

**ArupScotland**

Scottish Executive /  
Strategic Rail Authority

---

**Scotland Planning  
Assessment**

---

Part 1 Report Volume 2  
(Drivers of Change)

**FINAL**

**ArupScotland**

Scottish Executive /  
Strategic Rail Authority

---

**Scotland Planning  
Assessment**

---

Part 1 Report Volume 2  
(Drivers of Change)

October 2005

**Ove Arup & Partners Scotland Ltd**

Scotstoun House, South Queensferry, West Lothian EH30 9SE  
Tel +44 (0)131 331 1999 Fax +44 (0)131 331 3730  
[www.arup.com](http://www.arup.com)

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

Job number 117897-00

Job title	Scotland Planning Assessment	Job number
		117897-00
Document title	Part 1 Report Volume 2 (Drivers of Change)	File reference
		4-05-03

Revision	Date	Filename	Part 1 Report Vol 2.doc		
Draft 1	22/07/05	Description	First draft		
			Prepared by	Checked by	Approved by
		Name	Tom Bridges/Iain Mobbs/Jillian Hastings	Stefan Sanders	David Anderson
		Signature			
Final Draft	31/08/05	Filename			
		Description	Includes comments from the Scottish Executive and stakeholders		
			Prepared by	Checked by	Approved by
		Name	Tom Bridges/Iain Mobbs/Jillian Hastings	Stefan Sanders	David Anderson
		Signature			
Final	05/10/05	Filename	SPA Part 1 Report Vol 2 Ch 4-6 for reissue.doc		
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document

## Contents

	Page	
4	A 2011 Baseline – The Impact of the Committed Schemes	1
4.1	Purpose of Chapter	1
4.2	First ScotRail Franchise Commitments	1
4.3	Description of Committed Schemes	2
4.4	2011 with the Committed Schemes	4
4.5	Implications of the Committed Schemes for the Role of Rail in Scotland	10
5	Expected Future Changes in Scotland	11
5.1	Purpose of Chapter	11
5.2	Key Policy Issues	11
5.3	Population and Household Change	15
5.4	Forecast Economic and Employment Change	18
5.5	Regional Profiles	18
5.6	Railway Policy Changes	38
5.7	Airport Growth	38
5.8	Changes to Ferry Services	41
5.9	Committed Road Schemes	41
5.10	Future Rail Freight Market Changes	42
5.11	Overview of Stakeholder Aspirations for Transport Improvements	44
5.12	Planning Uncertainties	45
5.13	Conclusions on the Drivers of Change	45
6	Implications of Future Change in Scotland on the Rail and Wider Transport Network	47
6.1	Purpose of Chapter	47
6.2	Impact of Future Changes in Scotland on Future Rail Demand and Crowding	47
6.3	Impact of Expected Changes in the Study Area on Future Coach Demand	54
6.4	Implications of Future Changes to the Freight Market	54
6.5	The Capacity of the Rail Network and Services to Support Planned Changes in Scotland	55
6.6	The Adequacy of the Rail Network and Services to Support Planned Changes in Scotland	55
6.7	Implications of Future Change in Scotland on the Optimal Role and Focus for the Railway in Scotland	59

## Appendices

### Appendix A

Population and Employment Forecasts

### Appendix B

Transport Schemes and Aspirations



## 4 A 2011 Baseline – The Impact of the Committed Schemes

### 4.1 Purpose of Chapter

---

This chapter considers the impact of the various committed public transport schemes being promoted by the SE. Each scheme will deliver new services and will affect rail patronage. It is therefore important that our Baseline is adjusted to reflect these schemes. This will enable the identification of any capacity implications for the wider rail network and any on-train crowding that may result. As the schemes are expected to be completed by 2010, it was agreed with the SE and the SRA we would prepare a revised 2011 'Baseline' forecast to assess the impact of the schemes and to provide a revised Baseline against which to judge the impact of the future Drivers of Change.

In this chapter, we describe the seven rail schemes and two tram schemes. We have reviewed the business cases prepared by the Promoters to understand the impacts, both in terms of patronage and operational considerations. If there are gaps in these assessments, we have liaised with the SE and Network Rail to ensure our assumptions are reasonable. We have not reviewed the robustness of any scheme forecasts prepared by the individual Promoters as part of the SPA, and therefore we are assuming that the patronage and revenue forecasts are fit for purpose.

Also, during the period to 2011, FSR will implement their franchise commitments. We have reflected these in the revised Baseline.

### 4.2 First ScotRail Franchise Commitments

---

FSR's franchise started on 17th October 2004 and will deliver a £40m programme of improvements for customers across Scotland during its seven year life. Half of the £40million improvement package will be spent on improvements to stations; in particular, £2.4million will be invested to provide enhanced facilities at Stirling, Aberdeen, Glasgow Queen Street and Edinburgh Haymarket stations. A further £5.4m will be spent on the installation of Customer Information Systems, CCTV, Help Points and Public Address systems at carefully chosen stations improving passenger safety and security. Fleet reliability will also be improved with £7m invested. There is a franchise commitment to improve punctuality by 2% per annum.

Over the course of the franchise, FSR will work closely with the SE and SPT to:

- refurbish the interiors of 21 existing trains on the SPT network;
- introduce the 'Invernet' rail commuter service from Kingussie and Aviemore to Inverness with a two hourly service to Tain;
- provide more capacity and improve reliability with the introduction of Turbostar trains between Edinburgh /Glasgow and Inverness and Aberdeen, plus on the commuter routes into Edinburgh from Fife, Bathgate and Dunblane;
- improve local services in the Aberdeen area, and extending the Aberdeen - Inverness trains to Stonehaven; [we've put through a franchise variation on Portlethen stops]
- introduce services between Larkhall and Milngavie, Stirling and Alloa and Stirling and Motherwell;
- introduce alternative rolling stock on the North Berwick line; and
- introduce automatic ticket gates at Aberdeen, Ayr, Dundee and Stirling.

FSR will also look to construct cycle parking facilities at every station, and identify car parking improvements at stations. There are also proposals to re-introduce the Class 322 units to the North Berwick line, whilst the Class 170 units may also be cascaded from Hull Trains to ScotRail.

## **4.3 Description of Committed Schemes**

### **4.3.1 Larkhall – Milngavie**

Prior to the introduction of the full scheme in December 2005, 2tph were introduced between Anderston and Hamilton in December 2004. This increases train frequencies from Hamilton, with the extra services operating via Glasgow Central Low Level.

The full scheme will reinstate the single track from Haughead Junction to Larkhall, plus construct new stations at Larkhall, Merryton, Chatelherault and Kelvindale. A 2tph Larkhall to Dalmuir service will extend the new 2tph service between Anderston and Hamilton, and 2tph that currently terminate at Dalmuir will be diverted to start / finish at Milngavie.

Additional works will also be implemented for the Maryhill branch line. The Maryhill trains currently turnback at Westerton, but the extra trains to / from Milngavie will mean that there is insufficient capacity for this to continue. Consequently, a link to Anniesland will be restored (with a new station at Kelvindale) to remove the need for this turnback.

In total, the scheme delivers the following benefits:

- improves frequencies for commuters using the Milngavie branch line;
- offers 6tph through Glasgow Central Low Level;
- creates new rail journey opportunities for commuters south of Hamilton;
- removes the capacity constraint at Westerton; and
- supports wider regeneration initiatives in Lanarkshire.

### **4.3.2 Stirling-Alloa-Kincardine**

This link will reinstate 21km of railway from Stirling to Kincardine. It will be single track with two passing loops. The completion of this link will allow coal trains from Hunterston port to Longannet Power Station to be diverted from the congested Forth Bridge to the route via Greenhill and Stirling. This will free capacity over the Forth Bridge for additional services to Fife (after the Waverley Station upgrade below).

A new hourly passenger service from Alloa to Glasgow is also planned. This will be delivered by extending the hourly service between Stirling and Glasgow to Alloa. Other trains from Dunblane to Edinburgh or Glasgow are unaffected. No additional stations are currently proposed between Stirling and Alloa. Funding has been confirmed for the scheme, and completion is now expected in 2007.

### **4.3.3 Waverley Station Upgrade**

Phase 1 of the project comprises track remodelling at the western end of the station, two new through platforms, and better pedestrian links to the city centre from the station with the installation of lifts and escalators. A public exhibition in May 2005 illustrated the proposals. It will alleviate, in part, a critical constraint on the rail network. The Phase 1 revisions will allow train capacities departing Waverley to the west to increase from 24tph to 28tph. This could permit 2 extra trains per hour to operate to Fife once the Stirling – Alloa - Kincardine link is complete, and 2 extra trains from Bathgate to Edinburgh (once the Airdrie Bathgate route is reinstated). The exact service pattern of the extra trains is still to be finalised. For the purpose of the SPA, we have assumed, in addition to Bathgate services, an additional hourly stopping service via the Fife Circle and an hourly inter-urban train to Dundee.

During the construction works, train capacity into Waverley will be reduced, necessitating some services to terminate at Haymarket. A turnback facility at Haymarket will also be constructed, although this is only a temporary measure. There are no current plans to use this turnback facility once infrastructure works at Waverley are completed

#### **4.3.4 Airport Rail Links**

##### **4.3.4.1 Edinburgh Airport Rail Link (EARL)**

A new station will be constructed below ground at Edinburgh Airport. Four chords will connect it to the route to Fife from Haymarket, to the Edinburgh to Glasgow via Croy route and to the line from Dalmaney to Winchburgh Junction. Existing trains will be diverted to the airport, rather than extending trains from Edinburgh Waverley, given the capacity constraints at that location. This has the advantage of widening the potential catchment of the airport rail link so supporting the airport's planned growth. It is expected up to 8tph will serve the airport, comprising:

- 2tph from Stirling/Dunblane;
- 2tph from Glasgow via Croy;
- 2tph from Fife Circle;
- 1tph from Aberdeen;
- 1tph from Perth / Inverness (when trains operate).

It is expected new rolling stock will be needed for these services due to the steep gradients into the airport station.

##### **4.3.4.2 Glasgow Airport Rail Link (GARL)**

Glasgow Airport will be connected to the national rail network via a link from Paisley St James. Four dedicated services per hour will operate to Glasgow Central, with a single intermediate stop at Paisley Gilmour Street. One or two additional platforms will be required at Glasgow Central (subject to confirmation from Network Rail), and extra capacity east of Paisley. The route between Paisley and Shields Junction will be partially three-tracked with bi-directional running to increase line capacity. The feasibility of four-tracking was also assessed, but this was not found to be necessary.

Presently both airport links are expected to be completed by 2010, and will offer an attractive public transport alternative for air passengers.

##### **4.3.5 Airdrie – Bathgate**

The Airdrie to Bathgate scheme comprises the reinstatement of the former double track railway from Drumgelloch to Bathgate, with the existing single line sections from Bathgate to Newbridge Junction and from Airdrie to Drumgelloch doubled. New stations have been considered at four locations (Plains, Caldercruix, Blackridge and Armadale). For patronage and technical reasons, Armadale and Caldercruix (West) are likely to be chosen. Certain existing stations would also be improved. The route will be electrified. This will introduce new rail journey opportunities to West Lothian and Lanarkshire, and the scheme is expected to be completed by about 2010. 4tph will operate, utilising the double track railway and the Waverly Station upgrade's additional capacity.

The scheme is not intended to offer an alternative rail service for centre-to-centre trips between Edinburgh and Glasgow, since the journey is slower (just over an hour) than via Croy. However, the scheme offers significant benefits by improving journey opportunities between West Lothian and Lanarkshire / Glasgow.

At present it is assumed that the extended Ardie services will still run from Helensburgh and Balloch Pier. Passengers from north west Glasgow to Edinburgh may therefore find the through journeys offered more convenient, rather than changing trains in Central Glasgow.

##### **4.3.6 Borders Railway**

A Parliamentary Bill has been produced proposing an extension of passenger services that currently terminate at Newcraighall to Tweedbank, via the reinstatement of this section of the long closed Waverley route, albeit now as a single track route with passing places. The scheme assumes services will commence in 2008, although delays in the Parliamentary Bill process may mean 2009 is now a more realistic timescale for opening.

Six new stations are proposed at Shawfair, Newtongrange, Eskbank, Gorebridge, Galashiels and Tweedbank. Two trains per hour would operate, an extension of the existing service to Newcraighill. Significant housing growth is planned for the A7 corridor to support the patronage forecasts, although some of the housing allocations have been moved to the A68 corridor.

#### **4.3.7 Edinburgh Tram Line 1**

A Parliamentary Bill has been submitted for Line 1 to construct a new light rail corridor connecting Central Edinburgh with Leith Docks and Granton. It is expected the trams will significantly improve rail accessibility to Haymarket, and this could alter the proportion of trips boarding / alighting between Haymarket and Waverley stations. Although the SPA forecasting spreadsheet represents trips just to Central Edinburgh, we will take account of the probable increased use of Haymarket in the rest of the study.

#### **4.3.8 Edinburgh Tram Line 2**

A Parliamentary Bill has been submitted for Line 2 to construct a new light rail corridor to Edinburgh Airport from the City Centre. Whilst the route will run parallel to the existing rail alignment between Edinburgh city centre, Haymarket and Edinburgh Park, the tram journey times will be slower than the alternative rail timings via EARL. The tram will primarily serve the local travel market, with a very small number of passengers abstracted from rail.

### **4.4 2011 with the Committed Schemes**

---

The availability of information varies considerably between schemes. For some schemes, there are detailed patronage forecasts for the new service, a breakdown of station boarding patterns, and an assessment of the impact on alternative routes. Also, there are differences between the units used for reporting patronage and revenue (for example, AM peak hour, AM peak period, daily). We have not attempted to convert these outputs to a common base, since the conversion factors used by the Promoters are not explicitly given in the business case. Other schemes are less advanced at this stage. Any assumptions we have made have been carefully referenced and justified.

We have also reviewed the operational impacts of schemes. This includes the likely change in network performance that could result from any service alterations. There will be a requirement to restructure timetables for most routes in the Greater Edinburgh area, and several routes in Glasgow, particularly the routes to Milngavie, and Paisley. Interim timetables will also be required during construction works, but such considerations are outside the scope of the SPA.

#### **4.4.1 Larkhall – Milngavie**

1.5m passengers per annum are expected to use the link. The SE provided details of the numbers using the Milngavie and Larkhall sections respectively, although passenger usage from individual stations was not available.

Consequently, we have increased passenger numbers on existing sections of route by using the proportional change in journey time and applying elasticities as recommended in the PDFH. Although 2tph were introduced in December 2004 between Anderston and Hamilton, the additional trips will not yet be included in the LENNON data we used for Baselining. We have included this frequency increase. We have compared the additional trips generated by this approach with the data, to ensure broad consistency between the forecasts.

The implementation of the scheme could create performance issues. The Larkhall and Milngavie branch lines are both predominantly single track, and there are several flat junctions on the route. The service will cross north-west to south-east across the Glasgow suburban rail network via Glasgow Central Low Level, and through a number of known capacity hot-spots on the network. Consequently, if service perturbation does occur, there is potential to 'export' delays across a significant part of the Glasgow suburban rail network. Although we understand the operational performance regimes have been revised to reflect these potential difficulties this does not negate a potential risk to performance.

Whilst we will assume no negative impact on performance, we will take this issue into account when assessing interventions during Part 2.

#### **4.4.2 Stirling-Alloa-Kincardine**

The new passenger service to Alloa will generate about 300 new return journeys from the station per day, with about 100 trips boarding during the AM peak hour. Over 60% of these journeys have a trip destination beyond Stirling; important destinations include Glasgow and Edinburgh.

There will also be freight benefits delivered by this scheme. Allowing the coal trains currently routed via the Forth Bridge to Longannet Power Station to travel via Stirling from Hunterston will free up some capacity across the Forth Bridge for other services. The trains will now travel via Mossend, Cumbernauld, Larbert, Stirling and Alloa. The Forth Bridge has weight restrictions so the scheme has another advantage for freight in that it will allow Longannet's coal supply to arrive in 102 tonne bogie hoppers (which are banned from crossing the Forth Bridge) rather than smaller 45 tonne 2 axle hoppers. This will improve productivity and reduce the number of paths required to move a given quantity of coal.

#### **4.4.3 Waverley Phase 1 Station Upgrade**

The additional platforms and revised track layout will allow an extra 4tph to operate. 2tph will operate to / from Bathgate (and onto Airdrie), and 2tph to / from Fife. The extra patronage generated by the Bathgate trains is described elsewhere. The additional trips generated by the proposed Fife trains were calculated by applying PDFH elasticities to the proportional change in journey times. These ratios were then multiplied by the current demand to estimate the number of extra trips. The extra Fife trains were forecast to generate an additional 830 passengers per day (600 in the peak).

Whilst it is inevitable some disruption and passenger inconvenience will occur during the construction period at this busy station, these considerations are outside the remit of the SPA study.

#### **4.4.4 Airport Rail Links**

##### **4.4.4.1 EARL**

It is estimated that 2.1m passengers per annum will use the Edinburgh Airport rail link in 2011, increasing to 4.9m passengers per annum in 2026. We have used the passenger distribution from the EARL forecasting model. The model coverage is detailed for Edinburgh, West Lothian, East Lothian, Midlothian, Falkirk and Fife. Beyond this notional area, the representation of trips is unclear, so is grouped as 'external'. The assumed trip distribution is:

- Edinburgh – 49%;
- West Lothian – 15%;
- East Lothian – 2%;
- Midlothian – 7%;
- Fife – 6%;
- Falkirk – 7%;
- External – 14%.

There are a number of operational and capacity issues. There is already limited capacity on some specific peak services, and the introduction of a major trip generator could worsen crowding levels. This could be a particular issue for the busy Fife local passenger services.

##### **4.4.4.2 Glasgow Airport**

Table 4.1 provides the passenger forecasts for GARL. In addition to airport traffic, the frequency effect of an extra 4tph between Paisley Gilmour Street and Glasgow Central attracts an additional 1.8m annual passengers in 2009, rising to 2m annual passengers by 2030. Forecasts for 2011, 2016 and 2026 are derived through interpolation. There is no information on the future distribution of passengers, so we have applied BAA's information on the current passenger distribution to Glasgow<sup>1</sup>, which is:

<sup>1</sup> Glasgow Airport Surface Access Strategy 2002-2007

- 13% Glasgow city centre;
- 30% Greater Glasgow;
- 36% Rest of Strathclyde;
- 6% Lothian
- 4% Central;
- 3.5% Tayside;
- 2% Fife;
- 5.5% rest of the UK.

**Table 4.1: Number of Annual Rail Trips (million)**

	2009	2030
Air passengers	0.456m	0.826m
Employees	0.094m	0.150m
Non-airport related trips	0.838m	0.871m
Extra trips – Paisley Gilmour St-Glasgow Central	1.780m	1.955m
Total extra rail trips	3.168m	3.802m
Total trips on GARL	1.387m	1.847m

Source: Promoters forecast, via the Scottish Executive

Passenger overcrowding is not likely to be an issue due to the extra trains provided, but our analysis in Chapter 3 highlighted that the network between Paisley Gilmour Street and Glasgow Central is already operating close to capacity. For the purposes of the SPA, it is assumed that the additional infrastructure provided will maintain network performance after the introduction of the airport trains along the route to Paisley.

GARL may have a freight benefit in that the additional infrastructure provided could enable additional trains to run to and from Hunterston. At this stage though, it is unclear whether the Paisley to Glasgow infrastructure enhancements will provide any additional capacity for freight. Such a consideration is also important in the context of the proposals to establish a container port at Hunterston, which are discussed further in Chapter 5.

#### 4.4.5 Airdrie – Bathgate

New patronage will be generated from stations east of Bathgate. The proposal will also generate new rail journey opportunities, particularly to parts of South Lanarkshire from Lothian.

The scheme will attract 400 new public transport users during the AM peak hour, with about 60% abstracted from car. The improved rail service generates an extra 46,000 rail passenger kilometres during the AM peak hour, although 13,000 passenger kilometres are abstracted from bus during the AM peak hour. That combination of new journey opportunities, and better frequencies from existing stations means that there are about 100 new eastbound passengers from the proposed stations at Caldercruix and Armadale, plus an extra 100 trips from Bathgate and 75 from Livingston North. There are 50 extra passengers boarding at Haymarket, but the number of additional journeys boarding at Livingston North and Bathgate in the westbound direction is relatively small. The boarding pattern for stations west of Airdrie in the westbound direction is unchanged, since the service frequency is unchanged.

This scheme presents a number of operational issues. Trains from Airdrie / Drumgelloch currently operate to Balloch or Helensburgh Central. Consequently, there is potential for performance problems that occur in north west Glasgow to be ‘exported’ across to Edinburgh. This may necessitate retimetabling. Again, although we will assume no negative impact for the purpose of the SPA, we will take this issue into account when assessing schemes during Part 2. When introduced, the existing Bathgate trains will be subsumed, and extra trains added, so it may be necessary to re-timetable services in Greater Edinburgh.

#### 4.4.6 Borders Railway

The Promoter for Borders Railway has produced patronage forecasts of 2m trips per annum by 2011, 3.2m journeys by 2016, and 6.5m trips by 2026. These increases are attributable to a combination of underlying economic growth and new housing development located on the A7 corridor. The Promoter has provided details of demand from each new station:

- Tweedbank – 7%;
- Galashiels – 10%;
- Gorebridge – 29%;
- Newtongrange – 17%;
- Eskbank – 37%.

The Promoter has provided details of trip destinations, and this information has been incorporated into the forecasting model. In addition to Edinburgh being a major destination, the development proposals for Shawfair will also attract an important number of commuting journeys.

We understand that 6-car Turbostars will be operated to accommodate peak period demand. Until 2019, all passengers using Borders Rail are predicted to get a seat. These conclusions have been incorporated into the forecasting model.

#### 4.4.7 Impact of Edinburgh Tram Schemes

The discussion of the Edinburgh Tram schemes in Chapter 4 highlighted the relatively small-scale impact on tram patronage. The SPA forecasting model is not sufficiently detailed to reflect change in trip patterns between Waverley, Haymarket and Edinburgh Park, so the impact of the tram schemes is not included in the spreadsheet model. However, during our analysis we will bear in mind the impact of the Tram schemes on improving the attractiveness of Haymarket Station as a destination.

#### 4.4.8 Summary of Committed Schemes – Impact on Demand

Table 4.2 summarises the 2011 demand generated by the seven committed schemes.

**Table 4.2: Summary of Committed Schemes – Impact on Demand (2011)**

Scheme	2011 Net Impact on Demand
Larkhall - Milnagvie	4,450 trips per day
Stirling – Alloa - Kincardine	300 trips per day
Waverley Phase 1 ^	600 trips in the AM peak, 230 trips in the off-peak
EARL *	6,280 trips per day
GARL *	4,235 trips per day
Airdrie – Bathgate	400 new rail users (AM peak hour)
Borders Railway	6,130 trips per day
Edinburgh Tram	Not modelled by the SPA

Note: \* Figures for EARL and GARL are obtained by linear interpolation, assuming straight line growth between forecast years. ^ The Waverley Phase 1 project will provide additional capacity to accommodate extra train paths, although in itself, is not a trip generator. The four additional hourly paths have been provisionally allocated to the Airdrie / Bathgate services and additional Fife trains.

#### 4.4.9 Impact on Load Factors – Edinburgh Arrivals

Table 4.3 shows the impact of the committed schemes (combined with underlying growth and the FSR franchise commitments) on load factors of services arriving in Edinburgh during the 3-hour AM peak. It also shows the load factors of services upon their arrival at Edinburgh Airport. Load factors were calculated as described in Chapter 3. It should be remembered that the Waverley load factor does not include those passengers alighting at Haymarket.

**Table 4.3: Load Factor Analysis – Edinburgh (3 hour AM Peak)**

Service Group	Current Load Factor	2011 Load Factor-	2011 Load Factor
---------------	---------------------	-------------------	------------------

	- Waverley	Edinburgh Airport	Waverley
Fife Circle (Local)	83%	112%	94%
Newcraighall	18%		40%
North Berwick	38%		74%
Bathgate	63%		81%
Dunblane	64%	80%	73%
Fife (Inter-Urban)	67%	77%	67%
Glasgow via Falkirk	62%	75%	67%
Glasgow via Shotts	65%		70%

Source: Arup forecasting model, First ScotRail

The load factor for the local services via the Fife Circle in 2011 will be over 90% approaching Waverley, and the inclusion of airport passengers means the average load factor will be in excess of 110% west of the new airport station. This shows that, despite the use of newly available capacity across the Forth Bridge and at Waverly Station to introduce an additional hourly local service to / from Fife, crowding will remain an increasing problem for this route in 2011.

The load factors on the Newcraighall corridor increase significantly compared with the current load factors due to the re-opening of Borders Rail. Nevertheless, no crowding problem will exist by 2011. By 2011, the AM peak load factor will be about 40%, assuming 6-car trains operate for the majority of the peak period.

Load factors will also increase from less than 40% to about 70% on the North Berwick route. The causes of this increase are different to the Newcraighall route. Changes in the rolling stock used will contribute to the increased load factors, with 'Push-pull Mark 3' rolling stock replaced by alternative electric units with lower capacities. However, there will still not be a crowding problem on these services. No announcements confirming the replacement rolling stock have been made so we have assumed 3-car Class 334 units will be introduced. We understand that there are also proposals to re-introduce Class 322 units to the North Berwick branch, which have a similar capacity.

Load factors on the Bathgate route will also increase by 2011. The analysis indicates that the doubling of service frequency from 2tph to 4tph with the re-opening of Airdrie-Bathgate will attract additional rail passengers from both car and bus on the parallel M8 corridor. Furthermore, the new stations will generate additional trips into Edinburgh. It is assumed the current diesel units on the Bathgate branch will be replaced by a mix of 3 and 6-car Class 334 electric multiple units, with train arrivals in the peak hour between 08.00 and 09.00 formed of 6-cars. The load factor at Waverly of 81% suggests some crowding of peak hour services on the approach to Haymarket.

The change in load factor for the Fife Inter-urban services will be relatively modest. This is because the growth in demand for travel (fuelled by population growth in Fife and growth around Edinburgh, including the airport) will be accommodated by the additional inter-urban service. The only proviso is that the load factor approaching Edinburgh Airport suggests there may be a risk of crowding on certain peak services.

The express services to Edinburgh from Glasgow Queen Street via Falkirk High will remain busy. Air passengers using these services to the airport station will result in load factors of nearly 80%. Combined with luggage this may create problems in the peak hour, where the Baseline analysis showed demand for travel into Edinburgh is concentrated.

The increased load factors for the Shotts route is attributable to the forecast employment and population growth along the West Lothian route. There will be no service enhancements or introduction of major new trip generators contributing to the change in load factors. A load factor of 70% in 2011 suggests there may be some crowding on the peak hour services approaching Edinburgh (due to the infrequent services).

**4.4.10 Impact on Load Factors – Glasgow Arrivals**

Table 4.4 shows the impact of the committed schemes on load factors on trains arriving in Central Glasgow (calculated in the same manner as Chapter 3).

**Table 4.4: Load Factor Analysis - Glasgow**

Service Group	Load Factor (2003)	Load Factor (2011)	Difference
Electrics – North West	63%	59%	-4%
Electrics – South East	74%	78%	+4%
Electrics – South West	87%	69%	-18%
Diesels (Barrhead, East Kilbride, Paisley Canal)	49%	41%	-8%
Diesels (Maryhill, Cumbernauld)	41%	41%	0%
Diesels (Stirling corridor)	84%	84%	0%
Edinburgh via Falkirk High	71%	77%	+6%

Source: Arup forecasting model, FSR

The analysis shows that the extra services on the Larkhall - Milngavie route will reduce the load factor on the routes to north west Glasgow. Load factors will decrease from 63% to 59% by 2011 because the extra services to Milngavie will provide more capacity. The extra train capacity will offset the increased number of passengers using the more frequent service and the effects of growth in Central Glasgow. Some caution should be used in interpreting these figures because of where the additional capacity is provided. The 5% reduction in the load factor will be unlikely to benefit services to Helensburgh and Balloch, and some services to Dalmuir.

Load factors will increase slightly on electric routes to the south east of Glasgow due to growth along the route, and reopening of the route to Larkhall and the route between Airdrie and Bathgate. However, there is unlikely to be a crowding problem other than possibly on a few peak hour services.

Care should be taken in interpreting the significant reduction in load factors on the electrified routes to the south west of Glasgow, as the figures take account of the introduction of GARL. As highlighted earlier in Chapter 3, load factors are only measured upon arrival into Glasgow. During Baselineing we identified higher load factors (of above 100%) on services from Ayr/Adrossan/Largs south west of Paisley Gilmour Street. The additional 4tph on GARL will make a significant impact on reducing load factors between Paisley Gilmour Street and Glasgow Central, one of the largest flows in Scotland. They will not affect crowding levels south west of Paisley Gilmour Street. Population and Prestwick Airport growth on this corridor will further increase crowding on this part of the route up to 2011, especially in the peak hour.

There are committed proposals in the FSR franchise to introduce longer trains on the East Kilbride route. The additional capacity will contribute to reducing the average load factor for the Barrhead / East Kilbride / Paisley Canal diesel services from 49% to 41% (leaving significant spare capacity).

There will be no change in the load factor on the Maryhill and Cumbernauld diesel services by 2011.

The load factor on services to Stirling will remain unchanged in 2011. Growth arising from the extension of the 1tph to Alloa will be offset by population reduction elsewhere on the route. However, a load factor of 84% suggests there may be some crowding on peak services.

Growth will continue on the Glasgow to Edinburgh via Falkirk services. The modest increase in overall load factor may conceal some peak hour crowding.

## 4.5 Implications of the Committed Schemes for the Role of Rail in Scotland

---

The seven committed schemes will introduce new journey opportunities to and from major trip generators in Scotland. The completion of the two airport rail links will provide good public transport access for many air passengers, offering a convenient alternative to the car. This will be especially the case with EARL. The Airdrie-Bathgate, Larkhall and Alloa reopenings will offer new journey opportunities from residential areas to the principal employment and retail centres in Glasgow and Edinburgh. Many of the schemes will also increase frequencies and train lengths on existing routes with some associated crowding relief (particularly in north west Glasgow).

Nevertheless, these schemes will not specifically address all of the issues highlighted in Chapter 3. The present overcrowding problems affecting the Edinburgh to Glasgow route will not be resolved by the new rail connection between Airdrie and Bathgate, since the journey times will be too slow for most end-to-end passengers, and the scheme has different underlying objectives. The rail link to Edinburgh Airport will actually increase load factors on certain trains, including those from Fife where housing growth will further increase demand. Crowding on services between Edinburgh and Fife will remain a key issue in 2011 despite additional frequencies and capacity created at Edinburgh Waverly and on the Forth Bridge by other committed schemes.

In conclusion, the main impact that the seven committed schemes will have on the role of rail in Scotland in 2011 will be as follows:

- Enabling rail to connect Scotland's two largest airports at Glasgow and Edinburgh to a much larger hinterland by public transport so facilitating these airports' growth and helping to suppress environmentally damaging growth in car trips in the Central Belt. The new rail links will allow a relatively large numbers of passengers to use rail to reach these airports. The significance of this will increase once Glasgow and Edinburgh Airports have expanded in accordance with forecasts beyond 2011. These improvements will help to strengthen Scotland's economic cohesion and competitiveness.
- Enabling further commuting from areas not presently rail served such as between Airdrie and Bathgate and parts of the Borders to Edinburgh, further increasing the sources of skilled labour available to employers in the capital, as well as encouraging more commuting from stations of east of Bathgate.
- Encouraging further commuting by rail into and across Glasgow due to the frequency improvements between Paisley Gilmour Street and Glasgow and Larkhall – Milngavie, which will increase rail's role in supporting Glasgow's economy and future regeneration.

## 5 Expected Future Changes in Scotland

### 5.1 Purpose of Chapter

This chapter sets out how Scotland is expected to change up to 2026. It is based on an assessment of demographic and economic forecasts, as well as analysis of policy, particularly spatial planning policy, and changes in other drivers of travel demand.

A main aim of this chapter is to consider the wider framework for transport and rail in Scotland in the future, and in particular:

- The levels and spatial patterns of population and employment change that will need to be accommodated and facilitated by the transport network; and
- Wider policy priorities, in areas such as economic development, the environment and social inclusion, which rail has important role in helping to deliver.

The chapter considers main policy issues and planned demographic and economic change and expected changes to the transport network in terms of key drivers of travel demand (airports, ferry services, freight). A brief overview is provided of stakeholders aspirations, based on the discussion undertaken as part of the stakeholder liaison during Part 1 of the study.

Brief consideration is given to uncertainties in relation to planning assumptions. Some policy aspirations, seek to achieve levels and patterns of future population and economic change that run counter to friend-based forecasts. It is intended to consider these uncertainties in more detail, to inform sensitivity testing of the passenger demand forecasting. This analysis will be presented in a future addendum to this report.

An important component of the analysis of expected changes beyond 2011 are the Regional Profiles produced as part of the Planning Review. These are included in Section 5.5.

The Drivers of Change described in this chapter were quantified, where possible, for 2016 and 2026. These forecasts drive the forecasts in growth<sup>2</sup> and changes to travel patterns analysed in Chapter 6.

### 5.2 Key Policy Issues

#### 5.2.1 Introduction

An important consideration for the Scotland Planning Assessment is how rail can help support policy. We have identified five main policy themes as relevant to the study:

- sustainable transport;
- strengthening city competitiveness;
- delivering plan-led growth and regeneration;
- environment; and
- social inclusion.

#### 5.2.2 Sustainable Transport

A main aim of transport policy<sup>3</sup> in Scotland is to tackle congestion and reduce the harmful impacts of travel, by improving public transport, enhancing integration, and changing travel behaviour:

*“Our overall aim is to promote economic growth, social inclusion, health and protection of our environment through a safe, integrated, effective and efficient transport system.”<sup>4</sup>*

<sup>2</sup> Prepared using the approach described in Chapter 1.

<sup>3</sup> Including that set out in: *Scotland's Transport Future, The Transport White Paper*, June 2004.

<sup>4</sup> *Scotland's Transport Future: The Transport White Paper*, June 2004 (p17)

The White Paper sets out five main objectives for transport<sup>5</sup>. These are to:

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

The Transport (Scotland) Act 2001 is designed to ensure that the SE is equipped to deliver its aims for an integrated transport system.

Scottish Transport Appraisal Guidance (STAG) is designed to aid transport planners and decision-makers in the development of transport policies, plans, programmes and projects. Proposals for Regional Transport Partnerships<sup>6</sup> are aimed at strengthening transport planning and integration at regional level.

It is clear that the future of rail in Scotland needs to be considered in conjunction with the issues, opportunities and objectives of other modes. Rail has an important role to play in providing an alternative to car use for some key markets. The challenge is, where appropriate, to strengthen the competitiveness of rail in relation to private car use, and to enhance integration with other modes.

Policy in Scotland recognises the importance of freight transport in reducing the negative impacts on communities and the environment of some freight transport. This is reflected in various grant regimes aimed at supporting rail freight facilities and transport. The Scottish Executive is developing a *Freight Strategy* for Scotland.

### 5.2.3 Strengthening city competitiveness

Economic development policy in Scotland<sup>7</sup> highlights the key economic roles of cities, particularly in the context of the transition from a manufacturing and production-based economy to a service sector-based economy. The Cities Review<sup>8</sup> emphasised the importance of Scotland's cities, and the challenges in strengthening the role of cities as competitive locations attracting high value jobs and creative people. The National Planning Framework<sup>9</sup> sets out as a key element of the spatial strategy for Scotland to: “*support the development of Scotland's cities as main drivers for the economy.*”

Main trends and projections analysed in this report indicate a pattern of economic growth concentrated in cities, coupled with population growth in areas in the hinterland of Edinburgh, and in some locations in the Glasgow hinterland.

Rail can play a key role in contributing to city competitiveness, particularly in:

- supporting high densities of employment in city centres by commuter services drawing in a workforce from a wide catchment, strengthening the ability of cities to access a wide and skilled labour market;
- providing fast, long distance passenger services between the Scottish Cities, and major English cities, improving connections to key markets and trading partners;

<sup>5</sup> From Scotland's Transport Future: The Transport White Paper, June 2004 (p17)

<sup>6</sup> Set out in: Scotland's Transport Future – Proposals for Statutory Regional Transport Partnerships, October 2004.

<sup>7</sup> Set out in: The Way Forward: Framework for Economic Development in Scotland, June 2004

<sup>8</sup> Scottish Executive “Review of Scottish Cities”

<sup>9</sup> National Planning Framework, 2003, para 98

- supporting key utilities essential to cities, such as power generation in Scotland, and enabling the cost effective delivery of high volume flows of commodities essential to cities, such as supermarket products; and
- Providing fast links to major airports, supporting tourism and strengthening key international connections and long-distance domestic ones.

Rail can effectively provide significant transport capacity for areas of high population and / or employment density, offering high speed, reliable travel opportunities on a selection of key routes. These routes will be those which serve city centres and main transport corridors, as these are the locations which drive economic growth, and already suffer the worst problems of congestion and journey unreliability.

Rail can also well serve fast, intercity, long distance routes, allowing efficient travel over long distances, to airports and between cities, facilitating the type of face to face networking that, despite advances in ICT and changing working patterns, remains crucial to the wealth creating financial and business services companies<sup>10</sup>, and higher-order public services.

By understanding where growth in households and employment is located in Scotland, rail investment can be targeted to extend the labour catchments of its economic powerhouses of Edinburgh and Glasgow, and help spread economic success outwards from the core cities. Similarly, joined up policy should ensure that the forward planning system allocates housing land along commuter rail lines, or where it is well placed to connect into a line either with high quality bus feeder services, or ample car parking, or both.

Rail freight can also contribute to the economies of cities. In the context of expected future change in the rail freight market in Scotland (discussed below in Section 5.10), rail will continue to have an important role. Future planning should ensure that the need for rail freight terminals to promote distribution by rail is included in spatial, economic and transport plans. This should be focused on where rail is most effective: high volume, regular flows.

There is increasing recognition<sup>11</sup> that to enhance the competitiveness of cities it is vital to attract the brightest and best of the 'creative classes' who drive the wealth creating sectors of the economy. The Core Cities group attaches a high level of significance to the quality of transport connections in determining cities' reputations as places to live, and invest, in<sup>12</sup>. International connections are considered particularly important, with rail playing an important role in terms of cross-border travel and providing access to airports and ports.

#### **5.2.4 Delivering plan-led growth and regeneration**

A major policy theme at national level in the National Planning Framework, and at Structure Plan level as below, is the importance of delivering plan-led growth and regeneration. The specific issues and policy priorities are summarised in the six Regional Profiles later in this chapter. An integrated approach to transport and land-use planning is a key principle underpinning many of these plans.

The Planning Guidance, SPP17 *Planning for Transport*, provides policy guidance on the integration of land use development and transport. It states that land-use planning should aim to reduce the need to travel, and help promote travel by sustainable modes, by relating spatial strategy to the transport network, its current capacity, and future opportunities.

The National Planning Framework (paragraph 98) sets out as a key element of the spatial strategy for Scotland to 2005 to: "*promote more sustainable patterns of transport and land-use*". The NPF states that:

*"Transport issues will have to be addressed from the outset in planning for future development. They cannot be left to be dealt with as an afterthought. Development plan land allocations will require to be appraised against the capacity of the transport network; where economic growth*

<sup>10</sup> See , 'Everyone's Railway, the Wider Case for Rail', Strategic Rail Authority, 2003

<sup>11</sup> See, 'A Smart Successful Scotland', Scottish Executive 2001.

<sup>12</sup> Core Cities Group, 'Cities, Regions and Competitiveness', Interim report

*demonstrates a need for additional supportive transport infrastructure, delivery mechanisms which maintain the balance between development and the transport network will be necessary.*<sup>13</sup>

The ability and appropriateness of rail to serve planned developments will depend on a number of factors. Rail is best serving high density areas of employment in town and city centres. It is less good at serving peripheral business park type developments, where walking distances from stations are inevitably further, although good integration with other modes can help overcome these problems to some extent. Rail is best at serving high density commuter corridors. Housing development needs to be of a sufficient density and scale to be best served by rail. Integration with feeder modes, including car, is important in widening the catchment of rail stations. Rail is also best at serving high volume and regular flows of freight.

### **5.2.5 Environment**

Reducing the harmful environmental impacts of travel is an important policy priority in Scotland. The Transport White Paper<sup>14</sup> sets out the issues in relation to the negative environmental impacts of transport, for instance severance, poorer air quality, a negative impact on climate change and noise. It states *“we are endeavouring to stabilise road traffic volumes and are supporting the expansion of public transport, walking and cycling in order to reduce impacts on the environment”*<sup>15</sup>.

Stakeholders consider that environmental issues provide an important justification for investment in rail. Generally, rail performs well in terms of emissions compared with road travel, and the relative environmental advantage is particularly marked in the locations and circumstances where air quality is a concern, such as congested inner city and commuter routes. This is because rail's passenger loadings are maximised on these routes. Rail emissions will fall as older rolling stock is replaced.

The environmental performance of rail compared to other modes depends on a number of factors particularly the level of passenger loadings and the emissions from different types of diesel units. For long distance trips, rail generally has better environmental performance than short-haul air, although this comparison is not necessarily clear-cut due to the emissions required for power generation for electrified railways.

A report prepared by the Commission for Integrated Transport (CfIT)<sup>16</sup> concluded that domestic aircraft emit between 5 and 7.5 times more CO<sub>2</sub> per passenger kilometre than the equivalent rail trip. They also emit higher levels of other major atmospheric pollutants. Emissions from surface access to airports, although not included in these figures, are also important in considering the true environmental implications of domestic air travel. Therefore the reduction in car use for surface access is important for both modes. The report found that both rail and air have major emission advantages over road for domestic regional journeys.

### **5.2.6 Accessibility and Social inclusion**

Rail plays an important role in enabling people without cars to access employment and services. The latest Annual Rural Report<sup>17</sup> states that around 20% of Scotland's population live in rural areas; 6% of which are in remote rural areas. People who live in rural areas have a higher incidence of long-distance commuting and car ownership. They are more likely to travel to work by car.

A significant proportion of rural dwellers have no access to a bus service, and just under half have to wait over an hour between buses. Work undertaken to assess transport and social exclusion has highlighted the importance of bus services in accessing areas of significant deprivation, and the role of rail-bus interchange. Those on low incomes are particularly sensitive to changes in fare levels.

In September 2004 the social inclusion agenda in Scotland was refocused with 'Closing the Opportunity Gap' (CtOG). Target H from CtOG is concerned with *“improving service delivery in rural*

<sup>13</sup> National Planning Framework, 2003, para 115

<sup>14</sup> Scottish Executive, 'Scotland's Transport Future: The Transport White Paper', June 2004, Paragraphs 2.11 to 2.17

<sup>15</sup> Scottish Executive, 'Scotland's Transport Future: The Transport White Paper', June 2004, Paragraph 2.11

<sup>16</sup> 'A Comparative Study of the Environmental Effects of Rail and Short Haul Air Travel', Commission for Integrated Transport, September 2001.

<sup>17</sup> 'Annual Rural Report 2004', Scottish Executive, 2004

areas so that agreed improvements in accessibility and quality are achieved for key services in remote and disadvantaged communities". Actions arising from this target include expanding the Rural Transport Initiative, investing in lifeline ferry and air links, creating better value bus services, and supporting demand-responsive transport schemes to maximize accessibility benefits.

The report 'Poverty and Social Exclusion in Rural Scotland'<sup>18</sup> surmised that "Some services are unsuitable for local delivery, either because of diseconomies of scale or the nature of the service. An affordable, accessible and flexible range of transport options is therefore essential, especially for people without access to a car", although it goes on to conclude that public transport may not always be the best solution.

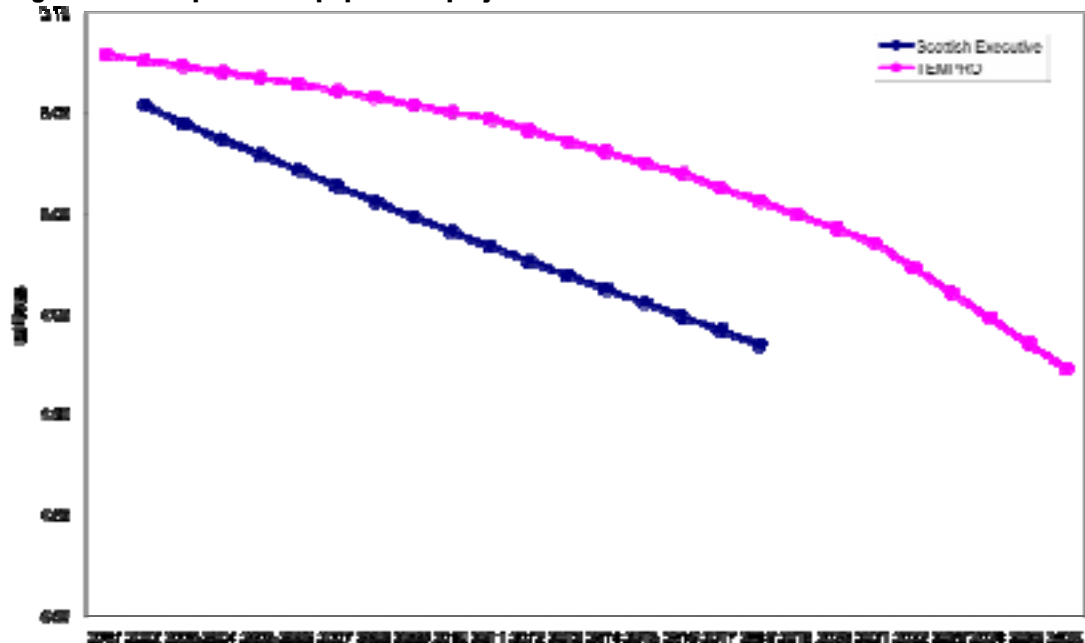
### 5.3 Population and Household Change

#### 5.3.1 Overview

Our analysis of future population change is based on a 'central scenario' derived from the SE's population projections that underpin the household forecasts for Scotland<sup>19</sup>. An alternative source of forecast would be those embedded in TEMPRO which are purely trend-based<sup>20</sup>. TEMPRO is a forecasting model for transport planning purposes developed by the Department for Transport. It includes forecasts of trip ends by time period, split by car availability, car ownership, and other planning data. A comparison of the two forecasts is given in Figure 5.1 below. Detailed forecasts can be found in Appendix A to this volume. There is some discrepancy between the two sets of projections; notably that the SE set is lower but shows a flatter rate of decline.

Population is projected to decline in Scotland as a whole. There have been suggestions that recent patterns of international migration could point to a reduction in this rate of population decline, but this has not yet been reflected in the official projections.

**Figure 5.1: Comparison of population projections for Scotland**



Source: Scottish Executive and Department for Transport

<sup>18</sup> 'Poverty and Social Exclusion in Rural Scotland', Scottish Executive Rural Poverty and Inclusion Working Group, 2001

<sup>19</sup> The 2002 Based Household Estimates at Projections were issued as a series of tables in April 2004. See:

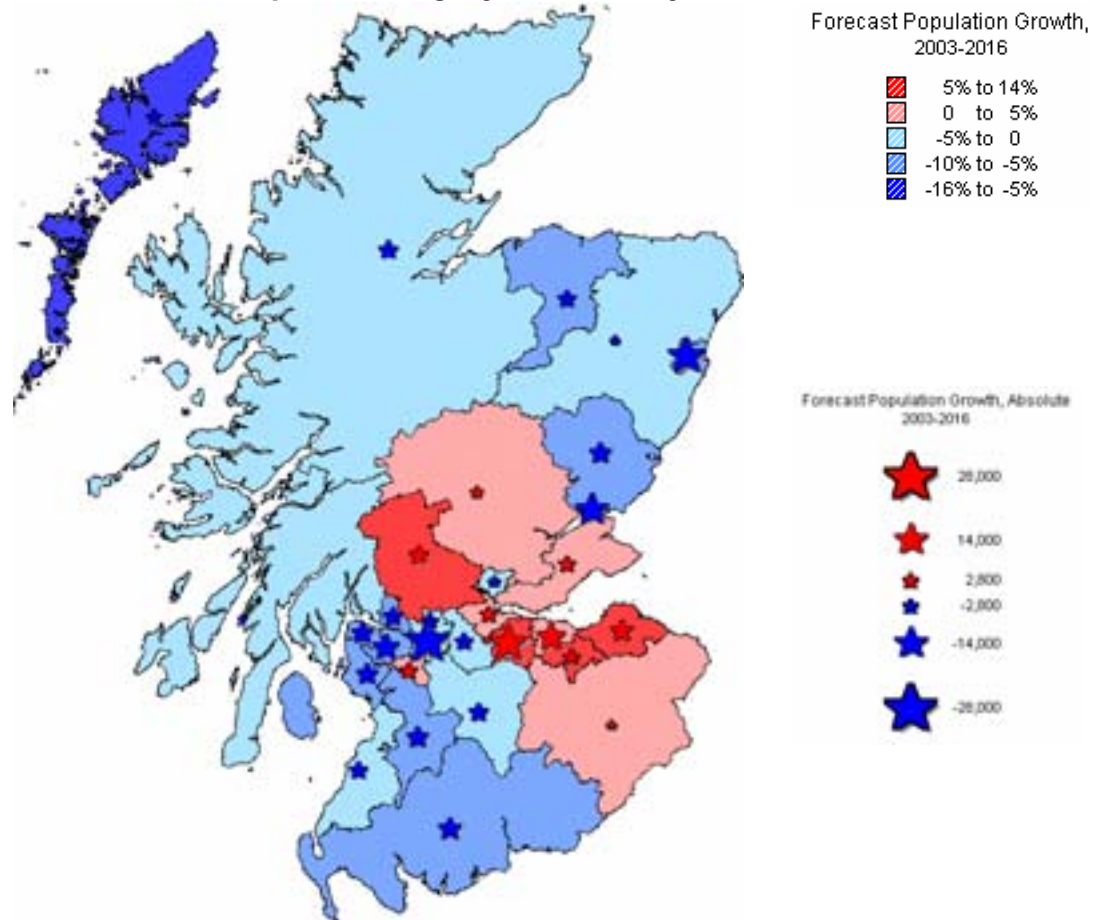
<http://www.scotland.gov.uk/Topics/Statistics/14844/16900>

<sup>20</sup> Although policy-based forecasts are under development

**5.3.2 Projected population change by area**

Figure 5.2 shows forecast population change at local authority level, in percentage and absolute terms.

**Table 5.2: Forecast Population Change by Local Authority Area 2003 - 2016**



Source: 2002-based Sub-National Population Projections: Scottish Executive

The main patterns of projected population growth are as follows:

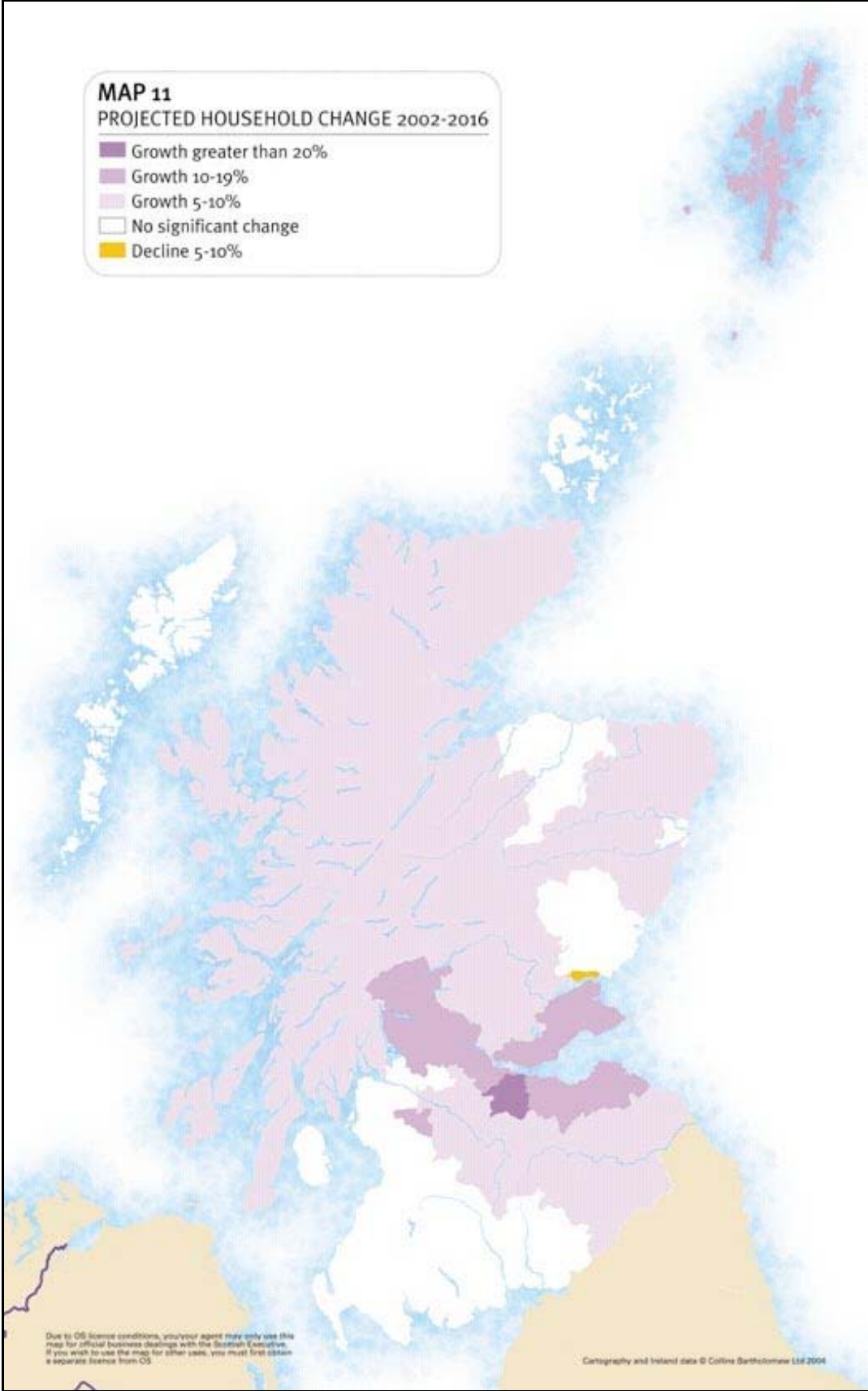
- significant growth in the region around Edinburgh (particularly the Lothians and Fife), as well as slower, but still substantial growth in Edinburgh itself;
- a continued decrease in population across most of the West and the South West;
- decreases in parts of the North East and Central and Tay regions, with substantial decreases projected for the cities of Aberdeen (due to the decline of the off-shore oil and gas industry) and Dundee; and
- a small decrease in the Highlands, although this masks important intra-regional trends, particularly the growth of Inverness and its immediate hinterland.

**5.3.3 Projected Change in Households**

It is important to note that rates of change in numbers of households do not directly mirror population projections. This is because of changes in household composition, particularly the trend towards smaller household size, as well as factors such as housing replacement. Reflecting these factors, household growth will continue in almost all areas of Scotland, even where there is predicted population decline. Clearly, household growth is forecast to be highest in regions with high population growth.

Figure 5.3, taken from the National Planning Framework, shows the projected change in households 2002 – 20016 by local authority area.

**Figure 5.3: Forecast Change in Households**

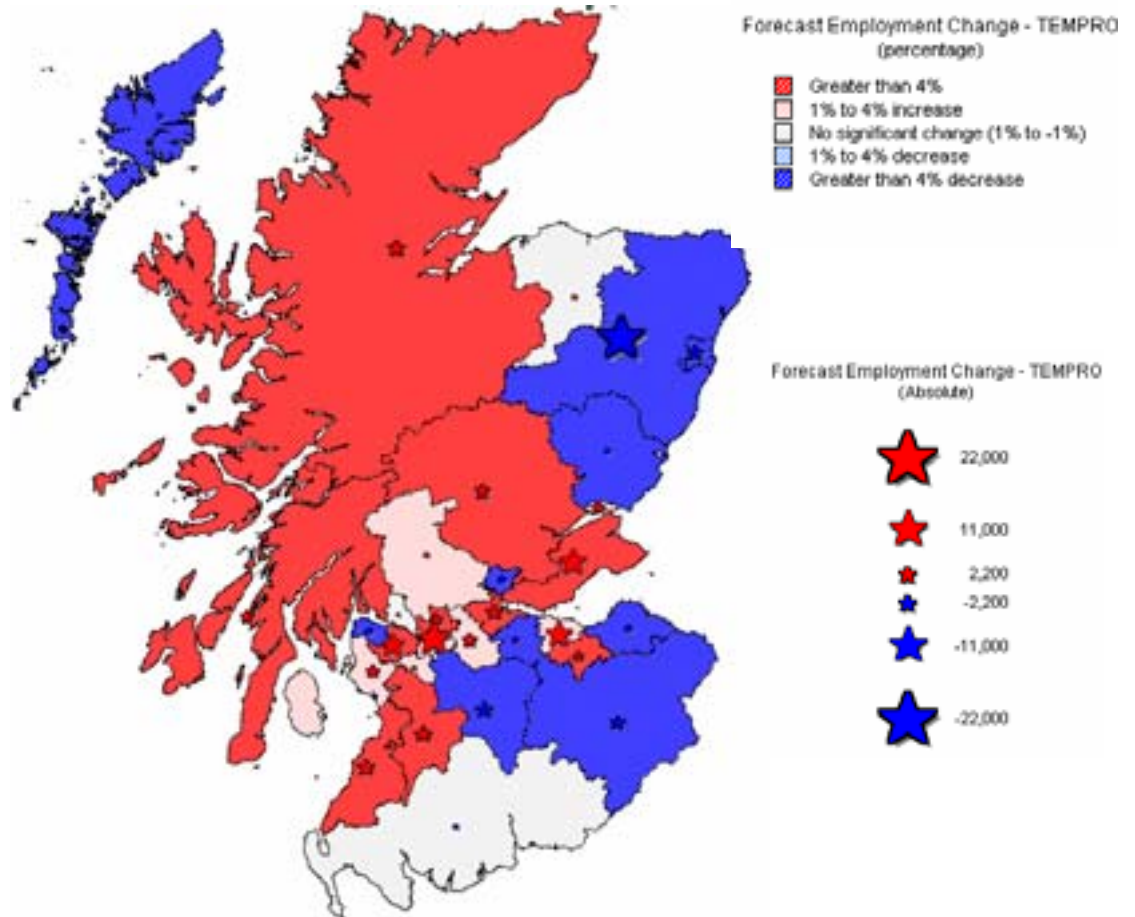


Source: National Planning Framework for Scotland, 2002

## 5.4 Forecast Economic and Employment Change

In the absence of any SE endorsed employment forecasts, the analysis of employment change has been based on TEMPRO forecasts (provided in Appendix A). Figure 5.4 below shows forecast employment change 2002 – 2016 by local authority area.

**Figure 5.4 Forecast Employment Change 2002 – 2016 by Local Authority Area (based on TEMPRO forecasts)**



Source: Arup, based on TEMPRO

Significant employment growth is forecast in Glasgow, and substantial further employment growth (in absolute terms) is forecast for Edinburgh. Major employment growth is also projected for Fife, and employment is projected to grow across much of the other areas in the Central Belt. Significant employment decline is forecast for the North East, due to the decline of the off-shore oil and gas industry.

## 5.5 Regional Profiles

### 5.5.1 Introduction

There is significant regional diversity in terms of spatial and economic characteristics, plans for future development, and the issues this raises for rail.

This section includes “Regional Profiles” for the six sub-regions identified to form the analytical basis for the Planning Review, which were described earlier in Chapter 2. The purpose of the Profiles is to provide a brief overview of the main transport and planning issues in each sub-region, and to consider strategies, policies and aspirations for how the sub-regions will develop and change in the future.

A map has been produced to show the main broad locations and areas of change for each region. Transport proposals and aspirations for each region are considered in Section 5.11 later in this chapter and in more detail in Appendix B.

## **5.5.2 Central & Tay<sup>21</sup>**

### **5.5.2.1 Overview**

#### **Description**

Much of this region is rural in nature, with a mix of high quality agricultural land and less intensively farmed upland areas. The principal settlements are Perth, Stirling and Dundee, although there are many smaller market towns, especially in the fertile areas to the east of the region.

The growth of Edinburgh is expected to create further demand for development especially along the major road corridors in the south and east of the region. Glasgow is also readily accessible by motorway from Stirling.

The universities in Stirling and Dundee support considerable activity, with a focus on biotechnology and medical services in Dundee. Dundee is the only city in Scotland which has experienced population decline since the 1970s, although the City Council is seeking to halt and reverse this trend with funding from Government and EU sources.

Tourism has an important role to play, especially related to outdoor activities: the sub-region includes the eastern part of the Loch Lomond and Trossachs National Park, Highland Perthshire and the Angus Glens.

#### **Overview of key land-use and transport characteristics**

There is development pressure in the Forth Valley (mainly south and east of Stirling), broadly bounded by the Ochil Hills to the north and the Trossachs to the west. However, pressure for housing in southwest Stirling council area comes from Glasgow rather than Edinburgh (as reported in Stirling SP 2002). Rural dwellers are highly dependent on commuting, mostly by car.

Tourism is focused on Stirling, the Trossachs and rural Perthshire. Perth and Stirling act as 'gateways to the Highlands': the A9 corridor northward from Perth, and the A84 corridor from Stirling, are very popular throughout the year.

Agriculture in the region is traditionally successful, in the form of livestock (beef cattle – Aberdeen Angus); soft fruit (on the south-facing slopes along the A90 corridor between Perth and Dundee); potatoes and arable crops.

Transport links through the region must overcome the obstacles of major rivers (Forth, Tay) and/or upland areas (to the north-west and north). There are good road links to Edinburgh and Glasgow via the motorway network, but there are pinch points on other key routes (including the A9 to Inverness). The rail network is relatively limited, with travel times on the Perth-Edinburgh route in particular much slower than the equivalent journey by road, due to the network configuration to the south (as described in more detail in Chapter 3). Junction upgrades and reconfigurations have improved the safety and speed of the A90(T) in recent years.

#### **Key policies**

*Dundee & Angus SP (2002, to 2016):* up to 50ha of employment land has been allocated at the Western Gateway of Dundee, to incorporate a high amenity site potentially for international inward investment, and a new employment site is identified on the west side of Arbroath. In total, there are allocations for 12,730 new homes (to 2016).

*Perth & Kinross SP (2003, to 2020):* development is to be focused in Perth (including residential opportunities nearby, to reduce commuting) and other existing settlements; support is to be provided

<sup>21</sup> Information from Stirling & Clackmannanshire SP 2002; Dundee & Angus SP 2002; Perth & Kinross SP 2003

for vital rural infrastructure (such as schools, sub-Post Offices and petrol stations), in order to maintain rural community life.

*Stirling & Clackmannanshire SP (2002)*: development is to be concentrated in the Forth estuary (south and east of Stirling), with the aim of attracting prestige offices, hi-tech and biotech industries. Uplands and National Scenic Areas to the north and west are to be preserved and protected.

### **5.5.2.2 Change**

#### **Anticipated housing and employment changes (quantum and location)**

*Stirling Council area*: 3,857 new homes will be required by 2017. Strategic employment sites have been identified along the Forth valley, with the greatest concentration of development to be located in a Search Area for Major Growth, at 'Stirling East' (including approximately 2,850 homes and at least two strategic employment sites).

*Perth & Kinross*: in total 9,780 new homes will be required (2000-2020); almost two thirds of these are to be in and around Perth. Employment growth is to be promoted in Perth city centre, and to maximise the accessible location of Kinross in relation to the motorway network. An expanded agri-research facility is to be promoted at the Scottish Crop Research Institute in Invergowrie.

*Dundee & Angus*: 12,730 new homes will be required by 2016, with construction to be concentrated on brownfield sites; family houses, rather than flats, are to be promoted. Approximately 1,200 of the homes are planned for the Western Gateway area. Dundee Central Waterfront redevelopment (between rail station and Tay Road Bridge) is expected to consist of some 50,000 sq m of mixed office, business, retail and residential development.

#### **Spatial distribution of locations of change (see Figure 5.5)**

Growth is expected to be focused in the southeast of Stirling, the west of Dundee, in and around Perth, and in Kinross. Dundee and Arbroath are to undergo physical regeneration. Further development is planned for Forfar and Brechin.

### **5.5.2.3 Commentary**

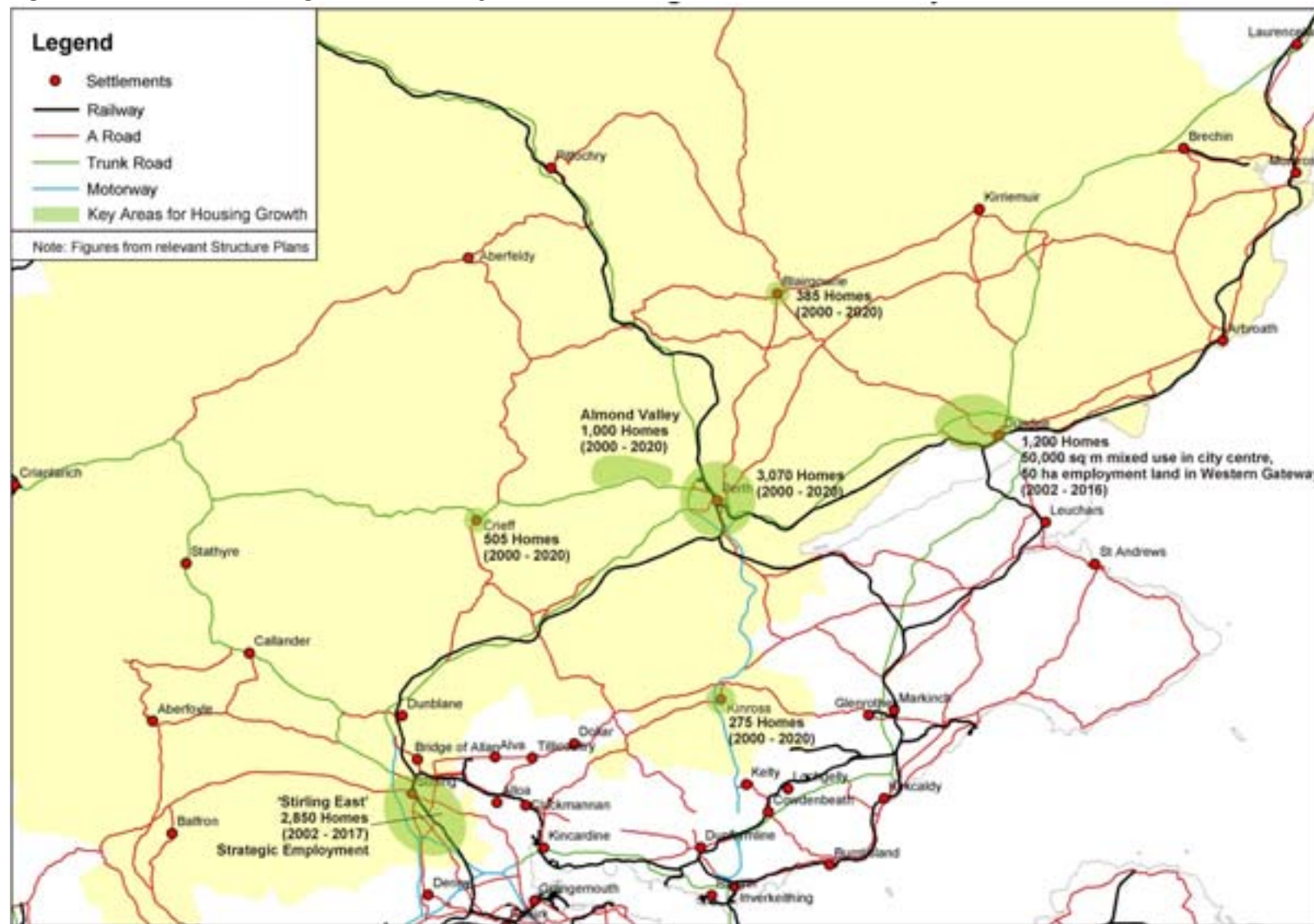
#### **Extent to which assumptions on land-use change are predicated on transport improvements**

More sustainable development patterns are sought, and accessibility to transport is considered to be a more significant issue than congestion (especially in Dundee and Angus).

#### **Nature and level of other main uncertainties re: land-use change**

Future growth in Dundee will be dependent to some extent on the relative success of turning around population decline. The frequency of weather related incidents appears to be increasing: flooding in the Forth and Tay valleys (especially around Perth), and landslides along the route of the A9, can cause significant disruption to the transport network.

Figure 5.5: Main Areas of Change: Central and Tay



Source: Arup, based on Structure Plan as noted previously

### 5.5.3 Highland (including Moray, Argyll & Bute)<sup>22</sup>

#### 5.5.3.1 Overview

##### Description

Recent growth in Inverness has been driven by tourism and increased opportunities for remote working since the mid/late 1990s – such as call centres and new technologies. The relocation of several public bodies including SNH and Forest Enterprise Scotland will add to an already growing office sector. Elsewhere in Highland, there are large areas of sparsely populated upland with little economic activity, with 'marked social and economic disparities' (Highland Structure Plan 2001) between some parts of the region and others. Pockets of deprivation exist in both urban and rural areas. Incomes across Highland are almost 20% lower than the UK average. The Highland Structure Plan estimates that by 2017, some 25% of the population will be of retirement age.

Moray is closely linked to the Inverness economy but also has a significant whisky industry along Speyside, and RAF base at Lossiemouth. Its population is expected to decline modestly in the next decade (by a maximum of 10% by 2018) although household numbers are expected to remain stable<sup>23</sup>.

Argyll & Bute is characterised by its scenic beauty, which draws significant tourist trade to the area. Forestry, upland farming, mineral extraction and renewable energy also contribute to the area's economy. A population shift is anticipated during the current decade, with decline in the more peripheral areas offset by growth in the south east, closest to Glasgow, and around Oban.

##### Overview of key land-use and transport characteristics

Tourism, agriculture and forestry are the three largest employers. One third of Highland is nationally designated for its landscape or wildlife/nature conservation value. Seasonal tourist trade is drawn to the area by outdoor pursuits (in particular, those related to mountains, water or golf) and its scenic beauty. In many places, the heavily-used trunk road network is squeezed into glens and along the sides of lochs.

Aquaculture is found in sheltered western sea lochs; there is commercial (sea) fishing off the west coast. Commercial forestry and agriculture (sheep, cattle and other hardy upland species including deer) influence the physical character of the sub-region but most of the landscape is 'wild'. Wild land is defined in NPPG14 as land with minimal human influence; preservation of this is a material condition in planning terms. A long tradition of renewable energy (hydroelectricity) is now being augmented by wind farm applications, although this is not always welcome - landscape impacts may be felt not only on the local area but also further south (e.g. Cairngorm National Park) in the form of pylons. There is some heavy industry along the Inner Moray Firth, relating to offshore oil and gas. Business parks and light industry are also found around Inverness and Fort William.

The rail network serves Fort William, Inverness, Aberdeen, the ferry terminals on the west coast and the far north although many services are infrequent. Argyll & Bute is sparsely populated and topographically challenging; although the rail network is very limited there are links to Glasgow via the West Highland line. Most public transport in the area is provided by long distance coach services.

##### Key policies

*Highland Structure Plan (2001)*: Several infrastructure developments (Inverness Southern Distributor Road, land preparation in Fort William, Tomnahurich canal crossing, Allanfean Waste Water Treatment Works) are required in order to provide enough housing land for the Highland sub-region. Proposals for a new settlement in the Inner Moray Firth area will be supported,

<sup>22</sup> Information from Highland SP 2001; Inverness City Vision 2003; Moray SP 1999; Highlands & Islands Enterprise Strategy 2005; Argyll & Bute Structure Plan Approved 2002

<sup>23</sup> National Planning Framework 2004

although the Local Authority is keen not simply to develop dormitories for Inverness. Business activity / investment is encouraged in a Simplified Planning Zone at Alness/Invergordon. National planning guidance requires the safeguarding of a site for large petrochemical development at Nigg in the Cromarty Firth. Atlantic Frontier oil and gas fields may be brought ashore in Caithness and this could result in growth in/around Wick (which already has a heliport). Diversification of the agricultural economy is also required.

*Inverness City Vision (2003)*: future settlements are to be clustered along the A96 corridor (Inverness-Nairn) and the Inverness Southern Distributor Road corridor.

*Moray Structure Plan (1999)*: development is to be focused in existing settlements.

*Highlands & Islands Enterprise – A Smart, Successful Highlands and Islands (2005)*: this is seeking to encourage in-migration, to create 20,000 new jobs (FTE) by 2025, and to raise income levels by 10-15% over that period. The University of the Highlands and Islands is to be formally launched in 2007 and it is hoped that this will become a driver of the regional economy, with links to a growing science and technology sector and creative industries (in English and Gaelic) facilitated by broadband internet connections.

*Argyll & Bute Structure Plan (2002)*: strategic proposals include developing timber processing in Oban to Dalmally corridor through major inward investment; planning for the expansion of Oban along its trunk roads; promoting regeneration in Rothesay and Dunoon; exploring the potential for a Trans-Clyde rapid transit; improving the A82 alongside Loch Lomond and improving links to the Clyde coast. The population is expected to remain almost stable<sup>24</sup> but housing numbers are expected to rise slightly due to decreased household sizes.

### 5.5.3.2 Change<sup>25</sup>

#### **Anticipated housing and employment changes (quantum and location)**

The population is expected to grow by 5% to 220,000 by 2017; much of this in the Inverness area. An estimated 25% increase in the number of households is expected by 2017 (extrapolated from 1994 SO data for the purposes of the Structure Plan 2001). Up to 26,200 additional homes will be required (1998-2017), mainly in the Inner Moray Firth area. There will be a need for strategic planning to avoid overdevelopment of Inverness and associated infrastructure / amenity problems. Rural depopulation is expected to be a continuing problem across Highland, especially in the far north and west.

*Moray SP (1998)*: 3,950 additional homes are required (1998 - 2010); especially in Elgin, Forres and Buckie. The strategy of concentrating development in existing settlements is intended to encourage sustainable land use patterns, and may serve to increase the feasibility of improving public transport services to these towns.

*Argyll & Bute SP (2002)*: net population growth of 2% (1998-2012) is anticipated, but this masks a decline in all areas except around Oban, Helensburgh and the south east of the Council area. The future growth of Oban will require it to expand beyond its existing boundaries, which are topographically constrained. Expansion is anticipated along the A82(T) corridor and, in the longer term, along the railway corridor towards Connel.

#### **Spatial distribution of locations of change (see Figure 5.6)**

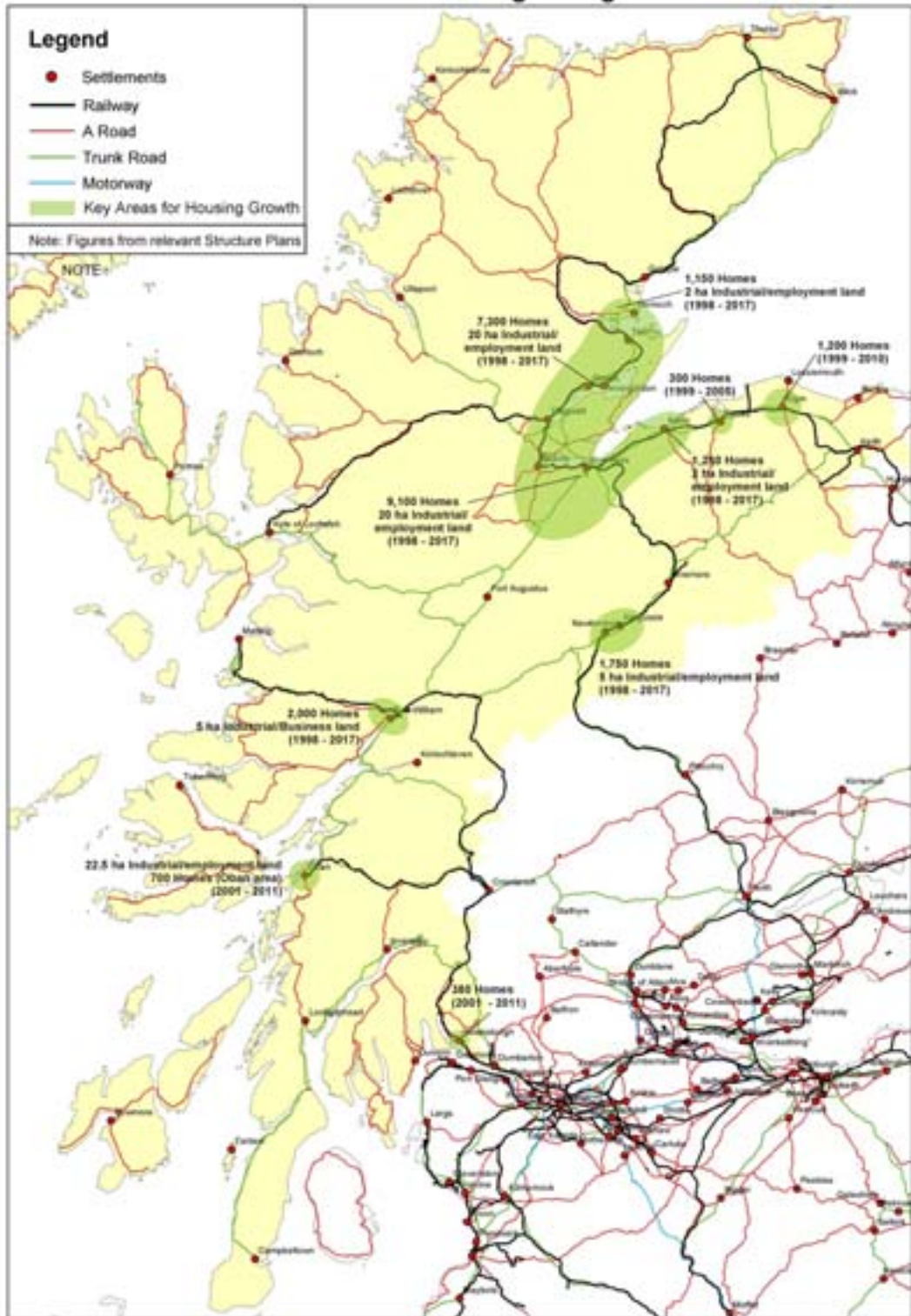
Growth in the Inner Moray Firth area, and Inverness in particular, is expected to be significant. Potential economic developments will be at Nigg (petrochemical site) and neighbouring Delny (single user employment site). Although the phased closure of Dounreay is well underway, decommissioning and environmental remediation of the site will still provide employment beyond 2017.

<sup>24</sup> A&B Local Plan Finalised Draft 2005

<sup>25</sup> *Highland Structure Plan 2001*, section 1.3, unless otherwise stated

Residential development in Argyll & Bute will be focused in the principal settlements of Campbeltown, Dunoon, Helensburgh, Lochgilphead, Oban and Rothesay (Bute), with smaller scale development in Bowmore (Islay), Inveraray, Sandbank, Tarbert and Tobermory (Mull).

**Figure 5.6: Main Areas of Change: Highlands**



Source: Arup, based on Structure Plan as noted previously

#### **5.5.4 Commentary**

##### **Extent to which assumptions on land-use change are predicated on transport improvements**

The proposed housing growth around Inverness is closely linked to the development of the Southern Distributor Road.

##### **Nature and level of other main uncertainties re: land-use change**

The relocation of public sector employment to Inverness and the establishment of the University of the Highlands and Islands are expected to add to existing optimism about the economic future of the area.

A further shift is anticipated from an agricultural to a service economy. Due to EU enlargement, the Highlands will lose their Objective 1 status in 2006 although alternative EU support may be available.

Potential limits to development include the capacity of the waste water treatment network in towns (according to the Highland Structure Plan), although this has been improved in recent years.

#### **5.5.5 North East (Aberdeen City and Aberdeenshire)<sup>26</sup>**

##### **5.5.5.1 Overview**

###### **Description**

Traditionally agriculture and fisheries based, the economy of the North East received a significant boost in the 1970s with the discovery of North Sea oil, leading to the establishment of Aberdeen as the 'oil capital of Europe'. North Sea fisheries are in decline, however, and deprivation is a feature of coastal towns such as Fraserburgh and Peterhead. The long term future of Aberdeen will be affected by developments in higher education and tourism as well as the affordability of North Sea oil.

Tourism and outdoor activities are a significant feature of the Cairngorm National Park, part of which lies in the west of Aberdeenshire.

###### **Overview of key land-use and transport characteristics**

The population is clustered around Aberdeen, other coastal settlements and inland along Deeside: infrastructure corridors closely reflect this settlement pattern. The railway connects Aberdeen to Dundee and the south, while the rail link from Aberdeen to Inverness serves local populations rather than acting to bring many visitors to the area.

House prices in and around Aberdeen are relatively high, influenced by the city's status as the European HQ for many oil companies. Commuter-related congestion is a significant issue. The growth of commuter suburbs in towns such as Stonehaven and Portlethen, and along Deeside, is putting pressure on the major road network at peak times.

###### **Key policies**

*Aberdeen & Aberdeenshire SP 2002*: residential development is to be spread across existing settlements, not concentrated in a single new settlement: development corridors are related to the long-term planned expansion of an integrated transport network (para 1.35). New homes must be in scale with the jobs and services and the function of the local communities in which they are located (para 5.10).

<sup>26</sup> Information from Aberdeen and Aberdeenshire SP 2002; Strategic Forecasts for Aberdeen City and Aberdeenshire 2001; NESTRANS Annual Report 2005

The “short to medium-term challenge is to hone the area’s economy to a new competitive edge” (para 1.30). There is a desire to build upon existing oil industry to become ‘the energy capital of Europe’ through diversification into renewable energy as well as the further development of R&D functions and other relatively ‘footloose’ aspects of the oil industry.

### **5.5.6 Change**

#### **Anticipated housing and employment changes (quantum and location)<sup>27</sup> (see Figure 5.7)**

**Housing** – Land for 26,500 homes will be required in the North East as a whole (2000-2015): 19,000 of these will be in the Aberdeen Housing Market Area and 7,500 in the rural market area (SP 2002). This is attributable to a decrease in average household size rather than a significant increase in population: the population is expected to grow by only 1.2% (5,000 people, 2000-2016) but household numbers are expected to increase by 19% in Aberdeenshire and 10.5% in Aberdeen City over the same period.

**Employment** – The North Sea Oil industry is expected to lose 7000 on/off-shore jobs between 2000 and 2016, a slower rate of decline than previously expected. Not all of these will be people who currently live in the North East – off-shore jobs in particular attract people from all over the east of Great Britain.

Total non-oil employment is expected to rise by 2,150 jobs to 2016 (up 1.2% on 2000). The great majority of these jobs are expected to be located within Aberdeen city: only 0.2% of total new jobs are expected in rural areas.

#### **Spatial distribution of locations of change (see Figure 5.7)**

Employment land is allocated in Aberdeen, Portlethen (including a new business park), Inverurie, Westhill, Banchory, Peterhead and Fraserburgh. National planning guidance requires the safeguarding of sites for a large petrochemical development at St Fergus North and North Collielaw, by Peterhead.

Aberdeen City is expected to experience continuing employment growth until around 2006, followed by stabilisation and a slight decline reflecting changes in the off-shore oil and gas industry. In rural areas, very limited employment growth will be offset by significant residential development, especially in settlements along transport corridors.

#### **5.5.6.1 Commentary**

##### **Extent to which assumptions on land-use change are predicated on transport improvements**

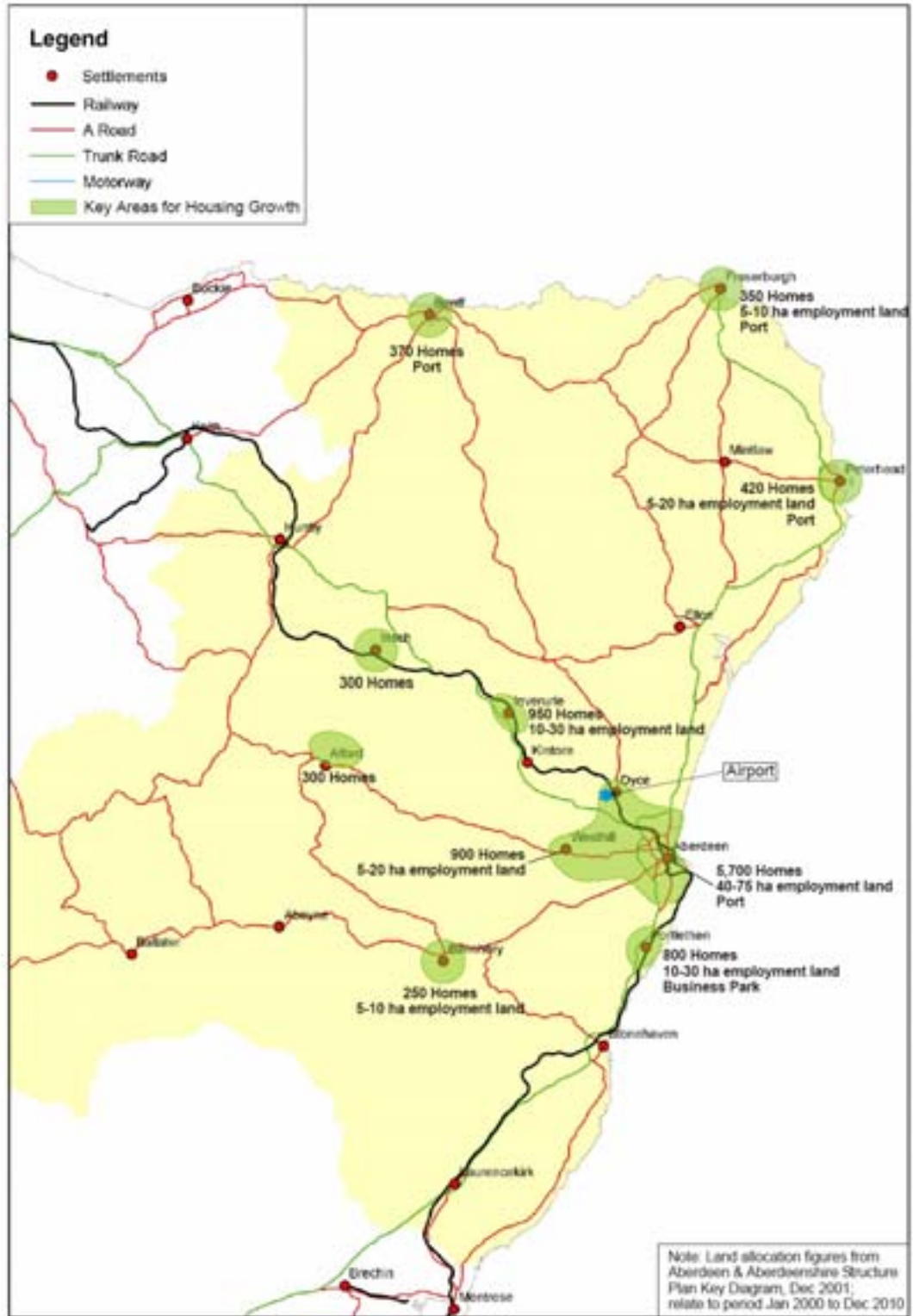
These are currently minimal, although potentially more significant after 2012 (current plan period) when new housing allocations will be required. These may be expected to be focused around the network of rail services which is in place by then. This is especially relevant to the Aberdeen Crossrail proposals.

##### **Nature and level of other main uncertainties re: land-use change**

Global oil prices are likely to influence the extent of future growth in the North East.

<sup>27</sup> Strategic Forecasts for Aberdeen City and Aberdeenshire, autumn 2001, unless otherwise stated

**Figure 5.7: Main Areas of Change: North East**



Source: Arup, based on Structure Plan as noted previously

## 5.5.7 South East<sup>28</sup>

### 5.5.7.1 Overview

#### Description

Substantial growth in Edinburgh's economy in the past decade has been driven by a number of factors including the re-establishment of the Scottish Parliament and continued growth in the financial services sector and knowledge economy.

Development pressure is spreading outwards and settlement growth is planned for East, Mid and West Lothian, Fife and the Borders, in order to accommodate this. There are also significant proposals for development of West Edinburgh (further development at Edinburgh Airport, the relocation of Ingliston showground and further prestige office developments).

Commuters from Fife are putting considerable pressure on transport links across the Forth (especially the road bridge but also, as we have highlighted, the rail links). The trunk road/motorway network to the west of Edinburgh in particular is severely congested at peak times. Commuters from the Borders also contend with relatively constrained road links, principally due to the upland topography of the area. Residents of Falkirk and parts of West Lothian also commute to Glasgow.

In Fife, St Andrews draws international tourists, students and golfers. The recent development of the Rosyth ferry terminal on the north shore of the Forth Estuary now provides a direct connection to Continental Europe (overnight ferry), and it is to be promoted as a multi-modal interchange for passengers and freight.

#### Overview of key land-use and transport characteristics

There is strong development pressure across much of the sub-region; sufficient employment land is available, but key pinch-points on the transport network are causing problems. Preserving the integrity of the Edinburgh Green Belt while meeting demand for new housing may be a challenge.

#### Key policies

*Edinburgh & Lothians SP (2004)*: this aims to satisfy the demand for housing and employment within Edinburgh and the Lothians, rather than 'exporting' any growth beyond this boundary, in order to minimise unsustainable commuting activity. There is a commitment to maintain a continuous Green Belt around Edinburgh, with an emphasis on brownfield development or, where necessary, greenfield development on existing or proposed rail corridors. A recent referendum on congestion charging rejected the proposal although traffic congestion remains a severe problem. There is an objective to intensify the use of business park(s) in West Edinburgh, which is linked to public transport improvements. West Lothian is to accommodate considerable growth, again linked with associated transport improvements (such as the Airdrie-Bathgate scheme).

*Fife SP (Con draft 2005)*: the objectives are to reverse downward trends in population and economic activity in Central Fife; address congestion and public transport infrastructure challenges; diversify the economy and create more high quality jobs. Providing good quality affordable housing as part of integrated communities is also important. The area will have to accommodate 20,000 additional residents by 2026, concentrated in Dunfermline, Glenrothes, Kirkcaldy, Lochgelly & Levenmouth.

*Falkirk SP (Final Alterations 2005)*: this provides a strategic framework for increased investment in employment, retailing and tourism related development. The aim is to improve the overall image of the area by addressing the negative aspects of the local environment and to accommodate significantly higher population growth than expected (principally attributable to in-migration). Its

<sup>28</sup> Information from Edinburgh and the Lothians, Scottish Borders, Fife, Clackmannanshire and Falkirk Structure Plans

target population is 152,000 by 2020; necessitating 14,000 new homes (2001-2020), and an annual net in-migration rate of 500 people per year (para 4.3).

*Borders SP (Approved 2002):* this encourages growth which supports the development of a sustainable Scottish Borders community and, within it, the development of individual sustainable communities. The aim is to create jobs locally as well as facilitating travel to Edinburgh; focusing development in three 'hubs': Central (centred on Galashiels/Melrose/St Boswells area), West (centred on Peebles) and East (between Eyemouth & Dunns).

### 5.5.7.2 Change

#### **Anticipated housing and employment changes (quantum and location) (see Figure 5.8)**

- Fife - Land for up to 12,850 homes is to be allocated in Dunfermline, Kirkcaldy, Glenrothes, Lochgelly and Levenmouth. Other residential development is to be permitted in St Andrews. Employment development is to be concentrated in the Rosyth/South Fife area. The feasibility of a Fife Energy Park at Methil Waterfront is to be explored. A coastal regeneration zone is identified from Rosyth to Methil.
- Clackmannanshire - The Structure Plan proposes that 1,205 new homes will be required by 2017. A 'smart village' is proposed at New Alloa (Alloa West) to focus on new technology, with mixed uses including housing. Strategic employment sites are identified in Alloa, Tullibody and Bridge of Allan and a new 'Clackmannanshire Bridge' across the Forth is proposed.
- Falkirk - The housing land requirement is for 6,450 homes (2001-2012) and a further 4,450 by 2020: a total of 11,000 during the Structure Plan period (SP Schedule Com1a). Development is to be concentrated in the main existing settlements (Bo'ness; Bonnybridge; Denny; Falkirk; Grangemouth; Larbert; Stenhousemuir; Polmont) and existing villages in rural areas. In addition, four new locations are proposed: Banknock; Bo'ness Foreshore; the former Manuel Works at Whitecross (up to 1,500 homes) and Slamannan (Schedule Com1b).
- West Lothian - Livingston and the Almond Valley are identified as a core development area for up to 5,000 houses, with a minimum of 3,000 to be allocated by 2015. The Winchburgh masterplan is currently under development: this proposes a further 5,000 houses with a minimum of 3,000 to be allocated by 2015, and an associated station. Armadale is to be allocated as a core (residential) area for 2,000 further homes. This development is associated with the provision of a new station on the proposed Airdrie-Bathgate line. The A8 corridor has long-term potential for high quality economic development and, depending on the take-up of sites that are already identified, land may be released post 2020.
- Edinburgh - West Edinburgh is a core growth area, based around airport expansion and prestige office development. Intensification of business uses at Sighthill/Edinburgh Park/South Gyle will continue; public transport improvements are expected to support this and be aided by it (West Edinburgh Tram, West Edinburgh Busway; Edinburgh Park Station). Brownfield redevelopment (residential and business) at Granton is to be promoted, dependent upon a tram link to city centre (scheduled for no sooner than 2008-9).
- Midlothian – the Structure Plan states that land for up to 2,200 homes is required, broadly along two transport corridors: the A7/A68/Waverley Line corridor (1,350 homes) and the A701 corridor (850 homes). This relatively low level reflects recent developments in Midlothian and a number of operational constraints (see below). The A701 and A7/A68 corridors are also to be the focus of employment development, especially for the biotechnology sector and other knowledge-based industries.
- East Lothian - 6 Core Development Areas are identified: a new settlement of up to 1,600 homes at Blindwells former opencast site (between Longniddry and Prestonpans); further residential development is to be concentrated in Musselburgh (450 homes), Wallyford (1,000), Haddington (750), North Berwick (500) and Dunbar (500). However, beyond 2015 it is not thought that existing settlements could contribute significantly to further development and new settlements may be required.
- Scottish Borders - The focus for development is to be the 'central hub' of Galashiels, Melrose, Kelso, Jedburgh, Hawick and Selkirk, with particular concentration on Galashiels-Melrose-St Boswells corridor (the north end of which is broadly coincident with the terminus of the proposed Waverley Line). The other main areas identified for development are the 'eastern hub' (Eyemouth, Duns) and 'western hub' (Peebles, Innerleithen and Walkerburn).

Development is to be *restricted* in the following areas (Edinburgh & Lothians SP 2004, paragraph 2.50):

- Rural West Edinburgh, defined as the area covered by the local plan excluding the core development area of Newbridge/ Kirkliston/ Ratho, which is constrained by the Green Belt, landscape, environmental objectives and road capacity;
- villages and small settlements in rural East Lothian and Midlothian that are constrained by infrastructure, landscape, built heritage and other environmental objectives;
- Bonnyrigg which has met a significant proportion of housing development arising from previous structure plans, and any further major growth is constrained by landscape and environmental objectives;
- Tranent, Prestonpans, Cockenzie and Port Seton which have met a significant proportion of housing development arising from the Lothian Structure Plan 1994 and which are constrained by infrastructure and/or environmental objectives;
- Linlithgow and north-west West Lothian which are constrained by infrastructure, landscape and environmental objectives.

### 5.5.7.3 Commentary

#### **Extent to which assumptions on land-use change are predicated on transport improvements:**

The following plans are predicated on improvements to the transport network:

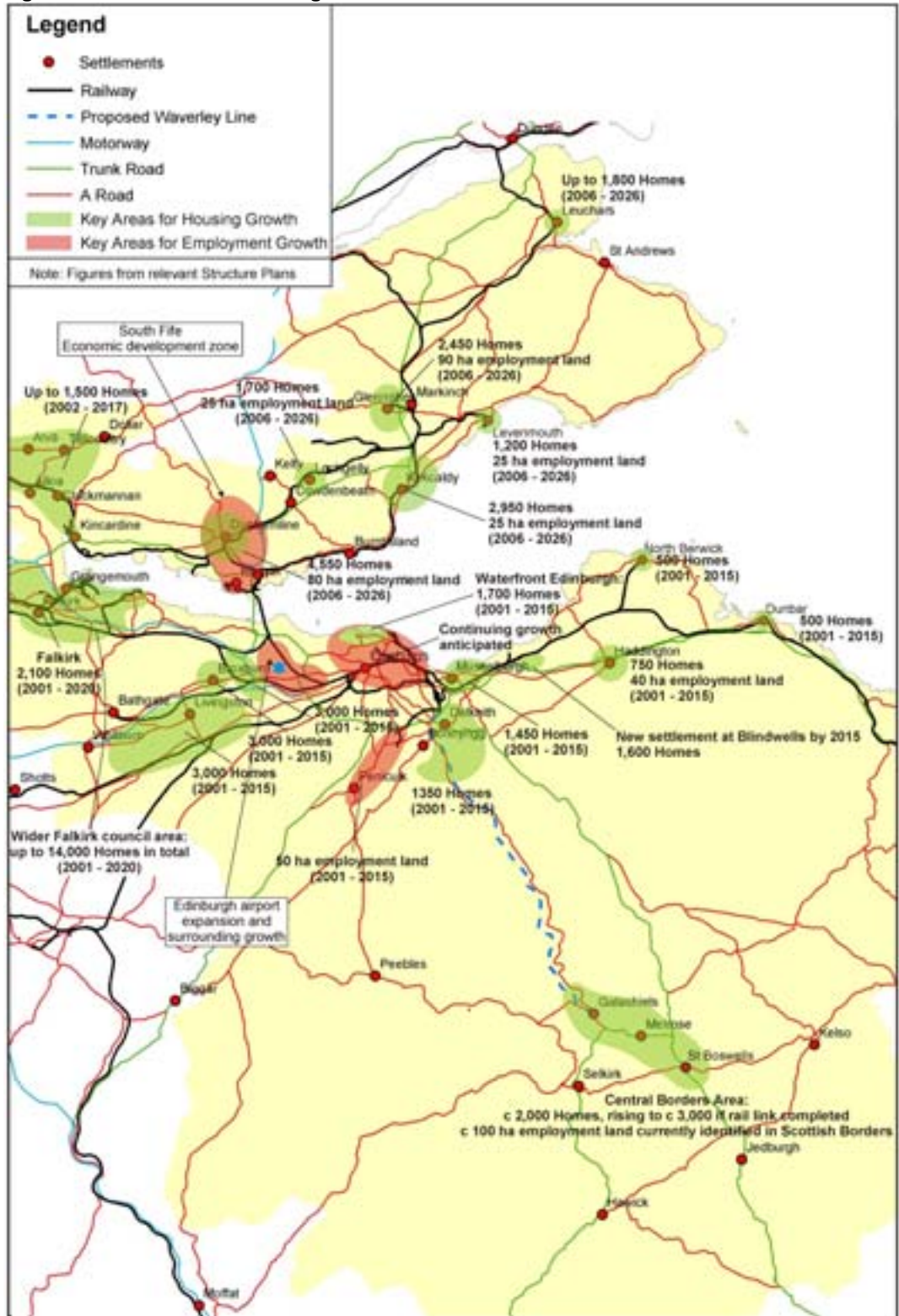
- Borders housing allocations are split into two phases, with Phase 2 subject to the reopening of Waverley Line;
- West Edinburgh development is closely linked to the expansion of the airport;
- intensification/redevelopment at Granton is dependent upon an Edinburgh city centre tram link;
- development in North Berwick and Dunbar will be dependent upon rail enhancements;
- development in Fife will be facilitated by transport infrastructure investment including road and rail;
- further development may be appropriate in Midlothian to the west of Gorebridge post 2015, subject to the reopening of the Waverley Line;
- a new Forth crossing could significantly increase commuting opportunities, although it is likely that most of the flow would be towards Edinburgh rather than into Fife from the south; and
- economic development north of the proposed Clackmannanshire Bridge will be subject to the bridge's construction

#### **Nature and level of other main uncertainties re: land-use change**

The Edinburgh & Lothians Structure Plan, Table 2.1, summarises necessary infrastructure developments as follows:

“The Core Development Areas will require major new infrastructure to accommodate the growth identified in this plan. In Edinburgh, this will include a new tram network linking the city centre with north and west Edinburgh supported by an orbital rapid transit system (bus-based). In East Lothian, rail enhancements to North Berwick and Dunbar and new education and drainage provision will be needed. Midlothian will require links to the tram system plus other major enhancements such as the Waverley rail line and the grade separation of the A720 Sheriffhall junction. Secondary school provision will also have to be increased. West Lothian will need stronger linkages with Edinburgh either through tram or busway extension as well as enhancement of services on the Bathgate and Shotts rail lines. New school provision will also be required.”

**Figure 5.8: Main Areas of Change: South East**



Source: Arup, based on Structure Plan as noted previously

NB: the map above shows data from Edinburgh & Lothians SP Adopted 2004; figures for West Lothian will be updated in Part 2 of the SPA to reflect recent change

## 5.5.8 South West<sup>29</sup>

### 5.5.8.1 Overview

#### Description

The South West of Scotland is characterised by a degree of peripherality that belies its location on the M74 corridor between England and Glasgow. The principal settlements are Ayr, Kilmarnock, Dumfries and Biggar. It is expected that in the next 20 years, development will be focused in coastal Ayrshire, between Ayr and the M74, and to a lesser extent in Dumfries.

In Dumfries and Galloway, forestry is a significant industry and, in anticipation of much of the crop maturing in the coming decades, new sawmill facilities are being installed in Lockerbie (although not rail served). The traditional seaside resorts along the Ayrshire coast are seeking to reposition themselves as attractive locations for new investment and residential development. In East Ayrshire, commuter travel congestion towards Glasgow is an issue, especially on the roads. In Ayrshire as a whole, GDP is falling further below the UK/Scottish average<sup>30</sup>. Parts of South Lanarkshire have also suffered decline, with significant job losses in the manufacturing sector since the mid-1990s, and more recently in tertiary employment as well. However, this may now have stabilised and the economy is expected to show modest growth over the coming decade.

Transport links include ferry services to Northern Ireland, and Prestwick Airport near Ayr, where passenger numbers are currently growing fuelled in particular by the expansion of budget air travel. To the south, parts of the Solway Firth coast are designated as National Scenic Areas, and tourism is important. Rural Dumfries and Galloway was badly affected by the foot & mouth crisis in 2001: farm diversification (including tourism) has been promoted.

#### Overview of key land-use and transport characteristics

The WCML runs through Lockerbie although many of the high speed services do not stop there.

A new terminal opened at Troon harbour in 2002.

Prestwick International Airport accommodated over 2m passengers in 2003-04<sup>31</sup> and serves 27 destinations (particularly in the USA). It also has freight capabilities and a new Ryanair maintenance facility is currently under construction there. Prestwick is West Central Scotland's second runway (after Glasgow International) and anticipates approximately 6 million passengers per annum by 2030.

The main port activities relating to Stena's services to Northern Ireland are moving to Cairnryan to the north. This is well served by road but 6 miles from the nearest railway. This move will have implications for rail services.

#### Key policies

*Consultation Draft Ayrshire SP (2004)*: there is a 'pressing need' to address population decline and revitalise communities in Ayrshire. Core Investment Areas are identified in Ayr, Irvine and Kilmarnock to this end, where the majority of development will be focused.

*Dumfries and Galloway SP (1999)*: a small number of industrial and business priority locations were identified in existing settlements in the south of the region, with residential development focused in the eastern half of this area, closest to Dumfries and the M74.

<sup>29</sup> Information from: Dumfries & Galloway SP 1999; Joint Ayrshire 'MONITOR 2004' report; Joint Ayrshire Structure Plan to 2025 consultation draft 2004; Glasgow Clyde Valley SP amended consultation draft 2005.

<sup>30</sup> Ayrshire Monitor 2004

<sup>31</sup> Ayrshire Monitor 2004

### **5.5.8.2 Change**

#### **Anticipated housing and employment changes (quantum and location)**

Ayrshire housing allocations have not yet been finalised: the Councils are awaiting the outcome of the Structure Plan consultation. There could be a need to accommodate between 8,800 and 13,400 additional dwellings by 2025 (between East and South Ayrshire), depending on population projections to be agreed.

Dumfries and Galloway may see 6,480 new households (1998-2009). Most of these are expected to be located in existing towns and villages in the eastern half of the region: there is potential for Gretna, Lockerbie and Dumfries to expand. Dumfries, Annan and Lockerbie are well located for business as a result of their proximity to the A74(M).

#### **Spatial distribution of locations of change (see Figure 5.10)**

*Ayrshire:* the Core Investment Area is bounded by Ayr, Kilmarnock (and Irvine – see the West profile for details). Investment Corridors are identified along the Ayrshire coast; from Ayr towards the M74 link, and in the A71 Irvine Valley east of Kilmarnock. ‘Gateway’ locations are identified as Prestwick International Airport and the ports of Ayr and Troon, with strategic investment to be encouraged at sites in Kilmarnock, Prestwick Aerospace Park, South East Ayr. Elsewhere, the coalfield communities of southern East Ayrshire are in need of regeneration, and are to be an investment priority.

*Dumfries and Galloway:* only stable or very modest growth is anticipated in this area. Residential development is to be focused in Dumfries, Annan and Castle Douglas. Some initiatives are being progressed to facilitate regeneration:

- the Crichton regeneration project in Dumfries to develop a University Campus and Business Park, along with providing expanded healthcare facilities consolidated onto the site;
- a strategy and action plan to regenerate Dumfries;
- a masterplan to provide a framework for a new development on Stranraer Seafront (including a new public transport interchange); and
- cessation of British Nuclear Fuels production at Chapelcross has been the catalyst for a major economic regeneration strategy for the Gretna-Lockerbie-Annan area.

### **5.5.8.3 Commentary**

#### **Extent to which assumptions on land-use change are predicated on transport improvements**

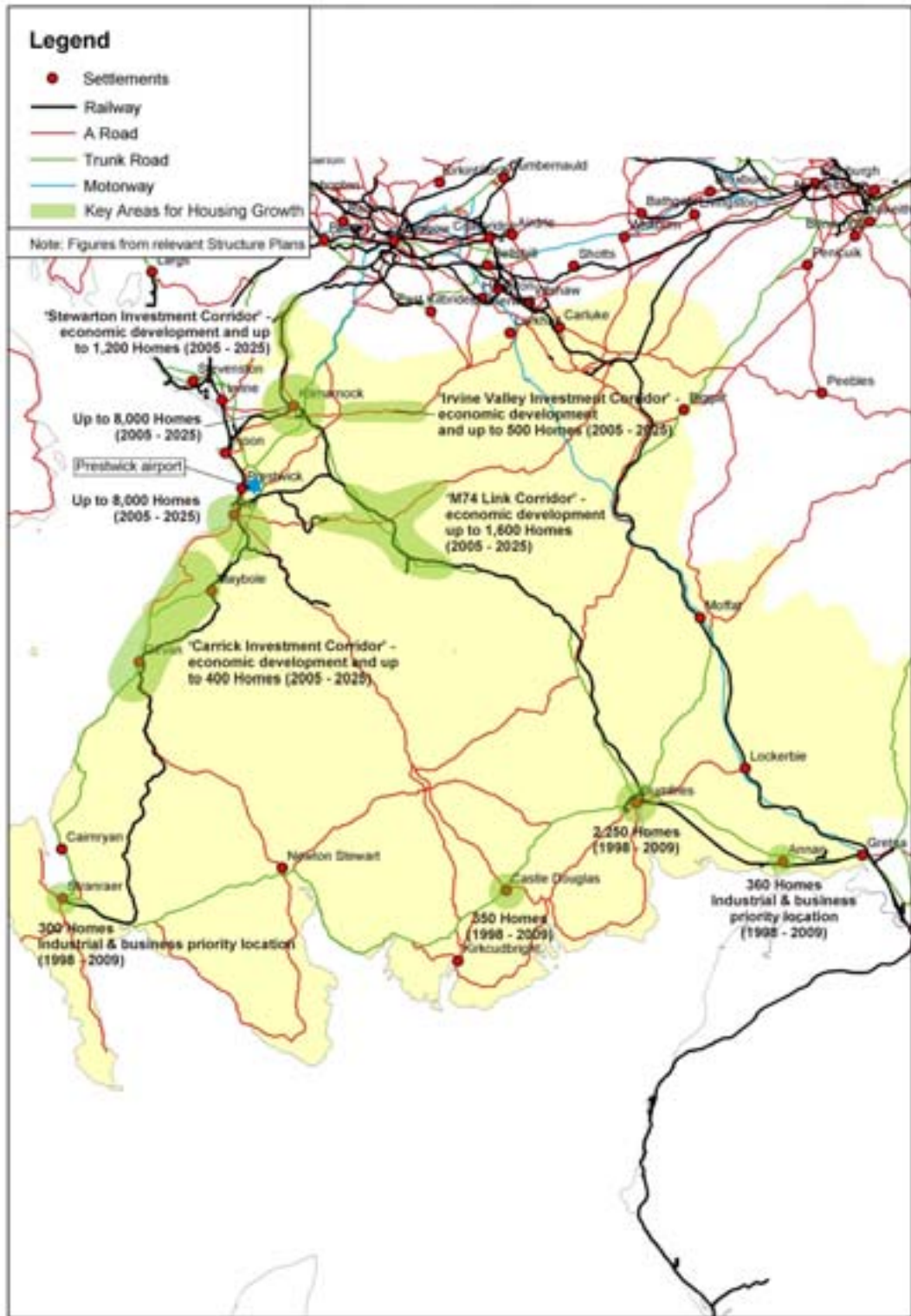
Variable: significant in the more developed areas in the north; less so in southern areas.

Growth in the Ayrshire towns of the scale anticipated by the Consultation Draft SP 2004 would require significant infrastructure investment in order to proceed successfully. The main growth locations have been established although the quantum is yet to be finalised. Improvements to rail services into Glasgow are expected to ease congestion on the road network.

#### **Nature and level of other main uncertainties re: land-use change**

The resolution of housing land allocations, and in particular the proportional split between Glasgow Clyde Valley and Joint Ayrshire councils (anticipated with the examination of the draft Structure Plans) will have a significant impact on land-use change, especially in the areas closer to Glasgow. This is expected to be determined by the SE over the next 18-24 months.

**Figure 5.10 Main Areas of Change: South West**



Source: Arup, based on Structure Plan as noted previously

## 5.5.9 West<sup>32</sup>

### 5.5.9.1 Overview

#### Description

The Glasgow conurbation dominates this sub-region, surrounded by more rural upland areas including the recently designated Loch Lomond and the Trossachs National Park. Glasgow's traditional role as Scotland's industrial centre has been diminishing in importance in recent decades, although this activity has been replaced by retailing, tourism and the knowledge economy. The city has successfully rebranded itself as a stylish destination for short breaks, and much of the former industrial land along the Clyde has been redeveloped for high value uses including leisure and office space. Nevertheless, Glasgow remains the UK's fourth most important manufacturing centre.

Unemployment rates are falling and rates of out-migration are decreasing. The population is anticipated to stabilise and begin to show net increase from around 2013 onwards due to increased in-migration. The main drivers of future economic growth are likely to be services, science and technology. Universities and further education establishments are also expected to contribute to the growing knowledge economy.

The traditional competition between Edinburgh and Glasgow is giving way to a recognition that co-operation between these cities will result in benefits for Scotland as a whole. To this end, schemes to strengthen transport and economic links between these cities are in development. The economy of Glasgow and parts of Lanarkshire may be showing growth, but there are pockets of deprivation in several areas of the sub-region including parts of Renfrewshire and Inverclyde. In the uplands to the south and east of the main conurbation, Rural Investment Areas have been identified with the aim of regenerating former coalfield communities also suffering from deprivation.

#### Overview of key land-use and transport characteristics

Significant economic growth is anticipated in the Glasgow and Clyde Valley (GCV) area, and proposed by the Consultation Draft Structure Plan (May 2005). Sufficient land is thought to be available for investment, but improvements are required to the environmental quality of some parts.

Key road links include the M74 to the south and England, the M8 to Edinburgh, the A82 to the north-west, and the A80 to Falkirk. Railway links include the WCML and the line to Falkirk and Edinburgh. About 5 years ago the Forth & Clyde and Union Canals reopened, linking Glasgow and Edinburgh, although these are used almost exclusively for tourism at present. Ferry links run from railway stations as follows: from Ardrossan to Arran, across the Clyde from Gourock to Dunoon, from Wemyss Bay to Rothersay and Largs to Cumbrae Ship. Passenger numbers at Glasgow Airport continue to rise.

#### Key policies

The *Glasgow & Clyde Valley Consultation Draft SP May 2005* (an alteration to the 2000 plan) presents an 'Agenda for Sustained Growth'. This anticipates much greater growth than was previously forecast (up to 95,000 additional households by 2017), and includes policy in support of reversing the population decline of recent decades. It promotes the SP 2000 proposal for a 'Corridor of Growth' across the area from Greenock and Dumbarton through Paisley and central Glasgow to Coatbridge and the M8 corridor. However, it should be noted that this is still a Draft plan and the quantum of proposed growth may be subject to change before approval by the SE.

The *Consultation Draft Ayrshire Joint Structure Plan 2025* (June 2004) also proposes significant housing growth in addition to SE population projections. Irvine is identified as a key growth area

<sup>32</sup> Information from: Glasgow & Clyde Valley Consultation Draft Structure Plan 2025, May 2005; Consultation Draft Ayrshire Joint Structure Plan 2025, June 2004; meetings with WESTRANS and SPT

It should be noted that it is considered unlikely that both Ayrshire and GCV will achieve their projected housing numbers: to some extent they are competing to accommodate the same individual households.

## **Change**

### **Anticipated housing and employment changes (quantum and location) (see Figure 5.11)**

The new Consultation draft amended Structure Plan for GCV anticipates there may be around 95,000 additional households in the GCV area by 2017: over twice as many as forecast in the 2000 SP and together accounting for roughly 40% of the SE's target growth for Scotland over the same period. The private sector housing requirement is consequently estimated at 112,700 (2002-2017) in the Conurbation Housing Market Area. Gartcosh (at least 2,500 houses) and Bishopton (possibly 2,000 houses) are identified as preferred locations for longer term expansion.

North Ayrshire is anticipating a need for between 3,500 and 11,400 new homes by 2025, depending on the population forecast chosen (CD Ayrshire SP, 2004). Space for up to 8,000 new homes may be allocated in Irvine, with further concentrations along the northern coast (up to 1,300), the Garnock Valley (up to 700) and the Stewarton/A735 corridor (up to 1,200).

Activity is to be concentrated along a 'corridor of growth' from Greenock via Glasgow towards the east. This includes the regeneration areas in the Clyde Waterfront, Clyde Gateway (central/eastern Glasgow) Gartcosh (north east of Glasgow), Eurocentral (N Lanarkshire) and Ravenscraig (a whole new settlement proposed to the south east of Glasgow, subject to the ongoing Public Inquiry). Sub-regional centres include Dumbarton, Paisley, Cumbernauld and East Kilbride. There is particular support for affordable housing in Renfrewshire, East Dunbartonshire and East Renfrewshire.

In North Ayrshire, Hunterston deep sea port is expected to play a significant role in economic terms: proposals are currently under development to promote it as a major deep sea container port for the northern half of Great Britain (see Section 5.10 below). In addition, strategic investment sites are identified at Irvine and Stevenston.

Hunterston is an opportunity for a globally significant deep-water terminal, and a major rail connected site to be protected in the national interest. It could act as a transshipment hub on a European scale but requires both road and rail improvements if it is to be developed successfully. These issues are discussed further in Section 5.10 below.

Passenger numbers are expected to continue to increase at Glasgow International Airport, facilitated by the Glasgow Airport Rail Link which is currently under consideration (see below).

### **5.5.9.2 Commentary**

#### **Extent to which assumptions on land-use change are predicated on transport improvements**

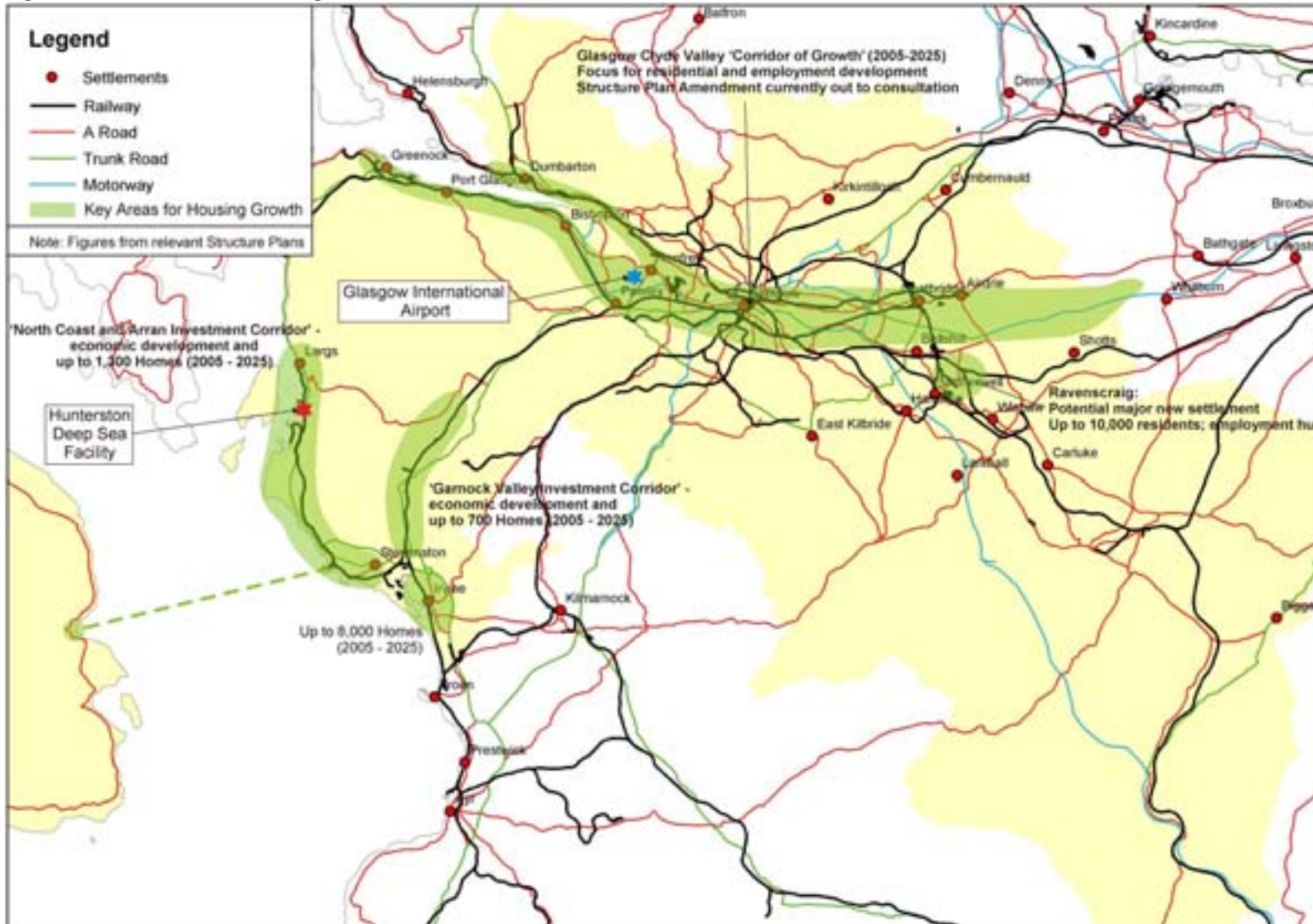
Better commuting opportunities would be likely to encourage growth in the wider conurbation. If the proposed levels of housing development are to be realised, this will place considerable strain on the transport network and significant work would be required to accommodate the increase in travel demand, especially commuter traffic.

#### **Nature and level of other main uncertainties re: land-use change**

The quantum of future housing development across Glasgow Clyde Valley and North Ayrshire is yet to be agreed, although it appears unlikely that both GCV and Ayrshire's ambitious proposals will be acceptable to the SE in their present form.

In addition to any transport improvements, investment is required in water, wastewater and ICT infrastructure in order to support future growth.

**Figure 5.11 Main Areas of Change: West**



Source: Arup, based on Structure Plan as noted previously

## 5.6 Railway Policy Changes

---

### 5.6.1 Fares

Fares are an important factor determining journey choice. The SRA revised their fares policy by altering the RPI-1% scenario to RPI+1% fares growth for three years from June 2003 (Fares Review Conclusion, 2003). This change means rail fares now increase faster than the rate of inflation. The main reason for the change in policy was helping to control the level of financial support needed, particularly against the background of rising costs affecting the rail industry. However, since average earnings increase at a faster rate than inflation, the real price of rail travel is decreasing.

Rail fares in Strathclyde are generally lower than other parts of Scotland for equivalent journey lengths. In particular, fares within Fife (for example) are relatively higher. There are two contributory factors for the relationship between fares in Strathclyde and Fife:

- SPT have been able to subsidise fares, and this initiative is consistent with wider social inclusion objectives. This is an important issue, given the relatively high proportion of households without access to a car; and
- historically, fares in Fife are more expensive than other parts of Scotland, following the service improvements in the late 1980s that was part-funded by fare increases. This disparity between fares has been maintained.

As a result of the Railways Act 2005, decisions on fares will be taken for the whole of Scotland by Scottish Ministers in their specification of the Scotrail franchise. This may be an opportunity to review fares, and re-base them, so they do not take account of usage or investment changes.

### 5.6.2 Policy Opportunities

ATOC recently published proposals to increase rail fares during the peak period. The document, '*Looking Forward: Contribution to Railway Strategy*', assumes that if road pricing is introduced, rail will be a practical alternative to expensive car journeys. The resulting increase in rail demand could lead to the need for peak pricing on rail services. This may be required to optimise funding resource, with innovative solutions needed to manage capacity, and ensure demand can be handled in the most efficient manner. Further work is needed to assess the proposals developed by ATOC, although the initial feedback from industry commentators has been sceptical. It should also be noted that the SPA does not assume road pricing will be implemented in Scotland.

This proposal is contrary to other initiatives adopted by some train operators serving London. Pricing mechanisms are used to 'spread' peak hour demand by reducing the ticket prices for commuters travelling during the shoulder peak periods. Although such initiatives require careful consideration to avoid a reduction in revenue, there is anecdotal evidence that such measures can be effective in managing peak load factors more efficiently. Such initiatives could also delay the timescale for capacity enhancements.

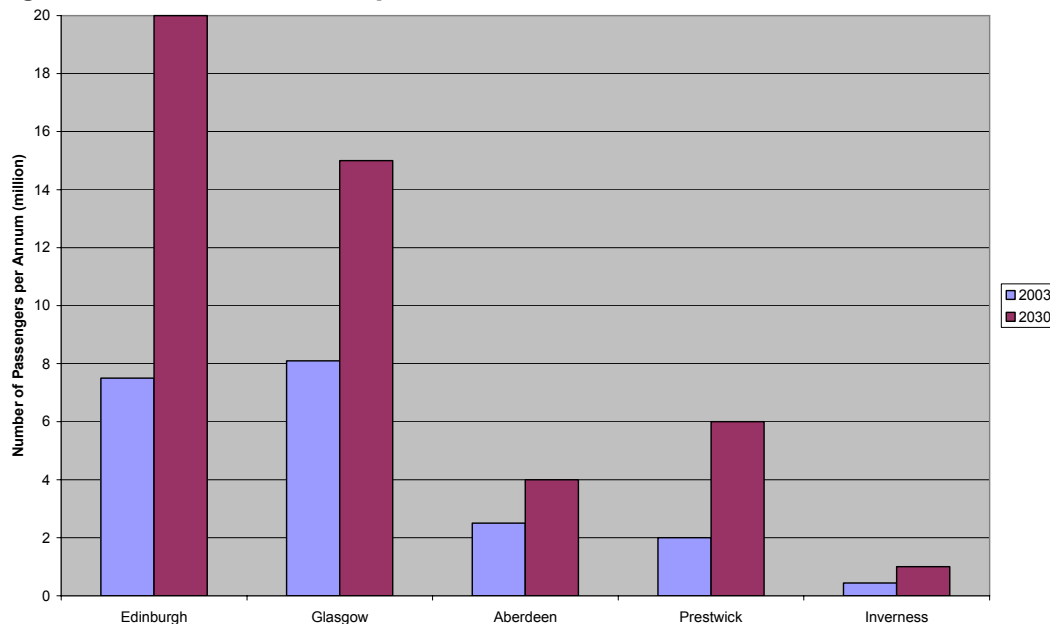
## 5.7 Airport Growth

---

The DFT's 2003 White Paper (*The Future of Air Transport*) set UK airport policy for the medium term. Its implications for Scotland are described below.

Figure 5.12 summarises forecast growth at the five largest airports in terms of passenger throughput.

**Figure 5.12 – Future Scottish Airport Growth**



Source: DfT

**5.7.1 Edinburgh Airport**

The White Paper forecasts that passenger demand at Edinburgh airport will increase to 20 million passengers per annum (mppa) by 2030 from 7.5mppa in 2003. This represents significant growth and will make Edinburgh Scotland’s busiest airport in terms of passengers. Edinburgh Airport is also expected to benefit from growth in air freight. Consequently, an economic case for phased development of additional runway capacity has been identified, and will:

- make full use of the existing main runway through a full parallel taxiway, new control tower and additional terminal and aircraft standing capacity;
- make better use of the existing crosswind runway for departing aircraft, although this will only provide a small increase in additional runway capacity; and
- eventually phase out the crosswind runway through construction of a new parallel runway.

Growth will mean that surface access to the airport will become an increasing issue. Committed improvements to the A8000 will help. The construction of EARL by 2010 serving Glasgow, Fife, Central Scotland and Edinburgh is forecast to increase the proportion of passengers travelling to or from the airport by public transport. Edinburgh Tram Line 2, when constructed will serve the local travel market in West Edinburgh.

**5.7.2 Glasgow International Airport**

Glasgow International Airport is expected to maintain its important role meeting demand for passenger air travel, although by 2030 its forecast passenger throughput will be 75% of Edinburgh’s. Developments include a new route to Dubai, and the commitment by Continental Airlines to using larger aircraft on the New York route.

The White Paper forecasts passenger numbers will increase to 15mppa by 2030. Surface access improvements will be needed to support this growth. The construction of GARL to Glasgow city centre is an essential component of such improvements.

The economic case for an additional runway is uncertain. Charter and long-haul flights comprise a significant proportion of air traffic into Glasgow; and these flights invariably carry larger numbers of passengers. The airport may be able to cope with increasing passenger volumes without constructing an additional runway. The terminal and airside facilities will need to be developed though to accommodate the extra passengers.

### **5.7.3 Glasgow Prestwick International Airport**

Glasgow Prestwick is expected to grow rapidly. The White Paper forecasts that its continued expansion as a hub for low cost carriers will increase passenger numbers to 6mppa by 2030 (a three-fold increase), with an additional 200,000 tonnes of air freight per annum (a 400% increase). Terminal facilities will be improved within the next 5-10 years when the current capacity of 3mppa is reached. The airport has also benefited from improvements to the M77/A77 roads. Prestwick's growth may mean that rail capacity to Central Glasgow may need expanding, since about 30% of passengers currently arrive by rail.

### **5.7.4 Aberdeen Airport**

Passenger demand is expected to rise from 2.5mppa to over 4mppa by 2030. The existing terminal building may be developed to cater for the anticipated increase in air passenger throughout. The runway may also be extended to widen the range of aircraft that can use the airport subject to land availability. There are unlikely to be any significant local environmental impacts resulting from this forecast level of growth of the airport.

Surface access to the airport will be improved by the construction of the Aberdeen Western Peripheral Route, easing congestion on the A96. This will also facilitate more reliable bus journey times from the city centre. Dyce Station also serves the airport and aspirations to improve service frequencies to it will benefit the airport.

### **5.7.5 Dundee Airport**

The type of aircraft permitted to land at Dundee is restricted by runway length. The route to London City Airport has successfully attracted local business traffic, and further routes could be added. There are no environmental constraints that would restrict the development of terminal facilities for up to 0.25mppa.

### **5.7.6 Inverness Airport**

Inverness Airport acts as the principal hub for the Highlands and Islands. The airport handled approximately 0.6mppa in 2004/05, and forecasts suggest that Inverness airport may have potential to expand to 1mppa. New routes to London Heathrow and Stockholm airports will help to achieve these targets. Plans to develop freight facilities at the airport are progressing. Runway extensions and additional terminal capacity will be required in due course to enable expansion. Surface access improvements will be focused towards local, rather than strategic improvements. A new station close to the airport on the Aberdeen to Inverness railway line is a local aspiration.

### **5.7.7 Other Highlands and Islands Airports**

Other Highlands and Islands airports include Barra, Benbecula, Campbeltown, Islay, Kirkwall, Stornoway, Sumburgh, Tiree and Wick. Lifeline air services are provided from the airports on the Islands to the mainland. Delivering a sustainable long term air service that supports social and economic needs whilst strengthening external business links and encouraging tourism is a key objective. Potential enhancements include:

- runway extensions at Sumburgh;
- runway rehabilitation and lighting as well as improvements to the Instrument Landing System (to facilitate aircraft operation during bad weather) at Kirkwall Airport, and
- new runway lighting, taxiway improvements and development of heliport facilities at Stornoway airport.

These airports could attract jet aircraft in the longer term, improving service quality and reducing journey times. However, the continuation of the present situation is assumed for the SPA. A programme of small-scale improvements to other airports has been developed, including possible development of Oban and Broadford airports.

### **5.7.8 Other Changes**

There is stakeholder pressure to increase the level of financial support for essential air services to the Highlands & Islands. A study for HITRANS identified high fares, inconvenient frequencies, unsatisfied demand, and infrastructure limitations as the main constraints preventing growth on these routes. When these routes are re-tendered in accordance with EU directives, additional financial support could enable air fares to be reduced, and frequencies to be increased. Although traffic is forecast to double over seven years, additional subsidy will be required to achieve this. Such changes would improve connectivity between the Highlands & Islands and the major economic centres in Scotland.

## **5.8 Changes to Ferry Services**

---

As described in Chapter 3, most of the Scottish ferries are subsidised by the SE, and operated by CalMac. Recently, the SE has been working to bring the CalMac services into line with European Union state aid guidelines. A consultation document 'Delivering Lifeline Ferry Services' was published in 2002 by the SE that examined options to put the subsidised services out to tender, so these routes could continue operating under EU law.

Following the consultation, a package of provisional proposals was submitted to the European Commission. This allowed the Scottish Executive to tender the ferry network in its entirety. The Gourock–Dunoon service has since been tendered separately as a commercial service.

Following the 2002 consultation, the following changes to services were implemented:

- regular users of the Ardrossan-Brodick, Oban-Craignure, Kennacraig-Islay and Largs-Cumbrae services are no longer required to pay a supplement to travel on peak sailings;
- new and enhanced ferry services were introduced; a new service to the Sound of Barra, additional services to the Sound of Harris, a winter passenger and vehicle service between Kilchoan-Tobermory and an enhanced summer service from Oban to the Western Isles;
- winter services between Mallaig & Armadale and Tarbert & Portavadie;
- the summer timetable for Colonsay was revised to ensure that school children can return to the island at weekends. However, the inclusion of a winter service was impossible due to early loss of daylight and weather conditions.

Proposals were also made for infrastructure improvements; funding was confirmed for a new sheltered water vessel for the Wemyss Bay-Rothesay route and work was undertaken at Oban to develop the pier facilities.

The SE has also recently consulted on the final service requirements for lifeline ferry services to the Clyde and Hebrides. This consultation allows interested parties to respond to the consultation document, should tendering be required.

Passenger ferry services from Stranraer will cease from December 2006, once Stena have consolidated their ferry departures to Northern Ireland at Cairnryan.

## **5.9 Committed Road Schemes**

---

Other than the M74 Northern Extension, we are not aware of any major road schemes that have been committed. The Forth Estuary Transportation Authority has an aspiration to a second crossing, as does Fife Council. The crossing could be constructed as a multi-modal bridge, but there have been no public announcements. Consequently, a new crossing is likely to be at least 10 years away.

As no firm proposals exist, we assume that road pricing is not introduced in Scotland in the period to 2026. The implication is road congestion at the hotspots listed in Chapter 3 will worsen, and additional capacity will be immediately utilised.

## 5.10 Future Rail Freight Market Changes

### 5.10.1 Main future changes

Freight services exist purely in response to market needs. Changes in the markets and in the services they require are not always easy to predict. The future of rail freight service is often practically difficult to call as rail is dependent on a limited number of commodity areas which may themselves be subject to major uncertainties. This is certainly the position in rails main markets in Scotland.

Major uncertainties include<sup>33</sup>:

- The future beyond 2016 of the coal fired power stations at Longannet and Coatbridge and of the coal flows from Hunterston and Ayrshire which support them. Outcome will depend on the balance that is eventually struck between the need to reduce omissions in accord with EU obligations and the obligation to supply sufficient power for the nations needs.
- The extent to which open cast production will be sustained or increased and the location of the market found for the product. At present much is burnt by English generators.
- The likelihood of the development by Clydeport of a new deep sea container port at Hunterston and both the level of rail movements it might generate and the consequences for existing Anglo-Scottish flows which would otherwise be likely to continue to increase at approximately the rate of throughput growth at the existing main ports in the south east of England.
- The extent to which continued cost, EU Working Time Directive and environmental concerns will improve rails' competitive position relative to road and increase the use of rail on trunk flow within logistics/supply chains.

More detailed information on these areas is provided in the paragraphs immediately following.

#### 5.10.1.1 Uncertainty over the future of Longannet and Cockerhill

The EU LCPD opt-out means that both remaining coal fired power stations in Scotland may close by 2016 with the cessation of the associated coal flows. However, the June 2005 deadline for fitting FGD equipment has been extended to December 2005. Furthermore coal fired electricity accounts for about 35% of UK generating capacity. Combined with the decommissioning of the Magnox nuclear power stations over the same period, it is unclear where the 35% shortfall in power generating capacity will come from. Therefore, it cannot be said categorically that these stations will close. Means may be found to extend their working life beyond 2016. Because the west – east flow of imported coal passes through a number of network pinch-points, this is a significant uncertainty for future rail strategies and plans.

#### 5.10.1.2 Continued growth in opencast mining

The EU LCPD applies to English coal fired power stations as well as Scottish, but about half of English generating capacity has opted into the Directive and fitted FGD. Whilst there is likely to be a small decline in demand for coal in England as some power stations close, the point made above about the shortfall in generating capacity that would result is still pertinent. Furthermore, in Chapter 3, the greater difficulty in securing planning permission for opencast extraction in England was highlighted. All these factors, combined with the decline of the English mining sector, suggests that any decline in southbound cross-border coal traffic is likely to be minimal.

#### 5.10.1.3 A new deep sea container port at Hunterston

Plans by Clydeport for the construction of a major deep water container port at Hunterston on the Firth of Clyde, adjacent to its existing bulk terminal are being brought to the stage of examination prior to a planning enquiry. The scheme's promoters believe it has two main strengths:

- it would exploit the natural anchorage available at Hunterston to berth any container vessel afloat (up to 10000 TEU) at any state of the tide; and
- it would provide a port outside the congested South East of England transport network.

<sup>33</sup> Based on information provided by the SRA and tested with stakeholders.

Clydeport plans not to seek to replace the ports of Southampton, Felixstowe or Tilbury, but to absorb some of the predicted growth in container traffic over the next 20 years. Should Clydeport proceed then it would have major implications for the rail industry.

Clydeport's considers that, with Scotland representing only 10% of the UK market, the majority of its containers would need to move cross-border to England. It is likely that ship feeder services would develop use of road, and rail modes would seem unsustainable. Even until the M77 extension southwards to Fenwick in East Ayrshire, the port would still be some distance from the motorway network. It is therefore probable that a reasonable proportion of available container traffic would move by rail. This in its turn would require investment in the rail network to give the port a suitable link to the WCML south of Glasgow. Improvements likely to be required include gauge clearance to W10 from Hunterston to Shield Junction in Glasgow, capacity increases on the same route (unless coal traffic were to decrease significantly) and possibly electrification and upgraded power supply to allow electrically hauled freight trains to operate into Hunterston.

Particular capacity issues arise between Paisley and Shield Junction although the GARC scheme provides some additional capacity which might allow for up to 6-8 additional freight trains.

Were any purely Scottish intensive flows to develop then it is likely that terminal capacity would require to be expanded.

#### **5.10.1.4 Growth in deep sea container traffic moving by rail from England**

Flows of deep sea container traffic from England to Mossend and Coatbridge are likely to continue to grow driven by the increase in imports to the UK from the Far East and the expansion this is driving in the numbers and capability of deep sea ports in the south and east of England.

#### **5.10.1.5 Increasing use of rail on trunk flows within the logistics chain**

The trend highlighted in Section 3.4 towards greater use of rail on the trunk flow is likely to continue. This may be affected by future engineering access strategies developed by Network Rail on both the cross-border routes and domestic routes within Scotland. Proposed terminal developments will encourage the switch to rail for the trunk flow; examples would include the proposed new intermodal terminal at Raithes Farm at Dyce north of Aberdeen to replace the existing less adequate facilities at Guild Street in the city when that site is re-developed, and the recently announced expansion at Elderslie assisted by a SE grant. It should be noted that successful penetration of the domestic intermodal market to some extent depends on Network Rail's ability to develop engineering strategies which allow operators to provide the quality of service necessary to win customers..

#### **5.10.2 Other Changes**

Some additional rail flows may emerge in the period to 2026 where volumes and regularity are sufficient. These include:

- Refuse, where the SE's policy objective of achieving a higher recycling rate is beginning to encourage local authorities to set up joint recycling / waste transfer depots to exploit economies of scale. These can generate high volume, regular movements to (for example) landfill sites and, if terminals are rail connected, rail transport becomes competitive. It should be noted, however, the incentives to reduce use of landfill could diminish the opportunity;
- Timber. At present, rail's mode is very small because of the poor economics of transshipment, particularly given low world prices. There is, however, a willingness amongst public and private stakeholders to encourage rail use on environmental grounds. If this was to result in measures to alter the economic balance then rail might gain a higher market share. There are also proposals – as yet at a very early stage – to use wood-based business as a fuel for electricity generation and, in the right combination of circumstances, this could create a market capable of being served by rail. Probabilities are not at present assessed as being very high;
- Nuclear Material. The planned decommissioning of the power station at Hunterston (by 2012) and Tonnes (by 2018) will result in loss of existing rail movements, but these are not high volume.

### 5.10.3 The Grants Regime

It should be noted that, although by far the greater part of rail freight passes for purely commercial reasons, the SE does have powers to grant-aid rail movements or the installation of rail facilities where use of the rail for freight can deliver wider social benefits (e.g. to the environment), but the economic balance would otherwise favour another mode. It is understood that the SE intends to continue to award such grants, as they provide a means whereby rail's penetration of otherwise difficult markets can reflect public policy priorities.

### 5.10.4 Conclusion

As has been noted, it is not easy to forecast future network use by freight. The SRA has developed a methodology to address this issue so that it could plan effectively the development of the network. Use of this methodology suggests that it would be appropriate to ensure that at least the current capacity and capability provided to freight operators should be maintained for the foreseeable future. There would also be value in developing schemes to relieve current major pinch points, to the point where a decision might be made on implementation. Where that requires funding the availability of private funds would clearly be significant.

Once there is greater clarity on the future demands of the coal market and of any development of Hunterston, the position should be reassessed.

## 5.11 Overview of Stakeholder Aspirations for Transport Improvements

During Part 1, we have collected and analysed stakeholders' aspirations and policies for transport through meetings with representatives from each of the voluntary Regional Transport Partnerships and SPT, and analysis of planning documents and reports of strategic transport studies. A list of stakeholder aspirations for specific schemes is set out in the Appendix B to this volume of the report. More general comments on stakeholder aspirations are set out below.

It is clear that the work and thinking of the Regional Transport Partnerships are still in early stages of development. Perhaps inevitably, views on transport issues and proposals are at this stage being inputted from the bottom up from individual local authorities, to some extent on a scheme-led basis. There is clearly some progress needed to develop genuinely regional perspectives on transport issues and problems and wider objectives, to provide an outcome-focused framework for the identification of specific regional priorities for transport investment and management. There is however fairly broad recognition of the need to plan the railway on a strategic, not an incremental, basis.

There are several competing stakeholder objectives for rail, for instance to serve short to medium length commuter markets, whilst improving journey times between the major cities.

There are numerous proposals and aspirations for new stations on the network. These proposals have not always been developed in conjunction with a wider strategic analysis of rail capacity, performance or capability issues and implications. Nor do they always recognise the importance of volume and density for rail to be successful.

Several stakeholders stressed the importance of improving the competitiveness of the wider rail product. As well journey times, a key issue is timetabling, which is considered by some stakeholders to significantly reduce the competitiveness of rail vis-à-vis other modes. Key problems with the timetable that were highlighted are:

- low frequencies on some inter-urban routes, a feature particularly unattractive to business travellers who require flexibility in journey opportunities;
- a lack of journey opportunities at the start and end of the business day, resulting in rail being a non-viable option for some business and commuter journeys;
- long interchange penalties due to the waiting time required when connecting between long-distance and local services; and
- timetabling of services that leads to direct competition with bus services, when a complementary approach could lead to more frequent journey opportunities.

Stakeholders' views are that there is significant scope to improve the integration between rail and other modes, including car (via more station parking). Stakeholders cited several examples of the need (although rarely firm proposals) for improving rail-bus interchange, to improve scope for feeding passengers on to the network, particularly from areas of new development.

There would appear to be some awareness amongst stakeholders of the strengths and weaknesses of rail in fulfilling different functions and serving different markets. However it is not clear that the questions "Why rail?" or "Can the transport outcome required be better delivered by another mode?", are applied routinely to rail aspirations and improvements.

There are few serious proposals or aspirations for major line re-openings or extensions, other than the seven committed schemes.

In contrast, there is broad awareness amongst stakeholders of the problems and constraints (in general terms) that constrain the capacity, capability and performance of the existing network. Some stakeholders stressed the need for these to be considered in a strategic, not piecemeal, manner.

## 5.12 Planning Uncertainties

The main areas of uncertainty in relation to expected change in Scotland to 2026 include:

- uncertainties resulting in differences between policy (particularly at Structure Plan level) and forecasts for population and employment growth;
- other uncertainties in relation to the forecasts for population and employment growth, particularly in relation to the extent to which structural demographic trends will continue;
- uncertainties in relation to "committed" transport schemes, which have yet to receive full funding approvals;
- uncertainty in relation to the extent to which levels of airport expansion set out in the 2003 DFT White Paper will be achieved;
- uncertainty in relation to future freight markets, particularly coal and the development of a container port at Hunterston; and
- policy uncertainty, for instance in areas such as road user charging.

A main aim of policy, at various levels, in Scotland is to counter long-run structural trends of population decline and economic underperformance. The SE issue population and household projections to provide the basis for spatial planning policy. However, several Structure Plans include housing growth targets significantly higher than those that would be required in relation to the SE's projections. Planning policy seeks to regenerate main urban areas, reversing trends of economic decline from some major towns and cities.

The SE do not produce or endorse economic or employment forecasts at below national level. Employment forecast from TEMPRO have been used as the basis for the analysis for this report. These TEMPRO forecasts are trend-based. Economic development policy in Scotland is to some extent seeking to run counter to these trends, particularly in aiming to reduce or reverse the widening of disparities in economic performance between different areas within Scotland.

There are questions whether the long-term trend of an ageing population, and population decline at national level might be slowed or reversed as a result of new patterns of international migration to and from Scotland.

The impact of some of these uncertainties is discussed further in the next chapter.

## 5.13 Conclusions on the Drivers of Change

Scotland is expected to continue to undergo important structural change in terms of its economy and population, and these changes will have important implications for transport.

Scotland's population is projected to continue decline overall. Despite falling population, household growth is projected across most of Scotland. Employment is forecast to grow across much of the Central Belt, particularly in the main cities, but this forecast growth contrasts with economic prospects in some other parts of Scotland. For both demographic and economic change, there are marked variations between Scotland's Local Authorities in the prognosis for the future.

The most substantial economic and population growth will be in Edinburgh and across the South East region, driven by the projected continued growth and success of the Edinburgh economy. Significant population growth is forecast for Edinburgh and particularly small and medium sized towns in Fife, the Lothians and the Borders. These changes are supported by plan policies, which are seeking to deliver plan-led expansion in many of these areas. To some extent, the economic roles and functions of these towns will continue to change, as they increasingly support and benefit from Edinburgh-based employment through commuting. This trend of major concentrations of employment in central Edinburgh, and increasingly in out of centre areas such as West Edinburgh, combined with population growth in the wider hinterland, will have important implications for the transport network, particularly that serving commuting. Demand for travel will also increase significantly as a result of the major expansion of Edinburgh Airport.

Around Glasgow, the challenge for policy is to reduce and reverse patterns of past and projected population decline. Significant regeneration is planned for inner areas of Glasgow, combined with forecast employment growth in central Glasgow. A pattern of inner-area regeneration, household growth in some suburban and commuter areas, and continued decline in some areas will have important implications for transport. The growth of Glasgow and Prestwick airports, and the future of freight markets to Hunterston will have major implications for rail. The future economic competitiveness of Glasgow will depend on its ability to attract and retain a skilled workforce, and to provide good connections to other cities.

In the Central and Tay and North East regions, population is forecast to decline, particularly in the cities of Aberdeen and Dundee. There are significant challenges for economic development. In Aberdeen there is a need to diversify the economy, as North Sea oil and gas production is projected to reduce significantly. In Dundee there is a need to attract and foster investment in growth sectors, following the decline of traditional industries. An important factor in the future success of these cities will be the quality of connections to other cities in Scotland, particularly the economically important Central Belt.

In the Highlands, Inverness is likely to continue to grow as a major business and services hub. Stakeholders point to the increasing importance of the connections to the Central Belt.

There is uncertainty in relation to main freight markets after 2016, in particular the market and patterns of distribution of coal.

## 6 Implications of Future Change in Scotland on the Rail and Wider Transport Network

### 6.1 Purpose of Chapter

---

This chapter considers the implications of the Drivers for Change identified in the last chapter for the railway network and wider transport system in Scotland over the period from 2011 to 2026. Chapter 1 explained how forecasts of rail demand were prepared. These forecasts were used to identify the effect of the Drivers of Change on railway passenger demand and the resulting changes to load factors on railway services and to identify the routes and / or services that may experience exceptionally high load factors and, therefore, may have insufficient capacity to meet future growth in demand. The impacts of future freight market changes are also considered, as they too will generate changes in demand for the use of scarce railway capacity.

The adequacy of the railway to support the outcomes of Scottish spatial and economic policies and plans in the future is also assessed. From this analysis, conclusions are drawn on the optimal role and focus for rail in the future.

The degree to which the achievement of the strategies contained within the main planning documents may be dependent on enhancements to the railway network is also considered.

### 6.2 Impact of Future Changes in Scotland on Future Rail Demand and Crowding

---

#### 6.2.1 Approach to Forecasting

Earlier in the report we described our approach to forecasting future travel demand for 2016 and 2026. Our analysis is focused on 3-hour AM peak trips to Edinburgh and Glasgow because the largest commuting flows in Scotland are towards Edinburgh and Glasgow, and the most acute crowding problems affect these routes. In contrast, there is currently spare capacity to accommodate growth in 'contra-peak' flows to regional centres.

We have prepared unsuppressed forecasts to that take account of:

- employment and population growth (as described in Chapter 5);
- worsening car congestion in the Central Belt that would encourage modal transfer to rail;
- the additional rail demand generated by the seven committed rail schemes (as described in Chapter 4);
- the impact of the WCML improvements<sup>34</sup>; and
- airport expansion.

#### 6.2.2 Change in Passenger Trip Patterns

We have used our forecasts to identify the changes in rail passenger trip patterns arising from future changes described in the last chapter. It is useful to remember our population forecasts used the SE's assumption and employment forecasts used TEMPRO.

The results of our analysis of changing trip patterns are presented in Table 6.1. This shows total 3-hour AM peak demand to specific sectors. The results are shown as actual numbers for 2016 and 2026, and the proportional change in demand compared with 2003. The actual trip totals provide a better context for understanding the impact of these changes.

The proportional change in 3-hour AM peak passenger demand to certain sectors is also illustrated in Figure 6.1, which shows growth to 2016, and Figure 6.2, which shows growth to 2026.

---

<sup>34</sup> The Lennon data used for Baselineing does not take into account of the impact of 125mph operation north of Preston. Using PDFH elasticities we calculated the impact of the resulting journey time improvement.

Some key findings emerge from this analysis:

- growth in peak rail travel demand is greatest to Edinburgh Park (these figures include Edinburgh Park and Haymarket), reflecting the city's continued future growth. Growth in demand into Central Edinburgh of 44% by 2026 exceeds the 13% growth into Central Glasgow over the same period in proportional and absolute terms;
- proportional growth in peak demand is also evident in the region surrounding Edinburgh in the period to 2026, although absolute numbers are much lower. This is caused by employment growth in areas such as West Lothian and also highlights the importance of Edinburgh Airport as a trip generator in the future;
- the significant growth in peak travel to South West Scotland is mainly due to GARL;
- otherwise growth is relatively modest with some small decline in travel to destinations around Glasgow in the period 2016.

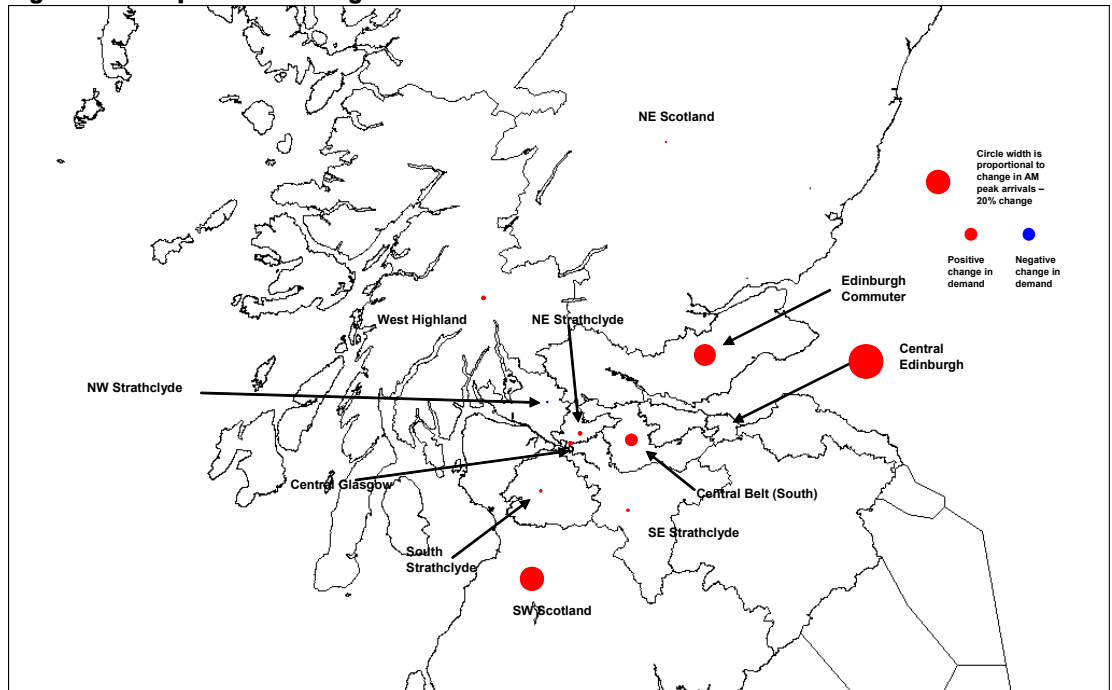
**Table 6.1: Forecast Growth in AM Peak Passenger Demand to Nominated Sectors**

Sector	2003	2016		2026	
		Total	% change	Total	% change
Edinburgh	11,452	14,798	29	16,505	44
Edinburgh Commuter	3,972	4,685	18	5,079	28
North East Scotland	3,042	3,073	1	3,297	8
Far North	46	45	0	48	4
West Highland Line	93	96	3	102	10
Central Belt (South)	643	709	10	770	20
South West Scotland	4,791	5,753	20	6,671	39
North West Strathclyde	2,502	2,468	-1	2,685	7
North East Strathclyde	567	563	-1	615	8
South Strathclyde	2,156	2,191	2	2,330	8
South East Strathclyde	2,134	2,180	2	2,319	9
Central Glasgow	28,686	29,347	3	32,273	13
External Zones	2,898	2,836	-2	3,261	13
New Rail Destinations		3,102		3,774	
<b>Total</b>	<b>62,981</b>	<b>71,848</b>	<b>14</b>	<b>79,729</b>	<b>27</b>

Note: The 'new rail destinations' covers destinations that are not currently rail served, for example, Edinburgh and Glasgow Airports

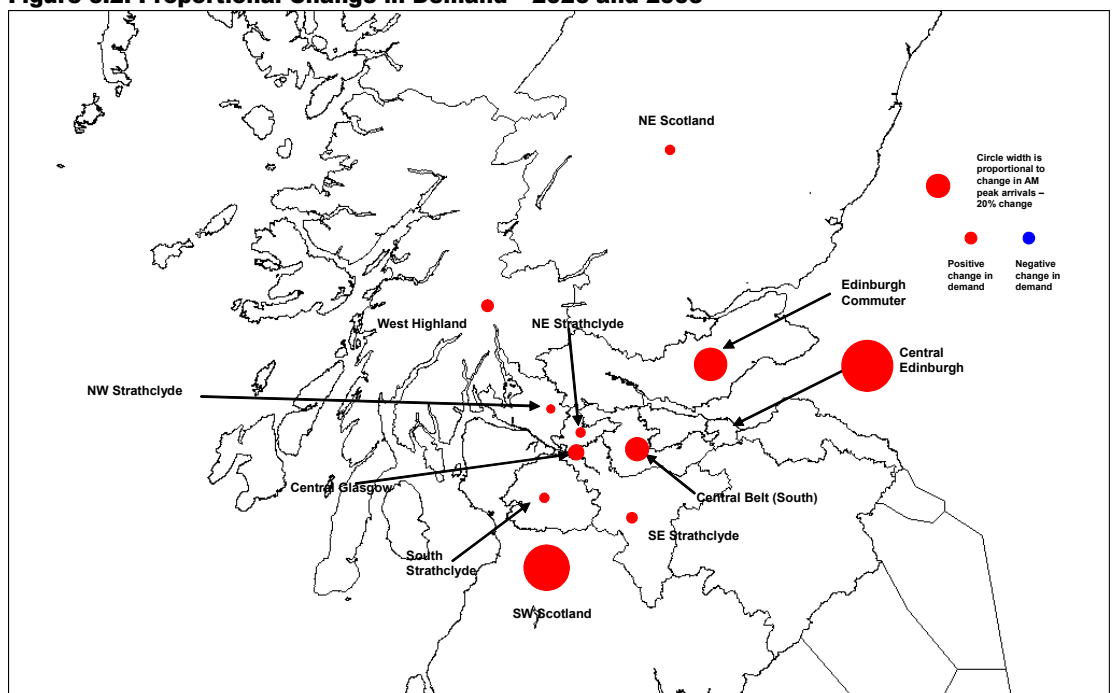
Source: Arup Forecasting Model

**Figure 6.1: Proportional Change in Demand – 2016 and 2003**



Source: Rail Travel into Edinburgh

**Figure 6.2: Proportional Change in Demand – 2026 and 2003**



Source: Rail Travel into Edinburgh

Table 6.2 shows the forecast load factors in 2016 and 2026 for arrivals at Edinburgh during the 3-hour AM peak period. We have illustrated the load factors arriving at Edinburgh Waverley and eastbound arrivals at Edinburgh Airport separately, since the load factors approaching the airport are higher. For the reasons explained in Chapter 3, the load factors approaching Haymarket will be higher than arrivals at Waverley.

**Table 6.2: Passenger Numbers and Seated Load Factor for Edinburgh Arrivals (AM Peak Period)**

Route	2016				2026			
	Edinburgh Airport		Central Edinburgh		Edinburgh Airport		Central Edinburgh	
	Arrivals	Load Factor	Arrivals	Load Factor	Arrivals	Load Factor	Arrivals	Load Factor
Fife Circle	2,978	119%	2,499	100%	3,246	129%	2,734	109%
Newcraighall			1,103	57%			1,959	102%
North Berwick			863	79%			944	86%
Bathgate			2,538	87%			2,839	97%
Dunblane	1,219	85%	1,140	79%	1,335	93%	1,290	90%
Fife Inter-urban	1,723	81%	1,449	71%	1,887	89%	1,648	78%
Glasgow via Croy	2,947	80%	2,657	72%	3,279	89%	3,005	82%
Glasgow via Shotts			445	74%			477	79%

Source: Arup Forecasting Model

Despite the additional 1tph arising from the committed schemes, overcrowding will continue to worsen on the Fife Circle services fuelled by Edinburgh’s growth and population growth in Fife. By 2016 the problem will be acute north of the airport station (given air passengers’ luggage) and it will worsen further to 2026 without additional capacity. Crowding between the airport and Haymarket will also worsen over the period. Station dwell times are likely to rise as passengers struggle to join crowded services, especially in the peak hours.

By 2026 local trains via the Fife Circle have a load factor of about 110% on arrival at Waverley. The additional hourly local service to / from Fife is also included in the capacity total.

On other routes the 3-hour AM peak load factor growth varies. All routes will have load factors of nearly 80% or above by 2026 at Waverley, suggesting there will be some crowding on those services travelling via Haymarket and increased peak hour crowding (assuming commuting travel remains concentrated in the peak hour).

Increasing load factors are an issue on:

- all services via Edinburgh Airport where by 2026 load factors will be around 90%, indicating potential overcrowding in the peak hour;
- services from Bathgate (and beyond) due to the effect of improved frequencies and population growth. Crowding at Haymarket will continue to worsen by 2016. Crowding at both Waverley and Haymarket will be an issue in the peak hour;
- services from Dunblane into Edinburgh, with crowding at Haymarket and possibly Waverley emerging as an issue in the peak hour;
- services from North Berwick, although little crowding is likely to result outside of the peak hour; and
- services via Newcraighall where phenomenal rates of growth on Borders Rail will cause small levels of crowding by 2026.

Crowding will be less of an issue on the inter-urban services and the lower frequency Shotts route, although this may conceal a potential crowding problem on arrival at Edinburgh Airport in the peak.

### 6.2.3 Rail Travel into Glasgow

Table 6.3 shows the in load factors on services into Glasgow in 2016 and 2026 in the 3-hour AM peak.

**Table 6.3: Seated Load Factor for Glasgow Arrivals (AM Peak Period)**

Route	2016		2026	
	Arrivals	Load Factor	Arrivals	Load Factor
Glasgow North Electric Routes – North West	6,907	61%	7,763	69%
Glasgow South East Electric Routes	10,654	81%	11,683	89%
Glasgow South West Electric Routes	6,696	73%	7,530	82%
Glasgow Diesel Routes – Barrhead / East Kilbride	2,446	42%	2,686	46%
Glasgow Diesel Routes – Maryhill & Cumbernauld	439	42%	482	46%
Stirling Corridor (local and inter-urban)	2,272	87%	2,494	95%
Edinburgh via Croy	2,617	80%	2,871	87%

On the electrified routes to the north west of Glasgow, the benefits of the Larkhall-Milngavie scheme continues to be apparent in 2016. Whilst employment in Central Glasgow will increase to 2016, the extra capacity from Milngavie is sufficient to carry the extra patronage. Continued growth means that the load factors will exceed 2003 levels by 2026. However, care should be taken in interpreting these results, as the Larkhall-Milngavie scheme will not benefit services to Helensburg and Balloch, and some services to Dalmuir.

The load factor on the electrified routes to the south east of Glasgow will continue to grow modestly due employment and population growth. By 2026 the load factor will have risen to 89%. Depending on the deployment of rolling stock, there may be some limited crowding in the peak hour.

As highlighted in Chapters 3 and 4, care should be taken in interpreting the load factors for the electric services to the south west of Glasgow. Whilst crowding is not an issue when examining the aggregated load factor (including the 4tph on GARL), our analysis suggests that the load factor on the Ayr/Ardrossan/Largs services will be between 110% and 115% approaching Paisley Gilmour Street by 2026. This suggests the risk of significant overcrowding in the peak hour (albeit dependent on rolling stock deployment).

The load factor changes for the Glasgow Diesel routes are modest. There is capacity on all these services in the period to 2026, with a maximum load factor of 46%.

Growth will begin to increase load factors on the Stirling corridor to 95% by 2026. This suggests a significant risk of peak hour crowding on these services.

Growth on the Edinburgh-Glasgow inter-urban service will push load factors to 87% by 2026. The peaked nature of demand on this route means the likelihood of peak hour crowding will increase from 2026.

### 6.2.4 Population Sensitivity Test

In addition to calculating the load factors based on the population forecasts prepared by the SE, 2016 load factors have been estimated using assumptions on housing and population change presented in the relevant Structure Plans. Contrary to recent trends, planning policy in many parts of Scotland is seeking to halt or reverse previous population decline and figures in many Structure Plans are higher or more aspirational than the (trend-based) SE forecasts. It is therefore important to consider the implications on load factors should these higher levels of plan-led growth be achieved.

Structure Plan housing targets have been used to calculate approximate population numbers. These take into account the gradual decline in average household size which is expected to continue.

The impact of this growth has been compared against the trend-based forecasts. Where Structure Plans present a range of growth targets, the higher targets have been used.

Table 6.4 illustrates the implications on load factors of the sensitivity test. It suggests that overcrowding problems facing the Fife local services will worsen, with an average load factor in excess of 100%. Load factors on the inter-urban services via Fife will also increase. There will also be a higher load factor on the North Berwick route if plan-led growth is achieved.

The main difference in load factors for Glasgow arrivals is seen on the North West and South West Electric routes. The average load factor for the South West routes increases from 73% to 80%. The overcrowding evident south west of Paisley Gilmour Street will worsen. Load factors on the North West Electric routes will increase from 62% to 67%, with much of this growth concentrated on the Helensburgh and Balloch routes. Crowding on the Stirling services will worsen.

**Table 6.4: Population Sensitivity – Impact on Load Factors (2016)**

Edinburgh			Glasgow		
Route	Core assumptions (based on SE Population Forecasts)	Sensitivity assumptions (based on Structure Plan housing allocations)	Route	Core assumptions (based on SE Population Forecasts)	Sensitivity assumptions (based on Structure Plan housing allocations)
Fife Circle	100%	104%	Strathclyde Electrics NW	61%	67%
Newcraighall	57%	59%	Strathclyde Electrics SE	81%	82%
North Berwick	79%	84%	Strathclyde Electrics SW	73%	80%
Bathgate	87%	84%	Strathclyde Diesels (East Kilbride, Barrhead, Paisley Canal)	42%	43%
Dunblane	79%	77%	Strathclyde Diesels (Maryhill, Cumbernauld)	42%	45%
Fife Inter-urban	71%	76%	Stirling Corridor	87%	91%
Glasgow via Croy	72%	75%	Edinburgh via Falkirk	80%	81%
Glasgow via Shotts	74%	72%			

**6.2.5 Rail Travel into Regional Centres**

Travel into regional centres in 2016 is described below, with key changes highlighted. The increasing importance of Edinburgh is evident:

- Aberdeen – most rail journeys will continue to originate from North East Scotland, principally the local stations south and west of Aberdeen. Edinburgh will become the second largest flow, although there are still 400 trips per day between Glasgow and Aberdeen.
- Dundee – the largest flows will continue to be to / from North East Scotland, principally Montrose and Arbroath. There is also a significant flow from Aberdeen to Dundee. The importance of Central Edinburgh as a trip end compared with Central Glasgow will continue. There are also significant flows from Glenrothes and Perth to Dundee;
- Inverness – most trips will be from North East Scotland, principally from Aviemore and the Aberdeen line. There will be 150 trips from Central Glasgow and Edinburgh to Inverness, with growth mainly focused on Edinburgh services;

- Perth – there will be 350 trips per day from North East Scotland, principally from Dundee. There will be more than 200 trips per day from Glasgow, although this total is largely unchanged compared with 2003. There is also a 15% increase in trips from the stations towards Edinburgh, principally from Stirling station;
- Stirling – trips to / from Central Glasgow will remain the most important flow, with over 750 journeys per day in each direction. This total is not significantly different to 2003. There will also be a 12% increase in demand for journeys between Stirling and Edinburgh, with about 650 trips per day by 2016. There is also strong demand growth to / from Stirling from stations within the Edinburgh commuter belt.

### 6.2.6 Implications of Expected Changes for Road Network Congestion

There was limited information from which to identify locations of future congestion. We have reviewed the conclusions from the Central Scotland Transport Corridor Studies (CTCS) to identify the sections of the road network that the study forecast to experience congestion by 2010. We are not aware of any road traffic forecasts available for the period beyond 2010, although the SE is currently developing future year matrices as part of TMfS.

The A8 CTCS highlighted the two lane dual carriageway between Newbridge and Baillieston as already operating close to the design capacity during the peak hour. One of the major causes of congestion is the high levels of long distance commuting to Edinburgh and Glasgow. Many of these journeys are not centre-to-centre, and therefore not easily transferable to public transport. The study identified several parts of the M8 / A8 and the parallel network operating close to capacity including eastbound between Shawhead and Carnbroe, A8 Baillieston and Bargeddie, the M74 / A725 Raith Interchange and localised congestion on the A89, A775, A73 and in Motherwell Town Centre. The peak increase in traffic flows up to 2010 is relatively small (3-13%), but the route already operates close to capacity. Continued growth in commuting will therefore increase M8/A8 peak congestion. The forecast increase in inter-peak trips to 2010 is 24-36%, so traffic will become significantly heavier during the daytime. It is expected that current congestion levels that occur during the AM peak will occur during the inter-peak period by 2010. Thereafter, congestion will continue to worsen throughout the day on the M8/A8.

The CTCS forecast severe problems by 2010 for traffic using the A80 unless a package of solutions can be implemented. The A80 near Castlecary and Haggs, the Auchenkilns Roundabout, Mollinsburn, A80 / M73, A80 Moodiesburn and Crowwood Roundabouts are already constrained by peak period congestion. Similar to the M8 / A8, the CTCS forecast relatively limited traffic growth during the AM peak by 2010, but significant growth during the inter-peak. Whilst the M74 Northern Extension will relieve the A80, without road pricing much of this spare capacity will be taken up by traffic from local roads.

The M74 corridor is forecast to suffer severe congestion by 2010 north and west of the Kingston Bridge (Junction 25-26), especially during major disruption. Routes parallel to the M8 and the M74 will also be affected. The congestion problems will be exacerbated if the M74 Northern Extension is not completed.

Chapter 3 reviewed analysis by the Scottish Executive on journey time reliability and levels of traffic congestion. We have not located any data that assesses the impact of future journey time reliability and the occurrence of severe congestion. In the absence of data, we have assumed that those routes that already experience severe congestion that affect at least 3% of drivers and have experienced recent traffic growth are most likely to suffer from future congestion. By these criteria the routes affected will include, the M8 via central Glasgow, the approaches to Kincardine Bridge, A720 Edinburgh Bypass, the M77 to Kilmarnock, A725 between East Kilbride and Coatbridge and the M9 near Claylands (particularly if the forecast growth for Edinburgh Airport is achieved). The construction of the M74 Northern Extension would have a positive impact on congestion levels on the M8.

Overall, our analysis indicates worsening congestion on most of the main motorways and roads of the Central Belt (particularly in the inter-peak). This will strengthen the competitive position of rail in this area.

Other analysis presented in Chapter 3 demonstrates that most other roads in Scotland are relatively uncongested at present. Future growth suggests this position is unlikely to change in the future, other than possibly around Aberdeen or Inverness, and the competitive position of rail will not be altered.

### **6.3 Impact of Expected Changes in the Study Area on Future Coach Demand**

The analysis presented in Chapter 3 highlighted that coaches have an important role to play as part of the Scottish transport network. Coaches fill gaps in the rail network, or provide a cheaper alternative to rail for price sensitive passengers on the busiest flows. The introduction of Stagecoach Megabus has intensified competition with Citylink between the principal Scottish population centres. Stagecoach primarily serve the largest population centres, operating as a limited stop services, whilst Citylink routes connect intermediate towns with the larger centres, but offer slightly slower journey times. This means passengers have benefited from attractive fares and improved frequencies.

However, our assumption of no road pricing suggests road congestion could become a growing problem affecting the attractiveness of coach for travel. Journey time may be a less important issue for price sensitive customers, but a significant deterioration in journey time could dissuade commuters from using coaches, particularly those using busy motorway routes to, through or between Edinburgh and Glasgow (especially crossing the Forth or Kincardine Bridges). Some road improvements, such as the planned upgrading of the A8 to motorway standard between Newhouse and Baillieston, will help to maintain current journey times.

Identifying destinations where the level of trip generation could expand is one solution to understanding how the existing network of coach services may develop over the next 10-20 years. We have identified that air passenger numbers at both Glasgow and Edinburgh Airports will increase significantly by 2030. Coaches are traditionally introduced as relatively low cost and provide a flexible solution to serve public transport markets if demand is inadequate, or too dispersed for rail. For example, there are coach networks serving many UK airports. Since there are committed proposals to construct rail links to Edinburgh and Glasgow Airports, this will reduce the likelihood of new coach routes being introduced to support the airport expansion other than to areas not served well or at all by rail. The forecast growth in air passenger numbers at other Scottish airports may be insufficient to support a major expansion of the coach routes serving each airport.

Consequently, the network of coach routes may not significantly change over the next 20 years, particularly against a funding background that is supportive towards rail investment and growing car ownership levels. However, there may be scope for improvements in service quality, the continuation of attractive fares and more effective ticket integration with other modes. Coach provision is most likely to expand on routes that lack a parallel rail service, or as part of a strategy to form a more integrated public transport timetable with rail. This would increase the number of departures on routes where the rail frequency is relatively low and could increase the role of coaches as a feeder into the rail network (subject to the provision of good interchange facilities).

### **6.4 Implications of Future Changes to the Freight Market**

As discussed in Chapter 5 there is considerable uncertainty in the Scottish rail freight market relating to the future of Longannet and Cockenzie coal fired power stations beyond 2016 and whether or not Clydeport's plans for a new deep sea container port at Hunterston will be approved. Both create uncertainty around capacity requirements across the Central Scotland rail network. If the coal fired power stations were to survive and the container port were to be approved, this would place significant pressure on capacity on critical stretches of the rail network in Glasgow.

Otherwise, there is likely to be continued growth in rail freight. This could arise from the deep sea container ports in England, the export of Scottish opencast coal from the Central Belt to England and the use of rail on trunk flows within logistics / supply chains both cross-border and on longer hauls within the country. These will put pressure on the most congested parts of the rail network in Central Scotland.

## **6.5 The Capacity of the Rail Network and Services to Support Planned Changes in Scotland**

The Scottish rail network had benefited from a number of enhancements already, most notably to the frequency of Glasgow to Edinburgh inter-urban services. Over the next twenty years the railway will benefit from further enhancements to capacity by FSR (mainly train lengthening) and through the SE's committed rail schemes.

However, the analysis in this chapter has indicated further issues will emerge regarding capacity on the Central Belt's rail network despite the delivery of the committed schemes. These will arise principally from continued significant economic growth in and around Edinburgh (with more steady growth in Glasgow), plan-led population and airport growth, and increasing road congestion.

Some areas (particularly surrounding Glasgow) may experience some decline, but our analysis has suggested at the most this will constrain demand growth on certain routes in the period up to 2026.

The committed projects will make some contribution to slowing growth in load factors, particularly in Glasgow. However, plan-led growth will lead to some crowding pressures on:

- services using the EARL to serve Edinburgh Airport (due to the airport's growth);
- services into Edinburgh from Fife despite service improvements arising from the committed schemes (due to plan-led population growth);
- services into Edinburgh from Airdrie/Bathgate and Tweedbank (again due to the combined impacts of plan-led population growth on these corridors and the continued economic growth in Edinburgh);
- services to Glasgow from the Ayr/Ardrossan/Largs corridor (due to plan-led population growth, the expansion of Prestwick Airport and economic growth in Central Glasgow);
- on services from Sirling/Dunblane (due to plan-led population growth along the corridor); and
- on certain peak hour services on a number of other routes (mainly into Edinburgh, especially from Glasgow via Croy) because of the concentration of the commuting peak interacting with plan-led growth.

On other services and routes both in the Central Belt and in the rest of the country, it must be emphasised, our analysis has not identified a crowding issue in the period up to 2026.

The uncertainty surrounding the future demand for and movements of coal and the Hunterston Container Port proposal makes it difficult to determine if there will be sufficient capacity for rail freight in the period up to 2026.

## **6.6 The Adequacy of the Rail Network and Services to Support Planned Changes in Scotland**

Future policy and planned changes in Scotland may lead to inadequacies emerging between what the rail network presently delivers and what is actually required. These inadequacies could cover a number of themes:

- the availability of services for passenger and freight in terms of characteristics such as journey time, frequency, arrival times, service quality on passenger services and weight and gauge for freight trains; and
- the accessibility of services in terms of interchange with other modes, integration with wider public transport fares and ticketing and physical access.

In this section, we do not consider the acceptability of services in terms of their performance because we assume performance will return to acceptable levels in the period up to 2011 (as discussed earlier in Chapter 3). We now consider potential future inadequacies on the rail network in the context of future policy and planned changes across the rail network.

#### **6.6.1.1 Edinburgh – Glasgow via Croy**

In the future, this route will have a key role connecting the two city centres and bringing people into them for business and leisure. Until at least 2016, the route also has an important role for conveying imported coal from Hunterston to Longannet power station. With four departures per hour, this service offers an acceptable turn-up-and-go service for an inter-urban passenger route. It also offers competitive journey times, and intermediate stations to serve the principal catchments. Interior on-train quality is also acceptable for such route. Two issues emerge for the future: lack of car parking at the intermediate stations and lack of luggage space for air passengers after the opening of EARL.

The route's gauge and weight limits are also adequate for the freight services that appear likely to use it in the future.

#### **6.6.1.2 Other Inter-Urban Routes**

Policy identifies city regions in Scotland as being critical to the future economic prosperity of the country. Inter-urban links between these centres (particularly between them and both Edinburgh and Glasgow) will be important to the success of this policy. Rail will have an important role to play, especially as road congestion worsens within the Central Belt. Also, inter-urban rail passenger services to Edinburgh will fulfil the key role of connecting the city's airport to a wide catchment across Scotland after the construction of EARL.

However, other than the Edinburgh – Glasgow inter-urban service analysed above, generally the present inter-urban rail passenger services have significant gaps in their adequacy, particularly when they are compared to other modes of transport. The crux of the problem is that these services generally fulfil multiple roles – serving both a local and inter-urban function. As a result end-to-end journey times are relatively uncompetitive versus car and coach. Frequencies are also poor on certain routes, both end to end and to intermediate stations. For example, on the Highland Main Line to Inverness there are just 8 trains per day to Perth, operating at uneven intervals, which does not promote travel from this medium sized town. Rail services also fail to offer sufficiently early arrival times for business travellers, particularly on southbound trains to the Central Belt. More positively, the recent introduction of new rolling stock on the inter-urban network has significantly improved the on-board environment; although facilities available for business travellers remain limited when compared, say, to VXC services. At many stations there is a lack of available car parking spaces and good interchange to and integration with other modes of transport.

In the future, pressures from the growth of intermodal freight traffic, such as to the proposed Raithes Farm terminal north of Aberdeen, may require enhancement of loading gauge on the route to Aberdeen.

#### **6.6.1.3 Edinburgh Local Routes**

In the future, these routes will continue to play a key role supporting the continued economic growth and success of Edinburgh. Rail's importance will increase as congestion worsens. Furthermore, the routes to Fife and Stirling / Dunblane will also provide important connections to the Edinburgh Airport after the construction of EARL.

Adequate frequencies for commuter routes is at least 2tph and experience elsewhere in Britain suggests higher frequencies are essential to stimulate a shift to rail from other modes for leisure and business travel because of the importance this market segment attaches to having a turn up and go service (and the fact an alternative, the private car, offers such flexibility). Following the completion of the Airdrie – Bathgate scheme, the Bathgate route will be electrified and 4tph will operate. These improvements are important to support future growth on the corridor.

On other corridors rail does not yet operate generally at 4tph. It is close to it on some of the routes through Fife and the effectiveness of such a frequency can be seen in the fact that rail captures an 80% mode share for some journeys between Fife and Central Edinburgh. Furthermore the new rolling stock recently deployed on the Fife Circle has enhanced service quality. The North Berwick route has the lowest level of frequency (1tph), although it is doubtful that demand on this service could support significant higher frequencies. At the edge of the commuter belt, future plan-led housing development in Clackmannanshire (centred on Alloa) does not have good direct rail links to Edinburgh. Again, availability of car parking is an issue, as is integration with bus at certain stations.

The network's capability is adequate for freight with the exception of the route via the Forth Bridge across Fife, should there be future growth in intermodal traffic to the north east of Scotland.

#### **6.6.1.4 Glasgow Routes**

In the future, the routes radiating from Central Glasgow will play an important part in the economic growth of Central Glasgow (and the continued growth of its service-sector based industry) as well as regeneration around the Glasgow city region, especially along the Clyde Valley. Furthermore, rail will provide an important transport link to both of the city's airports (International and Prestwick) and to the major port of Hunterston on the Ayrshire coast. The Glasgow suburban rail network is the UK's most extensive outside London, with at least half-hourly services operating on all routes. Journey times are generally competitive versus other modes. Worsening road congestion in the future will increase rail's competitiveness. There are good opportunities for cross-Glasgow rail journeys between the North West of Glasgow and the South East (including the new link across to Edinburgh from Airdrie once it is opened). However, there is presently an absence of a through rail service from the South West (including Prestwick Airport where we have highlighted that significant future growth is planned) to the North East necessitating interchange to other modes, such as the Glasgow Underground, within Glasgow to make these journeys. The low level stations at Queen Street and Central do permit some interchange between North West – South East services and trains terminating at the high level stations, although the interchange route is poor.

Earlier we highlighted the importance of turn up and go services. Although most routes will operate at 4tph after the introduction of the committed schemes, there will still be some gaps in this service pattern, most notably on the diesel operated routes. The introduction of Class 334 trains has improved the quality of the on-train environment the routes to the South West (Ayrshire coast). On other routes, the on-train environment is less satisfactory due to old rolling stock.

Like much of the rest of Scotland, many of the car parks on the Glasgow rail network are at capacity and although bus – rail interchange is better than elsewhere, there is still scope for improvement. SPT tickets also provide integrated ticketing.

The capability of the network for freight is generally adequate although there are issues surrounding access to Mossend terminal and, in the future, gauge clearance of routes to Hunterston if the deep sea container port proposal is implemented.

#### **6.6.1.5 Rural Routes**

Rural rail routes in the south west of Scotland and the Highlands will continue to play an important role in providing access from these areas to the local centres for business, employment, education and services. This contributes to delivering a number of social inclusion benefits. Furthermore, plan-led housing growth around Inverness will further increase the demand for commuting and leisure travel into this increasingly important centre.

However, the rural railway is not adequate in all areas to fulfil the role envisaged for it by policy. This is because of a number of constraints. To minimise cost and subsidy timetables are structured around operational considerations, rather than the market. To some extent this cannot be avoided on such routes. The adequacy of service frequency is a particular issue on routes to the east and north of Inverness where plan-led housing growth will increase the demand for travel.

Without rail improvements at least to the level of frequency envisaged by the Invernet proposals (and probably further), it will be difficult for rail to play a significant role in meeting demand for travel into Inverness. Secondly, Inverness (for the Far North), Glasgow Queen Street (for the West Highlands) and Carlisle (for south west Scotland) are key interchange stations, and more effective co-ordination between timetables is needed to minimise wait time and encourage onward travel. Most rural routes operate at two hourly intervals or less, so progression towards integrated ticketing and complementary bus/rail timetable frequencies would significantly improve accessibility to public transport and fill in the gaps that rail's cost and resource limitations prevent it filling.

The Far North line is also constrained by the indirect alignment (the rail alignment is about 30% longer between Thurso and Inverness compared with the road distance). Rail journey times are inevitably longer.

Opportunities for the further development of rail freight on these routes, except for opencast coal on the route to Stranraer, are likely to be limited, so the capability of this part of the network for freight is probably adequate.

#### **6.6.1.6 Anglo-Scottish Routes**

In the future, rail will continue to play an important role connecting Scotland to England both for freight and passenger services. Rail passenger services are most competitive to the North East of England, the North West of England and Yorkshire. Trains offer a frequent service (at least hourly on most routes after the completion of the WCML upgrade). Journey times are car competitive particularly to the Pennine cities and acceptable service quality. 'Clock-face' departures would offer an improvement, but aspirations for higher frequencies may not be realistic given the current load factors and constraints elsewhere on the WCML and ECML. Rail journey time is less adequate for passenger trips to London although the reduced journey time after the WCML upgrade from Glasgow when combined with suitable on-train facilities for business travellers may make rail more attractive. Within the SPA, it is assumed that any development of a north – south High Speed Line up the spine of Britain would not be complete by 2026.

On these routes, there are aspirations for local services to be introduced, and new stations to be opened. Whilst this will improve accessibility to some quite rural areas of the Borders and south west Scotland, serving these stations by rail may create the need for additional infrastructure and signalling capacity (combined with additional rolling stock) or mean slowing down Anglo-Scottish intercity services. It is questionable whether population densities are sufficient to make rail the best public transport option for improving public transport accessibility to these communities and it may be more effective and affordable to improve car parking and integration with other modes at existing stations such as Dunbar, Carstairs and Lockerbie.

While the WCML has sufficient gauge for high cube deep sea containers to Mossend, the ECML does not have such clearance. Cross-border rail freight has the potential to grow in the future driven by developments in the freight market, but the Anglo-Scottish routes have a number of constraints on their capability to accept increased frequencies. Single track constraints on the GSW and associated routes are a significant constraint. Accommodating additional Anglo-Scottish freight from a deep sea container port at Hunterston, if developed, may be a challenge on the existing network.

#### **6.6.2 Wider Integration**

There is a general shortage of spaces, particularly at stations located in the Central Belt where it may be convenient to park & ride for trips to Glasgow or Edinburgh for commuting, business and leisure purposes. This is a key issue for maximising the future contribution of rail to enable travel into these cities, as easy access to parking facilities is one of the factors that determine choice of mode, particularly for off-peak trips. The lack of parking may be perceived as a major deterrent to encourage rail trips in the daytime, even with worsening road congestion. There is a significant risk that the present inadequate availability of car parking spaces may represent a barrier to achieving further growth in rail travel within the Central Belt.

There are also gaps in integration (both physical and ticketing) with the bus and coach network. Bus and coach are more flexible and better able to cater for areas of lower population density than rail. They could have a greater role feeding travellers into the rail network in the future and fulfilling certain stakeholder aspirations for improved public transport access. In rural areas, as we have highlighted, the bus and coach network could have a role in complementing rail frequencies where there are long gaps in departures. The integration of bus feeders and rail should be a consideration for the tendering of a future ScotRail franchise.

### **6.6.3 Freight on rail**

Generally there is more scope for the use of rail for freight where volumes and frequencies are sufficiently high to make rail economic. In certain areas there are gauge and weight constraints, as well as capacity bottlenecks, that hinder an increase in rail freight traffic. Adequate terminal capacity may also be an issue, although a number of new terminals have opened over the last ten years and there are proposals in the pipeline for additional terminal capacity, such as Raithes Farm near Aberdeen.

### **6.6.4 Summary**

In summary, the present rail service is not always adequate to support future policy and changes:

- whilst the Glasgow – Edinburgh service is car competitive, the other inter-urban services in Scotland outside the Central Belt are not always car competitive;
- suburban rail frequencies within Glasgow are generally at or close to the level required to offer a turn up and go service, with a few exceptions; within Edinburgh frequencies tend to be lower on most routes;
- rail – rail interchange time is poor at certain nodes, such as Inverness and Carlisle, increasing journey times to certain rural areas;
- generally, there is poor integration with other modes, and car parking at stations is inadequate or the car parks themselves are full;
- rail does not always serve new development, although it is questionable whether all developments actually have sufficient density for rail to serve them efficiently; and
- there is scope for rail to convey more freight where volumes and frequencies play to its strengths.

## **6.7 Implications of Future Change in Scotland on the Optimal Role and Focus for the Railway in Scotland**

---

Rail's role will increase in importance within the wider transport network, especially on the railway corridors most affected by future changes in Scotland. This is because of the following factors:

- growth in Central Scotland driven by plan-led housing and employment growth ;
- rail's natural advantage in providing fast connections for centre-to-centre movements between the principal population centres and for bringing high volumes of commuters into centres;
- road congestion will continue to worsen, particularly around the Stirling, Glasgow and Edinburgh 'motorway box'. Despite some short term road enhancements, road congestion will worsen and rail's competitive position should improve (assuming no road pricing);
- the economy will continue to grow, particularly in Edinburgh which will contribute to wider growth in Scotland and increase demand for travel to this city. Economic growth will encourage continued growth in travel to / from Edinburgh, Glasgow, and other cities for employment, as well as business and leisure;
- significant growth in air passenger throughput at Edinburgh and Glasgow Airports. The opening of EARL and GARL will increase demand for the use of rail for travel to these airports and will cause some crowding on services to Edinburgh Airport. Growth will also be experienced at Prestwick, increasing crowding and probably necessitating frequency improvements on services to Ayr. Growth at Aberdeen and Inverness will be more modest and surface access needs will be mainly served by other modes of transport; and

- the grants to support rail freight provided by the SE will continue to encourage companies to examine the feasibility of rail rather than road. Other changes in the freight market are more uncertain, although the rail capacity requirements of some, particularly the development of a container port at Hunterston, could be significant.

Future changes raise a number of questions for the optimal role of and focus for rail:

- Should rail focus on commuting or providing inter-urban connections?
- If capacity is limited then should rail focus on fast or stopping services (and is further investment justified so it can do both, or are other modes of transport part of the solution)?
- What should be the balance of use of the network for passenger and freight services?
- Should new routes be opened or existing bottlenecks removed to enable the improvement of existing services?
- Should rail focus on the main city regions and centres in Scotland and, if so, how should it serve smaller centres and rural areas?
- Should new stations be opened or should better integration with other modes be used to focus services and growth on existing stations?

The nature of rail's fixed asset base means that rail is most efficient and effective (or good) at focusing on high volume flows of passengers and freight, and routes with high densities of population or employment along them. Examples would include inter-urban travel between major cities (especially where the road journey is less competitive or reliable), high density commuting flows, and bulk flows of freight such as coal and links to major airports.

This suggests that rail's future optimal role and focus should be as follows:

- Enabling rail commuting on high volume flows into Edinburgh and Glasgow each weekday. Rail's existing time advantage over road for such journeys should grow as motorway and road congestion worsens and the committed rail schemes are implemented. This should increase rail's importance as a mode for business and leisure journeys provided that rail frequencies facilitate turn up and go travel by passengers. Rail will continue to be critical to supporting the successful future growth of Edinburgh. Solutions to increase capacity and / or spread peak demand will be essential if rail is to fulfil this role.
- More commuting into regional centres where volumes and densities are sufficiently high. This can be achieved by timetabling services to make effective use of rolling stock capacity, since passengers are travelling in the contra-peak direction to the main flows towards Edinburgh or Glasgow.
- Improving connectivity between Glasgow and Edinburgh by providing a fast, frequent, high quality service on the main route via Croy as well as utilising the reopened Airdrie – Bathgate route for inter-urban trips less able to access the Croy route, and through improving frequency on the under-utilised route via Shotts.
- Providing a competitive inter-urban rail product in terms of journey time, frequency, arrival times and quality between the Central Belt and Inverness, Aberdeen and other major cities and towns (particularly Perth and Dundee).
- Enabling continued cross-border travel between Scotland and England (particularly the north) given the road competitive journey times on the ECML and WCML, particularly for journeys of up to 3 hours. Commencement of 125mph running on the WCML between Preston and Glasgow will reinforce the importance of the WCML as a strategic route.
- Linking Scotland to its major airports. Planned rail connections to Edinburgh and Glasgow Airports will offer attractive public transport connections from a range of origins across Scotland to these rapidly expanding airports, particularly against a backdrop of worsening congestion on the M8 and M9 motorways. Rail will also be critical in supporting a step change in passenger throughput at Prestwick Airport.
- Linking Scotland to its major ports and conveying high volumes and regular flows of freight. The rail connections to Hunterston are especially important and may become more so in the future.

- Enabling continued travel from rural areas into regional centres where railways presently exist, especially the network of rural routes serving Inverness from the West Highlands and South West Scotland. These routes will contribute to connecting the rural population with locations where regeneration and / or employment growth are planned. Private car and bus services will still have an important role to play, especially where employment locations are dispersed. However, better integration with bus, especially infilling when train frequencies are low, will contribute to improved public transport accessibility in these areas.

To achieve this requires:

- best use of rail on the trunk journey;
- integration with other modes and with spatial and economic strategies; and
- continuing to focus investment on flows with overall high volumes and densities.

Rail should avoid focusing on lower volume flows and densities where it is less efficient and effective such as:

- time sensitive Anglo-Scottish passenger journeys, principally business;
- acting as a local distributor network, since private car, buses or light rail are normally better placed to fulfil these roles;
- serving low density developments including local communities on high speed Anglo-Scottish routes;
- operating in isolation from other modes, particularly in rural areas;
- carrying wagonload or general merchandise freight unless on the trunk haul; and
- trying to fulfil multiple roles (fast inter-urban journeys and serving local stations) if the rail network has insufficient capacity / capability to meet both objectives.

Arup**Scotland**

Appendix A

---

**Population and  
Employment Forecasts**

## A1 Population Forecasts

Area	2002		2007		2012		2017		2022		2026	
	TEMPRO	SE	TEMPRO	SE	TEMPRO	SE	TEMPRO	SE	TEMPRO	SE	TEMPRO	SE
Aberdeen City	208,284	209,270	205,809	201,480	202,315	193,870	199,950	186,035	197,824	-	195,712	-
Aberdeenshire	219,077	227,280	218,592	227,528	218,808	226,766	217,993	225,242	216,393	-	214,095	-
Angus	129,290	108,130	128,468	105,498	127,752	102,472	127,621	98,977	127,383	-	127,087	-
Argyll and Bute	90,726	91,030	90,445	90,193	90,567	89,708	90,616	89,484	90,348	-	89,874	-
Clackmannanshire	50,456	47,930	50,811	47,271	51,322	46,415	51,253	45,353	50,869	-	50,237	-
Dumfries and Galloway	149,481	147,310	149,225	144,523	150,075	141,190	149,656	137,458	148,499	-	146,759	-
Dundee City	125,097	144,180	121,038	137,176	117,897	130,837	116,147	124,717	114,831	-	113,720	-
East Ayrshire	119,162	119,740	116,534	116,927	113,864	114,015	112,974	111,000	112,605	-	112,533	-
East Dunbartonshire	109,245	107,310	109,051	105,238	109,036	103,292	108,176	101,457	106,928	-	105,296	-
East Lothian	90,822	90,750	92,560	93,825	94,432	97,049	94,830	100,560	94,417	-	93,451	-
East Renfrewshire	93,846	89,630	95,890	91,143	98,031	92,705	98,351	94,476	97,760	-	96,527	-
Edinburgh City	459,781	448,080	464,121	451,330	469,355	456,246	468,602	462,050	464,782	-	458,716	-
Eilean Siar	27,045	26,200	26,369	24,858	25,855	23,506	25,661	22,035	25,517	-	25,395	-
Falkirk	138,645	145,560	136,695	147,126	134,889	148,726	133,330	150,279	131,770	-	130,097	-
Fife	332,758	350,700	334,211	352,369	335,262	353,812	335,282	355,124	334,103	-	332,051	-
Glasgow City	606,163	577,350	591,478	563,479	576,484	553,414	565,804	547,700	556,923	-	548,540	-
Highland	205,818	208,140	207,939	206,409	209,262	203,837	210,567	200,607	211,087	-	211,189	-
Inverclyde	83,184	83,600	79,762	80,527	80,282	77,607	80,030	74,755	79,358	-	78,356	-
Midlothian	79,673	80,500	79,732	81,937	80,037	83,614	79,760	85,411	79,142	-	78,249	-
Moray	86,031	86,740	86,710	84,793	87,429	82,597	87,813	80,395	87,783	-	87,506	-
North Ayrshire	142,039	135,650	147,075	133,007	136,554	130,130	131,489	126,941	128,851	-	127,545	-
North Lanarkshire	325,304	321,350	321,102	319,486	318,763	317,320	315,987	314,899	312,695	-	308,742	-
Orkney Islands	19,273	19,210	19,449	18,655	19,694	18,040	19,876	17,355	19,941	-	19,940	-
Perth and Kinross	115,678	135,160	118,324	136,213	120,981	137,019	122,534	137,748	123,061	-	123,019	-
Renfrewshire	184,552	171,940	184,347	167,684	185,399	163,300	185,119	158,786	183,936	-	182,092	-
Scottish Borders	108,058	107,400	109,057	108,363	110,204	108,995	110,251	109,383	109,628	-	108,523	-
Shetland Islands	22,409	21,940	21,991	21,948	21,645	22,085	21,381	22,190	21,133	-	20,867	-
South Ayrshire	112,313	111,670	111,318	109,533	109,559	107,382	108,963	105,274	108,585	-	108,379	-
Stirling	80,733	86,150	82,305	88,318	83,389	90,754	83,426	93,446	82,893	-	81,938	-
West Dunbartonshire	91,122	92,830	88,427	90,197	86,377	88,000	85,007	85,998	83,864	-	82,761	-
West Lothian	159,462	159,960	164,039	167,360	168,620	174,763	169,678	182,177	168,978	-	167,058	-
South Lanarkshire	311,265	302,110	308,980	300,086	308,106	297,631	305,407	295,061	301,806	-	297,315	-
<b>SCOTLAND TOTAL</b>	<b>5,076,793</b>	<b>5,054,800</b>	<b>5,061,853</b>	<b>5,014,480</b>	<b>5,042,247</b>	<b>4,977,097</b>	<b>5,013,534</b>	<b>4,942,373</b>	<b>4,973,695</b>	<b>-</b>	<b>4,923,569</b>	<b>-</b>

Note: The growth in rail demand based on these population forecasts is based on the relative, not the absolute, change over time.

## A2 Employment Forecasts from Temprow

Area	2002	2007	2012	2017	2022	2026
Aberdeen City	156,931	155,175	151,328	154,868	157,609	158,991
Aberdeenshire	92,387	87,541	71,459	70,139	68,759	67,567
Angus	41,412	40,583	40,833	40,905	40,850	40,696
Argyll and Bute	31,551	32,015	32,683	33,701	34,562	35,086
Clackmannanshire	15,036	14,639	14,043	13,930	13,763	13,594
Dumfries and Galloway	57,232	57,359	57,336	56,579	55,757	55,019
Dundee City	71,102	71,102	71,413	72,908	74,062	74,637
East Ayrshire	40,168	42,036	44,192	43,542	42,777	42,079
East Dunbartonshire	26,373	26,874	27,431	27,986	28,415	28,637
East Lothian	22,754	22,411	21,923	21,858	21,727	21,570
East Renfrewshire	15,226	15,426	15,430	15,619	15,731	15,760
Edinburgh City	274,593	278,246	276,306	284,771	291,615	295,576
Eilean Siar	12,942	12,667	12,431	12,497	12,523	12,501
Falkirk	61,519	57,046	63,787	64,094	64,142	63,951
Fife	138,757	143,227	147,929	147,225	146,007	144,565
Glasgow City	380,733	381,495	384,683	397,445	407,898	413,974
Highland	82,707	84,311	85,780	86,161	86,262	86,102
Inverclyde	46,014	44,637	44,695	44,949	45,000	44,867
Midlothian	23,922	24,577	25,015	25,256	25,403	25,427
Moray	41,751	42,055	42,359	42,088	41,715	41,325
North Ayrshire	46,106	47,377	48,156	47,763	47,191	46,621
North Lanarkshire	127,712	121,448	129,631	130,073	129,959	129,462
Orkney Islands	8,203	8,259	8,285	8,154	8,018	7,898
Perth and Kinross	51,188	52,214	53,130	53,389	53,451	53,348
Renfrewshire	100,375	105,664	105,674	106,949	107,729	107,898
Scottish Borders	48,976	47,037	46,935	46,413	45,826	45,271
Shetland Islands	12,111	11,923	11,761	11,612	11,444	11,285
South Ayrshire	51,505	53,015	54,513	54,969	55,220	55,234
Stirling	49,954	49,428	49,327	50,693	51,815	52,473
West Dunbartonshire	35,918	35,792	35,823	35,976	35,975	35,859
West Lothian	51,443	50,831	50,411	50,709	50,794	50,680
South Lanarkshire	119,287	118,117	115,580	115,500	114,976	114,217
<b>SCOTLAND TOTAL</b>	<b>2,335,888</b>	<b>2,334,529</b>	<b>2,340,279</b>	<b>2,368,721</b>	<b>2,386,974</b>	<b>2,392,170</b>

Arup**Scotland**

Appendix B

---

**Transport Schemes and Aspirations**

## B1 Highland

**Table B1.1: Scheme Descriptions – Highland Area**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Arrochar Commuter Service	Extends the catchment for rail commuters to Glasgow in the morning peak	Committed	December 2005	First ScotRail	Not known
Invernet 1	Introduces new commuter service to Inverness from Newtonmore. Additional two hourly service to Inverness from Tain / Invergordon	Committed	December 2005	First ScotRail	Not known
Invernet 2	More frequent services between Inverness and Elgin, with a possible station at Dalcross near Inverness Airport	Work ongoing	Short term	Scottish Executive, HRP	New station at Dalcross £750,000, initial operating subsidy of £180,000 required
Edinburgh to Inverness frequency enhancement	Improve rail frequencies to compete more effectively with the A9. Better timing of services to support business travel	Aspirational	Medium term	HRP	Unknown
Inverness / Aberdeen upgrade	Provide increased frequencies and journey time improvements between Inverness and Aberdeen. NESTRANS also supportive of this proposal	Feasibility studies underway	Medium term	HRP	£30m
Fort William 'gateway'	Bus station upgraded, travel information centre planned	Ongoing	Short term	HRP	??
Deeplaven terminal	Development of a freight terminal at Deeplaven New connection to the Far North would remove lorry movements from the Far North Line	Aspirational	Long term	HRP	£10-15m
Rannoch loading facility	Lineside loading facility at Rannoch to be used by timber. Longer term plans to develop a network of timber loading facilities.	Planning permission granted	Short term	HRP	£200,000
Improved commuting service from Perth to Edinburgh	Better rail services would compete more effectively with the M90. Trains could be routed via Dunblane to improve journey times if timings via Fife are too slow	Feasibility study	Medium term	HRP / SESTRAN	Not known
Improvements to the Highland Chieftain service between Inverness and London	Improved rail connectivity between Inverness and Edinburgh / northern England / London	Aspirational	Medium term	HRP / HITRANS	Not known
Reduced disparity between weekday and Sunday services	Increase Sunday train frequencies to improve competitiveness with other modes	Aspirational	Medium term	HRP / HITRANS	Not known
Faster rail services from Inverness to Wick	Improved connectivity to Northern Scotland from Inverness to support regeneration and economic growth	Aspirational	Medium term	HRP, Highlands & Islands Enterprise	Not known

**Table B1.1 (Cont.): Scheme Descriptions – Highland Area**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Better public transport connectivity between Oban and Mallaig	Opportunity to 'in-fill' rail frequencies by integration with bus / rail between Mallaig and Fort William. Services could be extended to Oban to improve connectivity in the west Highlands				
New station at Conan Bridge between Muir of Ord and Dingwall	Creates new journey opportunities	Feasibility study	Medium term	HRP, Highland Council, HITRANS	Not known
Georgemas Chord	Avoids trains needing to reverse to access Thurso delivering a journey time reduction				Not known
Improved commuting service from Perth to Edinburgh	Better rail services would compete more effectively with the M90. Trains could be routed via Dunblane to improve journey times if timings via Fife are too slow	Feasibility study	Medium term	HRP / SESTRAN	Not known
Improvements to the Highland Chieftain service between Inverness and London	Improved rail connectivity between Inverness and Edinburgh / northern England / London	Aspirational	Medium term	HRP / HITRANS	Not known

## B2 North East

**Table B2.1: Scheme Descriptions – NESTRANS area**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Aberdeen Crossrail (Inverurie to Stonhavern)	Improved local rail services to offer a viable alternative to car / bus for Aberdeen travel to work area. Opportunity to focus housing development towards these sites, construction of new stations Cairnrobin, Kintare, Newtonhill	SE has signed off STAG 1 report, and approved 400k funding for second stage study	Phase 1 delivered by 2008, phase 2 by 2012	NESTRANS / SE / Aberdeen Council / Aberdeenshire Council	Phase 1 £45m (excluding optimism bias) Phase 2 £90m (excl. optimism bias)
Aberdeen to Inverness improvements	Better rail connectivity between the two principal stations in northern Scotland. Scheme comprises four passing loops and line speed improvements near Keith. Consultants appointed to produce a consolidated engineering report on the two schemes.	Former Incremental Output Statement scheme for an hourly frequency, with a 2 hour journey time. No funding source currently available, since the benefit cost ratio is only 1	Uncertain	NESTRANS	£60m – proposals would offer synergies with the
Freight terminal at Raithes Farm	Existing terminal at Guild Street closed for redevelopment. Other facility at Cairnrobin offers scope for growth	NESTRANS to fund a freight strategy for North East Scotland to encourage investment in inter-modal facilities. One freight train path per hour to Raithes Farm	Short term timescale to complete the study	NESTRANS/ Aberdeenshire Council	
Laurencekirk Station	Creates new journey opportunities by rail for passengers in the rural hinterland between Montrose and Stonehaven.	STAG1 / STAG 2 completed. Further work to examine the robustness of the costs (GRIP Level 4). Further discussions with First ScotRail on the optimum level of service	Short term – opening by December 2007	NESTRANS / Aberdeenshire Council	£3m
Better rail links to Edinburgh	CREATE (Campaign for Rail Enhancement Aberdeen to Edinburgh) is lobbying for journey time and frequency improvements (6 direct trains to London, with a journey time of about 6 hours)	Other schemes promoted by NESTRANS have a higher priority	Medium term	NESTRANS, Aberdeen Council	Unknown
Western Orbital peripheral route - Aberdeen	Reduced congestion in western Aberdeen for both longer distance (A90 / A96) and local traffic	Public inquiry to examine the choice of routes is due to commence shortly	2010	Aberdeen Council	£210-280m depending on the preferred alignment
Park & ride schemes	Increase the number of P&R trips six fold, by trebling the number of sites	Planning permission obtained for Chapelbrae, with consents sought for Banchory, City South and Kingswell,	2006	Aberdeen Council	Not known
Aberdeen – Elgin freight shuttle	Link would call at Keith and Huntly.	Feasibility work ongoing	Medium term	NESTRANS, Direct Rail Services	Not known

## B3 South East

**Table B3.1: Scheme Descriptions – SESTRAN**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
'Caledonian Express'	Better rail connectivity from Glasgow to Edinburgh via Shotts to offer an alternative to the Falkirk route	Aspirational scheme. GNER have also expressed an interest to electrify the route to offer a faster journey time than via Motherwell	Medium term	City of Edinburgh Council, West Lothian Council, SESTRAN, WESTRANS, Scottish Executive	£3.2m capital costs, and £2.8m operating subsidy per annum
New local service Edinburgh to Berwick	Better rail connectivity to Berwick and Dunbar from Edinburgh, and local stations west of Drem. Scheme offers new journey opportunities for proposed new stations	Aspirational scheme, to be introduced in two phases, but proposal will cause capacity problems	Medium – long term	East Lothian Council, Borders Council, Scottish Executive	Not known, but scheme is understood to cause capacity problems
New stations at East Linton and Reston	Improved local rail access from the Borders (avoids driving to Berwick or Dunbar)	Aspirational schemes, new stations would form part of a local service from Berwick to Edinburgh	Medium – long term	Borders Council, East Lothian Council	Not known
Musselburgh Park & ride	Improved local station, also served by longer distance trains given proximity to A1	Aspirational scheme	Medium term	East Lothian Council, previously supported by GNER and Scottish Executive	Not known, but potential for developer contributions
Eskbank – Bonnybrigg - Penicuik	Proposal would create new rail journey opportunities via a branch line from Millerhill	Aspirational scheme not currently being pursued by Midlothian Council	Long term	Midlothian Council	Not known
New stations at Stow and Melrose	Two additional stations proposed for the Waverley Line would extend the line to the important tourist destination at Melrose, and the serve the rural area north of Galashiels	These stations are outside the current Borders Railway scheme	Long term	Waverley Route Trust	Not known
Edinburgh South Suburban Line	New passenger rail service introduced, that would avoid the congested approaches to Waverley Station	Feasibility study by Atkins	Medium term	SESTRAN, City of Edinburgh Council	Not known
Edinburgh to Glasgow and Stirling/Dunblane improvements	Train lengthening to 9 car trains would alleviate passenger overcrowding. Platforms would need to be lengthened though	Under consideration	Medium term	SESTRAN, City of Edinburgh, West Lothian Council, Falkirk Council	Not known

**Table B3.1 (cont.): Scheme Descriptions – SESTRAN**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Signalling Forth Bridge	To improve train capacity, higher train frequencies and longer trains across the Forth Bridge allowing two trains to cross the bridge in the same direction. Allows improved timetable flexibility – Markinch (Phase 2) sidings	Reviewed as part of the Scottish Strategic Rail Study, and SESTRAN Integrated Transport Corridors Study (SITCoS)	Medium / long term	SESTRAN, Network Rail	Not known
Service improvements in Fife	To improve timetable flexibility and improve train frequencies, and to improve local services	Examined as part of the Scottish Strategic Rail Study	Medium term	SESTRAN, Fife Council	Not known
Kirkcaldy East Rail Halt	Allows residents of East Kirkcaldy easier access to the rail network	Examined as part of the Scottish Strategic Rail Study and the South Fife & Forth Estuary Public Transport Study	Medium term	SESTRAN, Fife Council	Not known
Levenmouth Line	Interchange facility to allow direct access to the rail network, including Edinburgh	Examined as part of the Scottish Strategic Rail Study and the Fife & South Tayside Rail Study, Reviewed as part of SITCoS	Medium term	SESTRAN, Fife Council	£6 million
New rail station at Newburgh	Interchange facility to offer better rail access to North East Fife residents	Examined as part of the Scottish Strategic Rail Study and the Fife & South Tayside Rail Study	Medium term	SESTRAN, Fife Council	Not known
Wormit rail halt	Allows residents of Wormit to reach the rail network, giving better access to public transport	Tay Estuary Rail Study, Fife & South Tayside Rail Study, Scottish Strategic Rail Study	Medium term	SESTRAN, Fife Council	Not known
Addiewell Station upgrade	Improves facilities and access to the station	Aspirational, depending on whether the new prison is completed	Medium term	SESTRAN, West Lothian Council,	Not known
Winchburgh Station	New station serving 3-5000 houses to improve the expanded community, and offer opportunities for strategic park & ride	SESTRAN corridor study	Medium term	Developer, West Lothian Council	Not known
Edinburgh to London ECML journey times	Reduce journey times to about 3.5 hours to make rail more competitive versus other modes	None, could be achieved by the High Speed Line	Long term	SESTRAN	Not known
ScotRail Express network	Reduced journey times, better frequencies on certain corridors to improve rail competitiveness versus rail	Scottish Strategic Rail Study, Caledonian Express	Medium term		Costs for Caledonian Express presented elsewhere. Some schemes to reduce journey times do not have

**Table B3.1 (cont.): Scheme Descriptions – SESTRAN**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
St Andrews rail link	Reinstate rail link between Leuchars and St Andrews; will require significant capital expenditure. Potential for bus feeder service, particularly if Leuchars station is improved	Rail based solution unlikely to attract funding due to poor economic case. Feasibility of a bus based solution examined	Short term	Fife Council	£34m capital expenditure for rail link. Cost of bus link unknown but unlikely to be less than rail)
Development of strategic park & ride	Improves access to city centre from Hermiston, Ingliston, Straiton and Todhills	Committed	Short term	Edinburgh City Council, SESTRAN	Not known
Rail connection to Blindwells from the ECML, and conversion to passenger use.	Opportunity to provide a passenger service serving Tranent. Capacity issues east of Edinburgh Waverley needs to be understood	Aspirational	Long term	SESTRAN	Not known
Re-opening the Haddington to Longniddry branch line	Opportunity to provide a passenger service serving Haddington. Capacity issues east of Edinburgh Waverley needs to be understood	Aspirational	Long term	SESTRAN	Not known
Grangemouth passenger / freight initiative	Opportunity to operate passenger trains to Grangemouth	Aspirational	Long term	SESTRAN	Not known
Assessment of all stations within SESTRAN area for car parking, accessibility and commuter capacity	Initiative would identify those stations where car parking, or the level of bus interchange is inadequate	Feasibility	Short term	SESTRAN	Not known
Improved interchanges in Fife	Ferrytoll, Dalgety Bay, Kirkcaldy, Rosyth, Inverkeithing, Markinch	Committed	Short term	Fife Council SESTRAN	Not known
Link from ECML at Musselburgh to the Waverley Line at Brunstane	Connection would allow direct trains from the ECML to the Waverley route	Aspirational	Long term	SESTRAN	Not known
Charleston Chord	Improved flexibility for freight trains to Longannet, avoids trains reversing at Dunfermline	Aspirational	Long term	Fife Council	Not known
Rosyth Port Rail Freight	Freight connection will support the port expansion	Aspirational	Long term	Fife Council	Not known
Cross-Forth ferry service	Link to Granton / Leith with Kirkcaldy and Burntisland	Feasibility study underway	Medium	Edinburgh City Council, Forth Ports, Fife Council	Not known
On Street bus interchanges	At Haymarket and East End interchange; to improve train-bus interchange at Haymarket and Waverley stations	Ongoing		Edinburgh City Council	

**Table B3.1 (cont.): Scheme Descriptions – SESTRAN**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
A70 Currie Bypass	Local congestion relief, together with bus priority and traffic management schemes	Ongoing, subject to planning approval process	Short term	City of Edinburgh Council, Scottish Executive	Non known
A8000 upgrade	Reduced congested and traffic delays on the A8000 linking the M9 with the A90	Ongoing	Short term	Edinburgh City Council, Scottish Executive, FETA	
West Lothian – Edinburgh express bus service	Improve journey time / frequency on West Lothian – Edinburgh corridor	Committed	Short term	ECC, SESTRAN	
Bus priority schemes	Enhance bus priority on A7, A702, A703	Committed	Short term	ECC, SESTRAN	
Central Edinburgh Traffic Management scheme	Improve conditions for pedestrians, public transport and delivery vehicles	Committed	Short term – complete by Christmas 2005	ECC	
New multi-modal crossing for the Forth	Create additional rail and road capacity to support economic growth in Lothian, Fife and Eastern Scotland and alleviate existing congestion	Examined as part of the SITCoS and the FETA Local Transport Strategy	Long term	SESTRAN, FETA, Scottish Executive, City of Edinburgh Council, Fife Council, Perth & Kinross Council, West Lothian Council.	Not known

## B4 West

**Table B4.1: Scheme Descriptions – Rail Proposals – WESTRANS / SPT**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
West Coast Main Line upgrade	Major infrastructure upgrade to facilitate faster line speeds and journey times between London, North West, West Midlands	Ongoing	Short term	Strategic Rail Authority (SRA)	Total cost for the route is £9-10bn
Glasgow Crossrail link –two alignments via tunnel and non-tunnel	Link north and south electric networks together; complement airport link. New stations at: <ul style="list-style-type: none"> <li>• West Street;</li> <li>• Gorbals;</li> <li>• Glasgow Cross (high and low level)</li> <li>• High Street (east or west sites).</li> </ul>	Ongoing	Short term	Glasgow City Council (GCC)	£25m
Direct rail link to Glasgow Airport	Link to the Airport will enhance its contribution to the local economy	Design tender process completed	Short – medium term	GCC	£60m
Garngad Chord	Would allow a link between the Northern Electric and Cumbernauld Lines	Under consideration	Short – medium term	Strathclyde Passenger Transport (SPT), GCC	
Northern Suburban Extension	Provides new station at Dawsholm / Kelvindale	Ongoing	Short term	SPT, GCC	
Reopening of Carmyle to Newton Chord and the Strathbungo Link. Includes catchment improvement; new / relocated stations on Garngad / Newton Chord / Strathbungo alignments	Will improve operational flexibility and relieve congestion on the West Coast Main Line. New stations at: <ul style="list-style-type: none"> <li>• Blochairn/Garngad</li> </ul>	Under consideration	Short – medium term	SPT, GCC	
Allandale – extension of the electric services from Glasgow to Cumbernauld and Falkirk Grahamston	Mode shift to rail, and traffic congestion in central Glasgow relieved. Electric trains could also reduce journey times, and improve service quality. Potential further rail stations at Bonnybridge, Laurieston and Westfield	Recommendation from the Central Scotland Corridor Study, but no funding commitment by the SE yet	Medium term	Falkirk Council, North Lanarkshire Council, Strathclyde PTE (though scheme is outside the SPT area)	£82m capital costs, plus £13m in operating subsidy
Kilmarnock – Barrhead Upgrade	Improve service frequency to Kilmarnock to minimum half hourly service and line is presently single track. Improvements could allow 2tph	Under consideration	Short term	WESTRANS, SPT, Ayrshire Economic Forum and Joint Structure Plan Committee	
Partick Interchange upgrade	Improve rail / bus / underground connections	Ongoing	Short term	SPT, GCC	£10.5
Mossend Railway Study	Capacity upgrade at Mossend freight terminal -	Under consideration	Medium		

**Table B4.1 (cont.): Scheme Descriptions – Rail Proposals – WESTRANS / SPT**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Glasgow – Aberdeen fast service	Reduced rail journey time by the removal of stops in NESTRANS and Tay areas to improve the competitiveness of rail versus car.	Under consideration	Medium term	SE	Not known
Glasgow – Dundee new express service	Reduced journey time between Glasgow and Dundee	Committed	Short term	SE	Not known
New Bridge of Weir to Glasgow service	Service to throughout the day, and could allow faster journey times between Gourrock and Glasgow due to the removal of intermediate stops. Capacity implications for service resulting from Glasgow Airport Rail Link are unclear	Aspirational	Long term	SPT	Not known
Revised track layouts at Carstairs	Proposal would increase line speeds for trains from Edinburgh from the current 15mph	Aspirational	Long term	GNER / Virgin Trains	Not known
Services from Dalmuir to Whifflet and Shotts	Re-route existing service to Whifflet; new peak and off peak service to Shotts	Aspirational	Long term	SPT	Not known
Platform and train lengthening on Ayr, Gourrock, Stirling and Kilmarnock lines	Provide extra capacity on the services	Feasibility	Short term	SPT	Not known
Semi fast service for Edinburgh – Shotts – Glasgow Central 'Caledonian Express'	Frequency enhancements and journey time reductions	Feasibility study completed	Short – medium term	City of Edinburgh Council, West Lothian Council	£3.2m capital costs and £2.8m operating costs
Greenfaulds Park & Ride	Increased parking availability at SPT rail stations	Committed	Under construction	SPT / WESTRANS / North Lanarkshire	Not known
Ayrshire (Lanark) – Edinburgh rail link study	New journey opportunities given population growth in the A702 corridor	Aspirational	Long term	SPT / WESTRANS	Not known
Kilwinning to Paisley capacity improvements	Line operates close to current signalling capability. Additional capacity may be needed to support growth	Aspirational	Long term	SPT / WESTRANS	Not known
Glasgow to Ayrshire service enhancements	Additional train frequencies would support population and airport growth planned for Ayrshire coast, and support passenger growth at Prestwick Airport	Feasibility	Short term	SPT / WESTRANS	Not known
Prestwick Station upgrade	To support growth at Prestwick Airport	Feasibility study ongoing	Short term	SPT / WESTRANS	Not known
Glasgow to Whifflet / Holytown rail improvements	One of the recommendations from the Central Scotland Corridor Study. Electrification would allow trains to be diverted via Low Level station, alleviating platform capacity at Glasgow Central High Level Station	Aspirational	Long term	SPT / WESTRANS	Not known

**Table B4.1 (cont.): Scheme Descriptions – Rail Proposals – WESTRANS / SPT**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Mauchline Junction improvements	To increase freight capacity / offer better flexibility through construction of a passing loop	Aspirational	Long term	SPT / WESTRANS	Not known
Revise rolling stock formations to make better use of capacity	Restructured train formations would alleviate overcrowding on some routes	Aspirational	Short term	SPT / WESTRANS	Not known
Construction of new stations at Jordan Hill West / Parkhead Forge, Millerston / Heathfield,	Creates an opportunity to improve access to the rail network	Under consideration	Short – medium term	SPT, GCC	
Motherwell Station Transport Interchange	Proposal will deliver improved connections between bus and rail.	Aspirational	Long term	SPT	Not known
Kilmarnock to Carlisle additional rail capacity	Supports aspirations for freight growth, and offers scope to improve the existing passenger service to Carlisle.	Aspirational	Long term	SPT	Not known
Construction of new stations at Germiston, Robroyston and Millerston	Additional stations would improve access to rail for potential passengers close to the Cumbernauld line	Aspirational	Long term	SPT	Not known
Improvements to Kilmarnock / Ayr / Troon / Dalmeir Interchange stations	Encourages new passengers to use rail as their access mode	Aspirational	Long term	SPT	Not known
Croy Station park & ride extension	Additional parking facilities would support patronage growth for journeys to central Edinburgh and Glasgow, particularly during the off-peak	Aspirational	Long term	SPT	Not known
Expansion of park & ride facilities, particularly at Airdrie, Helensburgh Kilwinning, Uddingston, Easterhouse	Encourages new passengers onto the rail network by providing sufficient parking space at principal stations	Aspirational	Long term	SPT	Not known
New stations at Ayr Hospital, Ravenscraig, Auchenback, Ibrox, Boglestone	Construction of new stations would serve new proposed residential areas, and improve access to the rail network	Aspirational	Long term	SPT	Not known
Motherwell to Stirling via Cumbernauld	Extension of the existing rail service, proposal would improve rail connectivity to a major hub in central Scotland	Aspirational	Long term	SPT	Not known
Hamilton bus / rail interchange	Proposal will deliver improved connections between bus and rail.	Aspirational	Long term	SPT	Not known
Finnieston to Hyndland capacity improvements	Line operates close to capacity. Additional capacity would offer better timetable resiliency	Aspirational	Long term	SPT	Not known
Additional Sunday services, late night services and earlier services on some routes	Meets social inclusion objective by offering rail services at marginal times of the day	Aspirational	Long term	SPT	Not known

**Table B4.2: Scheme Descriptions – Road Proposals – WESTRANS / SPT**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
M74 Completion	<p>Will complete the missing link between the M74 at Fullerton and the M8 west of Kingston Bridge. Will also;</p> <ul style="list-style-type: none"> <li>• ease congestion on the M8 to improve business accessibility;</li> <li>• advance national competitiveness by improving access to Glasgow Airport and key strategic commercial and industrial facilities;</li> <li>• assist development of prime sites and the regeneration of derelict land and</li> <li>• facilitate ease of access to national motorway network.</li> </ul>	Ongoing	Short term, open to traffic by 2008	SE, GCC, South Lanarkshire Council, Renfrewshire Councils	£375m - £500m
East End Regeneration Route	Provide a transport route from the M74 completion at Polmadie through the East End of Glasgow to the M80/M8 junction at Provan Road to: facilitate the regeneration of derelict land, improve vehicular access and parking to the Forge Shopping Centre, Celtic Park and relieve congestion	Awaiting outcome of planning application	Short term, completion by 2008	GCC, Scottish Enterprise	£43.4m
Bishopbriggs Relief Route	Completion would improve accessibility to the Robroyston area, where significant urban expansion is taking place	Ongoing	Long term	GCC,	
A80/M80 Upgrade – Stepps – Haggs	Upgrade of A80 to motorway standard. Also replaces Auchenkilns roundabout with grade separated junction	Committed	Short – medium term; expected to be open in 2010	SE	
A77 Ayr – Stranraer upgrade	Provide safety improvements- includes Maybole Bypass- and access to Cairnryan ferry terminals	Under consideration		GCC	
A76 Mauchline by-pass	Remove through-traffic from urban areas		Short term	SE, Ayrshire councils	
A75 Gretna – Stranraer	A75 is part of the Trans European Network. Upgrade to improve access to Stranraer / Cairnryan ferry terminals.	Under consideration	Medium – long term	SE	£40m

**Table B4.3: Scheme Descriptions – Integrated Transport Proposals – WESTRANS / SPT**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
New QBC routes: <ul style="list-style-type: none"> <li>• Dumbarton Road to Baillieston;</li> <li>• Gt. Western Road to Victoria Road and Pollokshaws Road;</li> <li>• Paisley Road West to Possil/Summerston; and</li> <li>• Maryhill Road to Tollcross Road.</li> </ul>	Close gaps in the network where new development has occurred	Ongoing	Short term	GCC, SPT, SE	
Clyde Waterfront Mass Transit; Harbour - City Centre transport link	Tram will link SECC and Glasgow Harbour to Yoker and Clydebank; improving public transport access to Braehead Shopping Centre and beyond to Renfrew. Conversion of the Deanside freight line is an option. Waterbuses also an option.	Feasibility study completed, pre-LRT strategy proposed	Medium term; post 2010. Short term: modern bus based system on North Bank by 2007	SPT, GCC	£2.5m for pre-tram strategy
Park and Ride sites	Encourage car users to transfer to high quality public transport services where none are located within walking or cycling distance	Investigating locations for new Park-and-Ride	Medium term	SPT, GCC	

## B5 Central & Tay

**Table B5.1: Scheme Descriptions – Rail Proposals – Central**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Delivery Body	Cost
Edinburgh to Inverness frequency enhancement	Improve rail frequencies to compete more effectively with the A9. Better timing of services to support business travel	Aspirational	Medium term	Perth Council	Unknown
Improved commuting service from Perth to Edinburgh	Better rail services would compete more effectively with the M90. Trains could be routed via Dunblane to improve journey times if timings via Fife are too slow	Feasibility study	Medium term	Perth Council	Not known
New station at Dundee West	Serves local residential catchment and will alleviate city centre station parking problems	Reviewed as part of Tay Estuary study	Medium term	Dundee City Council	Approximately £3m
Service from Arbroath to Perth – including Dundee West and Invergowrie to Arbroath services	Better connectivity to regional hubs (Aberdeen-Dundee-Edinburgh) potential to reduce journey times by speeding up service	Reviewed as part of Tay Estuary study	Medium term	DCC	£2.3m p.a. for Dundee – Perth service
Station improvements at Arbroath, Montrose, Dundee, Carnoustie, Broughty Ferry, Monifieth	Will improve passenger waiting environment	Reviewed as part of Tay Estuary study	Medium term	DCC	£0.5m Arbroath, £0.4m Montrose, £1.6m Dundee £0.2m Carnoustie £0.6m Broughty Ferry £0.5m Monifieth
New station at Bannockburn	Bannockburn offers opportunity for strategic Park and Ride site (near M80 and M9) to relieve parking pressures at Dunblane and Stirling. Would also serve proposed housing development	Feasibility study complete	Medium term	Stirling Council	Approximately £3m
New station at Causeway	Located south of Bannockburn. Limited motorway access for Park and Ride, and residential catchment is smaller in scope	Not being actively pursued	Medium – long term	SC	Approximately £3m
New station at Cowie	Located close to residential area however limited scope for Park and Ride	Not being actively pursued	Medium – long term	SC	Approximately £3m
Potential station improvements at Invergowrie, Balmossie, Barry Links and Golf Street	Potentially attract tourists to make rail trips to Barry Links and Golf Street	Scheme viability is linked to wider role for these stations	Medium – long term	DCC	Approximately £5m

**Table B5.1 (cont.): Scheme Descriptions – Rail Proposals – Central**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Delivery Body	Cost
New stations at Greenloaning and Blackford	Would serve major new housing development and improve rail access from Callander and Crieff. Could be served by extending the proposed Arbroath to Perth service to Glasgow	Aspirational, dependent on the delivery of housing proposals	Medium – long term	PKC	Approximately £3m per station
New stations at Newburgh and Abernethy	Perth – Ladybank line is single track operating at capacity. Capacity enhancement would support better rail links from Perth to Edinburgh	Feasibility study	Medium term	Fife Council	Not known
Brechin – Montrose rail link reopening	Would link Brechin to the national rail network	Not being pursued at present	Medium – long term	AC	£18m
Dundee - Ladybank	New service	Ongoing	Medium term	DCC	Not known
Strathearn Stations	New stations to serve major housing development near Gleneagles				
New station at Errol	Offers rail access to the rural hinterland between Perth and Dundee	Aspirational	Long term	P&K	Not known

**Table B5.2: Scheme Descriptions – Road Proposals – Central**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Delivery Body	Cost
A92 upgrade	Dualling of busy A92 between Arbroath and Dundee to increase capacity and improve safety	Work ongoing	Short term – completion expected at end of 2005	DCC, AC	£51m
New Upper Forth road crossing	Provide crossing for M876 upstream of Kincardine. Also provides by-pass of Kincardine to alleviate existing traffic congestion	Committed	Short term – 2008 completion	Scottish Executive	Not known
A90(T) junction improvements	Provide improvements in safety improvement at known accident hot-spots	Work ongoing	Short term	PKC	Not known

**Table B5.3: Scheme Descriptions – Integrated Transport Proposals – Central**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Delivery Body	Cost
New bus/rail interchange facilities at Perth	Improved integration across modes	Outline scheme in development	Medium	Perth and Kinross Council	£2.9m
Integrate rail more effectively with other modes; parking availability and linkages with bus	Car parking at Dundee, Stirling and Dunblane is already close to capacity. Facilitating access by bus / cycle / walk would relieve pressure on the station parking	Individual feasibility studies	Medium term	Various	Not known

## B6 South West

**Table B6.1: Scheme Descriptions – Rail Proposals – Dumfries and Galloway**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Introduction of local services onto WCML between Glasgow and Carlisle through new stations at Beattock and Symington	Provide access for communities along the West Coast Main Line	Feasibility study costing £100,000	Medium term	Scottish Executive, Dumfries and Galloway Council, SPT	Unknown
Stranraer Public Transport Interchange	To consolidate and enhance rail facilities in the Stranraer area, and to provide easier access to rail facilities	Being designed	Short to medium term	Scottish Executive, Dumfries and Galloway Council	£2.3m
Dumfries flexibility	Provide inter-modal freight facilities in vicinity of Dumfries	Feasibility study	Medium term	SE	Unknown
Capacity enhancements on Glasgow South Western line	Cater for freight diversions from WCML and traffic from Ayrshire coalfields	Business case under development	Medium term	SRA	Unknown
Mauchline line enhancements	Capacity enhancements	Under construction	Short term	SRA	Unknown
Powharnall	New branch line and coal loading terminal to ease Central Scotland road congestion	Under construction – will need Glasgow South Western capacity scheme to reach full potential	Short term	Scottish Coal	£9.75m
Additional direct trains to Prestwick Airport	Additional trains would improve rail access to the airport, given the significant expansion proposed in the DfT White Paper	Aspirational scheme	Medium term	D&G	Not known
Track doubling between Annan and Gretna	Improved network performance and reliability, scope to support freight growth on the corridor	Aspirational scheme	Medium term	D&G	Not known
New station at Thornhill	Improved access to the rail network – avoids driving to Dumfries or Sanquhar	Aspirational scheme	Medium term	D&G	Not known
New station at Eastriggs	Creates new journey opportunities between Gretna and Annan	Aspirational scheme	Medium term	D&G	Not known
New station at Beattock	New parkway station that would be served by a local stopping service between Carlisle and Glasgow Offers new rail journey opportunities for Biggar	Aspirational scheme	Medium term	D&G	Not known
New station at Dunragit / Glenluce	Station would support the regeneration of Stranraer	Aspirational scheme	Medium term	D&G	Not known

**Table B6.2: Scheme Descriptions – Road Proposals – Dumfries and Galloway**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
A75 (Cairntop to Barlae) Euroroute upgrade	Provide overtaking lane in eastbound direction	Ongoing	Short term, construction to begin 2005	SE	£5.8m
A75 Dunragit bypass	Relieve Dunragit of through traffic and improve overtaking opportunities	Ongoing	Short term	SE	Not known
A76 realignments at Gaitside	Provide safety improvements	Ongoing	Short term	SE	£1.7m
A75 Gretna – Stranraer	A75 is part of the Trans European Network. Upgrade to improve access to Stranraer / Cairnryan ferry terminals.	Under consideration	Medium – long term	SE	
A7 Auchenvivock	Improved safety and faster journey times between Carlisle and the Borders	Scottish Executive are developing a scheme	Short term	SE	Not known
A76 Glenairlie	Improved safety and faster journey times between Dumfries and Kilmarnock	Scottish Executive are developing a scheme	Short term	SE	Not known
A75 Planting End to Drumflower	Improved safety and better access to the ports at Stranraer and Cairnryan from Carlisle	Scottish Executive are developing a scheme	Short term	SE	Not known
A75 Barfil to Bettyknowes	Improved safety and better access to the ports at Stranraer and Cairnryan from Carlisle	Scottish Executive are developing a scheme	Short term	SE	Not known
A75 Cairntop to Barlae	Improved safety and better access to the ports at Stranraer and Cairnryan from Carlisle	Scottish Executive are developing a scheme	Short term	SE	Not known
A75 Hardgrove to Kinmount	Improved safety and better access to the ports at Stranraer and Cairnryan from Carlisle	Scottish Executive are developing a scheme	Short term	SE	Not known
Various small scale road improvements on the A77	Improved safety and faster journey times for trips between Stranraer and Ayr / Glasgow				

**Table B6.3: Scheme Descriptions – Integrated Transport Proposals – Dumfries and Galloway**

Proposal	Objectives	Status	Timescale	Scheme Promoter / Deliver Body	Cost
Package of public transport/cycling/pedestrian measures in Dumfries	Improved access to Crichton Business and University park	Ongoing	Short term	SE, Dumfries & Galloway	£2m