

## 7.6 Corridor 6: Inverness to Perth

### 7.6.1 Setting the Context



Corridor 6 connects Perth and Inverness and serves a number of settlements including Pitlochry and Aviemore as shown in Figure 7.6.1.

The corridor forms part of Scotland's primary north to south route and links to Corridor 1 (Wick / Thurso), Corridor 2 (Ullapool), Corridor 3 (Mallaig) and Corridor 4 (Aberdeen) at its northern end and to Corridor 9 (Glasgow), Corridor 11 (Dundee) and Corridor 12 (Edinburgh) at its southern end.

It performs three roles:

- it provides a strategic link connecting Inverness and the Highlands to Perth and onwards to the Central Belt;
- it serves settlements within the corridor providing access to local services, employment and tourism; and
- it caters for commuting to the nodes at either end of the corridor.

The corridor is approximately 170 kilometres in length, largely rural in nature and the population within it is largely concentrated in main settlements along the route of the A9. The total population of the main settlements within the corridor was approximately 30,000 in 2006<sup>433</sup>. This is forecast to increase by five per cent by 2022. In the same period, a growth in the number of households of 12 per cent is expected<sup>434</sup>.

The economies within the corridor are primarily based upon agriculture and tourism. Employment in both the Highlands and Perth and Kinross is expected to increase by four per cent between 2005 and 2022<sup>435</sup>. The increases are expected to be spread over the corridor as a whole, although the areas immediately to the north of Perth are expected to show some slight falls in both people and jobs<sup>435</sup>. Figure 7.6.2 highlights the areas with concentrated forecast changes in population and employment over the period from 2005 to 2022.

Currently, 20 per cent of Perth and Kinross and 16 per cent of Highlands's residents are classed as economically inactive<sup>436</sup>. These figures are comparable to the national average of 21 per cent. Income levels for the corridor are around £387 per week in Perth and Kinross and in the Highlands, which is 94 per cent of the average for Scotland (£412)<sup>436</sup>.

<sup>433</sup> General Register Office for Scotland Mid-2006 population estimates for administrative areas: <http://www.gro-scotland.gov.uk/files1/stats/06mype-cahb-t2-revised.xls>

<sup>434</sup> Scottish Household Survey 2003/3004 Perceptions of safety from crime during evening bus/rail travel

<sup>435</sup> TELMoS

<sup>436</sup> Scottish Economic Statistics 2006, table 4.3, 4.20

Car ownership within the corridor, in both the Highlands and Perth and Kinross<sup>437</sup>, is 76 per cent. This is above the national average for car ownership of 67 per cent, measured as a percentage of households with access to a car, reflecting a greater dependence on the car due to the rural and dispersed nature of the corridor.

Future car ownership levels are expected to increase in line with economic growth and remain above the average for Scotland. Despite this increasing demand for travel by private car there is still expected to be a core of population, often including the most vulnerable, who will continue to be without access to a car.

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<sup>437</sup> Scotland's Census 2001: [www.scrol.gov.uk](http://www.scrol.gov.uk) Table KS17

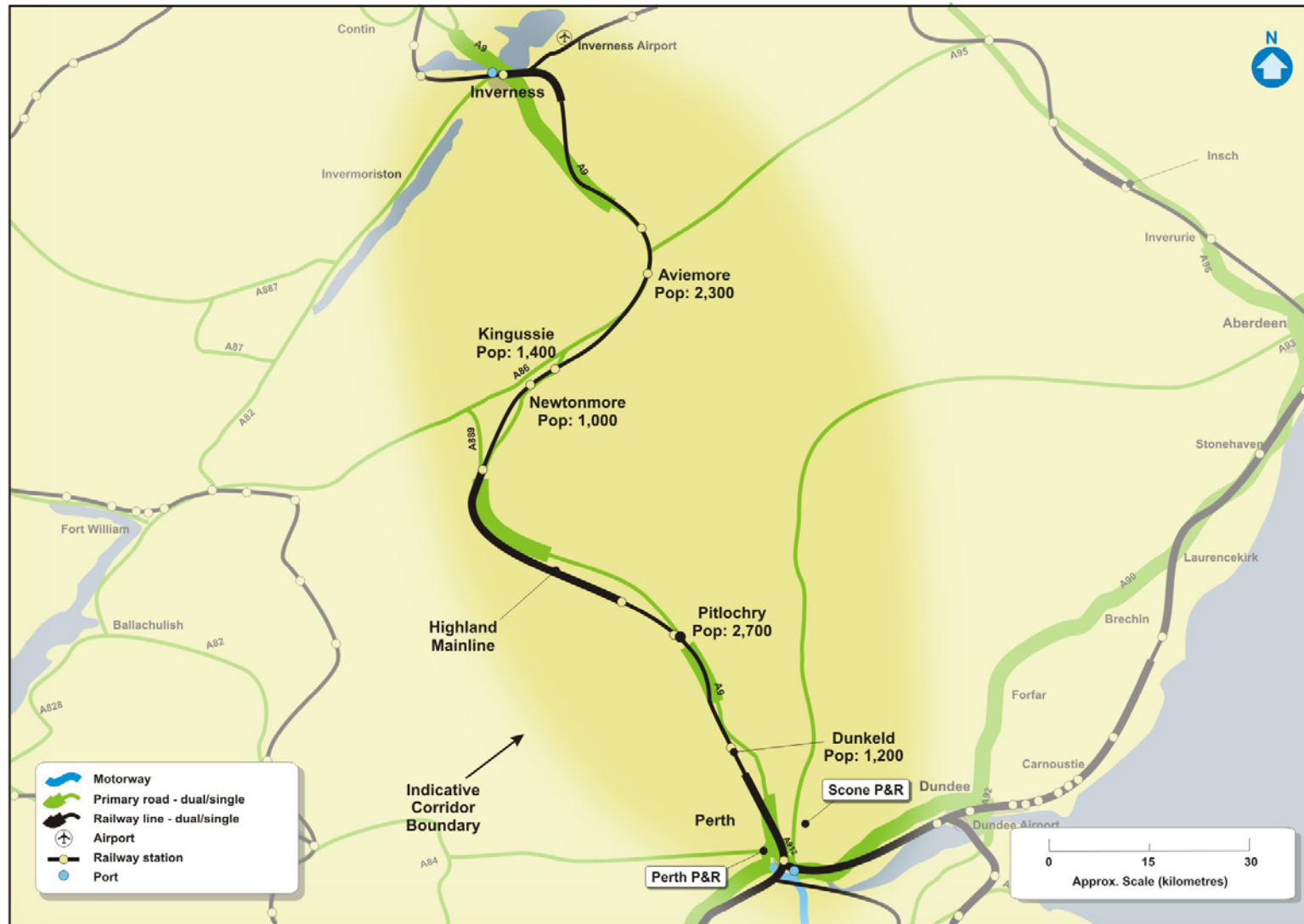


Figure 7.6.1: Setting the Context, Corridor 6 - Inverness to Perth

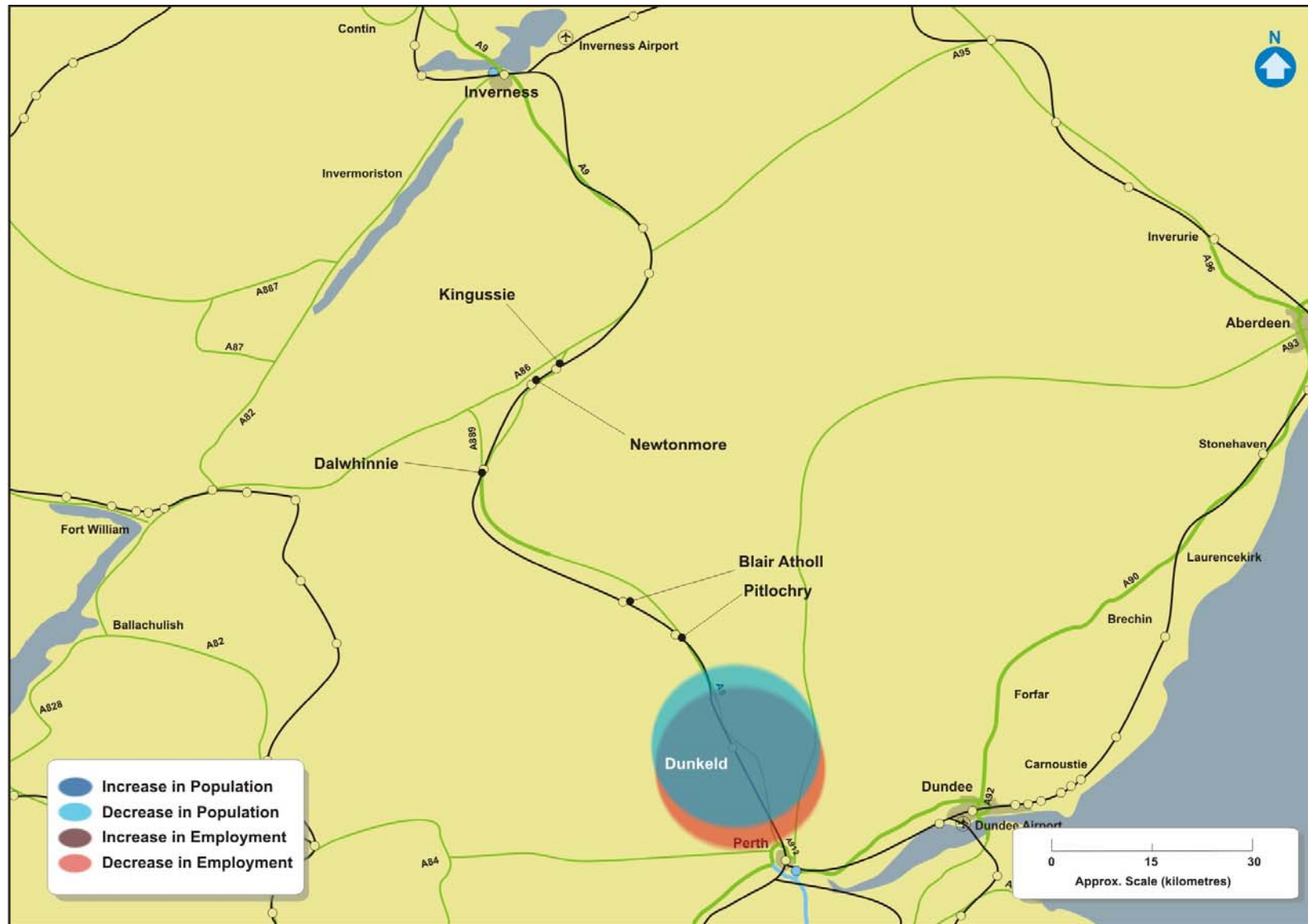


Figure 7.6.2: Changes in Population and Employment - 2005 & 2022, Corridor 6 - Inverness to Perth

## 7.6.2 Transport Network and Operations

### Infrastructure and Services

The principal elements of the transport network that play a national strategic role are shown in Figure 7.6.1. A significant length of the road and rail network is confined by the valley of the Rivers Tay, Tummel and Garry to the south, and by the Cairngorm and Monadhliath Mountains to the north.

The A9 Trunk Road, which is approximately 180 kilometres in length, forms the spine of the road network in the corridor and, for the most part, runs parallel to the rail line. The majority of the route consists of single carriageway road but there are a number of dual carriageway sections which provide additional lanes for overtaking. Approximately 42 kilometres or 23 per cent of the route is currently dual carriageway between Perth and Inverness<sup>438</sup>. There are approximately 100 at-grade junctions on the A9 which provide access to the population centres within the corridor.

The rail line provision is mixed as shown on Figure 7.6.1. Between Perth and Stanley, Blair Atholl and Dalwhinnie and Culloden Viaduct and Inverness it is dual track and elsewhere it is single track with passing loops. Approximately 34 per cent of the line is classified as double track. There are eight railway stations on the Highland Main Line between Inverness and Perth, which serve the larger settlements within the corridor.

There are approximately 11 rail services per day which equates to a capacity of 4,200 seats per day. Service patterns are generally:

- Three trains per day between Inverness and Glasgow;
- Six trains per day between Inverness and Edinburgh;
- One train per day between Inverness and London Kings Cross (National Express East Coast); and
- One overnight sleeper service between Inverness and London Euston.

Bus capacity is approximately 1,300 seats per day based on a two way total of 26 buses. This gives an estimated public transport capacity of 5,500 seats. Service patterns are generally:

- One services per hour between Inverness and Perth;
- One service per hour between Inverness and Edinburgh; and
- One services per hour between Inverness and Glasgow.

There is a coach park in Pitlochry that is two minutes walk from town the centre and also an additional one in Kingussie, close to the town centre.

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<sup>438</sup> Chapter 4 – A9 Perth to Inverness Economic Appraisal Study – Final Report, HITRANS and Highlands and Islands Enterprise, October 2007

An integrated ticket is available for rail journeys into Inverness and Perth in the form of the *PLUSBUS* ticket. This ticket covers rail journeys and unlimited bus travel within Inverness and Perth.

### Asset Management

In 2007, three per cent of the trunk road network pavement<sup>439</sup> in this corridor is judged to require structural strengthening as it has no theoretical residual strength. This compares with a national level of four per cent<sup>440</sup>. Under Transport Scotland's planned maintenance schedule, the net figure for the corridor is expected to rise to five per cent by 2012.

Further details on asset management, including bus and rail, are provided in Chapter 4.

### Demand Management

There are no demand management measures in place on the corridor. Car parking charges are low in both Inverness and Perth and maximum stays are long (10 - 24 hours). Parking charges in these hubs do not appear to be aimed to influence travel demand or modal split. No bus priority measures are provided along the length of the corridor.

There is a Park-&-Ride site at Broxden Roundabout in Perth<sup>441</sup>. Parking is free and there is a shuttle bus to the city centre which operates every 10 minutes at peak times and every 15 minutes off peak. The service costs £1 for adults. Monthly and annual discounted passes are available. The Park-&-Ride site is increasingly used as a transfer point for inter-city coaches including Megabus between Perth and Inverness.

### Programmed Schemes

The following programmed infrastructure schemes and developments that will affect the corridor are highlighted in Figure 7.6.3:

- A9 Ballinluig Junction;
- A9 Crubenmore Extension;
- A9 Bankfoot Improvements;
- A9 Slochd 2 + 1 Improvements and Maintenance;
- A9 Moy 2 + 1 Improvements and Maintenance;
- A9 Kincaig to Dalraddy;
- A9 Carrbridge 2 + 1 Improvements and Maintenance; and
- A95 Gaich to Craggan 4.

Also of relevance is the Highland Council's consideration of the Inverness Southern Distributor Road.

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<sup>439</sup> Transport Scotland SERIS Database

<sup>440</sup> STS No. 25 (2006) Table 5.5

<sup>441</sup> Perth and Kinross Council: [www.pkc.gov.uk](http://www.pkc.gov.uk)

No rail improvement infrastructure schemes are currently under construction or planned, however, improvements are planned to timetables and services.







### 7.6.3 Travel Patterns

As the area is not completely covered by the current TMfS, the approach taken has been to provide a review of travel patterns using the initial output from TMfS:05H, supplemented with additional data from TMfS:05 where appropriate. Demand growth has been based on National Road Traffic Forecasts.

Despite this corridor being over 180 kilometres in length, there are a relatively high proportion of trips travelling the entire length, as shown in Figure 7.6.4. To the south of Perth a large number of trips are heading to and from Stirling and beyond to Glasgow. This underlies the significance of the route as a link between northern and southern Scotland. Modal share by public transport is low for long distance trips outside the corridor but rises to 12 per cent for trips to and from Perth<sup>442</sup>.

Overall trips are forecast to increase by 2022 in line with national trends.

**Table 7.6.1: Summary of Demand (12 hour) and Public Transport Share<sup>443</sup>**

		Between Perth and Inverness	Within Corridor	Between Corridor and Perth	Between Corridor and Inverness	Between Corridor and other destinations	Total Trips
2005	Total Trips	11,400	10,500	5,800	2,700	9,500	39,900
	% of Corridor	28%	26%	15%	7%	24%	100%
	PT Trips	100	800	800	200	200	2,100
	PT Share	1%	8%	14%	7%	2%	5%
2022	Total Trips	14,400	13,200	7,300	3,400	12,000	50,300
	% of Corridor	28%	26%	15%	7%	24%	100%
	PT Trips	100	1,000	1,000	300	300	2,700
	PT Share	1%	8%	14%	9%	3%	5%
Change	Total Trips	+26%	+26%	+26%	+26%	+26%	+26%
	PT Trips	0%	+25%	+25%	+50%	+50%	+29%

<sup>442</sup> TMfS:05/05H

<sup>443</sup> STS No. 25 (2006), Table 10.6, 10.3

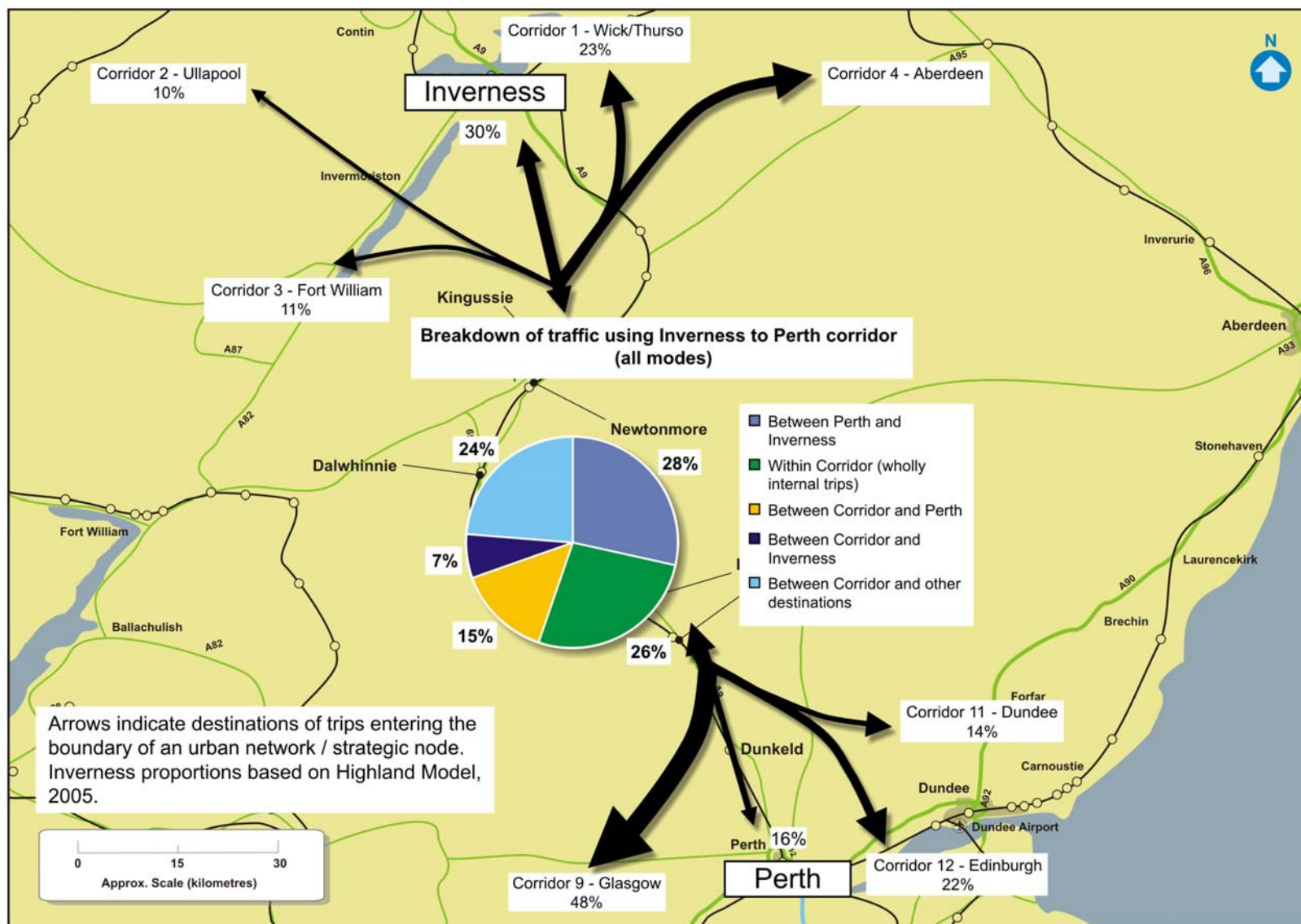


Figure 7.6.4 Travel Patterns 2005, Corridor 6 – Inverness to Perth

In the future, the modal share of public transport is expected to remain constant.

ATC data from the SRTDb gives a figure of approximately nineteen per cent HGV traffic on the A9 at Calvine. This reflects the importance of the A9 to the commerce and economy of Inverness and the northern Highlands. This is forecast to remain largely unchanged in the future<sup>444</sup>.

Total passenger throughput at stations on the corridor is 0.23 million passengers per annum, with Pitlochry and Aviemore the busiest<sup>445</sup>. Demand within the corridor is greatly influenced by travel over the full length of the line between Perth and Inverness. In total, the throughput is approximately 1.5 million passengers per annum. Forecast rail demand is expected to change little over present levels.

The average AADT levels in 2006 on the A9 vary between 23,000 vehicles adjacent to Perth and Inverness, influenced by commuter traffic, to approximately 8,000 vehicles on the rural sections<sup>446</sup>. Traffic levels exhibit a degree of seasonality with higher flows being experienced in the summer months and holiday periods. While during the summer period the composition of traffic changes to include higher proportions of caravans. Between Perth and Pitlochry traffic on the single carriageway exceeds the design capacity, with AADT up to 16,000 vehicles<sup>447</sup> while the design capacity is a maximum AADT in the year of opening of 13,000 vehicles.

The ports served by the corridor, Inverness and Perth, do not cater for passengers. Inverness sea port had a throughput of 665,000 tonnes of freight in 2005 and Perth 139,000 tonnes<sup>448</sup>. Much of this throughput completes its onward journey by road.

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<sup>444</sup> SRTDb

<sup>445</sup> Rail industry LENNON data (Station Usage 2004/2005)

<sup>446</sup> Transport Scotland: Scottish Roads Traffic Database

<sup>447</sup> TMfS:05

<sup>448</sup> STS No. 25 (2006) Table 10.3

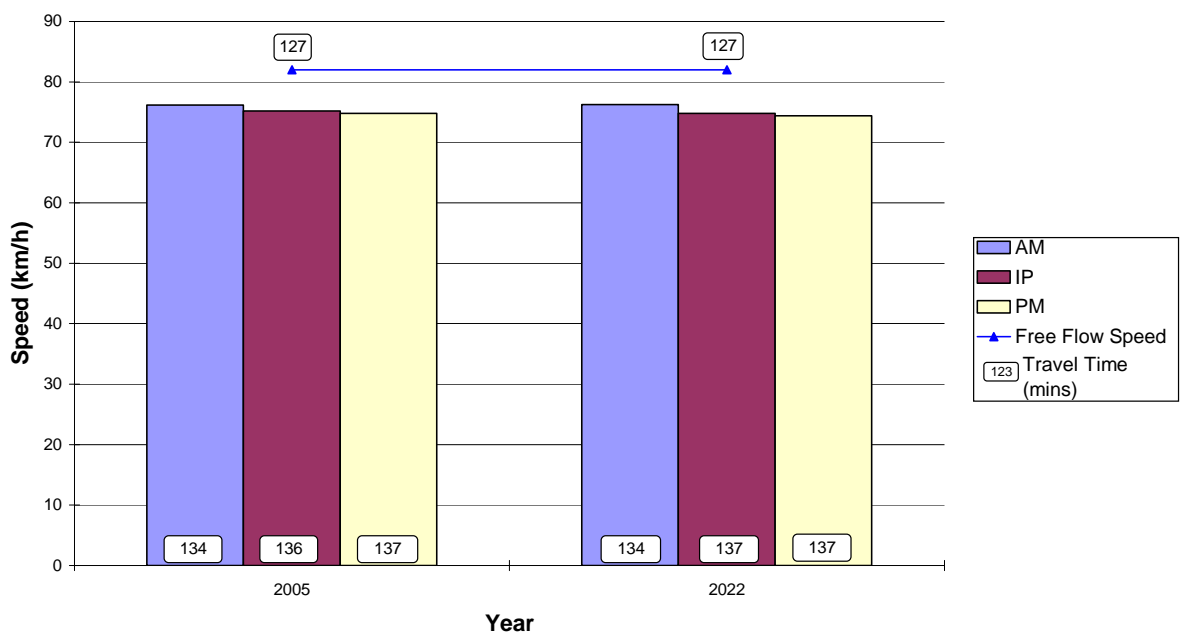
#### 7.6.4 Performance Review

##### Journey Times and Connections

This section addresses the following questions from Table 3.1:

- Does the network offer competitive journey times?
- Is the network operating efficiently and reliably?
- Where are the delays and when do they occur?

Figure 7.6.5 shows the current and forecast average speed for the A9. A typical city centre to city centre journey time is also shown.



**Figure 7.6.5: Average Road Speeds (Corridor 6)<sup>449</sup>**

Travel time in the off peak and evening peak is relatively consistent at approximately 2 hours 17 minutes in both 2005 and 2022. However the morning peak is quicker in both years at 2 hours 14 minutes. The free flow travel time for both 2005 and 2022 is 2 hours 7 minutes.

The consistency of speeds throughout the day reflects the fact that over the majority of the route, the characteristics are of a long distance rather than a commuter route. These speeds are considered to be reasonable for a route which is predominantly single carriageway and it compares favourably to the free flow speed of 82kph (51mph). Average speed on most of the route is forecast not to change significantly by 2022.

<sup>449</sup> TMfS:05

The combination of carriageway provision on the route leads to problems of bunching vehicles. It also leads to poor perception of quality on the route.

Journey time comparisons are shown in Figure 7.6.6<sup>450</sup> for trips from Perth to Inverness along the corridor in the morning peak. This provides a comparison of car, bus and rail journey times. Rail journey times are broadly comparable with car, with the journey between Perth and Inverness being just 20 minutes longer than by car. Bus journey times are much less competitive, the journey time between Perth and Inverness being 40 minutes longer than by car and 20 minutes longer than by train. The main reason is that buses call at intermediate settlements including Carrbridge, Aviemore, Kingussie, Newtonmore and Dalwhinnie.

The combination of irregular carriageway provision and presence of goods vehicles or tourist vehicles, particularly in the summer months and holiday periods, can cause local, temporary impediments to traffic flow that impact on journey times by road and on reliability. For example, the observed journey time between Perth and Inverness can vary by approximately 30 minutes<sup>451</sup>. There are also congestion issues in the Inverness area and, in particular, on the approach to Perth which will have an increasing effect on journey times by road. This increased congestion is largely as a result of increases in local traffic growth affecting the journey times of longer distance trips. Over time, this may make rail journeys between the cities even more competitive with the equivalent journeys by road based transport but the effect is expected to be slight.

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<sup>450</sup> Journey times for bus/rail include a 20 minute walk/wait time

<sup>451</sup> <http://scottishexecutive.itisholdings.com/>

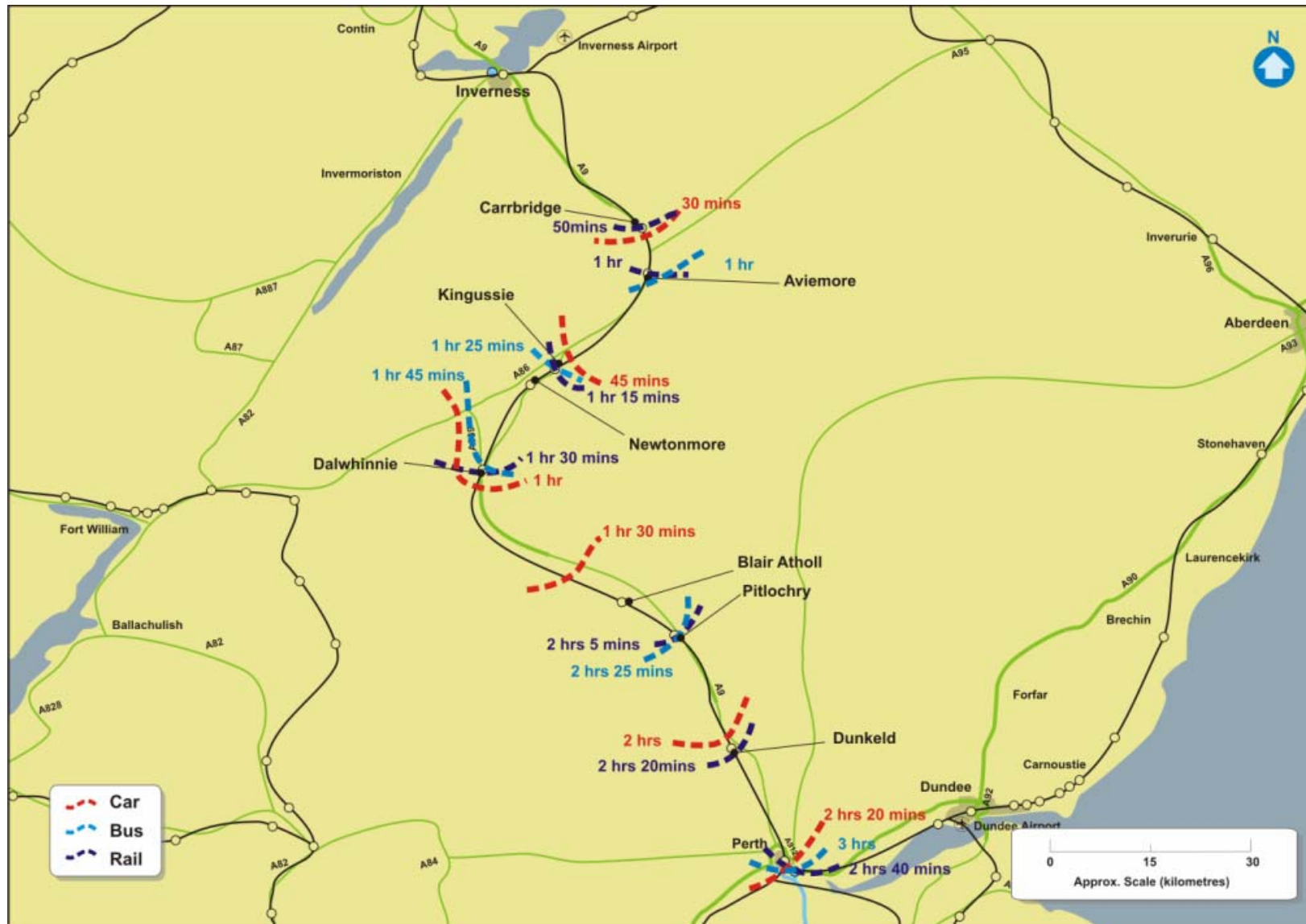


Figure 7.6.6: Journey time to Inverness City Centre (2005 AM Peak), Corridor 6 - Inverness to Perth



Currently, rail services between Perth and Inverness operate approximately every two hours although infrastructure constraints can result in infrequent and irregular services. The first services in the morning from Perth do not arrive in Inverness until after 10:00, however, there is one commuter service from Kingussie to Inverness which arrives before 09:00. This combined with the long journey times, particularly in the case of bus, does not facilitate commuting between the two cities by bus or train. Increasing congestion at both ends of the corridor is likely to affect road journey times including those by bus.

It is worth noting that it is planned to introduce an hourly skip stop rail service between Perth and Inverness and other timetable alterations to maximise the role of Perth and Inverness as key interchange stations<sup>452</sup>.

### Emissions (CO<sub>2</sub> only)

This section of the report addresses the issue:

- What is the level of transport based emissions within the corridor?

CO<sub>2</sub> per person kilometre is forecast to rise from 117 tonnes / million person kilometres to 141 tonnes / million person kilometres between 2005 and 2022 in this corridor. This is a result of CO<sub>2</sub> emissions rising, whilst person kilometres drop, between 2005 and 2022<sup>453</sup>.

The road based transport network produced 190,500 tonnes of CO<sub>2</sub> in Corridor 6 in 2005. This equates to approximately three per cent of the total road based transport related CO<sub>2</sub> emissions in Scotland.

By 2022, it is forecast that CO<sub>2</sub> emissions in Corridor 6 will rise to around 217,000 tonnes, remaining at around three per cent of Scotland's road based transport related CO<sub>2</sub> emissions in 2022.

The rail network produced 4,000 tonnes of CO<sub>2</sub> in Corridor 6 in 2007. This equates to approximately five per cent of the total rail based CO<sub>2</sub> emissions in Scotland<sup>454</sup>.

Therefore, it is estimated that the road and rail based transport network collectively produced 194,500 tonnes of CO<sub>2</sub> in Corridor 6 in 2005. This equates to approximately three per cent of the total road and rail based transport related CO<sub>2</sub> emissions in Scotland.

### Quality / Accessibility / Affordability

The following paragraphs address the issues of:

- Does public transport provision match origin / destination analysis?
- How competitive is public transport compared with the car?
- Do capacity issues impact on public transport service? and

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<sup>452</sup> Scotland's Railways

<sup>453</sup> TMfS:05

<sup>454</sup> AEA (2001) Rail Emission Model Final Report; [www.nationalrail.co.uk](http://www.nationalrail.co.uk); and [www.networkrail.co.uk](http://www.networkrail.co.uk)

- How safe is the network?

Overall, outside of the immediate area of access to the main road and railway, accessibility measures are low. Even within the core access area, the infrequent bus and rail services place those dependent on them particularly at a disadvantage. In the future, this situation is forecast to remain largely unchanged with the possibility that those dependent on public transport will become even more disadvantaged as public transport services are further reduced as access by private car increases. Even car users have relatively long journeys to gain access to social and employment opportunities.

Access to key services by both car and public transport is generally better in the more populated parts of the corridor; particularly the closer you are to Inverness and Perth.

The infrastructure and service provision potentially enable effective business interaction between and among the centres of this corridor, with commuting opportunities by public transport and private car allowing return journeys to be made within a working day, although due to geographic considerations this is unlikely over longer distances.

Table 7.6.2, provides an assessment of the quality of strategic bus services within the corridor on a scale of one to five, with one being 'poor' and five being 'excellent'.

**Table 7.6.2: Assessment of Bus Service Quality<sup>455</sup>**

Operators	Annual Bus Journeys	Reliability	Frequency	Simplicity	Value	Coverage	Vehicle Quality
Citylink (Megabus)	9,300	4	3	4	3	4	4

As Table 7.6.2 shows, the reliability, timetable simplicity, coverage and vehicle quality of bus services within the corridor are all considered to be 'good' whilst the frequency and value of services are considered to be 'average'.

While the accident rate on the A9 is lower than the national average of 15.5 accidents per 100MVKm, the proportion of fatal and serious accidents (39 per cent) is significantly greater than the national average of 25 percent. This is likely to be the result of lower volumes of traffic, travelling on a single carriageway road at relatively higher speeds. When accidents occur, they are more likely to be severe<sup>456</sup>. This can result in significant delays for traffic using the A9 at these times<sup>457</sup> and the lack of alternative diversion routes can compound the delay on affected traffic.

<sup>455</sup> Bus Users UK (Qualitative Assessment – 1: very poor; 5: excellent)

<sup>456</sup> Transport Scotland SERIS Database

<sup>457</sup> Chapter 5 – A9 Perth to Inverness Economic Appraisal Study – Final Report, HITRANS and Highlands and Islands Enterprise, October 2007

As might be expected in a largely rural area where many public transport users will be 'regulars', just three per cent of male and six per cent of female bus users in Perth and Kinross state that they do not feel safe travelling in the evening. This compares very favourably to the national averages of 16 and 30 per cent, suggesting that perceived security should not be a significant barrier to bus use in this area. Information regarding perceived security for Inverness and the Highlands is not available<sup>458</sup>.

### Summary of Infrastructure and Operational Constraints

Key constraints and congestion points are shown in Figure 7.6.7.

In terms of the rail network, there are areas of constraint between Inverness and Perth. The rail line in the corridor is predominantly single track, with passing loops at stations between Dalwhinnie and Culloden Viaduct, and between Stanley Junction and Blair Atholl. This single track layout impacts upon the operation of rail services within the corridor making it difficult to accommodate both express services and an all-stop service.

In addition to these constraints, the following is also of relevance for the STPR:

- The carriageway width of the A9 and the lack of alternative routes can lead to delays to other traffic following an accident, other incident or slow traffic. It is recognised that the A82 may provide an alternative route between Inverness and Dalwhinnie, albeit with a significant diversion, however there is no alternative route between Dalwhinnie and Perth;
- Parts of the A9 are prone to closure during periods of bad weather<sup>459</sup> due to the elevation of certain sections of the road through the Cairngorms. The A9 has also been affected by landslips in recent years;
- A9 operating at or over capacity between Perth and Pitlochry;
- The rail route within the corridor is also affected by periods of bad weather and landslips in a similar way to the A9; and
- Perth and Inverness railway station car parks currently operate at capacity.

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<sup>458</sup> Scottish Household Survey 2003/2004: Perceptions of safety from crime during evening bus/rail travel

<sup>459</sup> National Driver Information and Control System Strategy and Implementation Plan, Scottish Executive, 2006

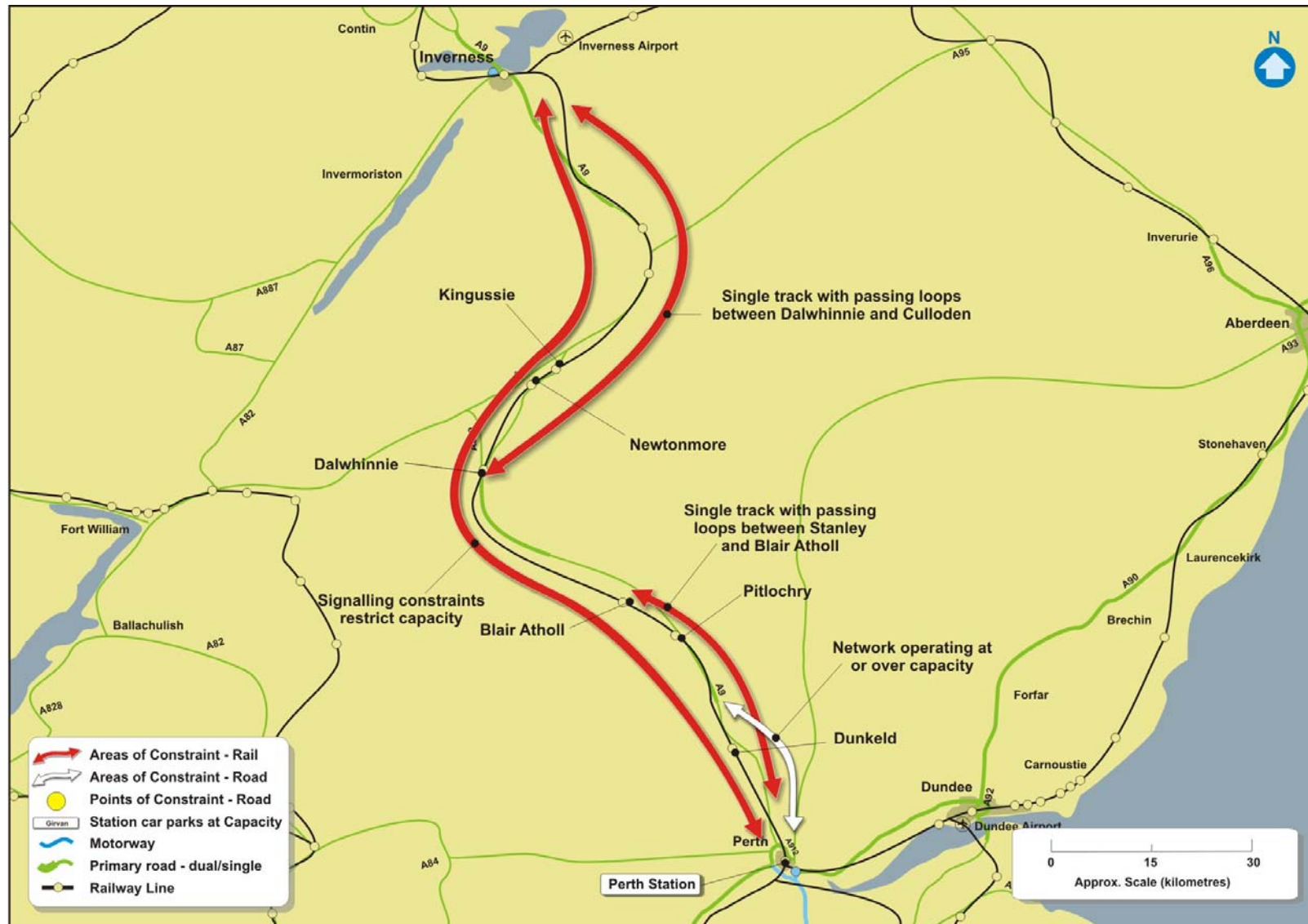


Figure 7.6.7: Areas of Constraint on the Network, Corridor 6 - Inverness to Perth

#### 7.6.5 Summary and Conclusions

##### **Overall, how well does the transport network perform?**

With the exception of the A9 between Perth and Pitlochry, which suffers from congestion particularly at peak times and has single carriageway sections that are operating over design capacity, the road network in the corridor is operating effectively.

However, slow agricultural, freight or tourist vehicles on single carriageways can cause local, temporary impediments to traffic flow that impact on journey times by road and on reliability particularly during the summer months and holiday periods. Accidents can also have an effect on journey times and reliability.

The higher than average proportion of fatal and serious accidents is a cause for concern on the corridor.

Rail journey times are broadly competitive with car. However the need to interchange at Perth for some longer distance services, impacts on the competitiveness of rail for trips to the Central Belt. Bus journey times are also broadly competitive with car or rail.

Currently, rail services between Perth and Inverness operate approximately every two hours but infrastructure constraints can result in infrequent and irregular services and make timetabling difficult. The first services in the morning do not arrive in Inverness until after 10:00. Timetable improvements should help address this.

##### **Will the transport network meet future demand, particularly in areas of economic activity?**

Traffic on the single carriageway between Perth and Pitlochry is forecast to exceed the design capacity. At the northern end, congestion at Longman Roundabout will also continue to be an issue. Average speeds are not forecast to change by 2022 on much of the route.

The programmed road improvement schemes (eight in total) which are either under construction or are planned for the near future will address most safety issues and lack of overtaking opportunity.

##### **What are the key drivers that will impact on performance in the future?**

The corridor is a largely strategic link between northern and southern Scotland with nearly two thirds of trips being to destinations outside the corridor. This means that the future performance will be influenced significantly by the economic performance of areas outside the corridor.

Within the corridor, both population and housing supply is expected to increase by 2022. Employment is also expected to rise. Car ownership is currently above the national average reflecting a greater dependence on the car due to the dispersed rural nature of the corridor. Future car ownership levels are expected to increase in line with economic growth and to remain above the average for Scotland.

### What are the key problems associated with delivering the KSOs?

The A9 between Perth and Pitlochry suffers from congestion particularly at peak times and has single carriageway sections that are operating over design capacity.

Accidents and slow agricultural or tourist vehicles on single carriageway sections of the A9 have a more transient impact on journey times and reliability but traffic can be severely disrupted when any accident occurs. These will be addressed to some extent by the programmed schemes.