increase in competition. Ayrshire is currently relatively well connected to the Glasgow conurbation and it is difficult to envisage any industry in the area not already being subject to intense competition. As such, increases in competition are likely to deliver only marginal benefits.
Impacts on Inward Investment

2.4.11 Dunning (1988) investigated the locational preferences of international businesses located in the UK. The survey was split into 30 ‘regional’ firms and 53 ‘branch firms’. A ‘regional’ firm was defined as one which has responsibility for a region (eg Europe) of coordinating the operations of a multi-national enterprise and a ‘branch’ firm was defined as one which performs the same role only in a smaller geographical region and without the coordination role. For all of the ‘regional’ firms, the most important locational factor was access to airports with others (in order of priority) including language, market size and prospects, telephone communications and the general business framework. For ‘branch’ firms, the key locational factors were proximity to clients, language and market size and prospects.

2.4.12 A similar study by Hall et al (1987) attempted to determine why 40 Berkshire companies chose to locate in the Thames Valley (or the eastern part of the M4 corridor). The percentage of firms mentioning the following main factors were

- Heathrow Airport (75%)
- M4 motorway (63%)
- other motorways and roads (40%)
- access to suppliers (40%)
- availability of suitable premises (40%)

2.4.13 DTZ Pieda argue that the indicative conclusion from these studies is that roads (other than motorways) are in the “middle ranking” in terms of importance in location decisions. A study into the effects of the M4 in attracting 18 firms to (re)locate in Gwent found that 8 firms (44%) had been attracted by the prospect of motorway access while 3 of these firms noted that it had been a major incentive (Welsh Office, 1981).

2.4.14 Pieda (1992) found that the Second Severn Crossing was a potentially major influence in 6% of 27 companies’ decision to locate or expand in South Wales in the future. Other key locational factors included access to suitable sites, proximity to markets and proximity to former sites. A study by Cardiff Business School (1997) discovered that the dualling of the A470 played an important role in attracting inward investment to Merthyr. Three companies actually stated that the road improvements were a key factor in their decision to locate in the area. The study also sought to quantify the employment benefits arising from the new inward investment projects around Merthyr. It found that ‘without the supporting infrastructure of roads it is unlikely that Merthyr would have been entered into feasibility studies for these new inward investment projects, with such wider effects on the local economy’.

2.4.15 The results of a study by Thornton (1978) are in stark contrast to those above. It sought to discover how successful Bradford was in attracting new industry given that the M606 linked the city with the M62, which in turn connects Manchester and Hull. While 5 businesses had opened manufacturing plants in the area in the 4 years prior to the study, none of the companies identified the road network as a key factor in their location decision.
Opening Sites for Development

2.4.16 It is argued that road infrastructure can play a key role in developing previously inaccessible sites. A case study of the M40 by Headicar and Bixby (1992) examined the development and traffic effects in the immediate vicinity of the motorway. The report found that the motorway altered the nature and pattern of accessibility meaning that certain types of new development became feasible (eg major shopping centres requiring large catchment areas). The focus of accessibility also changed from traditional town centres to motorway intersections.

2.4.17 Pieda argue that the study robustly proved that

- development had taken place on land not previously developed and outside the provisions of the approved development plan
- the nature and intensity of development had been very different from previous development in the vicinity
- the development has significant traffic generation factors

2.4.18 Cardiff Business School (1997) discovered that the opening of the latest section of the A470 has assisted in the opening of a new retail development area to the west of Merthyr. Similarly, Gould (1997) found that the M25 has played a significant role in extending the catchment area for regional shopping and warehouses.

2.4.19 The main themes drawn out of the above were

- that research evidence suggests that major road improvements do reduce production costs in the areas they serve
- variable evidence on the impact on labour catchment areas
- road provision only rarely influences inter-regional location decisions
- intra-regional and local location decisions are strongly affected by roads investment (particularly retail)

2.4.20 In addition to the above, a further literature review undertaken by Leitham (1996), and summarised in Appendix B, does demonstrate a wealth of studies which do give some support to the notion that transport infrastructure is a significant economic factor. Equally, there is much evidence that transport infrastructure projects do not fulfil their economic promise. There are pre-project appraisals, where very considerable benefits additional to road-user benefits were predicted, and other studies which demonstrated that significant benefits are difficult to attribute to one infrastructure project. More success in determining a relationship is met when transport infrastructure is considered at a more aggregate level, over a period of many years. The clearest conclusions are that the methodology and spatial scale adopted in a study are critical in determining likely post-project effects (Rietveld, 1994). As Drew (1990) concluded, 'measurable, causative relationships between transport and economic development are currently impossible to estimate', and 'there is no single causal based policy sensitive methodology applicable to all modes for all levels of analysis'.

2.4.21 It is clear from the literature that there is still much to be learned, both in terms of methodology and data. The importance of perceptions and qualitative factors has also been demonstrated (eg Henley et al, 1989), in order to investigate factors outwith the strict assumptions of much economic theory and cost-benefit analysis.
2.5 Summary

2.5.1 The inconclusive nature of the large volume of work which has attempted to quantify the economic effects of transport schemes has influenced the methods used in the appraisal of transport schemes. In the past, Government has been cautious when responding to some of the ‘new jobs’ claims made by promoters of particular schemes. This caution has been based, in part, on the lack of empirical evidence. Nonetheless, promoters of schemes do routinely make claims as to how these schemes will provide a boost to the economy (often without specifying at what spatial scale, ie local / regional / national), and it remains something of an article of faith that improved transport will bring economic benefits. New transport schemes will indeed generally bring reduced travel times – the issue is how these savings feed through into the wider economy, and this remains an area of significant uncertainty. There is a strong theoretical case that the time savings do translate into increased economic activity but the empirical evidence is limited.

2.5.2 Transport costs tend to be a low proportion of operating costs for most businesses, and reductions in transport cost are therefore making a small change to a low proportion of operating costs – this could be a more significant proportion of profits though. In addition, from an economic development point of view, the cost of the transport measure is rarely compared with the cost of other policies which could boost economic development, ie the opportunity cost.

2.5.3 There are no clear ‘rules’ as to in which local circumstances improved transport is likely to bring significant benefits in terms of economic development, eg which industrial mix, which geographical orientation? Present day guidance in STAG requires that an assessment is made of the impact of any transport proposal in terms of Economic Activity and Location Impacts (EALI). EALI is undertaken separately from Transport Economic Efficiency (TEE), the social cost-benefit analysis element of the appraisal.

2.5.4 For Ayrshire, and the potential impact of new transport on Ayrshire, there are therefore few examples of empirical evidence which can be drawn upon to directly inform these potential impacts. The best strategy is to determine the transport-related issues which act as constraints on the expansion of economic activity in Ayrshire. Schemes which resolve these constraints are likely to have a greater impact on economic development than other schemes. The following Chapters address these points in some detail.
CHAPTER THREE    A PROFILE OF AYRSHIRE

3.1   Introduction

3.1.1   The aim of this chapter is to provide a description of the characteristics of Ayrshire, its historical development and the present day economic situation. In order to consider the ways in which improved transport links can assist in the regeneration of Ayrshire, it is necessary to be clear in which areas the economy of Ayrshire is ‘lagging’, and this Chapter also seeks to fulfil this role.

3.1.2   This chapter is divided into 5 main areas

- landscape and history of Ayrshire
- population trends
- labour market and other measures of local economic performance
- National Planning Framework for Scotland
- deprivation

3.2   Ayrshire: Geography, History and Culture/Attractions

Geography

3.2.1   Ayrshire is situated in the south-west of Scotland, and consists of 3 separate unitary authorities – East Ayrshire, North Ayrshire and South Ayrshire. It is bounded by Inverclyde and the Glasgow conurbation in the north, Dumfries and Galloway in the south, the Firth of Clyde in the west, and South Lanarkshire and the Southern Uplands in the east. Figure 3.1 below shows the main settlements and local authority boundaries of Ayrshire.
3.2.2 The main urban centres in Ayrshire and the bulk of the population are concentrated in the centre of the region. North and South Ayrshire are more rural areas with a number of smaller towns. The principal towns are Ayr, Irvine and Kilmarnock but there are also many important service centres and rural towns, which all make a significant contribution to the economy.

3.2.3 The area has traditionally been regarded as a particularly scenic place, with a long and picturesque coastline, large areas of unspoilt countryside, and a number of pleasant towns. East Ayrshire benefited economically with significant coal deposits, while other areas also benefited from good quality agricultural land, fishable waters and timber.
Historic development

3.2.4 Despite its relative proximity to Glasgow, Ayrshire has a very distinct history. Naturally, however, the pattern of production in the area became entwined with serving the export and Glasgow markets. Unsurprisingly, the origin and development of many of Ayrshire’s towns reflected the need for productive land, agricultural service centres and the location of key resources such as coal. In addition, a strong fishing industry led to the development of a number of coastal towns. The biggest exception to this trend is Irvine, which was created as a ‘new town’ in 1969.

3.2.5 Many towns in Ayrshire were single industry areas that developed during the first industrial revolution. The most notable examples are the coalfield towns of east Ayrshire, such as Cumnock and Auchinleck. There are, however, other examples, such as Darvel and Galston, which were renowned for manufacturing curtains and fine lace.

3.2.6 The development of Ayr itself reflected the increasing orientation of agriculture to the marketplace. As a result of this, there was an increasing demand for expansion of the commercial, legal and financial facilities that were concentrated in towns. In addition, rising living standards and greater purchasing power for consumers led to increased demand for the products of luxury industries while there was also a clamour for better urban services in education, leisure and housing. In the years which followed, Ayr was a town incorporating both industry and an agricultural service centre. There were iron foundries in the town and the port facilities played a crucial role in its development (both for fishing and freight). In addition, Ayr became a holiday town, although its importance in this respect has markedly declined in recent years.

3.2.7 Kilmarnock had a number of industrial specialisms, including carpet manufacture, coal mining and whisky. However, this left the town extremely vulnerable to cyclical fluctuations in world trade. Other large towns such as Troon and Prestwick also played a role in the development of Ayrshire as a whole.

3.2.8 The ‘3 Towns’ of Ardrossan, Saltcoats and Stevenston was also an important industrial area. The Nobel Munitions factory at Ardeer provided employment for Stevenston (almost a ‘factory’ town) and the rest of the area. Its demise has left a legacy of land contamination and structural unemployment. The former workforce displays a certain inertia in taking up employment opportunities elsewhere.

3.2.9 The industrial boom in Glasgow created a city with extremely poor living standards and limited public amenities. As such, there was a demand for leisure outlets in other areas and this demand was partly satisfied with the advent of day-tripper towns. Largs is a good example of such a town, but there are many more. These towns became popular because of their seaside amenities, picturesque locations and easy accessibility for Glaswegians.
3.2.10 Ayrshire began to suffer a decline in a number of industries in the 1970s and 1980s. Most notably, there was a marked decline in many of the traditional industries on which its prosperity had depended for many years. Coal mining in Ayrshire and in Scotland generally was suffering from a lack of efficiency, poor economic conditions, changing energy demands, fierce foreign competition and a hostile political climate. The same could be said of textiles, iron and steel and a number of other industries. In addition, agriculture and fisheries had undergone an extensive period of rationalisation as the work became much more capital intensive. Lastly, the rapid rise in car ownership and the advent of cheap foreign holidays led to a decline in the demand for the tourist centres of Largs, Saltcoats and other areas.

3.2.11 The decline described above mirrored that of the UK in general. However, Ayrshire has as yet been unable to fully compensate for the loss of traditional industries with new industries in higher value added sectors. The historic decline in the share of the workforce employed in manufacturing together with the rise in the importance of service industries are illustrated in Figure 3.2 below.

![Historic trend in Employment in Ayrshire](image)

**Figure 3.2 Historic employment trends in Ayrshire**

3.2.12 Today, major private sector employees include BAE Systems, Jabil, GE Caledonian and Diageo. According to Scottish Enterprise Ayrshire, key industries include engineering, aerospace, food and drink, biotechnology and contact centre management.

**Culture / Attractions**

3.2.13 Ayrshire has a number of global attractions and a strong cultural heritage from which to build its future tourist industry. It is of course renowned for its link to the famous Scottish poet Robert Burns and the Robert Burns Heritage Centre is located at Alloway, between Ayr and Maybole.
3.2.14 Ayrshire also has a number of championship golf courses including Troon, Turnberry and Prestwick. These golf courses not only offer challenging rounds on links courses but they are also heritage areas for the sport. For example, Prestwick staged the very first British Open, a tournament that is now of world renown. In addition, Ayrshire also has 2 professional football teams (Ayr United and Kilmarnock) while Ayr racecourse is an important venue for high-class horse racing (it stages the Scottish Grand National).

3.2.15 In addition, all of the reports on Ayrshire stress the value of its picturesque coastline and pleasant places for days out and holidays. In particular, the Largs promenade recently underwent significant redevelopment while Ayr is also undergoing similar improvements. Furthermore, Ayrshire has many facilities catering for tourists, such as Vikingar, Culzean (Castle) and Kelburn country parks, various marinas, Dunaksin Heritage Centre, Clydebuilt and the Magnum Centre at Irvine, numerous seaside caravan parks, Craig Tara Holiday Park, Loudon Castle amusement park, as well as a number of other attractions.

3.3 Population trends

3.3.1 Like the UK in general and much of Western Europe, Ayrshire is suffering from adverse trends in its population. Increased life expectancy and reduced birth-rates are leading to an increase in the ‘dependency ratio’. This is the ratio of the number of economically inactive members of society (the sick and retired) to the ratio of economically active members of society. As such, unless there is an offsetting rise in productivity or employment rates, GDP growth will decline because there will be a decrease in the number of effective workers. Ayrshire also faces the problem of a shrinking population, with the added complication that the people who leave will tend to be the most productive.

3.3.2 In 2004, Ayrshire had an estimated population of 367,590 people (7% of the Scottish total), of whom 48% were male and 52% female (GROS, 2004). The population is relatively evenly distributed across the 3 local authorities with 30% in South Ayrshire, 33% in East Ayrshire and 37% in North Ayrshire.

3.3.3 During the 1990s, Ayrshire’s population fell by 3%, compared to 2% for Scotland as a whole. The decline was principally concentrated in East Ayrshire, which is a likely reflection on the final collapse of many of its traditional industries. Using 2004 as the base year, the General Register Office for Scotland (GROS) has projected that Ayrshire’s population will fall by 4,400 by 2014, and by 13,000 (4% of its current level) by 2024. While all 3 local authority populations are shrinking, the greatest decline is expected to be in North Ayrshire, where over half of the absolute decline is forecast.
3.3.4 Figure 3.3 below shows the current GROS forecast for the 3 Ayrshire council areas.

![GROS 2004 Population Projections](chart.png)

**Figure 3.3 Ayrshire population projections**

3.3.5 Ayrshire also has unfavourable demographics in terms of its current working age population. In 2001, around 61% of its residents were between the age of 19 and 64, which was largely reflective of the UK as a whole. However, within this group, 43% of people were aged 45 and over, which was 4% and 6% greater than the respective Scottish and UK figures. In addition, 20% of Ayrshire’s working population was aged between 60 and 65. Crucially, the projected decrease will be concentrated in the crucial 25-44 age group.

3.3.6 All 3 council areas display an older population than the UK average but this is principally driven by South Ayrshire. East Ayrshire currently has the most favourable demographics but it is also projected to have the largest decline in the core 25-44 age group. In all, it is clear that an ageing and declining population poses a serious threat to the future economic stability of Ayrshire.
3.4 Labour Market & Economic Performance

3.4.1 This section reports some of the main developments in the Ayrshire labour market in the last 10 years (1994-2004). Unless stated otherwise, the figures refer to the 3 Ayrshire council areas and are drawn from the SLIMS 2005 Labour Market Statements.

Employment amongst resident population

- growth in employment has been around the Scottish average (6%), meaning that an extra 9,000 people living in Ayrshire found jobs during this period
- in 2004, the employment rate, (ie the proportion of the working age population which has a job), is also now around the Scottish average at 75%, having lagged around 5 percentage points behind between 1995-2003 – thus 2004 could be a statistical ‘blip’
- the gap in employment rates between men (79%) and women (68%) is not reducing, unlike the rest of Scotland
- there is only a small jobs ‘gap’, ie the number of jobs which would be required to match employment rates elsewhere, 1,000 to match the Scottish average and 3,000 to match the UK average
- self employment levels are around 9% (of residents in work), lower than the rest of Scotland and the UK

Unemployment

- unemployment has reduced substantially from 19,000 in 1995 to 13,000 in 2004, a rate of 7%
- unemployment rates are still slightly higher than the rates in Scotland (6%) and the UK (5%)
- rates of long term unemployment have reduced dramatically from 2.6% to 0.6%, but are still slightly higher than the 0.4% in Scotland and the UK
- claimant count unemployment rates are higher than the Scottish average (3.2%), at 5.2%, 4.4% and 3.6% for North, East and South Ayrshire respectively (January 2006 figures2)
- this gives North Ayrshire the highest claimant count unemployment rate of any Scottish local authority area
- some council wards within Ayrshire have claimant count unemployment rates of around 9%
- youth unemployment remains a problem, at a level one third higher than the Scottish level, in some areas, unemployment is accepted as the ‘norm’ where second and third generation unemployment persists

3.4.2 One of the key issues is the continuing problem of unemployment in Ayrshire, although the picture here has improved in recent years. Much of the remaining unemployment in Ayrshire is of a structural nature. That is, it has been caused by a movement in the structure of industry thus undermining the skills base of certain workers and causing long-term unemployment (where people are unemployed for a period longer than a year).

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2 Source – Local Authority Economic Briefings, Scottish Executive, note that ILO figures (unavailable) are likely to be higher.
3.4.3 Unemployment in Ayrshire in 2002 averaged almost 15,000 people, which was significantly higher than national averages. Indeed, using the ILO measure, unemployment across Ayrshire has tended to be between 2%-4% higher than the Scottish level and 4%-6% higher than the British level. Unemployment in Ayrshire has declined recently but this has been at a slower rate than the rest of the UK meaning that the unemployment gap is widening.

3.4.4 Ayrshire has a high level of long-term unemployment caused by the structural change mentioned above. While North Ayrshire has the highest unemployment rate, the overall trend has been strongly driven by East Ayrshire. The collapse of traditional industries such as coal mining and textile manufacturing has caused acute economic problems in places. In particular, single industry towns such as New Cumnock and Auchinleck have been badly affected by the collapse of deep-mine coal mining, although significant open cast mining remains. The important issue is that it is not just the people that are redundant, it is the skills as well, meaning that these areas are unattractive for future investment. Indeed, one of the priorities of the AJSP is the regeneration of these areas and others like them.

3.4.5 Ayrshire also suffers from a large degree of seasonal fluctuations in its labour market, as migrants take up jobs at the harvest or during the summer tourist season.

The economically inactive

- economic inactivity rates have historically been higher than national averages (between 1995 and 2003), reducing to the average in 2004

Workplace employment (jobs located in Ayrshire)

- workplace employment has decreased by 1% between 1995 and 2003, compared to a growth of 8% in the west of Scotland and 10% in Scotland as a whole
- female workplace employment has declined by 2,100 compared to a gain of 800 in male workplace employment
- part time jobs have grown by 17% (5,800 jobs), whilst full time positions have reduced by 8% (7,100 jobs)
- part time jobs represent 32% of total jobs, slightly higher than the West of Scotland figure of 29% (2005)
- the imbalance between resident employment and workplace employment reflects a net out-migration of Ayrshire residents for employment

Industrial structure

- public services (32%) and retail / catering (26%) are the 2 sectors which employ the most people – these proportions are similar to the West of Scotland area
- financial & business services are under-represented at 8%, compared to 17% for the West of Scotland as a whole
- manufacturing jobs are over represented at 15%, compared to 11% for the West of Scotland as a whole
- in short, Ayrshire is over-represented in declining industries and under-represented in growth sectors
3.4.6 Table 3.1 below shows the change in employment by sector between 1995 and 2003, for each of the 3 Ayrshire council areas.

Table 3.1 Changes in Ayrshire employment, 1995-2003

<table>
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<tbody>
<tr>
<td></td>
<td>East</td>
<td>North</td>
<td>South</td>
</tr>
<tr>
<td>Agriculture</td>
<td>200</td>
<td>-</td>
<td>200</td>
</tr>
<tr>
<td>Utilities</td>
<td>600</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9,300</td>
<td>11,800</td>
<td>9,100</td>
</tr>
<tr>
<td>Construction</td>
<td>2,400</td>
<td>1,900</td>
<td>2,300</td>
</tr>
<tr>
<td>Retail, Catering etc</td>
<td>8,100</td>
<td>9,700</td>
<td>12,900</td>
</tr>
<tr>
<td>Transport &amp; Communications</td>
<td>1,200</td>
<td>2,100</td>
<td>3,200</td>
</tr>
<tr>
<td>Financial &amp; Business Services</td>
<td>3,500</td>
<td>3,600</td>
<td>4,000</td>
</tr>
<tr>
<td>Public Services</td>
<td>9,100</td>
<td>10,600</td>
<td>11,400</td>
</tr>
<tr>
<td>Other Services</td>
<td>2,100</td>
<td>2,000</td>
<td>1,800</td>
</tr>
<tr>
<td>Total</td>
<td>36,500</td>
<td>41,700</td>
<td>44,900</td>
</tr>
</tbody>
</table>

3.4.7 A total of 12,100 manufacturing jobs were therefore lost during this period, and this decline affected all 3 council areas to a similar degree. This has been compensated for by a gain in public and other services jobs of 9,300, the largest proportion of which have been in East Ayrshire.

3.4.8 One of the key problems identified in all of the reports considered is therefore the outdated industrial structure of Ayrshire. There is a strong consensus that the area has not progressed sufficiently from its industrial roots to a post-industrial society. Indeed, the area remains too heavily focused on traditional declining industries with insufficient representation in the high value added service industries, such as banking and consultancy. In addition, Ayrshire has a relatively low stock of VAT registered businesses compared to the UK in general.

3.4.9 The Ayrshire Economic Forum (AEF) report argues that despite its relatively strong manufacturing base, Ayrshire has structural weaknesses that are damaging its level of global competitiveness. An example of this is that the proportion of employees in clothing and textiles in Ayrshire is twice the proportion of the UK in general. This industry began to decline over a century ago and employment has declined faster in this sector than in any other industry. In contrast, Ayrshire’s representation in the fastest growing industry, business services, is only half that of the UK level. The report adds “private sector office based industries such as finance and business services (excluding public sector organisations) now make up 17% of all jobs in Scotland, but only 8% in Ayrshire”.

29
3.4.10 In addition, Ayrshire is also losing ground rapidly as the growth in this sector since 1984 has been significantly less than the figure for Scotland as a whole.

3.4.11 AEF provide a number of statistics relating to this issue. While there is a broad range of sectors across Ayrshire, all 3 regions have a high concentration of manufacturing jobs and a lower concentration of private services. In addition, the historic economic base of Ayrshire has created several pockets of local specialisms in a number of sectors. For example, textiles and mining in East Ayrshire, chemicals and electronics in North Ayrshire and transport equipment in South Ayrshire. Of the 3 councils, South Ayrshire displays the most favourable industrial mix.

3.4.12 In addition, while Ayrshire’s export performance is relatively good, the products produced in the area operate in highly competitive marketplaces. For example, while Ayrshire is highly competent in textile manufacturing, developing nations such as China are now powerful players in this arena and firms from these countries can almost always offer lower unit costs of production because their labour is so cheap. As such, Ayrshire faces the threat of being priced out of the export market and having its domestic markets affected by cheaper foreign products, as is happening with the import of coal at Hunterston. This type of development is not without precedent. For example, the competitiveness of British coal mining was largely undermined by the Eastern European coalfields, while iron and steel production and shipbuilding were usurped by South Korea amongst others.

3.4.13 The AJSP also argues that previous industrial activity has damaged the physical landscape in some areas of Ayrshire, most notably at Glengarnock, Stevenston / Ardeer and the former rural coalfield areas, but in a number of other locations as well. In the case of Ardeer, the Irvine Bay development programme is aiming to reverse this.

3.4.14 In terms of business locations, the AJSP states that

“the quality, availability and market perception and ability of locations, sites and premises to meet the needs of indigenous, new, mobile and restructuring businesses is a key economic driver and potentially a source of competitive advantages to communities”.

3.4.15 The report claims that Ayrshire does have some highly competitive strategic sites but that it is generally less competitive at attracting investment.

**Earnings**

- earnings in Ayrshire are relatively low - average weekly earnings in 2004 (workplace) are 85% of the UK average, less than Scotland as a whole where wages are 92% of the UK average

3.4.16 Low wages are important because the consumption element of demand is largely determined by disposable income. If demand is constrained by low wages, there is likely to be a knock-on effect in terms of GDP and employment.
3.4.17 The average weekly full time wage in Ayrshire in 2002 was £405, which is 95% of the Scottish average and 87% of the UK average. While Ayrshire’s wage levels have increased in recent years, they have increased at a rate slower than the Scottish and UK averages. Average wages rose by an estimated 11% in Ayrshire from 1999-2002 compared with Scottish and British averages of 15% and 16% respectively.

3.4.18 There is also an extremely significant gender gap in Ayrshire with women’s wages being much lower than men’s. This likely reflects the dated industrial structure. Wages for different types of roles largely mirror the national average, but the wage that managers and senior officials are paid is significantly lower than Scottish and British averages. There is also an issue with a ‘masculine’ work culture remaining in pockets of Ayrshire.

3.4.19 In terms of local variation, North Ayrshire has the lowest wage rate of the 3 areas, followed by East and South Ayrshire.

3.4.20 Economic theory suggests that improved connectivity will reduce wage disparities by making higher paid jobs more accessible. However, this can also work the opposite way if improved connectivity reduces the wage rate of a job due to competition from a low wage firm that previously posed little threat.

**Employment Forecasts**

3.4.21 Figure 3.4 below shows the forecasts of employment for the period 2004-2010, across the 3 council areas. For comparison, the actual change between 1994 and 2004 is also shown.

![Ayrshire Employment by Sector](image)

**Figure 3.4 Employment forecasts, Ayrshire 2004-2010**

3.4.22 The main points of note in Figure 3.4 are

- taken together, overall employment is forecast to drop by a further 800
- there will be continued decline in manufacturing, although that which remains should be ‘higher value’ such as aerospace and whisky
growth in public and other services will be much less than has been the case
previous growth in the retail / catering sector will turn into a small decline
the reduction in financial and business services is forecast to reverse

3.4.23 Note that the working age population in Ayrshire is forecast to decline by 7% (15,500) between 2003 and 2013, a big drop compared to projections for Scotland at -3% and the UK, where working age population is forecast to grow.

3.4.24 Importantly however, Ayrshire has a relatively poor level of job creation compared to other areas, although this is offset slightly by its declining population. In terms of labour force gender statistics, Ayrshire is slightly unusual in that female workers outnumber male workers. However, this picture is reversed for ‘residents’, which suggests that men make up the majority of out commuters as well as dominating jobs in the primary sector. Full time job creation and attainment is poor relative to Scotland and Britain although part time job creation is better.

**Business base**

- Ayrshire has relatively few VAT registered enterprises with the total stock of 7,900 in 2004
- the number of businesses per head of population is lower than the Scottish and UK rates
- over 95% of workers are employed in small firms (1-49 employees)

**Economic Performance**

3.4.25 One area where Ayrshire has traditionally performed well has been in its export performance. Indeed, Ayrshire generated exports and wealth in a far greater proportion to its size. Indeed, the AEF states that ‘Ayrshire still exports more per head than the Scottish average in 4 out of 5 of Scotland’s top manufactured exports categories’, in 2000. Ayrshire’s exports actually grew 22% between 1984 and 2000. This performance becomes all the more impressive when considering the fact that many of the area’s traditional export orientated industries were in decline.

3.4.26 By 2002, SLIMS report that Ayrshire’s share of Scotland’s exports was 8%, a lower share than in the past, but still a higher rate per person than average. The value of exports being developed from Ayrshire has recently reduced as a result of a downturn in the electronics sector.

3.4.27 Ayrshire’s recent GDP performance has been poor relative to the rest of Scotland. Given that GDP per capita is the principal measure of the standard of living, poor GDP performance suggests that quality of life in Ayrshire is lower than that of Scotland in general.

3.4.28 The AEF reported that the GDP per capita of Ayrshire is 3/4 that of Scotland and has been declining in recent years (1998 figures). More recent figures from SLIMS suggest that Gross Value Added\(^3\) (GVA) per head in Ayrshire is only 74% of the UK figure (2002). GVA per head is much worse in East and North Ayrshire (66% of UK figure) compared to South Ayrshire (93%).

\(^3\) GVA is the same as GDP with taxes and subsidies removed.
3.4.29 Other key measures of economic performance are

- business productivity – in 2002, Ayrshire’s business productivity was 10% higher than the Scottish rate in the production sector, but 15% below the Scottish rate in the service sector
- business investment – again in 2002, the data suggests that business investment has been higher than the rest of Scotland in the production sector and but significantly lower (25%) in the service sector

3.4.30 In summary, GDP equals productivity plus hours worked plus exogenous technical progress. Ayrshire has relatively poor productivity and poor employment therefore underperforms in terms of GDP.

New firm foundation

3.4.31 AEF states that Ayrshire currently and historically has a poor level of New Firm Formation (NFF) relative to the rest of the UK. The report indicates that the rate of business start-up for every 1,000 of the population has been only 3/4 of the Scottish rate over the past 5 years. Indeed, the North Ayrshire LTS argues that take-up on its available industrial sites has been poor. However, it must be noted that the level of NFF is relatively inconsequential – the important issue is the survival rate (Births (by VAT registrations) – Deaths (by VAT de-registrations)). The survival rates for Ayrshire, Scotland and the UK are shown in Table 3.2 below.
### Table 3.2 New Firm Survival Rates in Ayrshire, Scotland and the UK

<table>
<thead>
<tr>
<th></th>
<th>VAT Registrations per 10,000 Population</th>
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<tbody>
<tr>
<td>Ayrshire</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Scotland</td>
<td>24</td>
<td>23</td>
<td>22</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Great Britain</td>
<td>31</td>
<td>32</td>
<td>30</td>
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<table>
<thead>
<tr>
<th></th>
<th>VAT Deregistrations per 10,000 Population</th>
<th></th>
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<td>Great Britain</td>
<td>28</td>
<td>27</td>
<td>29</td>
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</table>

<table>
<thead>
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<th></th>
<th>Business Survival Rates per 10,000 Population (VAT Registrations - VAT Deregistrations)</th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
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<td>Ayrshire</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Scotland</td>
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<tr>
<td>Great Britain</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

3.4.32 Table 3.2 indicates that the ‘survival rate’ of new firms in Ayrshire is broadly comparable with that of Scotland although it does somewhat lag the GB rate. What becomes clear from the data is that while Ayrshire has a poor NFF rate, it also has a relatively low death rate. South Ayrshire performs best in terms of business survival.

**Skills Deficiencies**

3.4.33 Ayrshire’s level of schooling, qualifications and skills are broadly similar to the national average but it does have one key deficiency in terms of on-the-job-skills. That is, some Ayrshire employers found it difficult to fill professional and technical occupations. This is not to say that Ayrshire workers are unskilled but that in many areas, there is a mismatching of skills. In particular it is reported that ‘soft’ skills, eg written and verbal communication can be a problem.

3.4.34 The Scottish Employers Skills Survey 2004 provides some recent data on skills issues in Ayrshire. The number of vacancies found in the survey were in line with national figures. Some 900 vacancies were reported as ‘hard to fill’. For these vacancies, 54% of employees stated that ‘applicants not of sufficient quality’ as the reason for this. On the whole however, skills shortages are not seen as the most important issue facing businesses in Ayrshire.
Seepage to Glasgow

3.4.35 It is widely acknowledged that Ayrshire has a largely self-contained labour market. Despite this, the development of Ayrshire will always be influenced to a large extent by Glasgow. As such, Ayrshire has an excellent opportunity or is under the constant threat (depending on one’s opinion of ‘City-Regions’) of a seepage of its more skilled and able workers to Glasgow.

Potential for Growth

3.4.36 The various Ayrshire agencies have identified the major opportunities for growth as Glasgow Prestwick International Airport (GPIA) and Hunterston deep water port. In addition, it has a number of highly successful businesses with many skilled workers and has produced brand leaders in whisky production, aerospace, pharmaceuticals, engineering, textiles and carpets.

3.4.37 As mentioned above, Ayrshire benefits from having a picturesque landscape (at least in parts) which is attractive both to live in and for tourists. The stretches of scenic coastline and areas of unspoiled countryside coupled with a good endowment of natural resources makes the landscape one of Ayrshire’s biggest assets.

3.4.38 Ayrshire also has a strong tourist trade (both for Scottish people and foreign visitors). In addition, the location of Ayrshire provides urban areas in pleasant, coastal locations providing an attractive environment in which to live. It has the opportunity to become increasingly integrated with the economies of the major urban centres of Scotland through the City-Region concept. These areas offer a high quality environment that is relatively free from congestion.

3.4.39 In terms of resources, Ayrshire has access to good agricultural land, fishable waters, coal and mineral deposits, timber and renewable energy.

3.5 Investment

3.5.1 A particular problem which has been identified in Ayrshire is a lack of new (private sector) investment, or companies setting up new operations in Ayrshire, when compared to other previously declining industrial areas such as Lanarkshire. Although we do not have a set of figures to support this, the view of Scottish Enterprise Ayrshire was that a significant factor in explaining this is the relatively low stock of quality business accommodation in Ayrshire, compared with other locations.

3.5.2 Parts of Lanarkshire benefited from ‘Enterprise Zone’ status between 1993 and 2003. During this time a large stock of business / industrial premises were constructed. There remains a large stock of available property to accommodate ‘footloose’ industries. There is a shortage of this type of property in Ayrshire.

3.5.3 The immediate availability of property, coupled with closer proximity to the main centres of population has meant that Lanarkshire has been far better placed to attract this type of investment than Ayrshire, despite higher property rental values.
3.5.4 Recently, there have however been signs of private sector interest in building this type of property (Class 4) in Ayrshire on a ‘speculative’ basis – this type of speculative, private sector development has not been seen in the past in Ayrshire. The M77 extension is credited by local stakeholders as being a major factor in attracting this type of investment.

3.5.5 Although levels of private investment have been low, there has however been significant public sector investment, with for example, Cumnock benefiting from the relocation of the Child Support Agency. Other Scottish Executive jobs may come to Ayrshire as part of the on-going ‘decentralisation’ policy of spreading Executive jobs around Scotland.

**Financial Incentives**

3.5.6 Under the current EU regulations, much of North and East Ayrshire has Assisted Area status. Assisted Areas are those areas of the UK where companies are eligible to apply for regional aid. Regional aid includes schemes such as Regional Selective Assistance (RSA). The Assisted Areas map was agreed with the European Commission in July 2000 and will operate until the end of 2006 – it is shown in Figure 3.5, below.

3.5.7 The European Commission's regional aid settlement for 2007 onwards will offer significantly reduced scope for RSA in Scotland. The revised map will cover a significantly smaller area of the country and aid limits will generally be lower than they are now.

3.5.8 The areas of Ayrshire highlighted in black in Figure 3.5 are currently eligible for regional aid and have an aid intensity level of 20%. This is the same as a large swathe of west-central Scotland, so Ayrshire has no ‘competitive advantage’ in this regard.
3.6 ‘National Planning Framework for Scotland’ (NPF)

The NPF and Ayrshire

3.6.1 The National Planning Framework is

‘a framework to guide the spatial development of Scotland to 2025. It sets out a vision of Scotland in which other plans and programmes can share and to which they can contribute. It is not an economic development strategy but complements the Executive’s ‘Framework for Economic Development in Scotland’, highlighting the importance of place and identifying priorities for investment in strategic infrastructure to enable each part of the country to play to its strengths in building a Scotland which is competitive, fair and sustainable’.

3.6.2 As well as addressing national issues in Scotland, such as community regeneration, the environment, transport and communications, the NPF also highlights 4 geographical areas for the application of a spatial perspective, of which one comprised Ayrshire and the South West.
3.6.3 Within this section of the NPF, it was identified that this geographical area played a vital role as the ‘western gateway’ to Scotland, and advanced the following strategies impacting on transport connectivity

- build on the success of Glasgow Prestwick International Airport (GPIA)
- realise the potential of deepwater port facilities at Hunterston
- strengthen links to Ireland
- improve links to the central belt to support the development of knowledge-based industries to replace declining traditional industries
- develop clusters of export orientated businesses
- identify the role of tourism in supporting the economy

3.6.4 In a section entitled ‘Making it Happen’, the NPF indicated that the delivery of these strategies would be achieved through a variety of initiatives, including ‘the review of strategic transport projects’.

3.7 Deprivation

3.7.1 A further key element of the economic context is the Scottish Index of Multiple Deprivation (SIMD). The SIMD 2004 set out to identify the most deprived areas across Scotland. It is based on 31 indicators in 6 individual ‘domains’, these being Current Income, Employment, Housing, Health, Education, Skills and Training and Geographic Access to Services and Telecommunications.

3.7.2 SIMD 2004 is calculated at the ‘data zone’ level (representing between 500 and 1,000 people in a fairly homogenous area), enabling small pockets of deprivation to be identified. The data zones are ranked from most deprived (1) to least deprived (6505) on the overall SIMD 2004 and on each of the individual domains. The result is a comprehensive picture of relative area deprivation across Scotland.

3.7.3 Importantly, SIMD is used in the allocation of the Community Regeneration Fund, a major new anti-poverty fund launched by the Scottish Executive in 2004. Two thirds of this £104m fund is being directed to the most deprived 15% of data zones identified by SIMD. In 2005/06, the allocations to North, East and South Ayrshire were £3.4m, £4.0m, and £1.8m respectively.

3.7.4 Figure 3.6 and Figure 3.7 below show the SIMD rankings for central Ayrshire and all Ayrshire respectively. It shows the national SIMD ranking, grouped into 5 roughly equal categories, ranging from red – most deprived, to dark green – least deprived. The figure also highlights those datazones amongst the 15% most deprived in Scotland, ie eligible for CRF. The key in each map relates to the SIMD rank, so green is least deprived.

3.7.5 There are a total of 147, 154 and 179 data zones in South, East and North Ayrshire respectively. Of these, 18% of data zones in East and North Ayrshire are in ‘CRF eligible’ category – only 9% of South Ayrshire zones fall into this category. This gives a clear indication of the distribution of deprivation in Ayrshire.

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3.7.6 Research undertaken by the Coalfields Communities Campaign\(^5\) has highlighted the deprivation in these communities. They found that 66% of the coalfield data zones have deprivation levels above the Scottish average. In addition, deprivation in the ‘remote’ Ayrshire coalfield is the most pronounced of the Scottish coalfield areas, and 55% of all coalfield data zones are within the top 30% for deprivation across Scotland.

3.7.7 The main areas picked out as CRF eligible in Figure 3.6 are concentrated in the 3 main towns of Ayr, Irvine, and Kilmarnock and the East Ayrshire former coalfield areas, ie Catrine, Auchinleck and the Cumnock area.

\(^{5}\) Deprivation in Scottish Coalfield Communities, Coalfield Communities Campaign
Figure 3.7 Ayrshire SIMD rankings and CRF areas

3.7.8 The map for the whole of Ayrshire in Figure 3.7 also highlights pockets of deprivation at Patna, New Cumnock, Muirkirk, Ardrossan / Saltcoats / Stevenston and Dalmellington / Bellsbank.
3.8 Summary

3.8.1 A brief resume of the economic context, which provides the rationale for the study is now given. The ‘Western Gateway’ document produced by the Ayrshire Economic Forum highlights the following points relating to the Ayrshire economy:

- it has not yet created a firm place for itself in the knowledge and enterprise economy of the 21st century, and is lagging behind Scotland in economic growth and employment creation
- exports are still higher per capita but have recently grown much more slowly than the rest of Scotland
- business services, post-telecoms & financial services are all under-represented in Ayrshire, textiles and other manufacturing are over represented
- employment levels have been going down in Ayrshire whilst increasing in Scotland in recent years
- office-based industries (private sector) are significantly under-represented
- fewer new business starts per capita than the rest of Scotland
- GDP per head is significantly lower than the rest of Scotland
- unemployment rates are consistently higher than the rest of Scotland, with localities suffering exceptionally high rates of unemployment
- significant skills gap exist in some areas

3.8.2 Since the ‘Western Gateway’ document was produced, progress has been made in some of these fields. However, as a strategic statement of the problems of Ayrshire, it remains a relevant list.

3.9 What can transport do for Ayrshire?

3.9.1 The main ways in which improved transport can assist in promoting regional economic development and regeneration can perhaps be summarised as:

- it can support key Structure Plan aims – mainly a housing led population stability strategy
- it can assist indigenous and developing industries by reducing transport constraints, costs and times, and improving reliability
- it can help challenge the perception of peripherality which can be a barrier to new investment in Ayrshire

3.9.2 It should also be borne in mind that there are many areas of policy in which transport only has a small role – improved transport links cannot be seen as a panacea for Ayrshire’s economic problems.
CHAPTER FOUR OVERVIEW OF TRANSPORT IN AYRSHIRE

4.1 Introduction

4.1.1 The Ayrshire Joint Structure Plan has defined a community hierarchy with the top 2 groups of settlements within Ayrshire being ‘Major Towns’, and ‘Service Centres’. These are shown in Table 4.1 below and form a basis for the overview of Ayrshire’s transport system found in the following sections.

Table 4.1 Towns of Ayrshire (AJSP)

<table>
<thead>
<tr>
<th>Major Towns</th>
<th>Service Centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayr, Kilmarnock, Irvine</td>
<td>Girvan, Prestwick, Troon, Maybole, Stewarton, Auchinleck, Cumnock, Galston, Dalmellington, Largs, Kilwinning, Kilbirnie, Ardrossan, Saltcoats, Brodick</td>
</tr>
</tbody>
</table>

4.1.2 The main settlements, roads and railway lines were illustrated previously in Figure 3.1.

4.2 The Railway Network

Passenger Services

4.2.1 Ayrshire’s passenger railway network consists of 5 different routes connected to Glasgow on two lines, and a cross country route which runs to Dumfries and the north of England. These are

- Glasgow Central – Largs
- Glasgow Central – Ardrossan Harbour
- Glasgow Central – Ayr
- Glasgow Central – Stranraer
- Glasgow Central – Carlisle
- Stranraer - Carlisle and Newcastle (via Ayr & Kilmarnock)

4.2.2 The first 4 routes link north, central and south western Ayrshire with Glasgow and Scotland’s largest town, Paisley. The fifth route provides eastern Ayrshire (Kilmarnock and surrounding areas) with services to Glasgow and Carlisle. The final route links Ayrshire with the north of England. These routes will now be considered in turn, with a schematic diagram and map of the network shown in Figure 4.1 and Figure 4.2 below.
4.2.3 **Glasgow Central – Kilwinning – Saltcoats – Ardrossan South Beach - Largs**: The Glasgow Central to Largs route is an hourly service (half hourly in the peak hours) that runs via Paisley Gilmour Street. This route links north western Ayrshire with the central belt and also provides stations at several locations popular for day trippers, such as Saltcoats and Largs itself. This line splits from the Ardrossan Harbour line at Ardrossan South Beach and it is around ten miles of single track from there to Largs, with stops at West Kilbride and Fairlie (which is next to Hunterston Power Station). It is an important line because it links freight from the deepwater port at Hunterston into the wider railway network. In addition, it provides an interchange facility with the Caledonian MacBrayne ferry services to the island of Cumbrae.

4.2.4 **Glasgow Central – Kilwinning – Saltcoats – Ardrossan Harbour**: As mentioned, this line splits from the Largs line at Ardrossan South Beach and continues on around one mile to Ardrossan Harbour via Ardrossan Town. The service from Glasgow Central to Ardrossan and Largs is hourly with a roughly 2 hourly service to Ardrossan Harbour to link with the Arran ferry to Brodick.

4.2.5 **Glasgow Central – Kilwinning – Irvine – Troon – Prestwick - Ayr**: This is the principal service between Glasgow and Ayrshire and is the second busiest commuter route in Scotland. This train runs on a half hourly basis (more frequent in the peak hours) via Paisley and is a limited stop service. It connects the central belt with port facilities at Ayr / Troon and the various tourist attractions in central Ayrshire (eg the golf courses at Troon and Prestwick). In addition, the line has a stop at GPIA, which plays an important role in the local economy.
4.2.6  **Glasgow Central – Kilwinning / Kilmarnock – Ayr - Maybole – Girvan - Stranraer**: This infrequent service is usually an express with the principal stops in Ayrshire being Kilwinning and Ayr itself. The last stop on the line which is within Ayrshire is Barhill. In terms of accessibility, this line links the more outlying areas of Maybole and Girvan. In addition, it provides a direct route to Stranraer / Cairnryan (which is in Dumfries and Galloway), thus allowing access to hovercraft and ferry services to Larne and Belfast respectively. This railway line has been identified as a crucial component of the Trans-European Network.

4.2.7  **Glasgow Central – Stewarton - Kilmarnock – Auchinleck – New Cumnock - Carlisle**: This route links eastern Ayrshire with Glasgow and the north of England. In particular, it integrates Kilmarnock into the national rail network providing access to the West and East Coast Mainlines via Glasgow and Carlisle. In addition, it provides crucial transport links for depressed and outlying areas such as Auchinleck and is also the main link between Ayrshire and Dumfries.

4.2.8  **Stranraer – Girvan – Maybole – Ayr – Prestwick – Troon - Kilmarnock, Auchinleck – New Cumnock - Carlisle and Newcastle**: This circuitous route incorporates many of the key stations in Ayrshire, including Girvan, Ayr, Troon, Kilmarnock and the ex-mining village of Auchinleck. It provides vital access to the West Coast Mainline at Carlisle and its East Coast counterpart at Newcastle but the service is infrequent.
4.2.9 From the above, it can be seen that of the 3 main towns, Irvine and Ayr have a much better service than Kilmarnock, relying in the main on hourly longer distance services to Carlisle. This translates into a much poorer level of service at Kilmarnock, with only 2 trains to Glasgow in the 0700-0900 period. In contrast, Ayr and Irvine have 8 trains to Glasgow during this period, and Kilwinning (where the Largs / Ardrossan services join the line) has 11 trains during this key commuting period.

4.2.10 Note that of the ‘Service Centres’ identified in the AJSP, the following towns do not have railway stations: Kilbirnie, Galston, Dalmellington, and of course Brodick. The nearest stations for each are: Kilbirnie (Glengarnock), Brodick (Ardrossan Harbour), Galston (Kilmarnock) and Dalmellington (Ayr / Maybole / New Cumnock).

Freight Movements

4.2.11 There is also a great deal of freight traffic emanating from and travelling to the Ayrshire rail network. The principal freight terminals are Hunterston, the port of Ayr and the opencast coal mines at Knockshinnoch, Killoch and Greenburn. There are other freight facilities at Dalry, Irvine and New Cumnock with a further outlet planned at Powharnal. The principal freight transported is coal but there is the potential for a great deal of container traffic should a container facility be approved and constructed at Hunterston.

4.2.12 Freight traffic from Ayrshire generally travels to England or Longannet power station in eastern Scotland. In terms of freight routed to England, the principal destinations are to be in Yorkshire, Northumbria, Cumbria and Staffordshire, most notably power stations such as at Drax in Yorkshire.

4.2.13 Unfortunately, the configuration of the junctions for some of these freight halts has a detrimental impact on the routing and capacity in the area. The freight branch at Knockshinnoch faces north and the Killoch branch faces west meaning that trains are forced back into the Ayrshire network while they embark on unnecessary round trips. This further reduces capacity in the area and increases the cost of coal haulage. The effect of the junction configurations on freight movements are shown in Figure 4.3 below.
4.2.14 In addition, limited capacity in the area bounded by Kilmarnock, Barassie, Newton on Ayr and Mauchline prevents freight taking a direct routing. Furthermore, freight routing is of a very *ad hoc* nature and can often even be decided only on the day of travel.

4.2.15 The line via Dumfries is the preferred route to England but capacity constraints often means that rail freight must be rerouted via the East Coast Mainline.

4.3 The Bus Network

4.3.1 Ayrshire’s bus network is reflective of many other areas of the UK – it has a dominant operator and several smaller firms serving a number of routes. The bulk of the market in Ayrshire is controlled by Stagecoach who provide both intra-Ayrshire services and services to other local authorities. They are complemented by smaller firms like McGills, who provide services from Greenock (in Inverclyde) to Ayr via the Clyde Coast.

4.3.2 The bus network in Ayrshire provides important direct links throughout Ayrshire. For example, to go from Largs to Ayr by train, a person must get the train to Kilwinning and change trains. The bus services also provide crucial inter-region links.

4.3.3 The buses are also crucial for linking Ayrshire to ferry services in Inverclyde and Dumfries and Galloway. These include the 2 Gourock – Dunoon ferries, the Wemyss Bay – Rothesay service, the Gourock – Kilcreggan – Helensburgh service and Cairnryan and Stranraer - Northern Ireland services.

4.3.4 Stagecoach also provides express bus services to Glasgow.
4.4 The Ferry Network

4.4.1 The authority of the Ayrshire Councils extends over the islands of Cumbrae and Arran, with their principal towns of Millport and Brodick. Clearly, good accessibility for these areas is crucial given that the island communities have extremely small internal economies. As such, the ferry services run by Caledonian MacBrayne to each area are crucial to their prosperity.

4.4.2 Largs – Cumbrae: This is a fifteen minute shuttle service across the Cumbrae Slip (30 minutes in winter). During high season, the route is manned by 2 ferries which carry both cars and pedestrians. The service is absolutely vital to the island’s main community, Millport. It is relied upon to provide locals with an outlet to the mainland for work purposes while it is also crucial in bringing tourists to the island.

4.4.3 Ardrossan – Brodick: There is a relatively frequent car and pedestrian service between Ardrossan on the mainland and Brodick on the Isle of Arran. There are 6 ferries per day on summer Fridays, 5 per day Monday-Thursday. As with the Cumbrae ferry, this link is crucial for tourism and the people of the island.

4.4.4 Troon – Larne: P&O Ferries operate a car and passenger service between Troon in central Ayrshire and Larne on the outskirts of Belfast. This provides an important link between Scotland and Northern Ireland.

4.5 The Road Network

4.5.1 This section provides an outline of the principal roads in Ayrshire, the main routes are shown in Figure 4.4 below.

Main Routes

4.5.2 A77/M77: This road runs from Glasgow to Stranraer via Ayr and the coast. The road is now of motorway standard from Glasgow to Fenwick, just north of Kilmarnock. Importantly, it provides the port of Stranraer with access to the central belt.

4.5.3 The section of the A77 which has now been upgraded to motorway was particularly dangerous – it was dual carriageway most of the way but there was often no central reservation and the road was not lit. The remaining dual carriageway sections have recently benefited from a set of the most modern speed cameras (measuring average speed between 2 points rather than ‘spot’ speeds) which have significantly improved safety, but are not necessarily popular with the public. This road has been identified as a crucial part of the Trans-European Network.

4.5.4 The A77 at the Ayr bypass and to the south of this is exclusively single carriageway and runs through the towns of Maybole and Girvan. A Route Action Plan Report for the A77 was completed in 1997, and a range of relatively small scale improvements are currently programmed or under construction, eg a new overtaking lane at Turnberry.
4.5.5 There have been a total of 266 personal injury accidents (PIAs) on the A77 in South Ayrshire between 2000 and 2004, of which 14 were fatal. This equates to around 5 personal injury accidents per mile over this period, or one per mile per year.

4.5.6 **A737**: The A737 links Glasgow, Glasgow Airport and Paisley with Kilwinning. It is a single carriageway road that offers access to a number of small towns and villages in North Ayrshire. There is a bypass at Beith.

4.5.7 The 10-mile North Ayrshire stretch of the A737 between approximately Kilwinning and Beith had a total of 55 PIAs between 2003 and 2006, none of which were fatal. This is a rate of around 1.4 PIA per mile per year.

Figure 4.4 Ayrshire principal road network
4.5.8 **A78**: The A78 runs from Greenock to Ayr via the Clyde coast, taking in both major Ayrshire towns and smaller resort towns. It incorporates the recently opened ‘3 Towns’ bypass of Stevenston, Saltcoats and Ardrossan, and is of dual carriageway standard between the new section and its terminus at Prestwick.

4.5.9 **A71**: The A71 runs east-west directly from Irvine / Kilmarnock to Edinburgh via South Lanarkshire and West Lothian. This road also provides one of the main access routes to the M74 (Junction 8 – restricted access), thus helping to link Ayrshire with England. It is a single carriageway (of varying standard) except for the stretch between Irvine and Kilmarnock, and does not benefit from any bypasses, running through Newmains, Darvel, Strathaven and Stonehouse en route to the M74. The distance between the A77 and the M74 via the A71 is 26 miles.

4.5.10 **A70**: The A70 runs between Ayr and the M74 (Junction 12 - access to M74 for southbound traffic only) passing through Cumnock and many small towns and opencast mining areas. As such, it is considered as a crucial road for Ayrshire’s links to the south. Again, this road is single carriageway, and is of particularly poor standard east of Muirkirk. The distance between the A77 and the M74 via the A70 is 37 miles.

4.5.11 There have been a total of 167 injury accidents on the A70 in South and East Ayrshire between 2000 and 2004, of which 6 were fatal. This equates to around 6 personal injury accidents per mile over the five-year period, or just over one per mile per year.

4.5.12 **A76**: The A76 runs from the south of Kilmarnock to Dumfries. This is an important link between Ayrshire and Dumfries and Galloway. In addition, it provides access to the M74 via the A701, A709 and A75. Again this route is single carriageway along its length although it has benefited from a number of upgrades / junction improvements via a Scottish Executive Route Action Plan, the study for which was completed in 1996. Only one of the 6 planned overtaking schemes has been implemented however and a new group, ‘The A76 Partnership’ has been formed to press for the construction of these schemes. The distance between Ayr and the M74 via the A76 and A75 is around 95 miles.

4.5.13 The case for improving the A76 (particularly in Dumfries and Galloway) was debated in the Scottish Parliament on 7 December 2005, following recent fatal accidents on the route.

4.5.14 The characteristics of the above A Roads, together with the other A roads in Ayrshire are summarised in Table 4.2 below.
Table 4.2 Road network in Ayrshire

<table>
<thead>
<tr>
<th>Road</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M77</td>
<td>Motorway between the M8 and Fenwick.</td>
</tr>
<tr>
<td>A77</td>
<td>Trunk Dual Carriageway between Fenwick and Ayr and Single Carriageway between Ayr and Stranraer, the transition being at Whittlets roundabout.</td>
</tr>
<tr>
<td>A78</td>
<td>Trunk Coastal route linking Greenock and Prestwick. Mainly Single Carriageway between Greenock and Stevenston and Dual Carriageway thereafter.</td>
</tr>
<tr>
<td>A71</td>
<td>Irvine to the M74 (and further afield to Edinburgh). Trunk Dual Carriageway between Irvine and Kilmarnock and Single Carriageway thereafter.</td>
</tr>
<tr>
<td>A76</td>
<td>Trunk Single Carriageway between Kilmarnock and Dumfries.</td>
</tr>
<tr>
<td>A70</td>
<td>Non-trunk Single Carriageway between Cumnock and the M74 (and further afield to Edinburgh).</td>
</tr>
<tr>
<td>A79</td>
<td>Non-Trunk Single Carriageway between Prestwick and south east Ayr.</td>
</tr>
<tr>
<td>A737</td>
<td>Trunk Single Carriageway between the M8 and Kilwinning.</td>
</tr>
<tr>
<td>A760</td>
<td>Non-Trunk Single Carriageway linking Largs/Fairlie to the A737.</td>
</tr>
<tr>
<td>A736</td>
<td>Non-Trunk Single Carriageway linking Irvine with Paisley.</td>
</tr>
<tr>
<td>A735</td>
<td>Non-Trunk Single Carriageway linking Kilmarnock with the A736.</td>
</tr>
<tr>
<td>A713</td>
<td>Non Trunk Single Carriageway linking Ayr with Castle Douglas via Dalmellington.</td>
</tr>
<tr>
<td>A719</td>
<td>Non-Trunk Single Carriageway linking the M77 at Fenwick and the A77 at Ayr via Galston.</td>
</tr>
<tr>
<td>A738</td>
<td>Non Trunk Single Carriageway linking Ardrossan and Kilwinning.</td>
</tr>
<tr>
<td>A759</td>
<td>Non Trunk Single Carriageway linking Kilmarnock and Troon.</td>
</tr>
<tr>
<td>B Roads</td>
<td>A whole series of Non-Trunk Single Carriageway roads across Ayrshire.</td>
</tr>
<tr>
<td>3-TownsBypass</td>
<td>A recently constructed bypass around Ardrossan, Saltcoats and Stevenston.</td>
</tr>
</tbody>
</table>

4.5.15 It should be noted that many sections of the primary single carriageway A-Road network in Ayrshire have signs reinforcing the statutory 40 mph for HGVs (7.5 tonnes and over). The 40mph is generally exceeded by around 75% of articulated lorries\(^6\), and convoys of trucks travelling at 40 mph do create problems of platooning of cars leading to driver frustration.

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\(^6\) Vehicle Speeds in Great Britain (DfT)
4.5.16 It can be concluded from the above that connectivity between the 3 main towns of Ayrshire is actually of a fairly high standard, with modern dual carriageways linking Kilmarnock, Irvine and Ayr. The junctions between these routes are of a good standard, with some grade separation and high-capacity roundabouts.

4.6 Glasgow Prestwick International Airport

4.6.1 Having been part of the BAA portfolio at privatisation in 1987, Glasgow Prestwick International Airport (GPIA) had fallen into a state of disrepair in the early 1990s and was earmarked for closure. BAA sold GPIA in 1992 at around the time when trans-Atlantic flights were switched to Glasgow Airport, and passenger numbers were very low indeed. However, the dawn of low cost airlines (particularly Ryanair\(^7\) who arrived in 1994) and an increasing volume of freight traffic have restored GPIA to an important role in the local and national economy. Passenger numbers are now around 2.4 million passengers per annum (mppa), compared to approximately 9 mppa at each of Glasgow and Edinburgh Airports (2005 figures). The airport plays a crucial role meeting the requirements of the Scottish oil and electronics industries and is vital for freight in general. It was connected to the Glasgow Central – Ayr railway line with the opening of a station in the mid-1990s. The facilities at this station remain fairly basic, but train accounts for around 25% of passengers accessing GPIA.

4.6.2 GPIA now accounts for 60% of Scottish air freight (at around 35,000 tonnes per year), and in addition is now home to the ‘Prestwick International Aerospace Park’, where a ‘cluster’ of aerospace related businesses is being encouraged / developed. Freight traffic has dipped in the last 2-3 years however, due to a downturn in the electronics industry. GPIA now markets itself as Scotland’s fastest growing airport. The White Paper ‘The Future of Air Transport’, published in 2003 suggested that passenger numbers would grow to 6 mppa by 2030, with freight seeing a 5 fold growth to around 200,000 tonnes over the same period.

4.6.3 In terms of local employment, GPIA employs around 500 staff directly and 3,500 jobs are indirectly related to the airport. Again, by means of comparison, Edinburgh Airport employs around 2,200 people directly with a further 7,000 indirectly employed. This illustrates the scale of new jobs which could come with increased passenger numbers at GPIA. Indeed, GPIA received a significant boost in early 2006, with the announcement of a new contract with National Air Traffic Services. This is anticipated to create 700 highly paid positions.

4.6.4 It is likely that there will be increasing pressure on ‘low cost’ flight operators over the coming years regarding the environmental consequences of the growth in air travel. This must be considered a medium term threat to the future of GPIA.

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4.7 Hunterston

4.7.1 Hunterston, by Fairlie on the north-west Ayrshire coast, is seen as a key ‘gateway’ and opportunity for Ayrshire. Its owners, Clydeport describe the facility on their website (http://www.clydeport.co.uk) as follows:

“Located in Fairlie, near Largs on the Ayrshire coast, Hunterston bulk terminal deepwater port is the UK’s foremost facility for coal imports and ideally located for the UK, Irish and European markets. Hunterston has one of the deepest sea entrance channels in northern Europe, which can accommodate the largest cape size vessels afloat. Discharging rates are the fastest in the UK, ensuring efficient and cost effective movement of materials. In addition to the existing bulk terminal, Clydeport, North Ayrshire Council and Scottish Enterprise also propose a £200m international deep-water container terminal at Hunterston which would effectively act as a worldwide gateway port, and possibly become the major container port for the northern half of the UK. Initial environmental and economic impact studies are currently being undertaken.”

4.7.2 At present, the facility is used primarily for the importation of large volumes of coal. This coal is loaded onto trains and taken mainly to Longannet Power Station and the English markets.

4.7.3 The developers at Hunterston will be submitting a planning application during 2006. Significant investment (around £300m for Phase 1) will only follow if planning consent is obtained, although all local stakeholders are backing the application.

4.7.4 The future development of Hunterston will have significant effects on the transport networks of Ayrshire.

4.8 Recent Developments

4.8.1 Ayrshire has benefited from some major developments in the highway network in recent years. The M77 has been extended to Fenwick and the A78 3-Towns bypass has been constructed, taking traffic out of Stevenston, Saltcoats and Ardrossan, and improving road links to north-west Ayrshire, including the Hunterston site. The reduced journey time to Glasgow brought about by the M77 extension is reportedly having a very positive effect in the East Ayrshire area, and is being credited with boosting house prices8 and encouraging significant residential developer interest in sites in and around Kilmarnock and beyond. Scottish Enterprise reported that 32% of those moving into the new housing developments around Kilmarnock had moved from Glasgow postcodes, indicating a significant injection of new population into the area, attracted by relatively low property prices and good road accessibility.

8 It is too early to see evidence of this in published house price statistics.
4.8.2 The other significant development is the opening of the Glasgow Southern Orbital (GSO) which links the M77 with the A726 at East Kilbride. The A726 then links to the M74 and the M8 via the A725. This provides a continuous dual carriageway route between the M77 and the M74 / M8, providing a route to central and east central Scotland which avoids the M8 through Glasgow and the Kingston Bridge. However, the A726 / A725 is also a congested route with frequent junctions and will suffer from journey time reliability issues. Our own experience suggests that if travelling from Kilmarnock to the M74, the off-peak journey time is similar whether using the M77 – GSO – A725 – M74 (J8) or the A71. In the peak hour, the A71 is likely to still provide the faster journey times. Thus the GSO cannot be seen as a complete resolution of the ‘Ayrshire to M74’ problem.

4.9 Count Data and trends

4.9.1 A large volume of traffic count data was collected for use in the development of Transport Model for Scotland (TMfS). The relevant data for Ayrshire is shown below in Table 4.3 to give an idea of traffic flows in the area. A number of other count sites from throughout Scotland have been included to place the Ayrshire flows in a national context.

Table 4.3 Traffic count data in Ayrshire

<table>
<thead>
<tr>
<th>Count Location</th>
<th>Daily Traffic (AADT)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Ayrshire</strong></td>
<td></td>
</tr>
<tr>
<td>A78 Ardrossan-West Kilbride</td>
<td>11,250</td>
</tr>
<tr>
<td>A78 Irvine-Ayr</td>
<td>17,250</td>
</tr>
<tr>
<td>A78 Irvine A737-A71</td>
<td>19,750</td>
</tr>
<tr>
<td>A737 Kilwinning - Dalry</td>
<td>8,750</td>
</tr>
<tr>
<td>A737 north of Beith</td>
<td>9,500</td>
</tr>
<tr>
<td><strong>East Ayrshire</strong></td>
<td></td>
</tr>
<tr>
<td>A77 B764-A719, north of Fenwick (pre M77)</td>
<td>43,000</td>
</tr>
<tr>
<td>A77 North of B7038 (south Kilmarnock)</td>
<td>40,250</td>
</tr>
<tr>
<td>A77 North of A71 junction</td>
<td>32,750</td>
</tr>
<tr>
<td>A76 B7073-A719 (south east Kilmarnock)</td>
<td>12,450</td>
</tr>
<tr>
<td>A76 North of Mauchline</td>
<td>11,250</td>
</tr>
<tr>
<td>A76 North of New Cumnock</td>
<td>7,500</td>
</tr>
<tr>
<td>A70 Colyton (east of Ayr)</td>
<td>11,250</td>
</tr>
<tr>
<td><strong>South Ayrshire</strong></td>
<td></td>
</tr>
<tr>
<td>A77 South of Ballantrae</td>
<td>4,000</td>
</tr>
<tr>
<td>A77 South of Turnberry</td>
<td>8,750</td>
</tr>
<tr>
<td>A77 North of Turnberry</td>
<td>6,600</td>
</tr>
<tr>
<td>Count Location</td>
<td>Daily Traffic (AADT)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>A77 Minishant (Ayr-Maybole)</td>
<td>11,550</td>
</tr>
<tr>
<td>A78 North of A79 (Troon-Prestwick)</td>
<td>26,000</td>
</tr>
<tr>
<td>A78 West of A77</td>
<td>23,250</td>
</tr>
<tr>
<td>A77 North of A78 (Ayr-Kilmarnock)</td>
<td>34,500</td>
</tr>
<tr>
<td><strong>Further Scottish Context</strong></td>
<td></td>
</tr>
<tr>
<td>A75 Gretna-Dumfries</td>
<td>10,500</td>
</tr>
<tr>
<td>M9 Linlithgow</td>
<td>25,750</td>
</tr>
<tr>
<td>A720 Edinburgh City Bypass</td>
<td>73,250</td>
</tr>
<tr>
<td>A68 Jedburgh</td>
<td>6,500</td>
</tr>
<tr>
<td>A1 Border to Dunbar</td>
<td>7,250</td>
</tr>
<tr>
<td>A9 Blackford</td>
<td>26,500</td>
</tr>
<tr>
<td>A90 Stonehaven</td>
<td>21,500</td>
</tr>
<tr>
<td>A96 Elgin</td>
<td>9,750</td>
</tr>
</tbody>
</table>

* Source: Scottish Transport Statistics No.22 2003

4.9.2 Further data regarding strategic traffic on the A70, A71, A76 and A77 is provided in the Local Transport Strategy documents produced by East and South Ayrshire councils. For the A70, flows drop to around 3,500 vehicles per day at Muirkirk (the East Ayrshire / South Lanarkshire border). Similarly A71 flows drop to around 5,000 east of the Irvine Valley settlements. On the A76, traffic levels at the Dumfries and Galloway border are only 3,500 vehicles per day. The A77 sees flows of around 6,500 per day at its border with Dumfries and Galloway. What these figures demonstrate is that there is a substantial drop in traffic on these routes as you move away from the Ayrshire settlements, ie strategic traffic is a low proportion of the total traffic on these corridors. No flow data is available for the A78 ‘3 Towns’ bypass.

4.9.3 Further context is provided by the Scottish Executive’s published estimates of traffic levels by local authority area. Traffic growth for all the Scottish Local Authorities between 1994 and 2004 is shown in Figure 4.5 below.

4.9.4 It can be seen in Figure 4.2 that traffic growth (vehicle kilometres) in East and South Ayrshire has been amongst the highest in Scotland. North Ayrshire has seen a comparably small amount of growth at around 13%.

4.9.5 Note also that South Ayrshire has a substantially higher rate of car ownership at around 410 cars per 1,000 population. The values in East and North Ayrshire are around 360 and 350 respectively. Aberdeenshire has the highest rate of car ownership in Scotland at 475 cars per 1,000 population.

4.9.6 There is therefore considerable scope for growth in car ownership in Ayrshire. This has implications for future mobility and travel behaviour in Ayrshire.
Figure 4.5 Traffic growth by Scottish LA area
CHAPTER FIVE  CONNECTIVITY – TRAVEL TIMES

5.1  Introduction

5.1.1 This chapter reports an ‘inventory’ of travel times within Ayrshire and between Ayrshire and other parts of Scotland and England. The inventory considered travel times from each of the towns identified in the AJSP (Major Towns and service centres), reported in Table 4.1.

5.1.2 For travel within Ayrshire, travel times from each of these towns to the following destinations were found: Ayr, Irvine, Kilmarnock, Fairlie (for Hunterston), GPIA, and Troon. For travel to destinations outwith Ayrshire, the following destinations were considered: Stranraer, Greenock, M6 - Carlisle, Edinburgh, Glasgow and Aberdeen.

5.1.3 For car travel, data was obtained from the RAC ‘Routeplanner’ website (http://rp.rac.co.uk/routeplanner). These travel times may not necessarily reflect congested travel times, but are at least produced using a common set of assumptions. For rail travel, average weekday travel times were estimated for a journey starting at 1400 in each case. Again, these may not perfectly reflect the fastest journey times but do give a meaningful method for comparison.

5.2  Road inventory

Intra-Ayrshire Issues

5.2.1 The road inventory has given rise to a number of key issues that could be addressed by future transport policy – see Table 5.1 and Table 5.2 at the end of this section. The equivalent travel distances are shown for reference in Table 5.3 and Table 5.4.

5.2.2 Connectivity within central Ayrshire appears to be relatively good between the Major Towns identified by the AJSP, as discussed above. The key road is the A77 but this is supplemented by the A78 and A71. These roads link Ayr, Irvine and Kilmarnock and are of dual carriageway standard between each of these towns – travel times between the 3 towns are less than 30 minutes in each case. The area is also well served by a number of high quality A-roads such as the A79.

5.2.3 There are, however, issues of peripherality for some of the service centres, although these do not appear to be particularly bad. Most notably, the A77 south of Ayr is only single carriageway and often passes through town centres, thus adding to journey times. Maybole, and more particularly Girvan and Dalmellington suffer from this relatively poor road link, which exacerbates their peripheral locations.

5.2.4 Journey times to Fairlie / Hunterston are also relatively long but the new ‘3 Towns’ Bypass around Stevenston, Saltcoats and Ardrossan should, to a certain extent, alleviate this problem (note that this road was not included in the journey time calculations).
**External Connectivity Issues**

5.2.5 Ayrshire’s key concerns are with regards to its external connections. From the 3 Major Towns (Ayr, Irvine, Kilmarnock), the **average** travel times are as follows:

- Stranraer – 92 minutes
- Greenock – 66 minutes
- M6 Carlisle – 142 minutes
- Edinburgh (Hermiston Gait) – 88 minutes
- Glasgow (Charing Cross) – 46 minutes
- Aberdeen – 257 minutes

5.2.6 The upgrading of a large section of the A77 to motorway standards has helped improve both journey times and reliability for trips to Glasgow (all journey times less than one hour, except from Dalmellington and Girvan). It has also helped improve travel to Edinburgh although crucial constraints exist outwith Ayrshire which have a major impact on journey times. Most notably, traffic levels on the northern sections of the M77 and the M8 on the approach to the Kingston Bridge can add an hour onto journey times at certain points of the day. This is a severe connectivity issue for Ayrshire as it affects travel to a wide area of Scotland. The GSO does provide an alternative route for some journeys but it is also a congested route in its own right.

5.2.7 Journeys to Aberdeen suffer similar problems on the M8 and on other stretches of road such as the A80 (although the A80 upgrade has improved journey times and reliability).

5.2.8 A further crucial connectivity problem for Ayrshire is its links with the M74 / M6. It is most notable that it can be perceived to be quicker for motorists travelling from many areas of Ayrshire to travel via Glasgow rather than travelling directly to the road from Ayrshire. Travelling via Glasgow is believed to be a quicker option than using the A70 or A71, where journey times can be very slow and affected by HGV traffic. Many residents of southern Ayrshire travel on the A76 to Dumfries and then join the A75, which connects with the M74. However, the A76 offers long and unreliable journey times and is clearly not conducive to good connectivity.

5.2.9 Ayrshire’s connectivity with Stranraer could also be improved. The AJSP argues that increasing traffic flows and safety issues have led to the A77 being less than reliable, a particular problem when linking with ferry connections. Ayrshire’s links to Greenock are also relatively poor. While North Ayrshire residents have good access via the A78 coastal route, other motorists must travel to Greenock via Glasgow, which is a circuitous route that is also susceptible to delays on the M8.
Table 5.1 Travel times – Road, intra-Ayrshire

<table>
<thead>
<tr>
<th></th>
<th>Ayr</th>
<th>Irvine</th>
<th>Kilmarnock</th>
<th>Fairlie</th>
<th>GPIA</th>
<th>Troon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayr</td>
<td>-</td>
<td>26</td>
<td>28</td>
<td>53</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>Irvine</td>
<td>26</td>
<td>-</td>
<td>14</td>
<td>28</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Kilmarnock</td>
<td>28</td>
<td>13</td>
<td>-</td>
<td>40</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Girvan</td>
<td>34</td>
<td>55</td>
<td>56</td>
<td>82</td>
<td>45</td>
<td>48</td>
</tr>
<tr>
<td>Prestwick</td>
<td>7</td>
<td>16</td>
<td>19</td>
<td>43</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Troon</td>
<td>19</td>
<td>12</td>
<td>15</td>
<td>38</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>Maybole</td>
<td>14</td>
<td>36</td>
<td>37</td>
<td>62</td>
<td>25</td>
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</tr>
<tr>
<td>Stewarton</td>
<td>36</td>
<td>13</td>
<td>10</td>
<td>35</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Auch / Cum</td>
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<td>33</td>
<td>21</td>
<td>59</td>
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</tr>
<tr>
<td>Galston</td>
<td>26</td>
<td>22</td>
<td>9</td>
<td>48</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Dalmellington</td>
<td>25</td>
<td>44</td>
<td>45</td>
<td>70</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
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5.3 **Ayrshire Rail Inventory**

*Overview*

5.3.1 The rail inventory considers the same issues as the road inventory but also takes into account the transfer times between services. For the purpose of this exercise, a total transfer time in excess of thirty minutes on more than 50% of services on the one route is considered to represent a connectivity problem. Again the full set of travel times are given in Table 5.5 and Table 5.6 below.

*Intra-Ayrshire Issues*

5.3.2 Ayrshire faces 2 major problems with regards to internal rail connectivity – poor service frequency and an east-west divide. To a large extent, the hub-and-spoke nature of the rail network serves to undermine internal connections. The major hub is Glasgow Central / Paisley Gilmour Street although a smaller but nonetheless significant hub also exists at Kilwinning.

5.3.3 Journeys between different areas of Ayrshire often require interchange at these hub locations. For example, to travel from Ayr to Largs requires interchange at Kilwinning. This adds to journey times by enforcing interchange between trains.
5.3.4 There are severe connectivity problems between the rail network in east and west Ayrshire. Firstly, the rail link between Ayr and Mauchline is not signalled to passenger standards and faces the wrong way at the Ayr end, meaning that trains to Carlisle and Newcastle must travel via Kilmarnock, thus adding twenty minutes to journey times. In addition, large sections of single track, most notably between Barrhead and Kilmarnock, coupled with a high volume of freight limits service frequency (there are also single track stretches outside Ayrshire, eg Gretna to Annan). The result of all of these problems is that the connection times required when travelling between key towns are often excessive.

5.3.5 There is also an hourly service between Kilwinning and Largs and Kilwinning and Ardrossan, however, with rush hour headway there is an outward ‘peak gap’ in the morning (eg Largs trains leave at 0828 then 0953) and a similar inward peak gap in the evening.

**External Connectivity Issues**

5.3.6 Ayrshire also faces a number of external rail connectivity constraints, most notably for passengers and freight travelling to the east of Scotland and England.

5.3.7 Ayrshire is well connected with Glasgow, but travelling to Aberdeen and Edinburgh (using the 15-minute shuttle service) requires disembarking at Glasgow Central and travelling to Glasgow Queen Street, thus adding at least fifteen minutes to journey times. There are however, GNER and Virgin services direct to Edinburgh from Glasgow Central and an hourly service via Shotts.

5.3.8 It is also most notable that when travelling to England, it is quicker for many Ayrshire residents to travel to Glasgow Central and then continue their journey on the West Coast Mainline. This is a result of the capacity constraints and excessive journey times on the Kilmarnock to Carlisle rail service.

5.3.9 The hub-and-spoke nature of the rail network also disadvantages those travelling to Greenock by this mode. This would involve passengers travelling to Paisley Gilmour Street and changing trains. As a result, to travel between Largs and Greenock by rail (which is a distance of around 15 miles) takes one hour and fifteen minutes by rail. As a consequence, there is a frequent bus service which provides a direct link.

5.3.10 The service to Stranraer is also relatively infrequent and requires passengers to interchange at the key stations of Ayr, Troon and Kilwinning to travel anywhere else in North / South / East Ayrshire.
Table 5.5 Travel times – Rail, intra-Ayrshire

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Table 5.6 Travel times, Rail – outside Ayrshire

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5.4 Car versus train journey times

5.4.1 The data in the above tables are presented below in Table 5.7 in terms of the difference between road and rail. Positive values show where car is faster than train, negative values show where train is faster than car. Many of the longer distance journeys are quicker by rail, using this data.

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<td>Kilwinning</td>
<td>4</td>
<td>-6</td>
<td>-13</td>
<td>-3</td>
<td>-9</td>
<td>-71</td>
</tr>
<tr>
<td>Ardrossan</td>
<td>3</td>
<td>17</td>
<td>-32</td>
<td>3</td>
<td>-3</td>
<td>-63</td>
</tr>
<tr>
<td>Saltcoats</td>
<td>3</td>
<td>13</td>
<td>-32</td>
<td>0</td>
<td>-6</td>
<td>-66</td>
</tr>
</tbody>
</table>

5.5 Summary

5.5.1 Ayrshire displays relatively good road and rail connectivity but a number of specific problems do exist. In particular the 3 main towns of Ayr, Irvine and Kilmarnock are connected with high quality dual carriageway links but journey times to England and the east of Scotland are excessively long and display poor reliability, particularly on the long stretches of single carriageway road.

5.5.2 In addition, there is also an east-west divide in the railway network and many areas suffer from poor service frequency. Lastly, the ports at Greenock and Cairnryan (Stranraer) display relatively poor connectivity with Ayrshire.
CHAPTER SIX ACCESSIBILITY & TRAVEL TO WORK ANALYSIS

6.1 Introduction

6.1.1 This Chapter reports the results of accessibility analysis carried out using the TELMoS (Transport Land Use Model of Scotland) model. At this stage, it is only concerned with the base year (2002) – forecasting work with this model follows in Chapter 9. It also reports the travel to work patterns of Ayrshire residents as revealed by the 2001 Census.

6.2 Accessibility measures

6.2.1 The measures of accessibility used (known as ‘Hansen’ indicators) give a value for each zone in the model, for each travel purpose. The value reflects the cost of traveling to all the other zones in the modelled area (by mode), and the ‘opportunities’ in each zone for that travel purpose, eg for travel to work, the measure will be a combination of the cost of traveling to each zone and the number of jobs in that zone. A zone with short travel times to a range of employment opportunities therefore ‘scores’ better than a zone separated from the major employment opportunities by long journey times.

6.2.2 The measures of accessibility are the expected average generalised cost of going from each zone to work, or to meet someone at another business, given

- where the relevant ‘opportunities’ (jobs) are located
- the generalised cost of getting to them (by the specified modes) – congested travel costs taken from TMfS
- the TELMoS parameters describing how sensitive people are to generalised cost in choosing where to work or where to do business (a ‘decay’ function)

6.2.3 The formula used, together with the model parameters, ensures that

- adding jobs close to a zone will improve its accessibility more than adding jobs very far away
- transport improvements will always result in an improvement in accessibility (unless they only affect very long journeys or serve zones which offer no opportunities)

6.3 Accessibility Results

6.3.1 There are 1123 zones represented in TELMoS covering all of Scotland either in ‘fully modeled’ or ‘buffer’ form. An accessibility ‘score’ has been derived for each zone for the following measures

- personal access to employment (using car), to (i) manual and (ii) non-manual jobs
- personal access to employment (using public transport), to (i) manual and (ii) non-manual jobs
- business travel
- goods movements
6.3.2 For each measure of accessibility, each zone in the model was ranked – from best accessibility to poorest accessibility. In addition, the ‘score’ for each zone has been averaged to give an ‘average’ score for each local authority. The accessibility of the 3 Ayrshire council areas can then be seen in the context of other local authorities. Table 6.1 and Table 6.2 show the average accessibility for each local authority - personal access to employment (non-manual), by car, and by public transport (PT) respectively.

Table 6.1 Personal access to employment, car, non-manual, by LA

<table>
<thead>
<tr>
<th>Rank</th>
<th>Local Authority Area</th>
<th>Average ‘accessibility’</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>City of Glasgow</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>Renfrewshire</td>
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</tr>
<tr>
<td>3</td>
<td>East Renfrewshire</td>
<td>110</td>
</tr>
<tr>
<td>4</td>
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<td>112</td>
</tr>
<tr>
<td>5</td>
<td>South Lanarkshire</td>
<td>113</td>
</tr>
<tr>
<td>6</td>
<td>East Dunbartonshire</td>
<td>114</td>
</tr>
<tr>
<td>7</td>
<td>City of Edinburgh</td>
<td>118</td>
</tr>
<tr>
<td>8</td>
<td>West Dunbartonshire</td>
<td>122</td>
</tr>
<tr>
<td>9</td>
<td>West Lothian</td>
<td>123</td>
</tr>
<tr>
<td>10</td>
<td>Falkirk</td>
<td>126</td>
</tr>
<tr>
<td>11</td>
<td>Midlothian</td>
<td>132</td>
</tr>
<tr>
<td>12</td>
<td>East Ayrshire</td>
<td>144</td>
</tr>
<tr>
<td>13</td>
<td>Stirling</td>
<td>145</td>
</tr>
<tr>
<td>14</td>
<td>Clackmannan</td>
<td>146</td>
</tr>
<tr>
<td>15</td>
<td>Inverclyde</td>
<td>150</td>
</tr>
<tr>
<td>16</td>
<td>City of Aberdeen</td>
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</tr>
<tr>
<td>17</td>
<td><strong>North Ayrshire</strong></td>
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</tr>
<tr>
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<td>East Lothian</td>
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<tr>
<td>19</td>
<td>Fife</td>
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<tr>
<td>20</td>
<td>City of Dundee</td>
<td>166</td>
</tr>
<tr>
<td>21</td>
<td>Perthshire &amp; Kinross</td>
<td>176</td>
</tr>
<tr>
<td>22</td>
<td><strong>South Ayrshire</strong></td>
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<td>23</td>
<td>Angus</td>
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<tr>
<td>24</td>
<td>Scottish Borders</td>
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<tr>
<td>25</td>
<td>Aberdeenshire</td>
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</tr>
<tr>
<td>26</td>
<td>Dumfries &amp; Galloway</td>
<td>230</td>
</tr>
<tr>
<td>27</td>
<td>Argyll &amp; Bute</td>
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Table 6.2 Personal access to employment, PT, non-manual, by LA

<table>
<thead>
<tr>
<th>Rank</th>
<th>Local Authority Area</th>
<th>Average ‘accessibility’</th>
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<tbody>
<tr>
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</tr>
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<td>2</td>
<td>City of Glasgow</td>
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</tr>
<tr>
<td>3</td>
<td>City of Aberdeen</td>
<td>246</td>
</tr>
<tr>
<td>4</td>
<td>West Dunbartonshire</td>
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</tr>
<tr>
<td>5</td>
<td>Renfrewshire</td>
<td>256</td>
</tr>
<tr>
<td>6</td>
<td>City of Dundee</td>
<td>264</td>
</tr>
<tr>
<td>7</td>
<td>East Dunbartonshire</td>
<td>270</td>
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<tr>
<td>8</td>
<td>East Renfrewshire</td>
<td>271</td>
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<tr>
<td>9</td>
<td>South Lanarkshire</td>
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</tr>
<tr>
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<td>North Lanarkshire</td>
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<td>Midlothian</td>
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</tr>
<tr>
<td>12</td>
<td>Inverclyde</td>
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<tr>
<td>13</td>
<td>Falkirk</td>
<td>325</td>
</tr>
<tr>
<td>14</td>
<td>West Lothian</td>
<td>336</td>
</tr>
<tr>
<td>15</td>
<td>Clackmannnan</td>
<td>348</td>
</tr>
<tr>
<td>16</td>
<td><strong>North Ayrshire</strong></td>
<td><strong>359</strong></td>
</tr>
<tr>
<td>17</td>
<td>East Lothian</td>
<td>360</td>
</tr>
<tr>
<td>18</td>
<td>Fife</td>
<td>360</td>
</tr>
<tr>
<td>19</td>
<td><strong>East Ayrshire</strong></td>
<td><strong>367</strong></td>
</tr>
<tr>
<td>20</td>
<td>Stirling</td>
<td>379</td>
</tr>
<tr>
<td>21</td>
<td>Perthshire &amp; Kinross</td>
<td>381</td>
</tr>
<tr>
<td>22</td>
<td><strong>South Ayrshire</strong></td>
<td><strong>402</strong></td>
</tr>
<tr>
<td>23</td>
<td>Angus</td>
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</tr>
<tr>
<td>24</td>
<td>Dumfries &amp; Galloway</td>
<td>493</td>
</tr>
<tr>
<td>25</td>
<td>Aberdeenshire</td>
<td>554</td>
</tr>
<tr>
<td>26</td>
<td>The Borders</td>
<td>556</td>
</tr>
<tr>
<td>27</td>
<td>Argyll &amp; Bute</td>
<td>696</td>
</tr>
</tbody>
</table>

6.3.3 It can therefore be seen that the 3 Ayrshire council areas have relatively poor accessibility to jobs by both car and public transport (note that these figures are base year, ie no M77 Extension), in the Scottish context. None of the Ayrshire council areas figure in the top 10 of most local authorities with the best accessibility for either mode.
6.3.4 For travel by car, the results show the anticipated hierarchy of East, North and South Ayrshire in terms of decreasing accessibility. For travel to work by public transport, North Ayrshire proves to have better accessibility than East Ayrshire, due to its superior rail connections to Glasgow. In general, Ayrshire appears lower in the table for access to work by public transport than by car. It can be further deduced that, using this measure, access to jobs by car is 42% worse in East Ayrshire than in Glasgow City, and 28% worse than South Lanarkshire, for example. For public transport, East Ayrshire zones are 95% worse than Glasgow City and 33% worse than South Lanarkshire.

6.3.5 The comparisons with South Lanarkshire, North Lanarkshire and possibly West Lothian are maybe the most telling, since it is perhaps these areas which are Ayrshire’s main ‘competitors’ for attracting population and new ‘knowledge-based’ industries. They share similar problems of declining traditional industries etc. North and South Lanarkshire have particularly good access to jobs by road, important in attracting residential development and new population. Note that the ‘business travel’ (ie business to business) measure gives very similar results to the above. Note also that Inverclyde features higher up the list than Ayrshire for accessibility by public transport.

6.3.6 Figure 6.1 and Figure 6.2 overleaf show personal accessibility (to jobs) for both car and public transport respectively at the zonal level. Note that the figures given in the key are average generalised cost associated with travel from each zone – a low value represents good accessibility (ie short travel times) with high values indicating poor accessibility (and long travel times).

6.3.7 The picture which emerges is as anticipated with a gradual reduction in accessibility moving south through the area and further away from the Glasgow conurbation. Note that this is accessibility to all jobs ie jobs in Ayrshire and elsewhere, hence the cluster of better accessibility by public transport around Kilmarnock and Ayr.

6.3.8 In Figure 6.1, a clear hierarchy within Ayrshire emerges. The north-west of East Ayrshire and the north-east of North Ayrshire both have good accessibility to jobs by car. There is then a second band covering the rest of North Ayrshire, the north of South Ayrshire and the middle of East Ayrshire. Accessibility then drops again in the south of East Ayrshire and the Maybole area of South Ayrshire. Areas to the south of this see their accessibility dropping off further.
Figure 6.1 Access to employment (car)

Figure 6.2 Access to employment (PT)
6.3.9 Finally in this section, each zone in the (whole) model has been given a ranking from ‘best accessibility’ (1) to ‘worst accessibility’ (1123). Table 6.3 below, gives the ‘rank’ for each zone in Ayrshire (access to employment (non manual), car), corresponding with Figure 6.1, above.

Table 6.3 Zonal accessibility – to employment (non manual), Car

<table>
<thead>
<tr>
<th>Model Zone</th>
<th>Accessibility Rank</th>
<th>Model Zone</th>
<th>Accessibility Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenwick &amp; District</td>
<td>719</td>
<td>Kilwinning</td>
<td>854</td>
</tr>
<tr>
<td>Stewarton</td>
<td>740</td>
<td>Troon</td>
<td>860</td>
</tr>
<tr>
<td>Kilmarnock - Hillhead</td>
<td>763</td>
<td>Irvine West</td>
<td>863</td>
</tr>
<tr>
<td>Dunlop</td>
<td>764</td>
<td>Prestwick</td>
<td>865</td>
</tr>
<tr>
<td>Kilmarnock</td>
<td>778</td>
<td>Catrine &amp; Mauchline</td>
<td>884</td>
</tr>
<tr>
<td>Kilmarnock - Bellfield</td>
<td>779</td>
<td>Annbank</td>
<td>892</td>
</tr>
<tr>
<td>Kilmarnock North</td>
<td>782</td>
<td>Stevenson</td>
<td>893</td>
</tr>
<tr>
<td>Kilmarnock East</td>
<td>787</td>
<td>Whitletts</td>
<td>917</td>
</tr>
<tr>
<td>Kilmarnock South</td>
<td>789</td>
<td>Ayr</td>
<td>948</td>
</tr>
<tr>
<td>Kilmarnock West</td>
<td>796</td>
<td>Saltcoats</td>
<td>956</td>
</tr>
<tr>
<td>Crosshouse</td>
<td>803</td>
<td>Largs</td>
<td>962</td>
</tr>
<tr>
<td>Kilmarnock, Riccarton</td>
<td>806</td>
<td>Great Cumbrae Island</td>
<td>965</td>
</tr>
<tr>
<td>Newmilns and Darvel</td>
<td>808</td>
<td>Ayr South</td>
<td>973</td>
</tr>
<tr>
<td>Hurlford, Crookedholm</td>
<td>809</td>
<td>Fairlie</td>
<td>976</td>
</tr>
<tr>
<td>Kilbirnie</td>
<td>810</td>
<td>West Kilbride</td>
<td>997</td>
</tr>
<tr>
<td>Crookedholm</td>
<td>811</td>
<td>Drongan &amp; Ochiltree</td>
<td>999</td>
</tr>
<tr>
<td>Irvine East</td>
<td>814</td>
<td>Cumnock &amp; Muirkirk</td>
<td>1004</td>
</tr>
<tr>
<td>Kilmarnock, Shortlees</td>
<td>815</td>
<td>Wemyss Bay</td>
<td>1013</td>
</tr>
<tr>
<td>Kilmarnock - Grange</td>
<td>817</td>
<td>New Cumnock</td>
<td>1031</td>
</tr>
<tr>
<td>Dalry</td>
<td>832</td>
<td>Maybole</td>
<td>1046</td>
</tr>
<tr>
<td>Earlston</td>
<td>837</td>
<td>Dalmellington, Patna</td>
<td>1050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ballantrae</td>
<td>1107</td>
</tr>
</tbody>
</table>

6.3.10 The Ayrshire zone with the best access to employment by car is Fenwick & District, although it is ranked 719 of the 1123 zones in the model. The zones at the south end of Ayrshire, Girvan and Ballantrae are a long way down the ranking reflecting their position a long way from the employment centres in Ayrshire and beyond.
6.4 Travel to Work

6.4.1 The 2001 Census has been analysed firstly to determine the pattern of travel to work destinations within Ayrshire (including Ayrshire and non-Ayrshire residents), by car and public transport. This can be seen as a proxy for the location of the main employment centres in Ayrshire.

6.4.2 Figure 6.3 below highlights in red the destinations within Ayrshire (people traveling from within and outwith Ayrshire) where there are a large number of car-based journeys to work, whilst Figure 6.4 shows the same thing for travel by public transport. Note that the spatial scale of these data is the ‘data zone’. Data zones attempt to define homogenous areas with a similar level of population. Therefore, where population is sparse, data zones can be large.

6.4.3 Looking at Figure 6.3, the main employment areas around the 3 Major Towns are clearly highlighted. Comparing Figure 6.3 and Figure 6.4, the pattern of employment destinations for car users is very much more dispersed than in the case for users of public transport.

6.4.4 The travel to work data has also been used to examine the commuting behaviour of Ayrshire residents. Figure 6.5 and Figure 6.6 show the travel to work destinations of people who live in Ayrshire, again by car and public transport. These maps show the number of trips per square mile in each modeled zone, so avoid the problem of large zones / small zones.

6.4.5 The dispersed pattern of commuting to the Glasgow conurbation can clearly be seen in the ‘car’ map. In contrast the public transport trips are much more concentrated in the centre of Glasgow.

6.4.6 SLIMS report a summary of commuting patterns in Ayrshire. In 2001, some 153,700 Ayrshire residents were in employment. Of these, 127,800 worked in Ayrshire and 25,800 work outside Ayrshire (17%). Some 7,600 worked in Ayrshire but lived outside the area.

6.4.7 Looking at the 3 main towns, 16% of those who live in Kilmarnock have their main place of work outside Ayrshire – the figures for Irvine and Ayr are 12% and 11% respectively. It is anticipated that these proportions would be much higher amongst higher socio-economic groups (SEG).
Figure 6.3 Travel to work destinations in Ayrshire (car)
Figure 6.4 Travel to work destinations in Ayrshire (PT)
Figure 6.5 Travel to work destinations of Ayrshire residents (car)
Figure 6.6 Travel to work destinations of Ayrshire residents (PT)
CHAPTER SEVEN  STAKEHOLDER CONSULTATION

7.1  Introduction

7.1.1  This Chapter provides a brief synopsis of the key issues identified by the Ayrshire stakeholders who took part in consultations with MVA. It is by no means comprehensive and extensive additional information can be found in the consultation notes themselves – each consultation was written up in detail. It is structured in a manner that will outline both the level of support for a particular project and the reasons underlying this support. It will also divorce rail, road and other schemes so as to present a fair reflection of the importance of each.

7.2  Form of consultation

7.2.1  Face to face consultation meetings were held with

- South Ayrshire Council
- North Ayrshire Council
- East Ayrshire Council
- Scottish Enterprise Ayrshire

7.2.2  Telephone consultations were held with

- WESTRANS
- Freightliner
- Clydeport
- Associated British Ports (ABP)
- Freight Transport Association (FTA)
- Stagecoach (Western) buses
- Network Rail

7.2.3  The broad structure of the consultations was focussed on the following 4 main themes, from the perspective of the consultee

- present day constraints imposed on business and economic activity in Ayrshire, as a result of difficulties associated with transport or location
- key connectivity requirements for business in Ayrshire
- ideas for possible improvements to transport in Ayrshire, or between Ayrshire and elsewhere, which would assist in local or regional economic development
- the causal mechanisms by which improvements in transport provision assist in economic performance, at the company, local, or regional level

7.2.4  The following sections draw out the main themes resulting from the consultations, covering road, rail, and other schemes. A list of the consultees can be found in Appendix C.
7.3 ROAD SCHEMES

Links to the M74

7.3.1 A strong belief exists that an upgrade of Ayrshire’s links to the M74 is vital to its future prosperity. The current links are poor with the preferred route for travelling to England often incorporating the M77 and now the Glasgow Southern Orbital Route (GSO), meaning that most travellers must head northwards before going south. This is not a particularly attractive option, particularly at peak times when the A725 and other areas such as the M74 Raith Interchange are congested.

7.3.2 Improved links are thought to be crucial to both future business location in Ayrshire and to the competitiveness of firms currently located in the area. In particular, there is a need to ensure that the key ‘Gateway Locations’ identified in the AJSP along with prominent industrial areas are well linked with the national transport network.

7.3.3 However, while there is a strong belief amongst stakeholders that an improvement of links to the M74 are required, there is little consensus over the preferred corridor for any upgrade.

Links to the M74 - The A70 Corridor

7.3.4 The consultations identified the A70 as the marginally preferred corridor for any potential upgrade. However, care must be taken not to read too much into this as 3 of the 4 stakeholders who argued for the A70 indicated that they were not in full possession of the facts on the issue and were thus not providing an informed opinion.

7.3.5 South Ayrshire Council (SAC) prefers this corridor as it would be more beneficial for the residents of the area than any improvement further north. The Council did, however, acknowledge that, given the low levels of traffic flow on the road, a Route Action Plan was probably the best that could be hoped for. This could include the provision of overtaking opportunities, crawler lanes and local bypasses.

7.3.6 WESTRANS supported the A70 corridor on the grounds that North and East Ayrshire were relatively well connected by the M77 and GSO. While they acknowledged that this was not a robust justification, WESTRANS felt that it was the best that could be provided given the consultee’s knowledge on the topic.

7.3.7 This point was echoed by the Freight Transport Association (FTA) whose members use both corridors to the M74 intensively. They believe that the current constraints represent a key bottleneck which is making Ayrshire unattractive for business location. The FTA believed that while the A70 corridor should be upgraded, there should be an additional link towards the intersection of the M74 and A702. However, the organisation acknowledged that this was unlikely to be feasible given the low levels of traffic flow on the road.

7.3.8 The A70 was also the marginally preferred choice for Associated British Ports (ABP) given its close proximity to the port of Ayr. In addition, some of the opencast coal that is exported from Ayr originates from areas in and around the A70. ABP stressed the importance of this link because the current upgrades to the A75 will make the ports of Ayr and Troon less competitive vis a vis the port of Cairnryan.
7.3.9 In all, the A70 corridor was seen as a good option for organisations operating in the south of Ayrshire but it is acknowledged that the A70 is a poorer quality road than the A71 and that the possibility for the dualling of this road is remote.

**Links to the M74 - The A71 Corridor**

7.3.10 The A71 is currently a higher quality road than the A70 and the surrounding terrain is also more suitable for road construction. In addition, the A71 captures a greater proportion of Ayrshire’s population and was also strongly supported by a number of key stakeholders.

7.3.11 Both North Ayrshire Council (NAC) and East Ayrshire Council (EAC) support the A71 corridor because it connects with the 2 main population centres in these areas – Kilmarnock and Irvine.

7.3.12 NAC has weaker convictions about any upgrade to the M74 because the area is closer to Glasgow. As such, NAC is more concerned with the upgrade of the A737. Nonetheless, the Council still supports the M74 link and prefers the A71 corridor.

7.3.13 In principle, EAC are keen to promote a Greenfield route to the M74 but they acknowledge that their preference amongst the existing routes is the A71. However, they did note that one of the key constraints associated with the A71 option was that the land reserved for the Newmilns / Darvel Bypass (a vital component of any A71 upgrade) has been sold off and there are currently no plans in place for compulsory purchase orders.

7.3.14 Clydeport believe that any upgrade of the A71 would provide another good link to the central belt as well as access to the main road to England. As such, they are fully in support of the A71 option.

**The A77 South of Ayr**

7.3.15 There was a strong call from stakeholders for improvements to the A77 south of Ayr. The poor safety record of this road coupled with local congestion problems at the Whitletts Roundabout and at Maybole as well as slow moving HGV platoons from Cairnryan have led to demands for improvements to the route.

7.3.16 SAC noted that the A77 is a key trunk road moving freight from Cairnryan but that it is a relatively low quality single carriageway route which has a poor safety record. The Council have noted that a bypass of Maybole is required although it is hoped that new rail freight facilities at Barrhill and Grangeton will help shift some timber and distillery traffic onto the rail network and away from the A77.

7.3.17 WESTRANS echoed the sentiments of SAC and believe that improvements to the road should be a key priority. They also favour a Maybole bypass and the provision of overtaking opportunities and crawler lanes.

7.3.18 The FTA has noted that this is an issue that needs to be resolved very soon. They identified the same problems and scope for improvements as SAC and WESTRANS but they further noted that some supermarkets are considering serving their Northern Irish stores via Liverpool rather than Cairnryan if improvements to the A77 are not made.
Scottish Enterprise Ayrshire (SEA) believes that the poor quality of the road has only served to undermine safety. While they do believe upgrades are necessary in the long-term, SEA feel that average speed cameras can provide a cheap and effective short-term solution.

In all, while the A77 south of Ayr does not pass through or by many significant areas of population, a number of key Ayrshire stakeholders do believe that its upgrade is required.

**A737 Upgrade (including Dalry Bypass)**

The A737 is a key priority of NAC and the Council believe that its improvement is important for the future of the area. The A737 is a poor quality single carriageway with a number of local congestion hotspots. The principal difficulty associated with travelling on this road is not the journey time *per se* but rather the reliability of journey times. This problem is clearly illustrated by the fact that it is often quicker for residents of North Ayrshire to travel to Glasgow via the M77 rather than via the A737.

NAC believe that there would be a number of key benefits associated with upgrading this route. Most notably, it is expected that any upgrade would ease the passage of freight from Hunterston while it may also help regenerate the former industrial area in the Garnock Valley. Notably, however, Clydeport themselves did not mention the A737 as a key constraint to their business operations.

The views of NAC were echoed by WESTRANS who argue that the upgrade of the A737 is a priority in order to improve the connectivity of North Ayrshire and the ports of Hunterston and Ardrossan in particular. WESTRANS believe that the least that is required is a better quality single carriageway with a bypass around Dalry, which suffers from local congestion and noise pollution. Other improvements could include overtaking lanes and stretches of dual carriageway.

Stagecoach, the principal bus operator in Ayrshire, believe that, if feasible, it is necessary to convert the A737 into a dual carriageway. They argue that there is a severe congestion pinch-point between Beith and Howwood and that it has detrimental effects on both bus punctuality and journey time reliability.

Stagecoach argued that the A737 should be converted to a dual-carriageway between Johnstone and Kilwinning with bypasses around Dalry and Kilwinning itself. While the buses would still need to serve towns such as Dalry, the traffic levels in these towns would be markedly decreased thus leading to faster and more reliable passage.

In all, the A737 appears to be an insufficient road for those who have to use it on a regular basis and there appears to be a strong current of support for its upgrade.

**Extension of the M77 to Ayr**

There was also a certain amount of support for the extension of the M77 to Ayr. The recently upgraded road is credited with bringing a number of economic benefits to (East) Ayrshire and is said to have assisted development in many areas. As such, there is a strong belief that a further extension would be highly beneficial.
7.3.28 The main proponents of this view are EAC, who were also one of the principal benefactors of the initial stretch of motorway. EAC feel that the introduction of the M77 was an unqualified success and while they admit that any extension would not result in a marked improvement on the current route, they believe that there would be a perception of reduced journey times that would attract additional investment.

7.3.29 ABP have argued that there is the need for a series of improvements in the A77 south of Kilmarnock and are keen to see the upgrade of this road to motorway standards. They believe that this would further enhance the journey time reliability of goods leaving the ports of Ayr and Troon.

7.3.30 ABP also believe that the current junctions adjoining the A77 are a hindrance to the movement of goods and also a safety concern. As such, the company believe that the provision of grade separated junctions or, more realistically, roundabouts are required on this stretch of road.

7.3.31 Stagecoach also welcomed the prospect of the conversion of a further section of the A77 to motorway standards. Their business has evidently benefited from improved journey time reliability and they believe that further extensions of the M77 would serve to offer additional improvements.

**A78 Three Towns Bypass Extension to Fairlie**

7.3.32 The potential extension of the 3 Towns Bypass was strongly supported by Clydeport as they believe it would be highly beneficial for moving goods from the port should it become a container base. The current bypass is a largely dual carriageway link that runs around Stevenston, Saltcoats and Ardrossan.

7.3.33 Clydeport believe that the bulk of the container traffic would travel south on the A78, with little travelling north towards Inverclyde or east on the A760. A conceptual study by Halcrow found that the current A78 and 3 Towns Bypass would be sufficient to cope with Hunterston’s traffic until 2025. However, it must be stressed that these findings were of a very preliminary nature.

7.3.34 Clydeport argue that it would be possible and beneficial to extend the 3 Towns Bypass in single carriageway format, with crawler lanes, to Hunterston. The idea would be for the road to travel around West Kilbride, east of the railway line until near the port and then pass under the line to the port, although the costs are currently uncertain.

7.3.35 It is thought that this upgrade would offer 2 principal benefits. Firstly, improved road links would improve the quality of life and extend the effective labour market of the port. In addition, developed road links could potentially attract new light industry and light assembly firms which in turn may prove attractive to other firms looking to locate in the area.

7.3.36 In all, it is believed that any extension of the 3 Towns Bypass would principally benefit Hunterston, which supports the aim of encouraging Hunterston as a ‘gateway location’. However, the spin-offs in terms of the connectivity of Ayrshire as a whole may perhaps be more limited.
**A76 Upgrade (including Mauchline Bypass)**

7.3.37 There was little support for any extensive upgrade of this road. There is currently a Route Action Plan being undertaken on it and it is acknowledged that a number of upgrades such as safety improvements and a Mauchline Bypass are desirable. Evidently, any proposed upgrades are most strongly supported by EAC but it is nonetheless low in the order of priority for most organisations.

### 7.4 Rail Schemes

**Glasgow and South Western Railway (GSWR) Upgrade**

7.4.1 The notion of a GSWR upgrade is used as an umbrella term for a whole series of improvements on this route. These include the signalising of the Mauchline link to passenger standards, the reduction in the distance between signals, double-tracking between Annan and Gretna, and the upgrading of the line to allow Virgin Pendolino Trains to be hauled over it (allowing maintenance work on the WCML, or ultimately even the provision of Virgin ‘Cross-Country’ passenger services). Notably, this option does not include gauge clearance work for potential container freight trains from Hunterston as this is considered under a separate scheme.

7.4.2 The GSWR upgrade was supported by all of the relevant stakeholders and is considered vital to improving Ayrshire’s rail links to the south.

7.4.3 Network Rail outlined the key difficulties faced by trains travelling on this line. The most notable was the Annan – Gretna single track which limits the movement of freight from Ayrshire to England but it was noted there are currently active proposals in place to tackle this problem, most notably for the reinstatement of double track. Network Rail also noted that the long distance between signals limits the capacity of the line and they argue that any upgrade would provide a cheap and effective method of increasing capacity. However, they pointed out that for any real capacity gains to be realised, this must be done in conjunction with the reinstatement of double track between Annan and Gretna. Network Rail argue that signalling the Mauchline link to passenger standards would be beneficial but that problems would remain with the adverse orientation of rail freight halts.

7.4.4 The 3 Ayrshire Council’s strongly supported improvements to the GSWR. SAC believe that the reinstatement of the Mauchline link to passenger standards is an important objective in easing the level of freight being unnecessarily channelled into the Ayrshire passenger network. NAC were also keen to point out that if Hunterston is to come fully on stream, there is a need to make all of the improvements to the GSWR outlined above. EAC echoed the view of SAC with regards to the Mauchline link and are also keen to see a full package of improvements on the line in order to improve the level of service to more outlying settlements, such as Auchinleck.

7.4.5 WESTRANS indicated that the GSWR is of a particularly poor quality. While their key priority is the improvement of the Glasgow Central – Kilmarnock service, they believe that the long distances between signals and the single track between Annan and Gretna must be addressed if Ayrshire’s rail links to England are to be improved.
7.4.6 Freightliner, the FTA and SEA echoed these sentiments and argued that the full package of improvements must be made to the GSWR if rail freight is to assume an integral role in the future of Ayrshire.

7.4.7 Clearly, one of the most interested parties regarding the future of the GSWR is Clydeport. Like the other stakeholders, they believe that a comprehensive package of measures must be introduced to make the GSWR feasible for the expected increased freight traffic from Hunterston. Clydeport were particularly concerned about the section of single track between Annan and Gretna as this has the same effect on freight trains as the Barrhead-Kilmarnock section of track has on passenger trains. Clydeport did, however, suggest that Virgin Trains may assist in the upgrading of the line in order to provide them with an alternative route to the West Coast Mainline (WCML) from Glasgow (see 7.4.11 below).

7.4.8 In all, the capacity constraints on the GSWR south of Kilmarnock are seen by many stakeholders as a key rail constraint in terms of Ayrshire’s connectivity with England. As such, it is believed to be an important priority for Ayrshire that a number of improvements are made to the GSWR in the near future.

**GSWR Hunterston Upgrades**

7.4.9 In order for the potential of Hunterston to be recognised, it is a prerequisite that the GSWR is capable of handling container traffic. To this end, a series of upgrades to the line are required, most notably bridge clearance works. Evidently, this would have to be done over the full length of the line as even one bridge that was too low would prevent container movement by rail.

7.4.10 Network Rail estimate that the required engineering work would cost an estimated £30 - £50 million and they appear somewhat reluctant to commit to making the improvements until such times as the future of Hunterston as a container base is guaranteed. They also noted that the scale of capacity upgrades required would depend on the future of the coal import facility should the proposed container base come fully on-stream.

7.4.11 Clydeport themselves are evidently very keen on the implementation of the required upgrades. The issue is the height of the containers that would be leaving Hunterston. They have recently been upgraded in size to 9 feet and 6 inches. This means that a ‘W10’ gauge is required to move a standard wagon. Modified rolling stock like pocket or well wagons can be used, but this reduces the capacity of the train by one third. Alternatively there are lower wagons but as these have smaller wheels there is an issue of overheating. To put the cost of the Hunterston upgrade in perspective, the required upgrades between Felixstowe and the West Coast Mainline (WCML) would cost £75 million while a similar link from Southampton would cost £52 million. Network Rail estimated the cost of these upgrades at £30m-£50m, although Clydeport quoted a figure which was significantly less than this.

7.4.12 As Clydeport is one of the key economic hubs in North Ayrshire, NAC strongly support any upgrades that facilitate the introduction of a container base. SEA and WESTRANS also support this option because they believe that a container base would be beneficial to the economic performance of Ayrshire.
7.4.13 In addition, Freightliner and the FTA are proponents of the container upgrades because it would benefit their business/members. In particular, Freightliner argues that the development of Hunterston would encourage an alternative location for freight thus easing congestion on the WCML and the East Coast Mainline (ECML) thus freeing up additional rail capacity. Furthermore, it would create a more local port for Scottish cargo thus reducing journey costs.

**Barrhead - Kilmarnock Capacity Improvements**

7.4.14 The section of single track between Barrhead and Kilmarnock limits the passenger service between Glasgow Central and Kilmarnock to one train per hour. Indeed, Kilmarnock is the only major station within the SPT area that does not have a half hourly service to Glasgow. As a result, the level of rail commuting to Glasgow is relatively low and it jeopardises the connectivity of Kilmarnock and its ability to be part of the wider Glasgow City-Region.

7.4.15 The current proposal under consideration advocates the provision of a new ‘dynamic’ loop between Dunlop and Stewarton, which is around 3 miles of track in total. Network Rail has estimated that the cost of this upgrade would be between £15 - £20 million. This cost represents a full package of measures including the required track, additional signals and the reinstatement of closed platforms at stations such as Stewarton. SPT have recently been strongly lobbying the Scottish Executive for the necessary funds to implement this upgrade while Network Rail believe that there is a strong possibility that the upgrades will be undertaken in the near future.

7.4.16 The solving of this constraint is seen as the top transport priority for EAC. It is hoped that this would boost the attractiveness of Kilmarnock as a place to live as well as increase both journey time reliability and encourage modal shift. These views are shared by WESTRANS who feel that the restoration of a half-hourly service should be a key priority for Ayrshire.

7.4.17 Clydeport also support the double tracking of the Barrhead – Kilmarnock link as part of a wider package of improvements to the GSWR.

**Glasgow Central–Ayr Service – Fifteen Minute Frequency**

7.4.18 The Glasgow Central – Ayr line is the second busiest in Scotland in terms of passenger numbers and projections of future passenger numbers, most notably at GPIA, have led to support for increasing the service on this line to 4 trains per hour throughout the day.

7.4.19 Network Rail have indicated that this is a desirable outcome but have stressed that the capacity constraint between Paisley Gilmour Street and Shields Junction, coupled with a shortage of platform capacity at Glasgow Central is preventing its implementation at the moment. It is believed that the Glasgow Airport Rail Link and Glasgow Crossrail (should they be implemented) will assist this objective while there are a number of short-term solutions for addressing platform capacity constraints at Glasgow Central. In all, however, the 4 trains per hour service will be dependent on factors external to Ayrshire.
7.4.20 SAC are particularly eager for this issue to be addressed. They believe that the overcrowding on trains, particularly at peak times, coupled with the ‘lumpy’ demand at GPIA (together with luggage storage) is an important problem and one which must be addressed. WESTRANS and SEA echoed these views arguing that if GPIA is to be developed to its full potential, there is a need to improve the passenger capacity as well as the quality of integration between rail and air services.

**Largs-Ardrossan South Beach Double Tracking**

7.4.21 The section of the Glasgow Central – Largs line between Ardrossan South Beach (ASB) and Largs (which includes Hunterston) is only electrified for passenger trains on a single track and it is argued that this must be upgraded to a double track arrangement in order to facilitate passenger and freight movement.

7.4.22 NAC argued that the single track between Hunterston and ASB was likely to be a constraint on the future development of Hunterston, a view shared by WESTRANS and Freightliner. Interestingly, however, Clydeport, while acknowledging that any improvement would be welcomed, insisted that the upgrade was not a necessary prerequisite for the development of Hunterston. Clydeport noted that the port will have 8 one-kilometre sidings with a run-around loop meaning that the single track is not a major issue.

7.4.23 On the passenger side, however, NAC and WESTRANS noted that this constraint limited the frequency of passenger services to hourly. As such, this limits the accessibility of Largs, Fairlie and West Kilbride.

### 7.5 Other Schemes

**Internal Public Transport Improvements and Affordable Public Transport**

7.5.1 Internal public transport improvements are desirable to almost all of the stakeholders but affordable public transport is of particular significance to the 3 Councils and SEA.

7.5.2 It was universally argued that internal public transport improvements would increase the general level of connectivity thus increasing the incentive to travel on public transport. As a result, it is believed that better local public transport has the potential to improve the effective size of the labour market for the key towns in Ayrshire.

7.5.3 Cheap public transport links were also considered vital because many of the jobs on offer to the less skilled will also pay lower, meaning that, the greater the travelling cost, the lower the marginal benefits of a job that does not offer good marginal benefits in the first place. The result of high transport costs could be that a person may not take up a new job because of prohibitively high travelling costs.

7.5.4 SEA were also keen to note that there is a need to better integrate public transport with key employment locations, particularly key business parks and industrial estates such as Irvine Riverside.
**Park and Ride Strategy**

7.5.5 The 3 Councils and SEA also promoted the need for a clear Park and Ride (P&R) strategy. Central to many Local Transport Strategies is a pledge to reduce car use and P&R is seen as key to this in Ayrshire. However, a number of problems were identified with P&R making its actual implementation difficult. SAC noted that previous intra-Ayrshire P&R pilot schemes had been poorly used while the purchase of the required amount of land was also prohibitively expensive.

7.5.6 Nonetheless, many traders have identified P&R as crucial to their business as there are currently perceived parking difficulties eg in Ayr town centre. As such, the Councils and SEA believe that pursuing a P&R strategy would be valuable.

7.5.7 In terms of rail-based P&R offering access to Glasgow, a number of sites have been proposed by each Council. SAC have plans for a 600 car facility at Barassie while NAC are seeking potential improvements in and around Irvine and Kilwinning. Likewise, EAC plan a P&R facility near the Bellfield Interchange.

7.5.8 In addition, EAC noted that the deregulated environment in which transport operated led to poor integration between modes. For example, EAC argued that it was difficult to encourage bus companies to provide services to rail stations for trips to Glasgow because the bus companies wished to provide these services to Glasgow themselves.

**New Railway Stations**

7.5.9 As well as improvements to the actual railway network itself, each of 3 Councils as well as Network Rail has provided plans for additional rail halts – see Chapter 8.

7.5.10 These new stations would provide a general improvement in accessibility and enhance the attractiveness of certain areas of towns.

**Support of the Route Development Fund (Air)**

7.5.11 GPIA currently benefits from the Route Development Fund (RDF) and it is likely that they would continue to support the RDF.

7.5.12 The RDF is also supported by SEA who believes that it is important in boosting the performance of GPIA and Ayrshire as a whole.
7.6 External Constraints

7.6.1 As alluded to throughout this note, there are a number of external constraints affecting the connectivity of Ayrshire. The principal concerns raised by the different stakeholders were

- congestion at the M8 (Kingston Bridge)
- congestion at the M8 (Hillington to Glasgow Airport)
- congestion at the Raith Interchange (M74)
- standard of the GSWR outwith Ayrshire (rail)
- Paisley Gilmour Street – Shields Junction capacity constraint (rail)
- Glasgow Central platform capacity (rail)
- ECML and WCML capacity constraints (rail)

7.6.2 For a number of the desired Ayrshire schemes to be beneficial, it was strongly argued that these external constraints would have to be solved in tandem with any Ayrshire improvements.

7.7 Summary

7.7.1 Each of the 3 Council representatives were asked for an initial ‘top three’ schemes in terms of promoting economic development in their areas. Table 7.1, below summarised the responses.

Table 7.1 Council responses to consultation

<table>
<thead>
<tr>
<th>Easy Ayrshire</th>
<th>North Ayrshire</th>
<th>South Ayrshire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilmarnock–Barrhead railway line</td>
<td>Upgrade of A737</td>
<td>Increased frequency on Ayr-Glasgow line</td>
</tr>
<tr>
<td>Upgrade of A71 route to M74</td>
<td>Rail capacity increases, Largs / Hunterston</td>
<td>Upgrade of A70 route to M74</td>
</tr>
<tr>
<td>A77 Kilmarnock to Ayr improvements</td>
<td>Upgrade of A71 route to M74</td>
<td>Upgrade of A77 south of Ayr</td>
</tr>
</tbody>
</table>

7.7.2 Table 7.2 below shows a list of all the schemes raised during the consultation process, together with a record of which consultees expressed a view that the scheme should be pursued. Also included is a sum of the number of occasions each scheme was mentioned in the consultation. Although by no means scientific, this does provide some indication of the prominence attached to each scheme.
Table 7.2 Summary of consultations / schemes

<table>
<thead>
<tr>
<th>Scheme</th>
<th>SAC</th>
<th>NAC</th>
<th>EAC</th>
<th>WESTRANS</th>
<th>Freightliner</th>
<th>Stagecoach</th>
<th>ABP</th>
<th>FTA</th>
<th>Scottish Ent. Ayrshire</th>
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<tr>
<td>M77 Extension to Ayr</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>x</td>
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<td>A77 South of Ayr (Maybole and Whithfae Bypass)</td>
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<td>x</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
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<td>✓</td>
<td>x</td>
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<tr>
<td>A737 Upgrade (including Dalry Bypass)</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
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<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td>A76 (including Mauchline Bypass)</td>
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<td>x</td>
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<td>Ayr–Glasgow Central 15 minute service frequency</td>
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<td>Support of Route Development Fund</td>
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</tbody>
</table>

Key

SAC = South Ayrshire Council
NAC = North Ayrshire Council
EAC = East Ayrshire Council
ABP = Associated British Ports
FTA = Freight Transport Association

Notes

1) Of the original list of stakeholders provided, MVA were unable to gain responses from First ScotRail, EWS, the Rail Freight Group, SPT, Prestwick Airport and the Ayrshire Chambers of Commerce.
2) Where a scheme option is denoted as “x”, this does not necessarily mean that it is not desirable to the the stakeholder but that it was not mentioned during the consultation as a priority.
3) Account must be taken of schemes that certain companies will have no interest in. For example, Network Rail are not likely to promote road schemes or Stagecoach rail schemes.

7.7.3 It is perhaps surprising that the rail schemes, particularly the GSWR were identified so frequently. This may be a reflection of the prominence which is being given locally to the proposals for the development of Hunterston – the major new growth initiative in the area.
CHAPTER EIGHT    EMERGING SCHEMES

8.1 Introduction

8.1.1 Building on the consultation process, this Chapter reports the transport schemes which are currently being proposed by the various stakeholders in Ayrshire.

8.2 Ayrshire Joint Structure Plan

8.2.1 The new (2006) Ayrshire Joint Structure Plan (AJSP) has the following 5 key objectives

- to stabilise the population in 2025 at current levels
- to support measures that encourage economic development underpinned by a sustainable population
- to seek improved accessibility both within and to opportunities outside Ayrshire
- to develop strong and vibrant communities by realising their potential for regeneration and growth and through the promotion of appropriate development for rural areas
- to safeguard and enhance the quality of the environment

8.2.2 Key elements of ‘Delivering the Vision’ are given as

- “adopting a proactive economic agenda to grow and diversify the local economy and seeks to achieve closer integration with the Glasgow City Region”
- “improving accessibility, both nationally and internationally through major transport and port investment, offering new housing and employment opportunities”

8.2.3 There are a number of specific transport policies in the AJSP and these are reported below, together with the specific proposals under each of these headings which are of particular relevance to regional economic development.

TRANS 1 – land use and transportation

- provide adequate access by a range of modes to gateways at Hunterston, Prestwick and Ayr / Troon / Ardrossan (ECON1); and strategic business locations (ECON2)

TRANS 2 – rail investment

- increase capacity on rail network within and outwith Ayrshire
- promote new stations: Altonhill (Kilmarnock), Hurlford, Montfode (Ardrossan), South Gailes, Cumnock, Largs Marina/Kelburn, Queens Drive (Kilmarnock), Ardeer, Heathfield (Ayr), Mauchline, South East Ayr
- safeguard existing solums
- upgrading of stations, platform lengths and park and ride
- Kilmarnock rail links – to complement success of M77 (would need park and ride opportunities)
- Kilmarnock to Carlisle (for freight), long signal sections and single track sections
TRANS 3 – strategic road development

- ‘Gateway’ Locations – Core Investment Area (Irvine / Kilmarnock / Ayr triangle) to M74, including A78 to Hunterston, links to GPIA
- A737 upgrade, Kilwinning-Howwood
- A77 Kilmarnock – Stranraer improvements
- A76 Kilmarnock – Dumfries improvements

TRANS 4 – public transport

- enhanced park and ride facilities – Ardrossan South Beach, Dalry, Kilmarnock, Prestwick Town, Kilmars, Ayr, Glengarnock, Kilwinning, West Kilbride, Barassie, Irvine, Largs, Stewarton

8.2.4 Park and Ride can have a key role to play in effectively widening the catchment areas of stations. Without parking, station patronage is restricted to local ‘walk in’ or ‘drop off’ users – a small proportion will also use buses to access stations. Good parking facilities can spread the influence of any new station or improved services over a much wider area, although regular use of Park and Ride produces pressures within households for multiple car ownership. Good P&R will be an important element in the housing-led approach to regeneration too.

TRANS 5 – freight transport

- support the development of multi-modal freight interchange facilities at a wide range of locations.

8.2.5 As the updated AJSP ‘Key Diagram’ was not available at the time of writing, the previous ‘Key Diagram’ is reproduced in Figure 8.1 below, for reference. This nonetheless provides a useful overview of planning issues in Ayrshire.
WESTRANS

8.3.1 The Ayrshire local authorities are part of the WESTRANS Regional Transport Partnership (RTP). In August 2005, following public consultation during summer 2004, WESTRANS and Strathclyde Passenger Transport (SPT) published their ‘Joint Transport Strategy for Western Scotland to 2025’ (JTS).

8.3.2 The JTS document lists a number of schemes which WESTRANS would like to promote. The schemes relevant to Ayrshire are listed in Table 8.1 below, together with the WESTRANS objectives, for which the scheme is deemed to be relevant.
### Table 8.1 Summary of WESTRANS schemes

<table>
<thead>
<tr>
<th>WESTRANS Objectives</th>
<th>external connections</th>
<th>internal connections</th>
<th>mode shift</th>
<th>demand management</th>
<th>sustainable development</th>
<th>accessibility</th>
<th>environment</th>
<th>safety</th>
</tr>
</thead>
</table>

#### Ayrshire Schemes

**Short Term, 1-5 years**

**Projects Underway**
- Glasgow Airport Rail Link
- Glasgow Crossrail

**Proposed Studies**
- Kilmarnock to Carlisle rail capacity study
- Ayrshire rail freight capacity study
- Stranraer/Kilmarnock/Carlisle rail capacity study

**Proposed Projects**
- Kilmarnock to Barrhead capacity improvements
- Kilwinning to Paisley capacity improvements
- Glasgow to Ayrshire service improvements
- Glasgow Prestwick Airport station upgrade

**Medium Term, 6-10 years**

**Proposed Studies**
- GSW new stations - Mauchline & Auchinleck
- Ayr Hospital station
- Ardrossan North station
- Ayrshire to Edinburgh rail study

**Proposed Projects**
- Glasgow to Ayrshire capacity improvements
- Mauchline Junction improvements
- Kilwinning P&R improvements
- A76 Dumfries to Kilmarnock improvements
- Ardeer, Stevenson link to A78

**Long Term, 10+ years**

**Proposed Studies**
- none

**Proposed Projects**
- Ayrshire to Edinburgh rail service improvements
- Large to Kilwinning improvements
- Kilwinning P&R improvements
- A76 Dumfries to Kilmarnock improvements
- Ardeer, Stevenson link to A78
- Ayr harbour access
- Troon harbour access, link to A78
- A77 improvements
- A71 Kilmarnock to M74 improvements
- A70 Ayr to M74 improvements
- A78 improvements, access to Hunterston

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8.3.3 Table 8.1 contains a comprehensive list of schemes, gives some idea of their stage of development, and also the timescale envisaged. It should be noted that ‘economic development’ is not stated explicitly as an objective – it is probably regarded as implicit within ‘external connections’, ‘internal connections’ and ‘sustainable development’.
8.3.4 In terms of ‘proposed projects’, the WESTRANS list contains many of the Ayrshire schemes as ‘short term’ projects. The notable exceptions are the A70 and A71 improvements to the M74, which are regarded as ‘long term’ projects. The ‘improvements’ to the A70 and A71 are not specified, but it is notable that a new (off line) route to the M74 does not feature in the list. In addition, no specific bypasses are referred to on the A70 and A71 routes.

8.4 Summary of Schemes

8.4.1 The consultations with the 3 local authorities and the review of the WESTRANS JTS have not brought any ‘new’ schemes or proposals to light. Instead there is a fairly well established list of aspirations in published documentation.

8.4.2 In terms of proposals or aspirations which can be thought of as having particular regional significance, these are summarised below (in no particular order).

**Rail network and services**

- committed improvements related to Glasgow Airport Rail Link / Shields Road will relieve a significant constraint - Glasgow Crossrail and Central Station capacity improvements would be highly beneficial to Ayrshire in terms of increasing capacity
- double tracking (or dynamic loop) Kilmarnock-Barrhead, allowing a higher frequency service to Kilmarnock
- upgrading Mauchline line to passenger standards, allowing Stranraer-Dumfries trains to avoid Kilmarnock and freeing up track space
- double tracking Largs / Hunterston to Ardrossan South Beach
- Ayr – Glasgow general capacity / frequency improvements (also for Prestwick Airport), to allow 15 minute service
- freight routing issues from open cast coal sites (existing junctions do not allow for desired movements)
- new stations, expanded park and ride
- railfreight facilities

**Road network**

- further extensions to M77 to Ayr
- A77 improvements south of Ayr, including bypasses at Maybole and Whittlets
- A737 upgrade (Dalry bypass)
- A78 ‘3 towns’ bypass extension
- A70 or A71 upgrades for M74 link
- A76 Dumfries continuing upgrades – including Mauchline bypass

8.4.3 Chapter 9 takes and refines this list of schemes, and moves it into an Appraisal Framework.
CHAPTER NINE  STAG APPRAISAL

9.1  Introduction

9.1.1  An overview of the Scottish Executive’s STAG planning and appraisal process is shown in Figure 9.1, below.

Figure 9.1 Scottish Transport Appraisal Guidance
9.1.2 The ‘scoping’ nature of the Ayrshire study means that it is the pre-STAG Part 1 elements of STAG which are most relevant here. The main steps undertaken in the analysis have been as follows

- development of planning objectives (STAG Chapter 2)
- analysis of present and future problems (STAG Chapter 3) – covered earlier in Chapters 3-6
- option generation, sifting and development (STAG Chapter 4)

9.1.2 The specific sequence of steps undertaken here is as follows

- consultation
- sifting stage 1
- indicative modelling of options
- set planning objectives
- option sifting stage 2
- recommendations

9.2 Sifting Stage 1

9.2.1 Chapter 8 reported a comprehensive list of proposals and schemes which are or have been in recent public policy documents. However, STAG requires that the initial stage takes a ‘step back’ from these specific schemes and considers a wider range of options.

9.2.2 In recent years, building new roads has been the primary means to improve inter-regional connectivity. At one end of the scale, each of the main inter-regional route corridors, A737, A71, A70, A76 & A77 could be upgraded to motorway standard. Alternatively, a new motorway could be provided along a new route running east or south east from the Core Investment Area to the M74, giving Ayrshire excellent links to the south to complement existing links to the north. Clearly, road construction on this sort of scale is expensive.

9.2.3 To provide some benchmarking here, Table 9.1 below reports construction costs for recent road schemes in Scotland.
Table 9.1 Recent road construction costs in Scotland

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Cost</th>
<th>Length (km)</th>
<th>Cost / km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haddington-Dunbar expressway, 2004</td>
<td>£35m</td>
<td>13.7</td>
<td>£2.5m</td>
</tr>
<tr>
<td>M77 (motorway), 2005</td>
<td>£78m</td>
<td>15.0</td>
<td>£5.2m</td>
</tr>
<tr>
<td>GSO (dual carriageway), 2005</td>
<td>£52m</td>
<td>9.0</td>
<td>£5.7m</td>
</tr>
<tr>
<td>A78 3 towns bypass (dual / single carriageway), 2004</td>
<td>£26m</td>
<td>6.4</td>
<td>£4.1m</td>
</tr>
<tr>
<td>Kincardine Eastern Link Road (single carriageway), 2004</td>
<td>£10m</td>
<td>2.2</td>
<td>£4.5m</td>
</tr>
<tr>
<td>Dalkeith Northern Bypass (single carriageway), 2005</td>
<td>£25m-£30m</td>
<td>5.0</td>
<td>£5m-£6m</td>
</tr>
<tr>
<td>A96 Fochabers bypass (single carriageway), 2005</td>
<td>£22m</td>
<td>5.0</td>
<td>£4.4m</td>
</tr>
<tr>
<td>A8000 (dual carriageway), 2006*</td>
<td>£35.6m</td>
<td>4.5</td>
<td>£7.9m</td>
</tr>
<tr>
<td>M74 Completion (dual 3 motorway), 2006**</td>
<td>£375m-£500m</td>
<td>8.0</td>
<td>£47m-£62m</td>
</tr>
<tr>
<td>A9 Kingussie – overtaking lanes, 2003</td>
<td>£5m</td>
<td>3.9</td>
<td>£1.3m</td>
</tr>
</tbody>
</table>

Source – Scottish Executive press releases
** [http://www.m74completion.com/M74_Homepage.html](http://www.m74completion.com/M74_Homepage.html)

9.2.4 These costs give some context for the scale of the cost which is likely to be associated with new road building in Ayrshire. Note that the Haddington-Dunbar scheme costs look out of step with the other schemes. In addition, in a recent (October 2005) response under the Freedom of Information Act, the Highways Agency has estimated the cost of typical motorway construction as being £23m to £28m per mile (£14m-£17m per km).

9.2.5 Clearly any individual scheme cost will vary enormously depending on configuration, structure, junctions, ground conditions etc but Table 9.2 below gives indicative costs for large scale road building along the existing inter-regional corridors, based on the costs reported above.
### Table 9.2 Estimate of scheme costs – Ayrshire road building

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Length (km)</th>
<th>M-way cost*</th>
<th>Dual Cost**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A737 – M8</td>
<td>35</td>
<td>£525m</td>
<td>£175m</td>
</tr>
<tr>
<td>A71 – (Kilmarnock-M74)</td>
<td>40</td>
<td>£600m</td>
<td>£200m</td>
</tr>
<tr>
<td>A70 – M74 (Ayr – M74)</td>
<td>56</td>
<td>£840m</td>
<td>£280m</td>
</tr>
<tr>
<td>A76 – (Kilmarnock - Dumfries)</td>
<td>96</td>
<td>£1440m</td>
<td>£480m</td>
</tr>
<tr>
<td>A77 – (Ayr-Cairnryan)</td>
<td>67</td>
<td>£1005m</td>
<td>£335m</td>
</tr>
</tbody>
</table>

* assuming £15m per km, off line  
** assuming £5m per km, on line upgrade

9.2.6 Table 9.2 demonstrates the very large costs associated with major road building along the corridors. In Chapter 4, it was reported that strategic traffic on these corridors was low, around 3,500 on the A70 and A76, 5,000 on the A71 and 6,500 on the A77. In contrast, traffic levels on the A77 north of Kilmarnock prior to its upgrade to motorway status was around 43,000 vehicles per day.

9.2.7 These high construction costs, coupled with low strategic traffic levels lead to the motorway options being dropped for further consideration on the basis of cost and implementability.

9.2.8 The large scale building of entirely new railway lines is also not considered for reasons of costs and implementability.

9.2.9 During this sifting stage, other schemes were added to those raised during the consultation to form the ‘long list’ for appraisal against the Planning Objectives.

**Route Action Plans**

9.2.10 ‘Route Action Plans’ can be implemented along the length of single carriageway trunk road routes as a lower cost alternative to new road building. Trunk roads often pass through a number of communities where the construction of bypasses is not a practicable option for the foreseeable future. In these situations, traffic calming schemes can be incorporated into the Route Action Plan. An example of this is the treatment to the towns along the A76, where action to improve traffic conditions in roadside communities was given early priority.

9.2.11 Although drivers on long distance single carriageway roads often experience ‘congested’ driving as a result of long platoons of vehicles, the volumes of traffic on these roads are usually well below the ultimate capacity. This is clearly the case with the strategic links in Ayrshire. A successful, cost effective approach to such problems is to provide well placed and unambiguous overtaking opportunities where drivers can safely pass slower-moving vehicles. These measures can be a mix of discrete sections of dual carriageway, climbing lanes, and two-lane / one-lane running (such as the recent scheme implemented on the A9 at Kingussie).
9.2.12 Route Action Plan studies have been undertaken for the A76 and A77 – it may be that similar studies are required to be implemented for the A70 and A71. This would however be accepting the case that a new route will not be built in the short term, which may not be politically desirable.

9.3 TELMoS Modelling

9.3.1 The Scottish Executive has invested in a Regional Economic Model for Scotland, TELMoS, developed by David Simmonds Consultancy. This model is normally used in conjunction with TMfS, but can also be used in ‘stand alone’ mode, i.e. using existing or manually modified transport costs (these would normally be provided by a run of TMfS).

9.3.2 ‘Generic’ changes in transport costs (e.g. between a defined set of origins and destinations) can be manually applied to the model. This approach has been used here to give estimates of the effect of improving Ayrshire’s accessibility on regional performance (measured by employment and GVA (Gross Value Added)), in the context of the present planning policy in Ayrshire (reflected in TELMoS inputs). The effects of transport improvements on population levels has also been estimated in this way – important given the projected population decline in Ayrshire.

9.3.3 Following the early consultations, 4 generic tests were specified and run in TELMoS

- 15 minutes notional reduction in public transport (PT) between Glasgow and Ayr
- 15 minutes notional reduction in PT between Glasgow and Kilmarnock
- 15 minutes notional reduction in road costs between Ayrshire and the M74
- 15 minutes notional reduction in road costs along the A737 corridor - Irvine to Glasgow

9.3.4 These changes were applied to selected zone pairs within TELMoS and the model was run to provide forecasts up to 2015. Each test was compared to a Reference Case and the difference between the 2 is reported as being the impact of the test. The results of these tests, although indicative, do give further context for the appraisal of the options discussed above, and provide an indication of the relative merits of road and public transport schemes, in economic development terms.

9.3.5 Figure 9.2 below shows the results of the tests in terms of their forecast impact on (workplace) employment. The charts show percentage and absolute changes, for the 3 Ayrshire local authority areas, Glasgow, Lanarkshire, and total Ayrshire (along the base of the charts). Each set of coloured columns represents an individual test. Although the absolute numbers may be open to question due to the simplified way in which the tests have been implemented, the results give a good indication of the distribution of the impacts of each test, as well as the relative effect of one test against another.
9.3.6 The results in Figure 9.2 suggest that the two road improvement schemes have a far greater impact on employment than the public transport schemes. This reflects the general dominance of cars for passenger travel and of lorries and vans for goods movement. The scheme with the greatest impact is the A737 corridor test. It may be that a 15 minute reduction on this corridor would be difficult to achieve which is exaggerating the results, but on the other hand, it is improving travel times markedly to the key destination for Ayrshire – Glasgow, so a significant impact should be anticipated. Nonetheless, it can be seen that this scheme benefits North and South Ayrshire, at the expense of East Ayrshire (relative to the ‘Reference Case’). There is a transfer of jobs away from Glasgow, East Ayrshire, and Lanarkshire into North and South Ayrshire.

9.3.7 Improved travel times to the M74 also have a significant effect on Ayrshire jobs, with benefits to East and South Ayrshire, and a small loss in North Ayrshire. Interestingly, improving links to the M74 also benefits Lanarkshire – this illustrates the ‘2-way road’ nature of transport improvements.

9.3.8 Both the public transport improvements are forecast to increase employment in Ayrshire by around 1%. The distribution of the impacts is as anticipated with East Ayrshire benefiting most from the improved Kilmarnock-Glasgow service, increasing jobs there by around 1.5%. North Ayrshire gains most from the Glasgow-Ayr improvements with employment increasing by around 1.7%.
9.3.9 Figure 9.3 below shows a similar set of results for GVA. The top chart shows the absolute change in GVA by geographical area as before and the bottom chart shows the impacts of the tests on GVA by sector, for all Ayrshire.

![Abs Change in GVA (Em), 2015](image1)

![Abs Effect on GVA (Em) by Sector, Ayrshire, 2015](image2)

Figure 9.3 Effect of test series on GVA

9.3.10 Again, when considering GVA, the road schemes have a far greater impact than the public transport improvements. The GVA measure shows a smaller difference between the A737 Corridor and Ayrshire-M74 in terms of total impact on Ayrshire. The road schemes are forecast to increase GVA in Ayrshire by between £100m-£175m per annum by 2015, this is around 3% to 4.5%, highly significant impacts if these travel time savings could be achieved in reality. The GVA impacts of the public transport travel time improvements are positive, but very much smaller at around 0.5%. The distribution of impacts is similar to that seen for employment. The Ayrshire-M74 test sees a significant redistribution of GVA away from Glasgow to Ayrshire and Lanarkshire. Note that the modelling is constrained in such a way that there is no impact on GVA at the Scotland level.

9.3.11 Looking at the effects of the tests on GVA by sector, the A737 scheme has the largest impact for all sectors except Distribution & Catering, where the Ayrshire-M74 link is more significant. The sectors which see the greatest impact are Finance & Business Services and Public Administration. It should be noted that Finance & Business Services is forecast to be the main growth sector in Ayrshire (see Chapter 3) so any measure which supports this is to be encouraged. It is notable that Public Administration is the biggest gainer from the public transport schemes – perhaps reflecting the location of this sector primarily in zones which are served by public transport.
9.3.12 Finally, Figure 9.4 below shows the forecast effects of the tests on population.

![Population Change Chart]

**Figure 9.4 Effect of test series on population**

9.3.13 The percentage change effects on population in Ayrshire are much less than on employment or GVA, with the A737 having the largest effect at 1.2%, although this still amounts to a not insignificant 4,000 people. All of the schemes benefit each Ayrshire council area, the only exception being East Ayrshire seeing a small drop in the Ayr-Glasgow test. The population effects would probably increase further if the model was run for longer, as the population impacts result from a gradual migration process responding to the gains in employment, which themselves come about gradually during the period after the modelled changes in transport.

9.3.14 Note that the ‘planning policy’ inputs (ie the quantity of ‘developable’ land by zone) are common to all tests. The population impacts might also be greater if the planning policies were directly related to the transport policies, eg if additional residential development was allowed in zones where the transport changes would encourage commuting to Glasgow and other parts of the Central Belt.
9.3.15 The main points which can be drawn from the above are:

- Road improvements have a greater effect on increasing employment, GVA and population in Ayrshire.
- Reducing road travel times to Glasgow has a greater effect than improving links to the M74.
- The two rail schemes have a similar level of impact.
- The impacts of the rail schemes appear in the anticipated locations, i.e., Kilmarnock-Glasgow changes have the biggest impact in East Ayrshire.

9.3.16 These aspects, together with the cost and implementability of the schemes, are considered further in the appraisal which follows.

**Mapping economic impact tests**

9.3.17 The results shown above can also be presented at the (TMfS / TELMoS) zonal level, to give an indication of the distribution of impacts at a more spatially disaggregate level. Figure 9.5 below shows the impact of the two public transport tests on the distribution of workplace employment in the west of Scotland. Figure 9.6 shows similar graphics for the two road improvement tests. In each map, areas coloured red see a decline in employment (relative to the Reference Case) whilst green and black areas show job gains.

![Figure 9.5 Impact on employment, PT tests](image-url)
9.3.18 The Glasgow-Ayr PT test sees a pronounced ‘shift’ to the west, at the expense of East Ayrshire and Lanarkshire. For Glasgow-Kilmarnock, the ‘middle’ section of Ayrshire sees most benefit. The road schemes show bigger changes relative to the Reference Case, with the A737 test showing large job gains along the coastal strip of Ayrshire. The Ayrshire-M74 test shows gains across a large southern / eastern area, at the expense of jobs in Inverclyde and Glasgow. This type of redistribution of economic activity into Ayrshire would support national regeneration priorities.

9.3.19 These results provide some benchmarks for the STAG appraisal.

9.4 Planning Objectives

9.4.1 The setting of objectives is clearly the key early step in any appraisal process. In STAG, there are 2 main types of objective – planning objectives and government objectives. STAG describes planning objectives as: “those objectives established or adopted by the planners [those charged with carrying out the STAG assessment] for the purposes of the planning exercise”. The government objectives are those described in the White Paper ‘Travel Choices for Scotland’ covering environment, safety, economy, integration and accessibility.

9.4.2 In this case, the planning objectives seek to capture the key issues associated with transport and the economy in Ayrshire, whilst also covering the full range of government objectives in a way specific to this study. They were developed to encompass the key issues which emerged from the consultation meetings and other elements of the study.
9.4.3 These objectives are used as a high-level appraisal framework in both option sifting and appraisal. Given the high level at which the Ayrshire study is taking place, it should be noted that the planning objectives are not necessarily ‘SMART’\(^9\) in this instance. STAG objectives should generally be smart, but in this case, this scoping assessment is qualitative, which precludes the use of truly SMART objectives.

9.4.4 The planning objectives developed are listed below, together with a reference to relevant Government objectives:

1. To support key Structure Plan themes / objectives – assists in a housing led population stabilisation strategy, through improving access from Ayrshire to the Glasgow and other City Region employment opportunities and services (ECON & INT)
2. To support key Structure Plan themes / objectives – to improve linkages between the 3 Major Towns and assist in developing their ‘complementarity’ and integration as the Central Ayrshire Economic Development Zone (ECON & INT)
3. To assist indigenous and developing industries by removing identified transport constraints, reducing costs and times, and improving reliability of journey times (ECON)
4. To counter the perception of Ayrshire as a peripheral location – particularly as a location for new investment (ECON)
5. To ensure high quality access from Ayrshire to long-term growth and employment areas in the region – eg the Clyde Gateway & Clyde Waterfront (ECON)
6. To improve accessibility of ‘lagging’ areas as identified in SIMD (CRF areas), with the aims of reducing social exclusion and improving affordable access to (primarily local) jobs, further education and health services (ACC/SI & INT)
7. To provide assistance to key Ayrshire growth sectors – to address the specific connectivity issues for Hunterston, Prestwick, the 3 ports of Ayr, Troon and Ardrossan (freight and passenger ‘Gateway Locations’ identified in AJSP Policy ECON1) and the Strategic Business Locations identified in AJSP Policy ECON2. (ECON)
8. To conserve Ayrshire’s natural and cultural heritage resources and enhance the environment (ENV)
9. To deliver economic development benefits to the region as a whole (especially Core Investment Area), as opposed to single towns / locations – local or wider-area impacts? (ECON)
10. STAG Government – Safety (particularly road safety issues on key A Roads) (SAFETY)

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\(^9\) SMART – Specific, Measurable, Attainable, Relevant & Timed
9.5 Sifting Stage 2

9.5.1 The second stage of option sifting is the main element of appraisal in this Scoping Study. Chapter 8 reported the range of schemes being promoted by the various stakeholders in the area. These (together with the other schemes discussed in Section 9.2) were distilled down to the following list of schemes (shown with scheme reference numbers) for the purposes of appraisal:

**Road schemes**

- **Ro1 - Further extensions of M77 to Ayr**: this would involve the upgrading of the existing A77 to motorway standard as far as perhaps the Whittlets roundabout, requiring the construction of new junctions (particularly with the A78 at Bellfield), and may have to be built off line south of Kilmarnock. Existing junctions through Kilmarnock may have to be upgraded
- **Ro2 - A77 improvements south of Ayr**: including junction improvements at Whittlets, bypass at Maybole, improvements are likely to include improved overtaking opportunities and traffic calming through affected towns and villages
- **Ro3 - A737 improvements**: Irvine to Johnstone, including a bypass at Dalry, improvements are likely to include improved overtaking opportunities and traffic calming through affected towns and villages
- **Ro4 - A70 improvements**: Ayr to M74, improvements are likely to include improved overtaking opportunities and traffic calming through affected towns and villages
- **Ro5 - A71 improvements**: Kilmarnock to M74, improvements are likely to include improved overtaking opportunities and traffic calming through affected towns and villages
- **Ro6 - A76 improvements**: Kilmarnock to Dumfries, including a bypass at Mauchline, improvements are likely to include improved overtaking opportunities and traffic calming through affected towns and villages
- **Ro7 - A78 improvements**: extension of the ‘3 Towns’ bypass to Fairlie, bypassing West Kilbride / Seamill
**Rail schemes**

- **Ra1 - GSWR Upgrade (Kilmarnock-Barrhead):** double track or dynamic loop to facilitate a half hourly service for Kilmarnock-Glasgow Central
- **Ra2 - GSWR upgrade (Kilmarnock-Carlisle stretch, plus links to Hunterston):** upgrade of this line to increase capacity requiring improved junctions, signaling improvements, Annan-Gretna double tracking, and to provide clearance for new size containers (for Hunterston)
- **Ra3 - GSWR Upgrade:** provision of long distance passenger services south, Glasgow-London, ie linking Ayshire into UK rail network
- **Ra4 - Largs / Hunterston:** double tracking of this line (currently single track beyond Ardrossan South Beach) increasing capacity for passenger and freight trains
- **Ra5 - Ayr line ‘capacity’ and frequency:** including support for the enabling Glasgow Airport Rail Link project (increased capacity on Paisley Gilmour Street – Glasgow section and platform capacity at Glasgow Central), 15 minute service to Ayr [Note that current proposals for GARL are based on a Paisley-Shields Junction (west of Glasgow) capacity increase from 2 to 3 tracks, not 4 – this together with a ‘pinch point’ on the line means there is some uncertainty as to the operational viability of a 15 minute service, given this level of infrastructure]
- **Ra6 - Prestwick Airport station improvements:** better facilities for air travellers / increased capacity
- **Ra7 - Glasgow Cross-Rail:** to improve rail connectivity between Ayshire and the Central Belt, crucially assuming that Ayshire trains will travel beyond Glasgow to eg Edinburgh (NB present plans for Crossrail do not envisage this)

**Other schemes**

- **Oth1 - ‘Route Development Fund’:** further financial support for air routes out of Prestwick
- **Oth2 - Park and ride strategy:** as identified in Schedule 8 of AJSP)
- **Oth3 - Internal Ayshire PT improvements:** focussing on bus and ferry, affordable public transport (offering ‘routes’ to employment), ie improved bus services or busways linking outlying settlements with the Core Investment Area, and improving links within the Core Investment Area
- **Oth4 - Improved bus services from Ayshire to the wider City Region:** focussing on key employment centres not currently accessible by rail

9.5.2 Within this list, for the rail schemes in particular, there are clearly some dependencies. For example, Ra3 is clearly dependent upon Ra1 and Ra2, and Ra5 is dependent upon the improvements between Paisley Gilmour Street and Glasgow Central which are part of the Glasgow Airport Rail Link proposals

**9.6 Appraisal**

9.6.1 Each of the above transport schemes has been appraised against each planning objective using the following 7 point scale, adopted from STAG

- Major / Moderate / Minor benefit - no impact - small / moderate / major negative impact
**Appraisal Method**

9.6.2 The high level STAG appraisal took account of the following

- the relevant planning framework
- our review of transport and connectivity as it affects Ayrshire
- information obtained via the consultation process
- environmental baseline information
- TELMoS modelling outputs
- Local socio-economic information

9.6.3 The study team held 2 meetings where the appraisal was considered in detail. The approach taken to appraising each of the 5 Government objective areas is outlined below.

**Environment**

9.6.4 No specific consultation has been undertaken to access detailed environmental baseline information because of the high level nature of the study. Information has been used from the Ayrshire Structure Plan Key Diagram (see Chapter 8) and also from relevant mapping (for the location of towns, villages etc). In addition key environmental baseline information was made available by the Ayrshire Joint Structure Plan team from their environmental audit web map facility which is under development. This included map based information on

- European sites of nature conservation (Special Areas of Conservation and Special Protections Areas)
- Sites of Special Scientific Interest
- Areas of important bog
- Sensitive landscape character areas
- Historic gardens and Designed Landscapes
- Scheduled Ancient Monuments
- Geological resources

9.6.5 The broad location of key constraints was taken from these sources and used in the comparison of options. In general smaller schemes (ie those with little requirement or no for land-take etc) or on-line improvements have been assumed to have less environmental impact than major off-line improvements or those requiring major new infrastructure.

**Safety**

9.6.6 The assessment of the impact of any scheme on safety assumed

- road improvements would be beneficial on routes with a poor safety record
- public transport schemes likely to induce significant modal shift are regarded as beneficial
Economy

9.6.7 Many of the planning objectives developed contained an ‘Economy’ element. This was appropriate given the focus of the study. Our appraisal of Economy was based on an informed, qualitative judgment, developed from our consultation with key stakeholders. The results of ‘generic’ TELMoS model runs were also drawn on.

Integration

9.6.8 The Integration objective covers integration of transport services, integration of transport and land use, and wider policy integration. There was an Integration element to 3 of the objectives and a qualitative judgment was made as to how the proposal impacts on these 3 areas of integration.

Accessibility and Social Inclusion

9.6.9 The effect of the proposals on improving the accessibility of CRF areas was the basis for this objective. The maps of SIMD discussed in Chapter 3 were used for this purpose.

9.6.10 The results of this appraisal are summarised in Table 9.3 overleaf. The ticks and crosses in the table correspond to the above 7 point scale as follows:

- major benefit (✔✔✔)
- moderate benefit (✔✔)
- minor benefit (✔)
- no impact (-)
- minor negative impact (✘)
- moderate negative impact (✘✘)
- major negative impact (✘✘✘)

9.6.11 The paragraphs following Table 9.3 provide commentary on the appraisal.
### Table 9.3 STAG Appraisal of ‘Long List’

**LONG LIST / OBJECTIVES**

<table>
<thead>
<tr>
<th>1. To support key Structure Plan theme / objective – assists in housing and population stabilisation strategy, through access from Ayrshire to the Glasgow and other City Region employment opportunities and services. (ECON &amp; INT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. To support key Structure Plan theme / objective – to improve linkages between the three Major Towns and industries by removing transport constraints, costs and times, and improving reliability of journey times. (ECON)</td>
</tr>
<tr>
<td>3. To assist indigenous developing industries by removing identified transport constraints, costs and times, and improving reliability of journey times. (ECON)</td>
</tr>
<tr>
<td>4. To counter the perception of Ayrshire as a peripheral location – particular as a location for new investment. (ECON)</td>
</tr>
<tr>
<td>5. To ensure high quality access from Ayrshire to long-term growth and employment areas in the region – eg the Clyde Gateway &amp; Clyde Waterfront (ECON)</td>
</tr>
<tr>
<td>6. To improve accessibility of ‘lagging’ areas identified in SIMD (CRR areas), with the aim of reducing social exclusion and improving affordability of access to (primary) local social services. (ACC/SE &amp; INT)</td>
</tr>
<tr>
<td>7. To provide assistance to key Ayrshire growth sectors – to address the specific connectivity issues for Hunterston, Prestwick, the three ports of Ayr, Troon and Girvan (freight and passenger 'Gateway Locations' identified in ASP Policy ECON1)</td>
</tr>
<tr>
<td>8. To conserve Ayrshire’s natural heritage resources and enhance the environment. (ENV)</td>
</tr>
<tr>
<td>9. To deliver economic development benefits to the region as a whole (especially Core Investment Area), as opposed to single towns/locations – local or wider-area impacts? (ECON)</td>
</tr>
<tr>
<td>10. STAG Government – Safety (particularly roadsafety issues on key ARoads) (SAFETY)</td>
</tr>
</tbody>
</table>

**Ro1: M77 Ext to Ayr**

| Ro2: A77 south of Ayr upgrades |
| Ro3: A737 upgrade |
| Ro4a: A70 upgrade |
| Ro4b: A70 new route |
| Ro5a: A71 upgrades |
| Ro5b: A71 new route |
| Ro6: A76 upgrade |
| Ro7: A78 three towns bypass ext. |
| Ra1: Kilnmanock – Barrhead |
| Ra2: GSWR & Hunterston upgrade |
| Ra3: Virgin / GSWR |
| Ra4: ‘Large’ – Hunterston – South tracking |
| Ra5: Glasgow–Ayr |
| Ra6: Prestwick Airport station |
| Ra7: Crossrail |
| Oth1: ‘Route Development Fund’ |
| Oth2: Park and ride ‘strategy’ |
| Oth3: Internal PT |
| Oth4: Interreg buses |
9.6.12 The appraisal of each of the potential schemes is now briefly discussed.

**Ro1 - Further extensions of M77 to Ayr**

9.6.13 The upgrading of the A77 between Fenwick and Ayr to motorway standard would make a significant contribution to the AJSP strategic objective of improved connectivity with Glasgow City Region for a significant area of Ayrshire. Improved reliability and speed of journey times, particularly during peak times, would improve accessibility between Ayr / Prestwick (GPIA) / Troon and Glasgow City Region (city centre and Clyde Gateway in particular). This high-profile scheme would also clearly help counter the perception of peripherality.

9.6.14 It would also have a significant contribution to the AJSP strategic objective of improved connectivity between the 3 Major Towns. The removal of potential bottleneck junctions would improve reliability and speed of journey times between 2 of the 3 Major Towns identified in the AJSP’s strategy, Ayr and Kilmarnock. Benefits would accrue to both public transport (bus) and private cars, and hence indigenous and developing industries would be assisted.

9.6.15 Large scale road building of this nature cannot generally be regarded as sustainable from the point of view of environmental impact and the use of the car. In this case, the improved A77 / M77 would not provide relief to any significant communities along its length, limiting the scope for local environmental improvements.

**Ro2 - A77 improvements south of Ayr**

9.6.16 The main positive impacts of the A77 south of Ayr improvements are to improve links to Northern Ireland for businesses in Ayrshire and to improve road safety. There would also be local environmental improvements in Maybole as a result of the bypass, but it would make a very limited contribution to improved connectivity with the Glasgow City-Region. There will be improved road access from areas of Ayrshire south of Ayr to Glasgow City Region, but travel times will still be long and the population and number of businesses affected are relatively small.

9.6.17 Negligible contribution to AJSP strategic objective of improved connectivity between the 3 Major Towns. In general, the impacts of this scheme are minor.

**Ro3 - A737 improvements**

9.6.18 The A737 improvements would make a significant contribution to the AJSP strategic objective of improved connectivity with Glasgow City-Region. Improved reliability and speed of journey times, particularly during peak times, would improve accessibility between Irvine and Ayr / Prestwick / Troon, and significant economic drivers in the Glasgow City-Region (including Glasgow Airport and Clyde Waterfront in particular), supporting the AJSP strategy. The A737 has been repeatedly identified as a constraint on the development of North Ayrshire, so upgrades would address this. A significant number of CRF areas would benefit from improved reliability.
9.6.19 There is a negligible contribution to AJSP strategic objective of improved connectivity between 3 Major Towns, as links between Kilmarnock, Ayr and Irvine are unaffected.

9.6.20 The A737 would provide a better link from Hunterston to the western areas of the Glasgow conurbation. It also improves links between GPIA and Glasgow International Airport. Road safety would be improved and Dalry would benefit environmentally from a bypass.

**Ro4a/b - A70 improvements**

9.6.21 Improved reliability and speed of journey times would improve accessibility to economic opportunities in eastern area of Glasgow City Region (Lanarkshire), and also to mid Central Belt (Falkirk, Stirling) via M74/M73 link. There is no contribution to AJSP strategic objective of improved connectivity between 3 Major Towns.

9.6.22 Upgrades to the A70 would improve links between primarily South Ayrshire and UK markets, via the M74, including GPIA. The degree to which identified constraints are removed is dependent upon the scale of the upgrade constructed. Clearly a high quality dual carriageway would provide a step change in quality, on line improvements rather less so, but these could still be significant in reducing journey times and improving reliability. The same argument applies for the impact on the perception of peripherality. The A70 affects the Core Investment Area as a whole to a lesser degree than the A71.

**Ro5a/b - A71 improvement**

9.6.23 Improved reliability and speed of journey times would improve accessibility to economic opportunities in eastern area of Glasgow City Region (Lanarkshire), and also to mid Central Belt (Falkirk, Stirling) via M74/M73 link. There is no contribution to AJSP strategic objective of improved connectivity between 3 Major Towns (assuming no upgrade between Irvine and Kilmarnock).

9.6.24 Upgrades to the A71 would improve links between primarily North and East Ayrshire and UK markets, via the M74, including Hunterston – identified as a key constraint by Ayrshire stakeholders. The scheme would have little impact for South Ayrshire however. The degree to which identified constraints are removed is dependent upon the scale of the upgrade constructed. Clearly a high quality dual carriageway would provide a step change in quality, on line improvements rather less so, but these could still be significant in reducing journey times and improving reliability. The same argument applies for the impact on the perception of peripherality.

**Ro6 - A76 improvements**

9.6.25 Improvements to the A76 would make a limited contribution to the AJSP strategic objective of improved connectivity with the Glasgow City Region. Improved reliability and speed of journey times would improve accessibility to Dumfries and M74/M6 south into England, challenging current perception of peripherality to a small degree.

9.6.26 There would be a negligible contribution to the AJSP strategic objective of improved connectivity between the 3 Major Towns. Improved road-based accessibility between
outlying Ayrshire towns (eg Cumnock) and economic opportunities in Kilmarnock would increase accessibility for some CRF areas. The scheme would benefit the whole Core Investment Area, and road safety would be improved.

**Ro7 - A78 improvements (extension of the 3 towns bypass)**

9.6.27 There is a limited contribution to AJSP strategic objective of improved connectivity with Glasgow City Region. Slight improvement to journey times between 3 Towns, Hunterston and Greenock, but other bottlenecks would remain further north on the A78.

9.6.28 The impacts of this scheme are small – however it may be a key scheme for the success of the Hunterston proposals, as the current route does impact on urban areas, where additional HGV traffic would clearly be undesirable.

**Ra1 - GSWR Upgrade (Kilmarnock-Barrhead)**

9.6.29 Improved rail services for Kilmarnock would make a significant contribution to the AJSP strategic objective of improved connectivity with the Glasgow City-Region, providing much improved access from Kilmarnock to the City Region’s key economic driver, Glasgow city centre. The geographical scope of the impacts are limited to Kilmarnock however.

9.6.30 Improved public transport could also help achieve modal shift from private cars in line with AJSP strategy. There is a negligible contribution to AJSP strategic objective of improved connectivity between 3 Major Towns (unless rail service improvements are continued through from Kilmarnock to Ayr).

9.6.31 The scheme would have positive impacts on Kilmarnock town centre as a business location, but would not directly impact on key Ayrshire growth sectors.

**Ra2 - GSWR freight upgrade (Kilmarnock-Carlisle stretch, plus links to Hunterston)**

9.6.32 There would be significant benefits to the AJSP strategic objectives by releasing critical constraints on increased use of Hunterston and other Ayrshire ports for trans-shipment of container and heavy freight to English destinations. This would be a significant benefit to sectors which use rail freight in particular.

9.6.33 Negligible contribution to AJSP strategic objective of improved connectivity between 3 Major Towns (unless creation of a chord at Barassie facilitates introduction of passenger services between Irvine and Kilmarnock).

9.6.34 Again, this scheme could be essential for the long term development at Hunterston, so has a strong positive impact on key growth sectors. Otherwise, the impacts of this scheme are smaller, in terms of links to Glasgow, effect on CRF areas etc.

**Ra3 - GSWR passenger service upgrade**

9.6.35 There is a limited contribution to AJSP strategic objectives, although improved accessibility to Dumfries, Carlisle and the West Coast Main Line would challenge current perception of peripherality.
9.6.36 There would clearly be strategic benefits for local businesses of having Virgin Cross Country services routing through (and stopping) in Ayrshire. It would also be a significant factor in attracting investment, however the likelihood of this outcome is extremely low.

**Ra4 - Largs / Hunterston (double tracking)**

9.6.37 This scheme has very limited impacts, affecting Largs and possibly Hunterston. The operators at Hunterston have stated that although desirable, this upgrade is not essential for the further development of the site. There is therefore a limited contribution to AJSP strategic objectives, as passenger service improvements would be limited from an Ayrshire-wide perspective.

**Ra5 - Ayr line ‘capacity’ and frequency**

9.6.38 This scheme would make a highly significant contribution to AJSP strategic objective of improved connectivity with the Glasgow City-Region, both from a residential and business perspective. Improved frequency and reliability of journey times would improve accessibility between Ayr / Prestwick / Troon / Irvine and the Glasgow City-Region (city centre and Clyde Gateway in particular). Current problems of overcrowding would be addressed.

9.6.39 It could also help achieve modal shift from private cars in line with AJSP strategy, making this a highly sustainable proposal, also impacting on safety. There would be a significant contribution to AJSP strategic objective of improved connectivity between 3 Major Towns (Ayr-Irvine). Doubling of frequency would improve connectivity between 2 of the 3 Major Towns identified in the AJSP’s strategy, Ayr and Irvine. GPIA would benefit from increased rail frequencies.

**Ra6 – GPIA station improvements**

9.6.40 Improvements to the facilities and perhaps capacity at GPIA have only a modest impact on the planning objectives. There is a limited contribution to AJSP strategic objectives, but clearly, GPIA itself would benefit.

**Ra7 - Glasgow Cross-Rail**

9.6.41 If Ayrshire trains were routed via Glasgow Cross-rail to destinations beyond Glasgow, it would be a significant contribution to AJSP strategic objective of improved connectivity with the Glasgow City-Region and the Central Belt. Avoidance of station transfer between Glasgow Central and Queen Street would greatly improve speed and ease of journeys, with greatly improved connectivity to destinations beyond Glasgow Central within the Glasgow City Region (eg Clyde Gateway), in the Central Belt (eg Edinburgh) and beyond (eg Aberdeen). The proposals could also help achieve significant modal shift from private cars in line with AJSP strategy.

9.6.42 The strategic nature of this scheme means that it scores well against most of the planning objectives, the exceptions being social inclusion (as it does little for ‘local’ public transport), and the improvement of transport between the 3 main towns.
9.6.43 Depending on airports served, there would be some contribution to AJSP strategic objectives by providing direct links to potential business destinations and challenging the notion of peripherality. This would also assist in reducing the perception of peripherality, and could provide a boost to the aerospace industries at Prestwick. The damaging effects of air travel on the environment is recognised.

9.6.44 Improved Park and Ride facilities would make a contribution to the AJSP strategic objective of improved connectivity with the Glasgow City-Region. Improved parking at stations would improve accessibility between all 3 Major Towns and Glasgow City Region (including city centre, Glasgow Airport, Clyde Waterfront and Clyde Gateway), and provide a new option for those currently driving to central Glasgow in particular.

9.6.45 Park and Ride can also help achieve significant modal shift from private cars in line with AJSP strategy. However, evidence suggests that a significant share of new Park and Ride users previously used public transport entirely. Park and Ride is of most benefit to one adult / one car and 2 adult / 2 car households.

9.6.46 Local improvements to public transport would make a significant contribution to AJSP objectives of consolidating the role of the 3 Major Towns as service / employment centres, and improving access to them from other settlements. This policy also scores strongly on assistance to CRF areas.

9.6.47 The effectiveness of the measure depends on the range and extent of local transport improvements proposed. The focus should be on connections with Major Towns.

9.6.48 This policy would improve links to the Glasgow City-Region and therefore makes a significant contribution to AJSP strategic objective of improved connectivity with the Glasgow City-Region. Improved journey speed, frequency, range of destinations and reliability of journey times (often starting from a very low base) would improve accessibility with Glasgow City Region. Access to long terms growth centres throughout the City-Region would be the focus of these services.

9.6.49 The effectiveness of the measure clearly depends on the range and extent of bus services proposed.

9.7 Appraisal Ranking

9.7.1 It should be noted that STAG is not designed to produce a clear ranking of schemes. Instead, any scheme or policy is appraised against government and planning objectives. A balanced view is then taken as to the best option with which to proceed.
9.7.2 However, in this case, we have taken the appraisal on one stage further and ranked the schemes in accordance with the Research Specification. The ‘scores’ from the planning objectives are obtained by simply adding ‘ticks’ and subtracting ‘crosses’, shown in Table 9.4. A further score is added to represent the potential effect on GVA and employment in Ayrshire – this has been informed by the results presented in Section 9.3. This provides an adjusted score and the schemes have been ranked according to these scores, to provide an indicative order of priority. Comments are then included on costs and implementability. These costs are very approximate, where not sourced, and should be regarded as ‘ballpark’. Where the ‘adjusted total’ scores are the same, lower cost schemes are presented above higher costs schemes.

Table 9.4 Indicative ranking of options

<table>
<thead>
<tr>
<th>LONG LIST / OBJECTIVES</th>
<th>Score from Planning Objectives</th>
<th>Ayrshire GVA/employment</th>
<th>Adjusted Total</th>
<th>Cost / Implementability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra5: Glasgow-Ayr</td>
<td>18</td>
<td>2</td>
<td>20</td>
<td>Low – Essentially additional trains and operating costs only, if GARL upgrades between Shields Road and Glasgow Central are sufficient to allow 4 tph – about which there is some uncertainty, plus station capacity issues at Central, dynamic loop Kilwinning-Paisley Gilmore Street (£2-£2.5m).</td>
</tr>
<tr>
<td>Ra1: M77 Exit to Ayr</td>
<td>17</td>
<td>3</td>
<td>20</td>
<td>High – possible junction re-building @ existing A77 dual section junctions, £110m (assuming £6m per km)</td>
</tr>
<tr>
<td>Ra3: A737 upgrade</td>
<td>13</td>
<td>6</td>
<td>19</td>
<td>Medium - Dalry Bypass £12m (assuming £4m per km), £10m on other upgrades, Total £22m</td>
</tr>
<tr>
<td>Ro5b: A71 new route</td>
<td>15</td>
<td>4</td>
<td>19</td>
<td>High, £200m, assuming £5m per km</td>
</tr>
<tr>
<td>Ro4b: A70 new route</td>
<td>14</td>
<td>4</td>
<td>18</td>
<td>High, £280m, assuming £5m per km</td>
</tr>
<tr>
<td>Ra7: Crossrail</td>
<td>15</td>
<td>2</td>
<td>17</td>
<td>Low marginal cost – Crossrail construction cost estimate £200m, additional trains and train operating costs if trains from Ayr travel beyond Glasgow Central, current indications are that Ayr trains will not use the Crossrail facility</td>
</tr>
<tr>
<td>Ra3: Virgin / GSWR</td>
<td>13</td>
<td>1</td>
<td>14</td>
<td>No significant capital costs if line is upgraded anyway - securing Virgin services and getting them to stop in Ayrshire may be problematic</td>
</tr>
<tr>
<td>Ro5a: A71 upgrades</td>
<td>10</td>
<td>3</td>
<td>13</td>
<td>Medium - assuming 15km overtaking schemes over the 40km route @ £1.3m per km = £53m</td>
</tr>
<tr>
<td>Oth4: Interreg buses</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>Low – Long term revenue support may be required</td>
</tr>
<tr>
<td>Ra1: Kilmarnock – Barrhead</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>Medium - £15m-£20m for dynamic loop</td>
</tr>
<tr>
<td>Ra3: GSWR &amp; Hunterston upgrade</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>High - £60m, plus £20, for Virgin / Hunterston containers clearance</td>
</tr>
<tr>
<td>Oth3: Internal PT</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>Low - Long term revenue support may be required</td>
</tr>
<tr>
<td>Ro4a: A70 upgrade</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td>Medium - assuming 30km overtaking schemes over the 60km route @ £1.3m per km = £40m</td>
</tr>
<tr>
<td>Ro4b: A76 upgrade</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>High - assuming 40km overtaking schemes over the 96km route @ £1.2m per km = £51m</td>
</tr>
<tr>
<td>Ro2: A77 south of Ayr upgrades</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>High - assuming 30km overtaking schemes over the 67km route @ £1.3m per km = £44m, Medeate bypass £15m = £15m</td>
</tr>
<tr>
<td>Oth1: 'Route Development Fund'</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>Low - Scottish Executive funding</td>
</tr>
<tr>
<td>Oth2: Park and ride 'strategy'</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>Low, no implementability issues</td>
</tr>
<tr>
<td>Ra5: Prestwick Airport station</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>Low</td>
</tr>
<tr>
<td>Ra4: Large / Hunterston double tracking</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>Low-Medium cost</td>
</tr>
<tr>
<td>Ra7: A78 three towns bypass ext.</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>Medium - £30m, assuming £4m per km</td>
</tr>
</tbody>
</table>

9.7.3 The indicative ranking of schemes which emerges from the appraisal results in the more strategic schemes appearing at the top of the list. In terms of aggregate ‘score’ the Glasgow-Ayr rail service improvements come out on top followed by the M77 Extension to Ayr. There are however significant uncertainties in the implementation of the Glasgow-Ayr
scheme, as is also the case with Crossrail, with both being highly dependent on developments elsewhere in the rail network (outside Ayrshire).

9.7.4 In terms of road schemes, the M77 extension to Ayr and A737 upgrade achieve higher scores than the other road schemes. These links, which improve connections to Glasgow narrowly outscore the A71 and A70 improvements. The A71 appears ahead of the A70, echoing the conclusions of the earlier ‘Access to Ayrshire’ study. Improvements to the A76 and A77 to the south come much lower down this list of priorities, when assessed against this list of objectives.

9.7.5 A low cost option which scores relatively well is improvements to inter-regional bus services. Improvements to the GSWR are also well down this list, reflecting the relatively narrow, but potentially key impacts of these improvements. The schemes at the bottom of the list have only specific or local impacts. These may however be key to the development of certain locations or sectors.

9.8 Summary & Conclusions

9.8.1 It is often the case that supporters of new transport infrastructure schemes will place a strong emphasis on the economic development benefits of ‘their’ scheme. In addition, poor transport links are often identified by policy makers as a contributory factor to national, regional or local economic underperformance. This Scottish Executive Research study has taken an objective look at the economic and transport problems facing Ayrshire in 2006.

9.8.2 The available literature which has examined the economic development impacts of transport suggests a strong theoretical relationship between transport and economic performance but limited empirical evidence to support this. In the UK context, there have actually been relatively few ex post studies which have sought to identify economic impacts in a rigorous, statistical way. It is of course very difficult to observe and isolate the effects of a change in transport within any economic system given the myriad of other influences on economic performance. There is also no counterfactual with which to compare. This lack of empirical evidence has influenced the way in which Government appraises ex ante transport schemes. Until relatively recently, appraisal methods were limited to social cost benefit analysis. More recently, some benefits coming from the redistribution of economic activity have been ‘permitted’. It is not at all easy to estimate these distributional benefits without a land use (regional economic) – transport model. This study has made illustrative use of TELMoS (Transport Economic Land Use Model of Scotland) in this regard.

9.8.3 An economic overview of Ayrshire has established the main ways in which the Ayrshire economy is different to other areas of Scotland. This is principally seen in an over-reliance on declining industries and an under-representation in (private) service and knowledge based industries. There are also pockets of deprivation which remain, many of which are associated with single industry towns or areas, where this industry has collapsed, eg the Ayrshire coalfields and 3-towns. The characteristics of the transport system in Ayrshire and between Ayrshire and the rest of Scotland have also been summarised.

9.8.4 A programme of consultation with key stakeholders has highlighted the key issues regarding connectivity within Ayrshire and between Ayrshire and the rest of the country. It also established views on how transport was acting as a constraint to economic development
in Ayrshire. An analysis was undertaken looking at travel times within and outwith Ayrshire. Best use has been made of the available material to analyse accessibility at a local and local authority level, relative to the rest of Scotland. Existing literature and stakeholder consultation allowed a comprehensive list of projects to be established – these represent the aspirations of stakeholders for future transport investment in Ayrshire.

9.8.5 TELMoS was run in a simplified fashion to give indicative results regarding the potential effects of transport improvements in terms of employment, GVA and population for 4 of the emerging schemes. The results of the illustrative modelling showed that the road schemes had a far greater impact on these key measures. Of the schemes tested, the A737 appeared the most beneficial – these tests were necessarily implemented in a simplified manner however.

9.8.6 In the light of the above analysis, a set of detailed STAG ‘planning objectives’ was developed which encompassed the main issues raised in the study, in addition to the 5 government objectives. A long list of schemes was developed, based again on consultation but also a wider view of schemes which could be beneficial to the Ayrshire economy. Each of these schemes was then appraised against the planning objectives, in an informed, although qualitative way. A simple ‘scoring’ system was used to provide an indicative ranking of the schemes.

9.8.7 The schemes which came out at the top of the ranking were strategic schemes which primarily improved connectivity to the Glasgow City-Region. Most of these schemes already feature in the WESTRANS future programme and the outcome of this Scoping Study could assist in the prioritisation of these. The initial ranking obtained here could be used as a ‘filter’ to select a proportion of the schemes identified here for further appraisal. The next steps would be to undertake STAG Part 1 and STAG Part 2 appraisals. These appraisals would move the analysis from the qualitative to the quantitative, and provide a basis for a funding application.

9.8.8 The TELMoS runs in this study were indicative. An interesting follow up to this study would be to run the key schemes fully in the TMfS / TELMoS models, which would provide a more accurate estimate of the effects of the schemes on regional GVA, employment and population. A much more detailed picture of the changes in typical transport costs brought about by each scheme would be used as input to TELMoS. Different planning scenarios could be explored. Given the current policy focus on economic development in Ayrshire, these new model runs should be incorporated within a more detailed STAG EALI Study, where the impact of various transport interventions for Ayrshire could be explored in detail.

9.8.9 As discussed in Chapter 2, the DfT have recently launched a new ‘wider economic impacts’ methodology. It would be of potential interest to ‘pilot’ this methodology, which includes an assessment of agglomeration, in the Scottish context.

9.8.10 There are 2 main growth initiatives in Ayrshire – Hunterston deep water port and Prestwick Airport. Hunterston in particular has specific requirements for improvements to rail infrastructure within Ayrshire and the wider rail network, which will be essential in the medium-term if the port is to develop as anticipated. The requirements for Hunterston are worthy of further detailed study, given its central role as a major potential investment in Ayrshire.
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[www.clydeport.co.uk](http://www.clydeport.co.uk) – Clydeport/Hunterston

[www.gpia.co.uk](http://www.gpia.co.uk) – Glasgow Prestwick International Airport

**REFERENCES (EMPIRICAL EVIDENCE)**


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Appendix A

Research Specification
Research Specification
Avrshire – Transport and the Economy
The Scope for Improving Connectivity Between Avrshire and the Central Belt

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Planning Division
The Scottish Executive Development Department
6 October 2005
Introduction

1. Ayrshire has been less successful than some other areas in securing investment, including in the knowledge economy, to replace jobs lost in traditional industries. This scoping study concerns the assessment and prioritisation of potential transport proposals in Ayrshire which would support regeneration and economic development by improving connectivity. It will provide a basis for any subsequent detailed appraisal. The Consultative Draft of the Ayrshire Joint Structure Plan 2025 identified a need to improve accessibility within Ayrshire and more widely. The proposals included key locations for by-passes, strategic road development and rail investment. Ministers have indicated a desire to support the economic development and regeneration of Ayrshire.

Background and Context

2. The National Planning Framework (NPF) included Central Ayrshire as a broad economic development zone which contains business locations with the potential to become the focus for key industries and clusters. It said that the strategic business locations will require to have good links to the rest of Scotland and the wider world, be well connected to each other and readily accessible from residential areas. The NPF in its section on Spatial Perspectives also identified Ayrshire as an important gateway for Scotland. It suggested that the aim should be to build on the success of Prestwick Airport, realise the potential of the deep-water assets at Hunterston and strengthen strategic transport corridors between Ireland and the Continent. There is a clear need to improve connectivity to secure better integration with the economy of the Central Belt, between the settlements in Ayrshire, and to further the idea of Ayrshire as a Gateway.

3. In Central Ayrshire, the transport corridors linking Prestwick Airport and the ports of Ayr, Troon and Hunterston with the main urban centres of the Central Belt provide good locations for developing clusters of export orientated industries and a stronger service sector. The improved link to the Glasgow Conurbation provided by the M77/A77 is acting as a catalyst for new development in the Kilmarnock area, though constraints imposed by lack of capacity in water and drainage infrastructure require to be addressed.

4. The Ayrshire Economic Forum has responded positively to the challenges with its strategy for Ayrshire-Scotland’s Western Gateway. The Ayrshire Joint Structure Plan and Transportation Committee (AJSPTC) have been actively pursuing these issues in several ways which have been developed in a number of reports.

5. “Growing Ayrshire” the Ayrshire Joint Structure Plan 2025, Consultative Draft published in June 2004 referred to the National Planning Framework and the Ayrshire Economic Forum report-“Ayrshire-Scotland’s Western Gateway”. The draft SP considered that one of the economic drivers in that report, “Creating a Business Structure for the 21st Century”, provided a development planning context for the area and the themes raised in it were translated into the principal elements of the draft Structure Plan’s proposed Spatial Development Strategy. The SP also identifies a number of potential transport proposals and these are key to this study. The themes are further developed in the “Westrans-Joint Transport Strategy(JTS) for Western Scotland to 2025”.

6. The strands running through all this work concern connectivity outwards to Ireland and further afield from Prestwick Airport and the ports; connectivity to the Central Belt and...
national Motorway network; interconnectivity between and around the settlements of Ayrshire and the idea of Ayrshire as a Gateway. There is now a need to bring these strands together, place them in the national context, and determine overall priorities for transport investment.

7. Carrying out an objective-led STAG type scoping study should lay the foundations for defining solutions to identified issues which will help to inform national and strategic policy development for this part of Scotland through the mechanisms of the National Planning Framework 2, the Ayrshire Joint Structure Plan and the Joint Transport Strategy.

Aim

8. To identify the key features of the Ayrshire economy and what scope there may be for improving connectivity within and beyond Ayrshire which will support economic development and regeneration.

Objectives

9. The objectives of this study are:

1. Identify the key features of the Ayrshire economy and their locations.

2. Identify the general circumstances under which improvements in connectivity lead to improved regeneration and economic development. Identify whether any such improvements in connectivity need to be accompanied by other measures.

3. Identify the connectivity issues specific to each of Ayrshire’s main settlements, gateway facilities and economic centres including Prestwick Airport, Hunterston, Ardrossan, Saltcoats, Stevenston, Troon, and Ayr, Kilmarnock and Irvine (giving particular emphasis to those in the Central Ayrshire economic development zone).

4. Identify the connectivity issues associated with links to key economic areas and locations in the Central Belt and beyond.

5. Identify the connectivity issues for specific industries and other economic activity by sector and types of traffic.

6. Identify indicative project costs* and relevant delivery partners to enable prioritisation and feasibility to be ascertained. *Ball park/or a cost range will suffice.

7. Rank the key transport improvements identified by the STAG objectives: environment, safety, economy, integration, and accessibility/social inclusion.
Research Design/Methodology

10. The Research is a scoping study based on objective-led STAG principles. It should include a thorough desk study analysis of all the reports and studies referred to in the background above to examine and compare the common ideas and issues. Although the work should be based on STAG principles, transport modelling is not expected to be part of the approach. Otherwise Contractors are encouraged to suggest and devise their own approach but we would expect them to interview local stakeholders and local government officials. Please provide details of any potential problems or weaknesses with your proposed approach and how you would seek to address them.

Research Outputs

11. The key output will be a final report with an Executive Summary that meets the aim and objectives of the research as outlined in this specification. A four-page Research Summary and a 500 word abstract will also be required. The contractor should submit five paper copies and one electronic version (compatible with Word format) of both the report and research summary by the dates specified.

12. An interim report on findings to date and emerging issues will be required one week before the 2nd Steering Group meeting in January 2006. Prior to the final report the contractor will submit a draft final report for consideration by the Steering Group.

13. All written reports must be prepared in a clear, accessible and concise manner, be submitted in a publishable standard and in the Scottish Executive’s Social Research house-style. Details of the required style are available on the following website: www.scotland.gov.uk/cru

Ownership & Publication of Outputs

14. The ownership of the research material including the final report and data produced as a result of the research will lie with the Scottish Ministers. It is normal practice to publish research as part of the Scottish Executive’s Transport Research series, the date and format of which will be determined by the Executive.

Responsibilities of the Contractor

15. The contractor will be responsible for the design, desk research, fieldwork, data analysis and preparation of the final report to a standard agreed with the Scottish Executive. It is the responsibility of the contractor to ensure that the proposed methodology does not contravene the provisions of the Data Protection Act 1998. Contractors must also agree to abide by appropriate professional guidelines, for example the Social Research Association’s Code of Ethics (www.the-sra.org.uk/ethics.htm), and the Market Research Society’s Code of Practice (www.mrs.org.uk).
Contract Management

16. The contract will be managed by George Lyall of Planning Division 4, who will be responsible for the day-to-day liaison with the contractor and for agreeing final versions of all research tools and outputs (telephone 0131 244 7549 or e-mail george.lyall@scotland.gsi.gov.uk).

17. There will be a Departmental Steering Group with representation from the Ayrshire Joint Structure Plan & Transportation Committee (AJSPTC) and one or more councils individually. The contractor will be expected to attend at least 3 meetings to report progress, discuss issues and seek advice. In addition, the contractor will engage with the key players individually. At the final meeting of the Steering Group the contractor will give an oral presentation of the conclusions of the research (this may involve a wider audience) and receive comments prior to submission of the final report.

18. The contractor will prepare a minute of all meetings with the client and of the Advisory Panel and circulate a copy to the project manager for amendment/approval and subsequently to those concerned within 10 working days.

Timetable

19. It is anticipated that the study will be completed within about 5 months, commencing on 14 November 2005. The contractor must be in a position to begin the project by that date.

20. A detailed research schedule will be agreed with the contractor, which will form part of the contract. The indicative timetable is as follows:

- Tenders submitted
- Contractor appointed
- Project inception meeting
- 2nd Steering Group meeting
- 3rd Steering Group meeting
- Submission of final report

   - Friday 28 October 2005
   - Monday 14 November 2005
   - 21 November
   - (Jan 2006)
   - (March 2006)
   - March 2006

Costs

21. A budget of £30,000 (excluding VAT) is available for this work. This must cover liability for all costs including staff costs, attendance at meetings, equipment, travel and subsistence and overheads. Payments will be phased and linked to the successful completion of key stages of the research. Tenderers liable for VAT on government-funded research projects should indicate this in their proposal.

Contract Conditions

22. The contract awarded will be governed by the standard contract conditions covering Scottish Executive research awards (SR/SC/01/05), a copy of which is attached.
Criteria for the Evaluation of Tenders

23. Tenders will be assessed for their value-for-money and on a defined set of criteria as detailed below:

- Understanding of the research brief
- Research method(s) and approach
- Development of the brief/added value of approach
- Understanding of, and sensitivity to, the policy and practice issues
- Experience of research staff, including relative inputs from senior staff and management arrangements
- Detailed knowledge of the Scottish planning and transport appraisal scene, including the relevant legislation.
- Costs
- Quality control mechanisms

Guidance for Submitting a Tender

24. The following information should be included in a response:

1) **Name** of the tenderer(s), status in the company/institution, and name of person for further contact (if different);
2) A brief statement detailing an **understanding and interpretation** of the purpose, specific objectives and scope of the project;
3) Details of the **proposed methodology and timescale**, including dates for the completion of discrete stages of the work as detailed in the specification.
4) **Curricula vitae of all staff involved** (including, where applicable, staff not yet appointed) and associated management arrangements for the project, including individual roles;
5) Estimated input in days for each named member of staff. This should be associated with particular research and admin tasks, so it is clear who is involved in which activity and how much of their time is devoted to each task.
6) Details of **previous research experience** relevant to the current application, both within and outwith the Scottish Executive;
7) Contact details for two people who have agreed to be approached to supply **references** in relation to this work.
8) A clear statement of the **tender price and specific costs** under the following subheadings:
   - Day rates for each member of the project team
   - Research/management costs broken down by principal task
   - Equipment and materials
   - Travelling expenses directly related to the project (including any costs for attendance at meetings)
   - Overheads
• Statement of total cost excluding VAT (and indication as to whether this will charged)
• Details and costs of any work to be sub-contracted; this should include information as to how this process will be managed to ensure that quality is maintained alongside examples of previous projects involving the same subcontractor.

25. Details of approach to quality assurance (including adherence to timescales and the quality of key outputs) and any relevant procedures/ accreditation;

26. The tender document should be signed by the principal researcher(s) and countersigned by a partner of the market research company/ consultancy or by the Head of Department of an academic institution, as appropriate.

27. Responses should be based on the information given in the Specification and upon the professional knowledge and expertise of the contractor. Clarification of specific points can, however, be sought by e-mail from George Lyall, project Manager, email: george.lyall@scotland.gsi.gov.uk until 21 October 2005. Anonymised questions and our subsequent response will be forwarded to all contractors involved in the tendering process for information.

28. It may be necessary to invite shortlisted contractors to give a short presentation of their proposal before a decision is made. These will take place on 9 November 2005, if required.

29. The acceptance card should be returned no later than 14 October 2005. Five copies of the tender documents should be submitted in a sealed envelope marked ‘Ayrshire-Transport and the Economy’ with the serial number provided on the card, to John Tibbitt at the following address:

Scottish Executive
DD ASD
1F(Dockside)
Victoria Quay
Edinburgh
EH6 6QQ

The Tenders must arrive by 2.00 pm on 28 October 2005. An electronic version of the tender should be submitted on the afternoon of Friday 28 October 2005 after 2.00 pm to george.lyall@scotland.gsi.gov.uk.
Appendix B

Research Specification
<table>
<thead>
<tr>
<th>Author</th>
<th>Dependent Variable/Impact</th>
<th>Independent Variable</th>
<th>Timescale</th>
<th>Geographical Scale</th>
<th>Methodology</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA/CBI (1998)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>Issues such as the availability appropriate sites and suitably skilled workers are as important, if not more important, than transport in shaping investment decisions.</td>
</tr>
<tr>
<td>Andersen et al (1993)</td>
<td>Measures of business activity (retail sales)</td>
<td>Economic characteristics of bypassed and non-bypassed cities</td>
<td>Cross section</td>
<td>US Cities (Texas)</td>
<td>Regression models and cluster analysis</td>
<td>Bypasses generally brought a small but statistically significant reduction in total business in bypassed cities, reversed in some cases by regeneration.</td>
</tr>
<tr>
<td>Arnott (1987)</td>
<td>Local economic growth, property values and labour accessibility</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Developer attitudes and perceptions when marketing sites are more important than the actual accessibility of the site. As such, transport has been identified as a potentially important economic development and planning tool.</td>
</tr>
<tr>
<td>Banister and Berechman (2001)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Transport infrastructure is an integral factor in promoting economic growth and but is not sufficient in itself to deliver this growth. Investment potential can only be realised if a series of other conditions are met, including a buoyant economy, a stable political environment and other ancillary investment.</td>
</tr>
<tr>
<td>Black Country Redevelopment Corporation in SACTRA (1999)</td>
<td>Investment in deprived areas</td>
<td>Black Country Spine Road Investment</td>
<td>Unspecified</td>
<td>Black Country (Midlands)</td>
<td>Unspecified</td>
<td>A significant amount of floor space provided by the Black Country Spine Road was vital to regenerating derelict land</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
<td>Independent Variable</td>
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</tr>
<tr>
<td>Briggs (1981)</td>
<td>Migration and employment changes</td>
<td>Presence of Interstate highway in County</td>
<td>1950 and 1975</td>
<td>Non-metropolitan US Counties</td>
<td>Descriptive statistics and regression models</td>
<td>There is a generally weak relationship between interstate highways and development, the presence of an interstate highway is no guarantee of development.</td>
</tr>
<tr>
<td>Button (1994)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Use of meta-analysis on previous work, values of time, impact studies</td>
<td>The best use is not made of previous studies when estimating the effects of a new project, previous studies are not used collectively for statistical analysis</td>
</tr>
<tr>
<td>Cambridge Economic Consultants (1987)</td>
<td>Unspecified</td>
<td>Transport costs</td>
<td>Unspecified</td>
<td>Severn Estuary</td>
<td>Unspecified</td>
<td>The opening of the Seven Bridge could potentially change south Wales from being a high cost transport location to average cost transport location.</td>
</tr>
<tr>
<td>Cardiff Business School (1996)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>A55 North Wales</td>
<td>Unspecified</td>
<td>30% of business believed that improvements to the A55 had reduced their production costs. However, it was argued that there was no evidence of the catchment area for these businesses expanding. However, lower delivery costs did bring an increase in competitiveness.</td>
</tr>
<tr>
<td>Cardiff Business School (1997)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>A470 Corridor, Merthyr, Wales</td>
<td>Unspecified</td>
<td>The dualling of the A470 played an important role in attracting inward investment to Merthyr. Three companies actually stated that the road improvements were a key factor in their decision to locate in the area. They study argues that without the road improvements, Merthyr would not have entered into feasibility studies for these new inward investment projects.</td>
</tr>
<tr>
<td>CBI in SACTRA (1999)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>UK</td>
<td>Business surveys</td>
<td>A survey of 12,000 firms found that better transport was one of a firm’s top three priorities (out of 22 factors) for improving competitiveness in their region</td>
</tr>
<tr>
<td>Cleary and Thomas (1973)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Severn Estuary</td>
<td>Unspecified</td>
<td>First Severn Bridge had an impact on business travel in terms of allowing staff to cover both sides of the Seven Estuary from one base. However, there was expected to be very little impact on commuting because there was little industrial activity within ten miles of the bridge.</td>
</tr>
<tr>
<td>Coalfields Task Force in SACTRA (1999)</td>
<td>Employment and regeneration in ex-coalfields</td>
<td>Public transport provision</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>Increasing public transport provision can be beneficial to the regeneration of ex-coalfields, although this is not a given</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
<td>Independent Variable</td>
<td>Timescale</td>
<td>Geographical Scale</td>
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<tr>
<td>Cornwall County Council (1999)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Cornwall</td>
<td>Unspecified</td>
<td>57% of executives surveyed argued that the quality of life and the natural and built environment were the most important factor in influencing relocation decisions. Transport infrastructure is important but not the single deciding factor in business location.</td>
</tr>
<tr>
<td>Corporation of London (2002)</td>
<td>Unspecified</td>
<td>Air travel and infrastructure related expenditure</td>
<td>Unspecified</td>
<td>City of London</td>
<td>Unspecified</td>
<td>Almost 70% of firms in the City of London consider air services to be critical for staff business travel. In addition, a further 50% consider air travel crucial for meetings with clients.</td>
</tr>
<tr>
<td>Cushman and Wakefield (2002)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Europe wide</td>
<td>Unspecified</td>
<td>London was voted the top European trading location by the European Cities Monitor 2002. This was based on the views of senior executives from over 500 European companies. However, ‘transport links’ was only one of twelve criteria considered as being integral to business location.</td>
</tr>
<tr>
<td>Cutanda and Paricio (1994)</td>
<td>Regional income indicators</td>
<td>Public infrastructure capital stock</td>
<td>1987-89</td>
<td>17 Spanish Regions</td>
<td>Regression (Quasi-production function)</td>
<td>Large regional disparities in infrastructure appear to have a significant effect in accounting for regional income disparities.</td>
</tr>
<tr>
<td>Drew (1990)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Input-output analysis</td>
<td>the direct effects of infrastructure spending can be modelled using input-output analysis. However, Drew (1990) also argues that there is no single causal-based policy sensitive methodology applicable to all modes for all levels of analysis. Indeed, it is claimed that establishing clear relationships between transport and economic development is currently impossible.</td>
</tr>
<tr>
<td>DTZ Pieda</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Severn Estuary</td>
<td>Unspecified</td>
<td>The Second Severn Crossing was a potentially major influence in 6% of 27 companies’ decision to relocate or expand in South Wales in the future. Other key locational factors included access to suitable sites, proximity to markets and proximity to former sites.</td>
</tr>
<tr>
<td>DTZ Pieda (1992)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Severn Estuary</td>
<td>Unspecified</td>
<td>Levels of commuting across the Second Severn Crossing were low and that the benefits of the bridge were not likely to be sufficient to deepen the labour pool on either side of the crossing.</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
<td>Independent Variable</td>
<td>Timescale</td>
<td>Geographical Scale</td>
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<tr>
<td>DTZ Pieda (1999)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Skye and Lochalsh area</td>
<td>Unspecified</td>
<td>The opening of the Skye Bridge opened business in the local market to competition from the rest of Scotland but consumers of construction services benefited from lower prices.</td>
</tr>
<tr>
<td>DTZ Pieda (2004)</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>The potential of road improvements to widen labour catchment areas is dependent on specific geographical areas and the circumstances surrounding each project.</td>
</tr>
<tr>
<td>DTZ Pieda (2004)</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Local/Regional - Norway</td>
<td>Unspecified</td>
<td>A new road link from Kristiansund to the mainland of Norway led to an increase in commuting but a significant movement of business relocation from the island to the mainland. In essence, many people were not commuting to relocated jobs. While the short-term effects were damaging to Kristiansund, the long-term effects of increased competitiveness and lower costs was positive.</td>
</tr>
<tr>
<td>DTZ Pieda (2004)</td>
<td>Unspecified</td>
<td>Business Location</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Roads (other than motorways) are in the “middle ranking” in terms of importance in location decisions.</td>
</tr>
<tr>
<td>Dunning (1988)</td>
<td>Unspecified</td>
<td>Business Location</td>
<td>Unspecified</td>
<td>UK</td>
<td>Business Surveys</td>
<td>The survey focused on the location preferences of international businesses in the UK. The survey was split into 30 ‘regional’ firms (responsibility for a region eg Europe) and 53 ‘branch’ firms (similar role although in a smaller geographical area and without the coordination role). For all of the regional firms, the key locational factors in order of priority were access to airports, language, market size and prospects, communications infrastructure and the general business framework. For branch firms, the key issues were proximity to clients, language and market size and prospects.</td>
</tr>
<tr>
<td>Eagle and Stephanedes (1987)</td>
<td>County employment levels</td>
<td>County highway expenditure</td>
<td>1964-82</td>
<td>87 Minnesota Counties (US)</td>
<td>Time series causality tests, structural plots</td>
<td>Increases in highway expenditure do not in general lead to increases in employment levels.</td>
</tr>
<tr>
<td>EEDA (2000)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Infrastructure investment may alter the perceived accessibility of locations thereby attracting inward investment, regardless of any real change in accessibility. In addition, it is argued that transport infrastructure can play an important role in supporting industry clusters by increasing labour catchment areas and improving inter-area connectivity. Transport infrastructure is also believed to be a key element in attracting mobile investment.</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
<td>Independent Variable</td>
<td>Timescale</td>
<td>Geographical Scale</td>
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<tr>
<td>Eno Foundation (1983)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Study of location decisions and policy objectives</td>
<td>The complexity and unpredictability of the economy undermines the viability of economic models. However, failure to maintain transport infrastructure will lead to an area losing its share of investment.</td>
</tr>
<tr>
<td>Ernst and Young (1996)</td>
<td>Unspecified</td>
<td>Road Infrastructure</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Congestion and the unreliability of journey times add to business costs, particularly for companies in the service sector and those serving urban areas.</td>
</tr>
<tr>
<td>Ernst and Young (1996)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Fixed costs (such as terminal costs) usually make up a large proportion of total transport costs meaning that new infrastructure would not alter costs significantly. This may not, however, be true if a new link opens up a new field of economic activity that is inherently fixed in location, a new mine for example.</td>
</tr>
<tr>
<td>Ernst and Young (1996) in SACTRA (1999)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>20% of firms identified positive external benefits (such as reduced inventory costs and access to new markets) to their business as a result of transport improvements.</td>
</tr>
<tr>
<td>Ford and Poret (1991)</td>
<td>Total factor productivity</td>
<td>Public sector infrastructure investment</td>
<td>Various</td>
<td>12 OECD National economies</td>
<td>Regression (production function)</td>
<td>Estimates of the effect of infrastructure investment on productivity do not support a policy of acceleration of infrastructure investment (infrastructure was a significant factor in 5 countries).</td>
</tr>
<tr>
<td>Friedman et al (1992), Coughlin et al (1991) and Armstrong and Taylor (2000)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Road, rail and air connections are crucial to the locational decisions of inward investors. This is perhaps well demonstrated by regional FDI employment and business numbers. The highest concentration of jobs and businesses appear to be located in markets with good transport provision (such as the Midlands and South East) and with good access to London, the Channel Tunnel and Europe. Peripheral areas such as Scotland and Northern Ireland fare less well, except in lower value-added industries. However, these patterns are also induced by many other non-transport related factors such as regional grants and the skill of local employees.</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
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<tr>
<td>Friends of the Earth (Cornwall) in SACTRA (1999)</td>
<td>Local Economic Performance</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Devon/Cornwall towns</td>
<td>Unspecified</td>
<td>Transport improvements have had different effects on different towns. For example, the recent completion of bypasses around Okehampton and Liskeard has led to people shopping in other locations (such as Plymouth). In contrast, Millbrook, which has poor transport infrastructure, is performing relatively well and has a full range of services despite being only three miles away Plymouth. Indeed, even the DETR argues that rural transport improvements may counter regeneration policies. This is an important point to consider when analysing the series of new bypasses proposed for towns in Ayrshire.</td>
</tr>
<tr>
<td>Fritsch and Prud’homme (1994)</td>
<td>Private sector productivity / output</td>
<td>Level of highway provision</td>
<td>1973-89</td>
<td>French Regions</td>
<td>Regression (Cobb-Douglas)</td>
<td>Measures of highway provision are significant in determining output / productivity especially when considered in terms of demand and spatial provision.</td>
</tr>
<tr>
<td>Gould (1997)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>M25 Corridor</td>
<td>Unspecified</td>
<td>The M25 has played a significant role in extending the catchment area for regional shopping and warehouses.</td>
</tr>
<tr>
<td>Halcrow (2002)</td>
<td>UK Region</td>
<td>Road – M65 Extension</td>
<td>Unspecified</td>
<td>Survey of companies</td>
<td>Unspecified</td>
<td>27% of decision-making processes were influenced by factors that had some transport components. The most important factor cited by firms who chose to locate near the M65 were the cost of premises, the quality of site environment, access to customers and the availability of a site of suitable size. The report highlighted the fact that while transport related factors were less important than a combination of non-transport related factors, it is clear that they still had a significant effect on the economic regeneration of the area. The issue raised is whether a firm would consider a particular premises or area at all if transport links were poor.</td>
</tr>
<tr>
<td>Hall et al (1987)</td>
<td>Unspecified</td>
<td>Business Location</td>
<td>Unspecified</td>
<td>Thames Valley</td>
<td>Business Surveys</td>
<td>The study attempted to establish why 40 Berkshire firms chose to locate in the Thames Valley. The main factors were Heathrow Airport (75%), M4 Motorway (63%), other motorways and roads (40%), access to suppliers (40%) and availability of suitable premises.</td>
</tr>
<tr>
<td>Hamer (1990)</td>
<td>Inner City Development</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>UK Inner Cities</td>
<td>Unspecified</td>
<td>Public expenditure on new roads is inefficient and pointless in terms of assisting inner cities</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
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<td>Timescale</td>
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<tr>
<td>Headicar and Bixby (1992)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>M40 Corridor</td>
<td>Unspecified</td>
<td>The M40 motorway altered the nature and pattern of accessibility meaning that certain types of new development became feasible (eg major shopping centres requiring large catchment areas. The focus of accessibility also changed from traditional town centres to motorway intersections.</td>
</tr>
<tr>
<td>Hurdle (1992)</td>
<td>Regional economic development</td>
<td>General transport investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>The argument that transport investment generates national economic growth is weak and transport investments are unlikely to have a major impact on the distribution of economic activity.</td>
</tr>
<tr>
<td>Invest UK (2000)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Glasgow</td>
<td>Unspecified</td>
<td>Good transport links were only one of four factors that encouraged a large American firm to locate in Glasgow. The other factors were the availability of a technologically skilled and customer-service focused workforce, the relatively reasonable price of property and the existence of the local college and university system.</td>
</tr>
<tr>
<td>Johansson and Karlsson (1994)</td>
<td>Productivity of factors of production</td>
<td>Supply of public infrastructure (modelled as a spatial variable)</td>
<td>Unspecified</td>
<td>284 Swedish municipalities</td>
<td>Regression (production function)</td>
<td>Infrastructure capital must be given an accessibility description in order to explain spatial variation in productivity. It is recommended that some municipalities invest in road infrastructure.</td>
</tr>
<tr>
<td>Lawless and Gore (1999)</td>
<td>UK Region</td>
<td>LRT - Sheffield</td>
<td>Unspecified</td>
<td>Survey of companies</td>
<td>Unspecified</td>
<td>Business responses to the proposed Sheffield LRT show that only 7% of 300 business believe that public transport was a principal ‘push’ factor in their (re)location</td>
</tr>
<tr>
<td>Lee (1981)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Unspecified</td>
<td>Estimated quantitative benefits of transport are too imprecise to provide clear guidance to policy.</td>
</tr>
<tr>
<td>Lombard et al (1992)</td>
<td>County employment or wage income</td>
<td>Highway condition, mileage and expenditure</td>
<td>1980 and 88</td>
<td>92 US Counties (Indiana)</td>
<td>Regression analysis (Cross-sectional)</td>
<td>Highway mileage significantly associated with economic development in most cases, expenditure was not.</td>
</tr>
<tr>
<td>London First Centre (2002)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>London</td>
<td>Unspecified</td>
<td>Good transport links were only one of a number of factors that influenced the decision to locate in London. Others included good access to European markets, London’s status, the proximity of the client base and the English language.</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
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<tr>
<td>McCalla et al (2001)</td>
<td>Unspecified</td>
<td>Characteristics of areas surrounding inter-modal freight termini</td>
<td>Unspecified</td>
<td>Canadian Regions</td>
<td>Unspecified</td>
<td>The study of 196 manufacturing firms around eight Canadian inter-modal freight termini (three seaports, three airports and two rail yards) found that transportation land-use dominated the use of other industrial land and that linkages between industry and the respective transport hubs were weak. Business proximate to the termini did not use the facilities intensively and very few claimed that their location decision was determined by these hubs. Businesses located there because of high levels of accessibility associated with the termini.</td>
</tr>
<tr>
<td>McKinnon (1995)</td>
<td>Economic Development</td>
<td>Motorway Expenditure</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>Diminishing marginal returns are beginning to offset the benefits of additional motorway expenditure.</td>
</tr>
<tr>
<td>McLintock (1998)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Transport provision has the indirect effect of making towns and cities more attractive places for firms to locate.</td>
</tr>
<tr>
<td>McQuaid et al</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Unspecified</td>
<td>A discrepancy often exists when discussing the impact of road infrastructure. This is that many studies fail to acknowledge the distinction between inter and intra-regional location factors. For example, a motorway is an important intra-regional location factor but is less significant in determining inter-regional location.</td>
</tr>
<tr>
<td>McQuaid et al (2004)</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>Non-economic factors are important in determining business location. UK studies have found that the quality of life and the general environment were critical pull factors for inward investment and inward migration. As such, transport infrastructure is only part of a package of amenities contained in an area.</td>
</tr>
<tr>
<td>Mills (1981)</td>
<td>Economic / Population data</td>
<td>Presence of 'beltway', (urban orbital motorways)</td>
<td>1950-77</td>
<td>Sample of US cities</td>
<td>Comparison with 'control' cities</td>
<td>'Beltways' appear to have no significant effects on city centre activity or suburbanisation of people and jobs.</td>
</tr>
<tr>
<td>Moon (1986)</td>
<td>Physical development</td>
<td>Highway interchanges at non-metropolitan locations</td>
<td>1985, Cross section</td>
<td>US State (Kentucky)</td>
<td>Survey and classification</td>
<td>Non-metropolitan interchanges are becoming increasingly attractive location factors in development decisions.</td>
</tr>
<tr>
<td>Author</td>
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<tr>
<td>OECD (2002)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>New transport provision can extend the effective size of the labour market but it must be accompanied by housing and social policy in order to improve accessibility.</td>
</tr>
<tr>
<td>PA Cambridge Economic Consultants (1995)</td>
<td>Unspecified</td>
<td>Air travel and related infrastructure</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>In terms of FDI, 10% of firms identified air transport and well connected airports as being a ‘very important’ factor in their location decision.</td>
</tr>
<tr>
<td>PA Cambridge Economic Consultants (1995)</td>
<td>Unspecified</td>
<td>Air travel /infrastructure</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>In terms of FDI, 10% of firms identified air transport and well connected airports as being a ‘very important’ factor in their location decision.</td>
</tr>
<tr>
<td>Parkinson (1981)</td>
<td>COBA freight benefits</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Econometric analysis and business surveys</td>
<td>It is implausible that road schemes are likely to lead to significant increases in GDP. However, it is argued that some schemes will assist localised relocation and that it is probable that road programmes have a small effect on employment distribution in the long-term.</td>
</tr>
<tr>
<td>Quarmby (1999), Mackie and Tweedle (1993) and McKinnon (1995) in SACTRA (1999)</td>
<td>Unspecified</td>
<td>Road Infrastructure</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Road improvements have powerful indirect effects on firms by allowing them to restructure their logistical systems, thus reducing stockholdings and costs. These studies coupled with a number of other works argue that ensuring certainty of journey times is a crucial issue. However, it is argued that by centralising distribution, there is an increase in vehicle mileage and thus an increase in pollution with the cost being borne by society rather than the private firm.</td>
</tr>
<tr>
<td>Rich (1980)</td>
<td>Change in manufacturing activity</td>
<td>Accessibility / Economic potential</td>
<td>1961-71</td>
<td>Pre-1975 Scottish Counties</td>
<td>Regression methods</td>
<td>Manufacturing became increasingly dispersed, and at the intra-regional scale there was a trade off between distance cost advantages and the congestion costs of centrality</td>
</tr>
<tr>
<td>Rietveld (1994)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Use of multi-regional models</td>
<td>Production function and interview approaches suggest the greatest impact but there is also a need to consider the perceptions of new infrastructure and identify any data deficiencies.</td>
</tr>
<tr>
<td>SACTRA (1999)</td>
<td>Unspecified</td>
<td>General Transport investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Transport provision is just one of a number of factors that influence firm location. Others include the availability of suitable premises and skilled staff as well as market accessibility.</td>
</tr>
<tr>
<td>SACTRA (1999)</td>
<td>Economic development</td>
<td>Motorway Expenditure</td>
<td>50 year time period</td>
<td>UK</td>
<td>Unspecified</td>
<td>The advent of the British motorway network in the last fifty years has been of equal importance in facilitating economic growth as the invention of the canal and the railways. SACTRA term this a “Network Development Episode”.</td>
</tr>
<tr>
<td>Author</td>
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<tr>
<td>SACTRA (1999)</td>
<td>UK Region</td>
<td>Road – A14 link between the A1 and M1</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>The A14 link between the A1 and M1 is reported to have saved 30-35 minutes on journeys accessing the motorway network. Since the completion of this road, industrial and commercial development within a seven mile radius of the road increased by 470%, although this does not include the expansion of existing companies. As such, it is unclear how much of this was influenced by changes in planning policy as well as increased demand.</td>
</tr>
<tr>
<td>SACTRA (1999)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Most studies highlight the fact that transport factors were not a defining influence in causing people to move either jobs or home. However, it may have an influence one the decision to move has been taken. Workers may also be encouraged to move into an area with improved transport provision as a result of lower house prices and improved living conditions caused by the extension of the effective commuting distance.</td>
</tr>
<tr>
<td>SACTRA (1999)</td>
<td>Business Investment</td>
<td>General transport investment</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>By providing direct rail links between the Channel Tunnel and the north of England and Scotland, it will be possible to alter the perceptions of investors that they are a considerable distance from their key markets.</td>
</tr>
<tr>
<td>Scottish Natural Heritage</td>
<td>Unspecified</td>
<td>General transport expenditure</td>
<td>Unspecified</td>
<td>Scotland</td>
<td>Unspecified</td>
<td>Scenery is an important factor in business location and has been an integral factor in attracting inward investment. Transport infrastructure is considered an important but not over-riding factor in business location.</td>
</tr>
<tr>
<td>Sharp (1980)</td>
<td>UK transport costs</td>
<td>General transport investment</td>
<td>Unspecified</td>
<td>UK</td>
<td>Unspecified</td>
<td>Transport investment is unlikely to cause significant new activity in less prosperous regions although transport must be provided to supplement government regional policies.</td>
</tr>
<tr>
<td>Steer Davies Gleave</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Transport infrastructure is necessary to deliver economic improvements but its key role is facilitating other investment by removing bottlenecks that were previously obstructing expansion.</td>
</tr>
<tr>
<td>Stephanedes (1990)</td>
<td>County employment levels</td>
<td>County highway expenditure levels</td>
<td>1957-82</td>
<td>87 Minnesota Counties (US), in 6 categories</td>
<td>Vector Autoregression / causality tests</td>
<td>Highways encourage long term development in excess of the normal trend in 'regional centre' counties and those under an urban influence.</td>
</tr>
<tr>
<td>Author</td>
<td>Dependent Variable/Impact</td>
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<tr>
<td>Thompson et al (1993)</td>
<td>County per capita income</td>
<td>Highway expenditure / density / congestion</td>
<td>1980-90</td>
<td>67 US Counties (Florida)</td>
<td>Regression models</td>
<td>Results show little support for the idea that road construction leads to economic growth.</td>
</tr>
<tr>
<td>Thornton (1978)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>M606/M62 Corridor, Bradford</td>
<td>Business Surveys</td>
<td>The study contends that the new M606 link to the M62 had no real effect on business location. While five businesses had opened manufacturing plants in the area in the four years prior to the study, none of the companies identified the road network as a key factor in their location decision.</td>
</tr>
<tr>
<td>Trinder (2001)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Additional transport infrastructure that reduces job search time and cost while also improving accessibility influences both the location of firms and workers. In addition, the ancillary demands of labour (such as the need for leisure facilities) are also encouraged by transport investment.</td>
</tr>
<tr>
<td>Trinder (2002) and SACTRA (1999)</td>
<td>Unspecified</td>
<td>General Transport Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>workers may be encouraged to move into an area with improved transport provision as a result of lower house prices and improved living conditions caused by the extension of the effective commuting distance.</td>
</tr>
<tr>
<td>Various Authors (2005)</td>
<td>Unspecified</td>
<td>City Centre Traffic Management</td>
<td>Unspecified</td>
<td>Scottish Region – City of Edinburgh</td>
<td>Unspecified</td>
<td>Certain types of transport infrastructure may cause business relocation out of an area because of its detrimental effects on firms. For example, it is argued that new bus lanes and parking regulations have decreased the turnover of businesses in central Edinburgh.</td>
</tr>
<tr>
<td>Welsh Economic Research Unit (1997)</td>
<td>Unspecified</td>
<td>Road Infrastructure</td>
<td>Unspecified</td>
<td>Welsh town, Merthyr</td>
<td>Unspecified</td>
<td>Improved road access has facilitated the economic development of the ex-coalfield of Merthyr and has been an important factor in attracting investors. In addition to transport cost savings, strong local multiplier effects have also percolated through the area because of new investment.</td>
</tr>
<tr>
<td>Welsh Office (1981)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>A55 North Wales</td>
<td>Business Surveys</td>
<td>35% of manufacturing firms and 34% of distribution firms believed that the A55 improvements could influence travel-to-work patterns and the extent of their labour market catchment. In addition, it was expected that the road improvement could allow firms to tap into an area of high unemployment to the east.</td>
</tr>
<tr>
<td>Author</td>
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<tr>
<td>Welsh Office (1981)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>M4 Corridor South Wales</td>
<td>Unspecified</td>
<td>The effects of the M4 in attracting 18 firms to (re)locate in Gwent found that eight firms (44%) had been attracted by the prospect of motorway access while three of these firms noted that this was a major incentive.</td>
</tr>
<tr>
<td>Whitelegg (1985)</td>
<td>Unspecified</td>
<td>Road Investment</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>Economic indicator analysis and use of previous studies</td>
<td>Road construction is of no benefit to depressed regions and a disbenefit to urban areas.</td>
</tr>
<tr>
<td>Whitelegg (1994)</td>
<td>Unemployment levels / New firm foundation</td>
<td>Accessibility (travel times to a selection of destinations)</td>
<td>1985-92</td>
<td>34 UK travel to work areas</td>
<td>Association plots</td>
<td>No evidence found of a relationship between economic performance and accessibility.</td>
</tr>
<tr>
<td>Wilson (1986)</td>
<td>N/A</td>
<td>N/A</td>
<td>25 year survey of US practice in transport economics</td>
<td>N/A</td>
<td>Desk based study</td>
<td>The cause and effect in the relationship of transport to economic growth are easy to confuse.</td>
</tr>
<tr>
<td>Wilson et al (1986)</td>
<td>Per capita income</td>
<td>Regional highway expenditure</td>
<td>1957-80</td>
<td>Canadian Province (New Brunswick), 5 Regions</td>
<td>Regression models</td>
<td>Regions react differently depending on their state of development, Saturation levels of highway investment are reached where no further economic development is encouraged</td>
</tr>
<tr>
<td>Zografos and Stephanedes (1992)</td>
<td>County employment levels</td>
<td>County highway expenditure</td>
<td>1957-82</td>
<td>87 Minnesota Counties (US)</td>
<td>Vector Autoregression</td>
<td>Counties containing a major highway corridor experience a small but significant increase in total and manufacturing employment, counties not containing a major highway corridor experience a significant reduction in employment</td>
</tr>
</tbody>
</table>
Appendix C

List of Consultees
MVA would like to thank the following stakeholders for their input into this study:

Alan Neish   East Ayrshire Council
Alastair MacFarlane  Associated British Ports
Bill Burns   Clydeport
Bobby McVeigh  South Ayrshire Council
Eddie Clark   South Ayrshire Council
Gavin Scott   Freight Transport Association
Geoff Cook    Network Rail
George Connell  Stagecoach
Graham Shaw   Scottish Enterprise Ayrshire
Ian Johnson   South Ayrshire Council
Jim Mason   North Ayrshire Council
Kay Walls    Freightliner
Margaret Ferrier  North Ayrshire Council
Michael Wright  Scottish Enterprise Ayrshire
Rodney Mortimer  WESTRANS