6 Performance of the Strategic Nodes

6.1 Inverness

6.1.1 Setting the Context

The city of Inverness is the 'Capital of the Highlands' and is Scotland's most northerly city. It has a population of approximately 41,000 people[262], approximately one-fifth of the overall Highland population of 215,000 people[263].

Inverness is the regional centre providing opportunities for employment, leisure and retail in the Highlands. The city's economy is based on the tourism / service sector.

Figure 6.1.1 highlights the areas of particular relevance within the context of STPR. This shows the key areas of economic activity and the principal components of the transport network that supports the city region. The city centre is the key concentration of economic activity where it records an employment density of 6.3 strategic jobs per hectare, higher than the local average. Key employment sectors include the financial and business services, life sciences and tourism. Table 6.1.1 summarises relevant socio-economic indicators for Inverness.

[262] General Register Office for Scotland Mid-2004 population estimates for town/city populations: http://www.gro-scotland.gov.uk/files1/stats/04mid-year-estimates-localities-table3.xls
[263] 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

Table 6.1.1: Summary of Socio-Economic Indicators

Indicator	Inverness	Region HITRANS	Scotland	UK
Population (2005)[264]	41,000	437,000[265]	5,078,000	60,000,000
Population (2022)[266]	43,500	428,000[265]	5,118,000	62,400,000
Population Change (2005 – 2022)[266]	6%	-2%	+1%	+4%
Employment (2005)[266]	31,800	195,300	2,330,900	27,900,000
Employment (2022)[266]	39,750	241,000	2,427,800	29,300,000
GVA per head (2004)[267]	£14,600	£11,820	£15,500	£16,200
Cars/Capita (2005)[268]	Figure Unavailable	0.44	0.39	0.42
Households with Car (2005)[269]	67%	74%	67%	75%

Population and employment in Inverness is expected to increase, however housing pressures exist in Inverness[270] which is leading to an increased demand for new housing outside Inverness. A masterplan[271], encompassing development immediately east of Inverness and at a number of towns along the A96 is under review. This strategy includes new housing, commercial development, regeneration and new public amenities, all of which are likely to increase demand to travel, particularly on the eastern approach to the city.

Capacity exists for major housing development to the south of the city, with committed funds available for road infrastructure improvements in this area[270].

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[264] General Register Office for Scotland Mid-2004 population estimates for town/city populations: http://www.gro-scotland.gov.uk/files1/stats/04mid-year-estimates-localities-table3.xls
[265] 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
[266] TELMoS
[267] Scottish Economic Statistics 2007
[268] STS No. 25 (2006)
[269] Scotland's Census 2001 www.scrol.gov.uk Table KS17
[270] Inverness Local Plan, March 2006
[271] Inverness City-Vision (Inverness City Partnership) , May 2006

Overall, employment levels are projected to increase from 31,800 to 39,750 between 2005 and 2022 in Inverness and from 195,300 to 241,000 between 2005 and 2022 in the HITRAN area. The economic inactivity rate within the Highlands area was around 16 per cent in 2006 which was lower than the national average of 21 per cent. Median gross weekly earnings in the Highlands are 6 per cent below the national average for Scotland of £412. Inactivity rates are projected to decline in Inverness from 11,200 in 2005 to 3,000 in 2022.

Within the city, 67 per cent of households have access to a car which is in line with the Scottish national average[272]. Future projections suggest that the number of households will increase, indicating a fall in household size.

Although the current population forecasts show no significant change in the population within the Inverness area, the current Inverness Local Plan[273] identifies the A96 corridor (towards Aberdeen) as a major strategic economic development opportunity. A total of 396ha of land has been allocated for economic development on this corridor linked to the A96 via direct or distributor roads. It is estimated that the population could increase by approximately 40,000 people in this corridor by 2041. Economic development on this scale is likely to generate a significant increase in travel demand between Corridor 4 and Inverness and within the strategic node itself.

[272] STS No. 25 (2006)
[273] The Highland Council: Inverness Local Plan, 2006

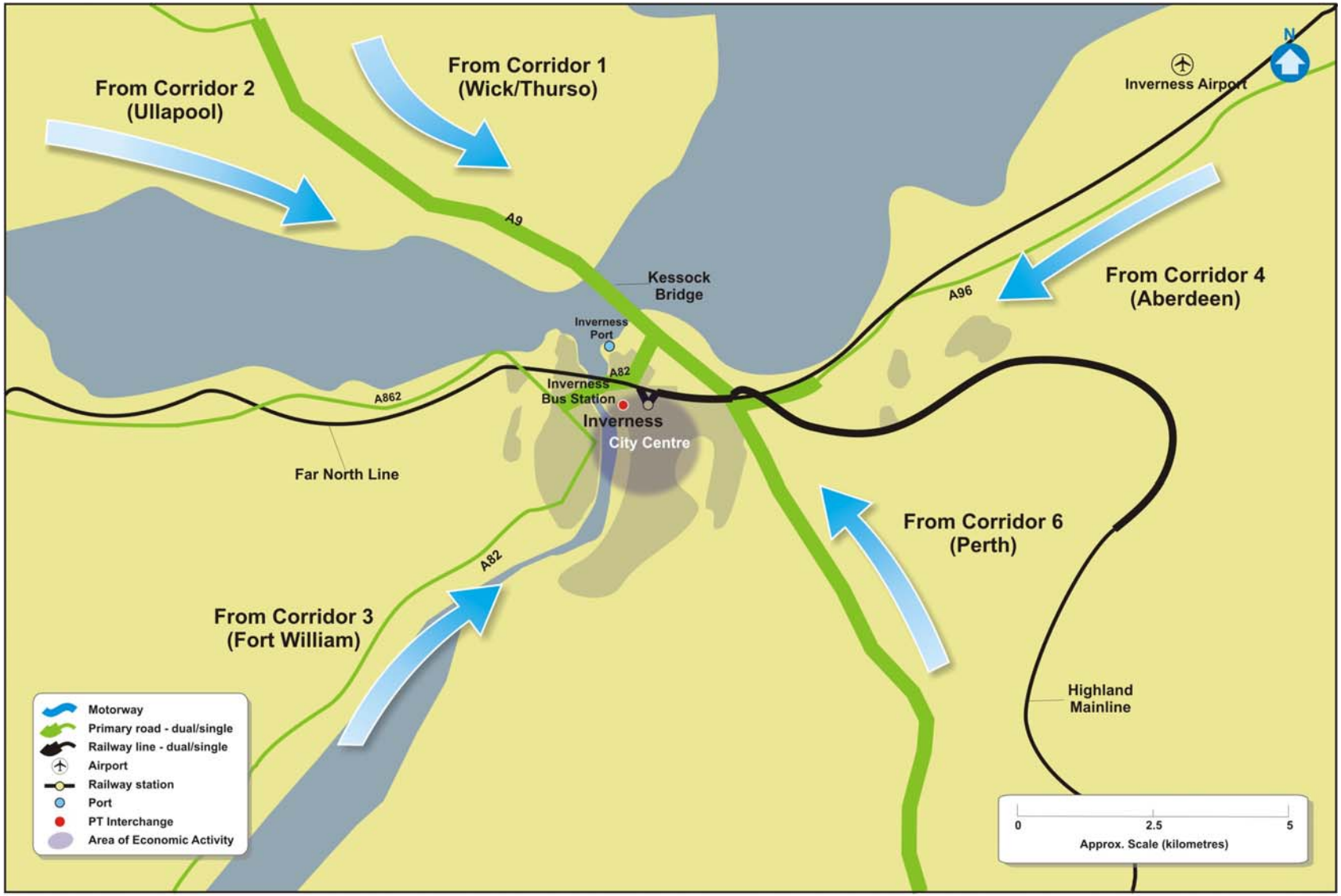

Figure 6.1.1: Setting the Context, Inverness Strategic Node

6.1.2 Transport Network and Operations

Infrastructure and Services

As Figure 6.1.1 shows, Inverness is at the crossroads of routes linking the far north of Scotland with the south. The A96 links east to Aberdeen (Corridor 4), the A82 southwest to Fort William (Corridor 3), the A9 north to Thurso (Corridor 1) and south to Perth (Corridor 6). Rail routes from Inverness provide connections to Kyle of Lochalsh, Thurso, Wick, Aberdeen and central Scotland via Perth. In addition, Inverness Airport provides an international gateway for the city and the Highland council area.

The centre of Inverness is bisected by the River Ness and there are only three vehicle crossing points in the urban area: the A82; Grant Street; and Young Street. In addition, there is one railway bridge and a number of pedestrian bridges along the river.

The A9 provides a dual carriageway bypass to the north east of the city centre. It also links the A96 and A82 and provides a route for all north-south through traffic to avoid the city centre. Apart from through the city itself, the road network in the area is generally single carriageway with sections of dual carriageway that facilitate over-taking.

Inverness railway station is located in the centre of Inverness with road access from the B865. The railway station currently caters for some 823,000 passengers per annum (2005) [274] and is the 22nd busiest station in Scotland. The frequencies of rail connections from Inverness vary between the corridors served. Service patterns are generally[275]:

- Four trains per day between Inverness and Kyle of Lochalsh;
- Ten trains per day between Inverness and Aberdeen;
- Ten trains per day between Inverness and Perth (extending to Glasgow and Edinburgh);
- Three trains per day between Inverness and Thurso / Wick;
- One train per day between Inverness and London Kings Cross[276]; and
- One overnight sleeper service between Inverness and London Euston.

Rail commuters in Inverness are currently served by Invernet. Invernet is a suburban rail network which serves Inverness and the city's surrounding area. The timetable opened on the 12th of December 2005 and is supported by the Highland Rail Partnership and has been funded for 3 years by Highland Council, Highlands and Islands Enterprise and the Scottish Government. ScotRail will take over the Invernet operations under the new franchise agreement after these 3 years[277].

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[274] Rail industry LENNON data (Station Usage 2004/2005)
[275] First ScotRail: http://www.firstgroup.com/scotrail
[276] National Express East Coast: http://www.nationalexpresseastcoast.co.uk
[277] http://www.invernet.info/home.html

The infrequent nature of services leads to overcrowding on peak hour services. There are limited rail freight services operating to, from or through Inverness. These include a weekly flow of cement from Dunbar to Inverness and a weekly flow from BP Grangemouth to Lairg.

Inverness bus station is located on Margaret Street in the city centre and near to the railway station. It serves both long distance coach services to Aberdeen, Glasgow and Edinburgh, as well as more local based bus services. The bus station has been upgraded relativity recently with funding from the Scottish Government's Public Transport Fund.

Bus services from Inverness to Aberdeen depart every one to two hours during the day, while services to Perth depart every two hours. Services to Wick are every three hours and the Mallaig service every four hours. There are two daily services to Ullapool.

Urban buses are mainly operated by Stagecoach in Inverness. The network is primarily commercial, and the company has invested in new vehicles. There is a complex and comprehensive network of eight routes, most of which are cross city.

Most city bus services have a frequency of between ten and 30 minutes during the daytime, with limited evening and very limited Sunday services. Highland Country Buses (Rapsons) also run one city route on a half hourly basis during the daytime.

Stagecoach operates a number of regular services along the A96 Aberdeen corridor, which has seen considerable investment and growth and in recent years. They also operate services to Dingwall, Tain, Dornoch and Invergordon.

Highland are the principal operator of the other rural services, and they serve other destinations across the region, such as Aviemore, Fort William, Inverness Airport, Ullapool, and Wick / Thurso (jointly with Citylink). There are also a number of local services run by small independent operators.

Citylink run longer distance coaches to Perth, Edinburgh, Fort William, Wick, Thurso and Scrabster, Portree and Ullapool.

Megabus operates to Edinburgh, Perth, Glasgow and destinations in England, and National Express run to Glasgow and England.

Inverness bus station and Inverness railway station are located adjacent to each other. Immediately in front of the station space is provided for a small number of short term and disabled parking spaces together with a drop-off / pick-up bay for passengers.

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

Asset Management

The condition of the trunk road network pavement in Inverness has been covered by the residual strength analysis of parts of Corridor 1 (Inverness to Wick/Thurso and Northern Isles, section 7.1.2), Corridor 3 (Inverness to Fort William/West and Western Isles, section 7.3.2), Corridor 4 (Aberdeen to Inverness, section 7.4.2) and Corridor 6 (Inverness to Perth, section 7.6.2).

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

Demand Management

There has been some investment in bus priority measures in the city but reliability has been compromised by congestion caused by unrestricted car access to the city centre.

Currently, there is a short length of bus lane on Bank Street. Most roads into the city centre of Inverness are too narrow and closely built up to allow provision of bus lanes, although this may be possible in the suburbs, particularly in the eastern part of the town where bus journeys are disrupted by congestion. Car parking is available at a number of railway stations and the station car park at Inverness is close to capacity.

Programmed Schemes

There are currently no programmed schemes for Inverness however of relevance is the Highland Council's consideration of the Inverness Southern Distributor Road.

6.1.3 Travel Patterns

TMfS:05 does not adequately cover the full extents of Inverness. As such, data has been taken from the emerging Highland model which is being developed further in conjunction with TMfS:05, which became available for use in later packages at the end of 2007.

Table 6.1.2 provides a summary of the volume of trips entering and leaving Inverness per day. Figure 6.1.2 also highlights the origins and destinations of the trips travelling to and from Inverness, however also includes through trips.

Table 6.1.2: Summary of Demand (12 hour) and Public Transport Share 2005[278]

Corridor Approach	2005	
	Total Trips	PT Share
Thurso / Wick / Dingwall	15,800	7%
Ullapool	8,000	12%
Mallaig / Western Isles	4,300	2%
Aberdeen	24,700	15%
Perth	5,400	9%
Total	58,200	11%

Almost half of all trips (24,700) are to / from Corridor 4 (towards Aberdeen.) Just under a third of all trips (15,800) are to / from Corridor 1 (towards Wick / Thurso) and 14 per cent of trips (8,000) are to / from Corridor 2 (towards Ullapool).

The highest public transport mode share is fifteen per cent (some 3,700 trips) to and from Corridor 4 (towards Aberdeen). Corridor 2 (towards Ullapool) has a public transport mode share of 12 per cent, however this accounts for less than 1000 trips. The public transport mode share for trips from all other corridors is low due to the predominately rural nature of the surrounding area and the generally low frequency of public transport services.

Forecasts of future travel demand are not available at present; however forecast increases in population and employment within Inverness are likely to result in significant increases in travel demand.

[278] TMfS:05H

Table 6.1.3 – Daily Traffic Flows on Routes to Inverness

Corridor	Road	AADT	Percentage HGV
Inverness to Wick / Thurso and Northern Isles	A9 Inverness – Tore Roundabout	15,000-26,000	9-10%
Inverness to Ullapool and western Isles	A835 Tore Roundabout – Maryburgh	9,700	5%
Inverness to Fort William / west and western isles	A82 Inverness – Fort William	2,400 – 6,900	20-28%
Aberdeen to Inverness	A96 Fochabers – Inverness Airport Roundabout	8,900– 17,300[279]	4-5%
Inverness to Perth	A9 Carrbridge – Inverness	8,500 – 10,800	7-8%

Inverness airport is located on Corridor 4 (Inverness to Aberdeen) to the north of the A96 and is accessed via the B9039. Passenger numbers are around 590,000 per year and are increasing at a rate above ten per cent per year[280]. The airport handled 894 tonnes of freight in 2005 which was a decrease of four per cent over the previous year[281].

Inverness sea port does not cater for passengers although it has a throughput of 665,000 freight tonnes per annum[282]. Much of this throughput completes its onward journey by road.

The central forecast for the airport is for passenger numbers to increase to 1.8 million by 2030. Associated airport development is planned which will further generate traffic in the area. Table 6.1.3 shows the level of traffic and proportion of HGVs on the strategic routes surrounding Inverness.

[279] Aberdeen to Inverness Transport Corridor Study (Draft) Figure 1
[280] STS No. 25 (2006) Table 9.6
[281] STS No. 25 (2006) Table 9.13
[282] STS No. 25 (2006) Table 10.3

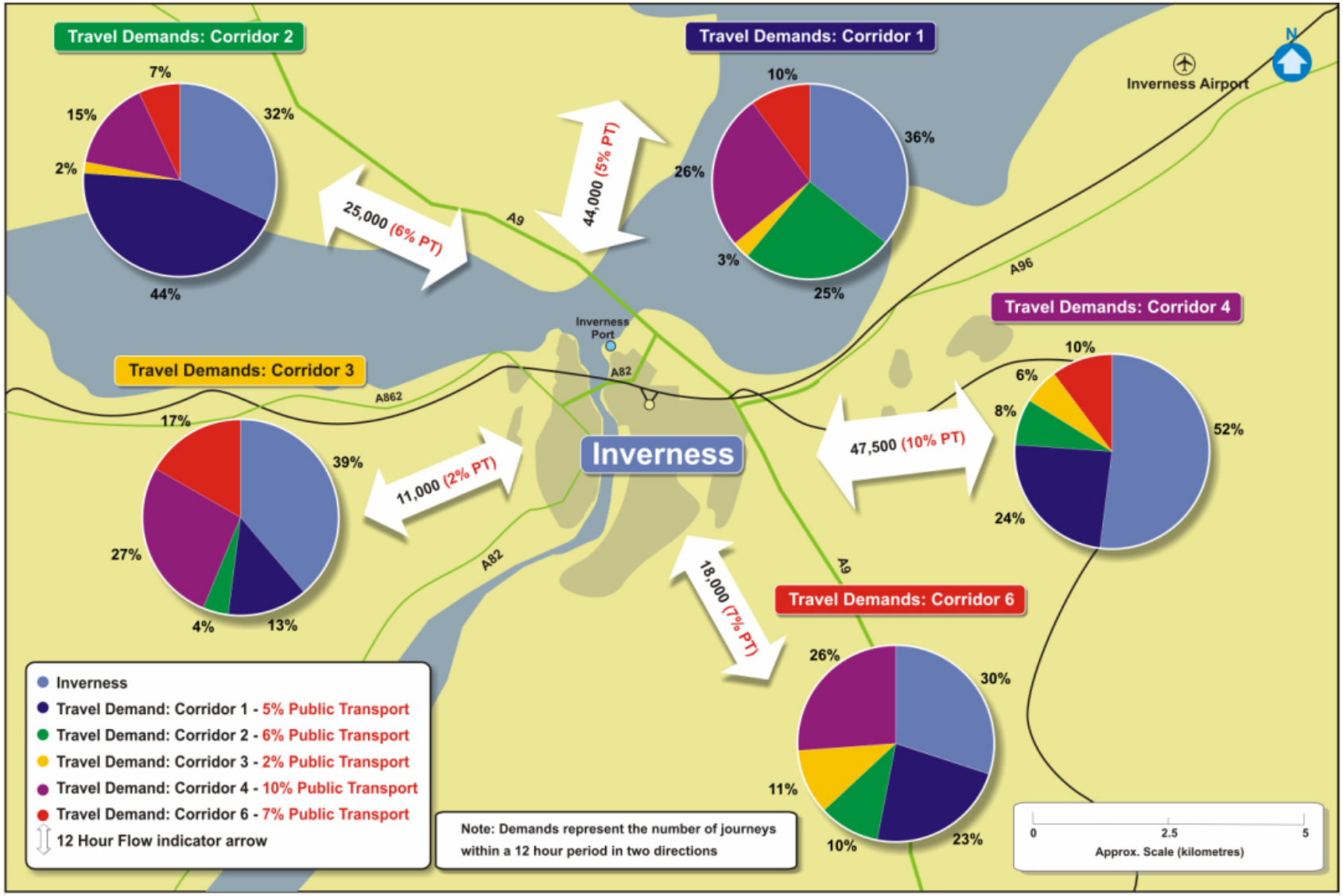

Figure 6.1.2: Travel Patterns to, through and around Inverness (2005)

6.1.4 Performance Review

Network performance is considered within the context of the three KSOs:

- Improving journey times and connections;
- Reduce emissions; and
- Improving quality, accessibility and affordability.

Journey Times and Connections

The following paragraphs address the issues of:

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

Figure 6.1.3[283] summarises typical journey times by road and rail for trips to the city centre. Approximately 88,000 (1.7 per cent) of Scotland's population live within a one hour commute of the city centre. Whilst increasing car ownership and travel demand is expected to result in lower travel speeds and increasing journey times in the city, the low level of traffic generally means that the labour catchment area is not expected to reduce significantly by 2022.

[283] Journey times for bus/rail include a 20 minute walk/wait time

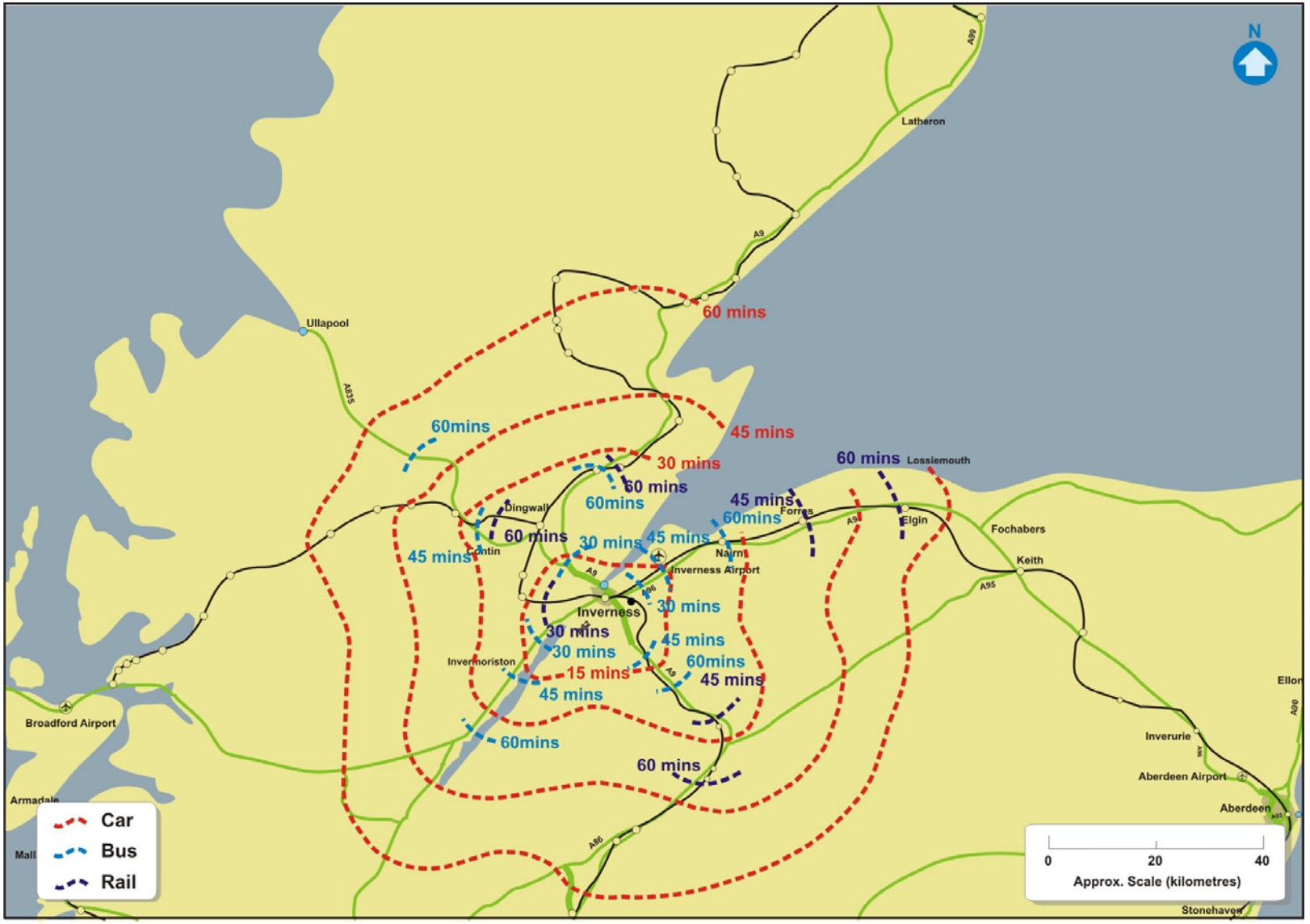

Figure 6.1.3: Journey time to Inverness City Centre (2005 AM Peak)

With Inverness being a Strategic Node the following paragraphs address the issues of:

- Is the network operating efficiently and reliably? and
- What are the delays and when do they occur?

Peak time congestion is experienced on the A9, A96 and A82 routes into Inverness and the main route through the town centre. In addition, the A82 through the town centre suffers from congestion. During the summer, tourist traffic also results in significant seasonal increases in traffic flows on the strategic corridors that meet at Inverness

In terms of the rail network, the constraints on the network are currently focused on the predominately single-track layout of the railway line, with passing loops at some stations. There are also low running speeds and indirect alignments on parts of some routes which contribute to slow journey times. The constraints, and specifically the irregular and infrequent service, lead to overcrowding on peak hour services as well as making the accommodation of both express and all-stop services difficult, ultimately hindering the express services.

These constraints have been addressed in two recent (2006) studies. The Scottish Government's 'Scotland's Railways' and Highland and Islands Enterprise 'Room for Growth' Study Final Report have proposed development strategies for the short, medium and longer terms. The Perth to Inverness route is also prone to winter weather and landslips[284].

While the above congestion issues affect trips to and through Inverness, they also impact the wider connections to Aberdeen and the central belt. These longer journeys are further affected by issues identified within the connecting corridors. (See Corridors 4, 6, 9, 10 and 12 for details of these issues.) The same principle applies to rail connections but these are further affected by timetabling constraints. The overall impact on journey times may limit effective business interaction between Inverness and the other Urban Networks.

Emissions (CO_2 only)

This section of the report addresses the issue:

- What are the level of transport based emissions within the strategic node?

CO_2 per person kilometres are forecast to rise from 142 tonnes / million person kilometres to 178 tonnes / million person kilometres between 2005 and 2022. This is a result of CO_2 emissions rising at a slightly greater rate than person kilometres between 2005 and 2022[285].

[284] http://www.scotland.gov.uk/Publications/2005/07/08131738/17395
[285] TMfS;05

The road based transport network produced 23,000 tonnes of CO_2 in Inverness in 2005 (TMfS;05). This equates to less than one per cent of the total road based transport related CO_2 emissions in Scotland. By 2022, it is forecast that CO_2 emissions in Inverness will rise to around 26,000 tonnes, still less than one per cent of Scotland's road based transport related CO_2 emissions in 2022.

Rail based CO_2 emissions within Inverness are negligible in comparison to road based CO_2 emissions, and are therefore not considered.

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?
- How integrated is the transport network?
- Do capacity issues impact on public transport service? and
- How safe is the network?

Journey times between Inverness and Aberdeen, Inverness and Kyle of Lochalsh and Inverness and Perth are similar by either road or rail transport. Journeys from Inverness to Wick by road takes around two hours 30 minutes but are around two hours longer by rail, due to low running speed and the indirect route. Rail journey times to Thurso are timetabled at three hours 45 minutes.

The expansion of rail services as a result of Invernet has created an improved timetable which serves Inverness and its surrounding settlements. Enhancements to services have increased passenger capacity and improved job opportunities for local populations surrounding Inverness. Services between Inverness and Lairg experienced a 30 per cent growth in the number of passengers in the first year of implementing Invernet[286].

Inverness bus station is close to Inverness railway station, both of which are centrally located. Local urban services are concentrated on nearby Queensgate and Union Street, so interchange is generally good.

Inverness airport is located nine miles east of the City and has seen significant growth in recent years. As a consequence, bus services have recently been improved and there is now a high quality half hourly service run by Highland from Holm Park to Ardersier via Inverness city centre and the airport. There is also an hourly daytime service from Nairn to the airport. However, there are no direct rail services to Inverness airport. Prospective passengers must interchange at Inverness bus station onto a local bus service to the airport.

[286] http://www.invernet.info/home.html

The safety[287] and security[288] of all motorised forms of transport in the Inverness area are generally better than national averages. Travel by train within the UK is generally safer than bus or car. An assessment of safety on the UK's railways highlighted that travel by train is 1.3 times safer than bus and nine times safer than travelling by car[289].

[287] Road Accident Scotland 2005Statistics (2006)
[288] Scottish Household Survey (2003/2004): Perceptions of safety from crime during evening bus/rail travel
[289] Safety on Britain's Railways, The Railway Forum December 2001

Summary of Infrastructure and Operational Constraints

Figure 6.1.4 highlights areas of constraint on the road network. This shows the focus of road congestion is located on the following five junctions:

- Raigmore Interchange;
- Inshes Junction;
- Longman Junction; and
- A82 Kenneth Street including Harbour Road Roundabout and Telford Street Roundabout.

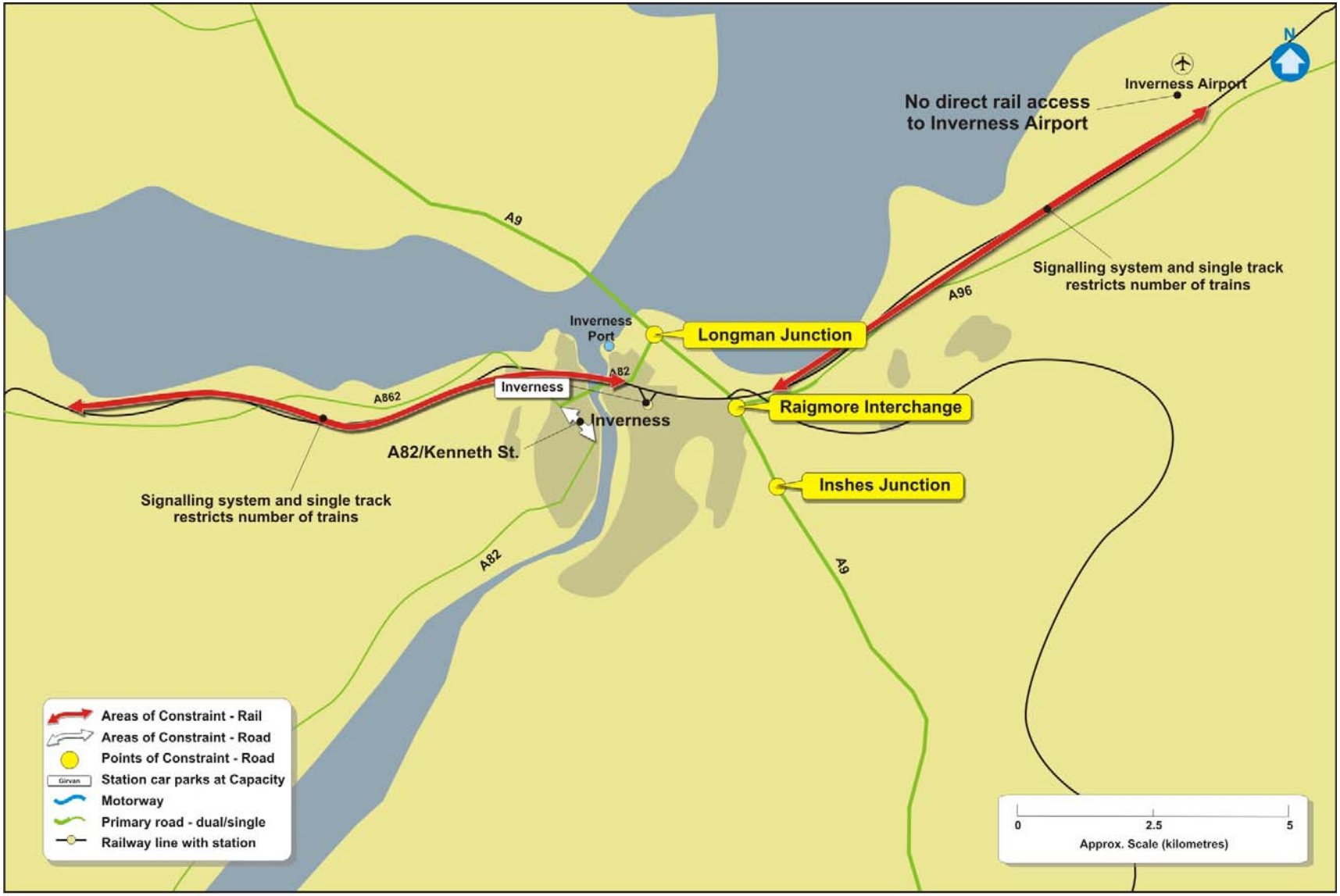

Figure 6.1.4: Areas of Constraint on the Network, Inverness

6.1.5 Summary and Conclusions

Overall, how well does the transport network perform?

For the most part, the transport network operates efficiently, however the road network experiences congestion at peak times, especially during the summer months. In addition, the rail network experiences peak time overcrowding.

The physical integration of public transport services in Inverness is considered to be good overall due to the close proximity of the bus station, and rail station in the city centre.

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

As a result of the overall increase in demand, and in particular the significant expected expansion on the A96 corridor, access to Inverness from adjoining corridors is likely to become increasingly congested. This will impact upon the performance of these strategic corridors.

While there may be opportunities for new Park-&-Ride facilities at the boundary of the city, there will be limited opportunities to integrate these with any new rail based site due to the limitations of current service patterns.

Rail overcrowding at peak times is likely to continue as a problem due to the limitations of the service pattern imposed by the current track arrangements. This may constrain potential growth in patronage in the future.

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

Expected population and economic growth is likely to increase the demand for travel to and from Inverness. Significant growth in employment and population is planned on the A96 corridor to the east of Inverness. Current local authority projections indicate a potential increase in population of 40,000 by 2041 along this corridor and a substantial increase in the number of job opportunities, as well as continued growth at Inverness Airport. This growth in demand will increase pressure on the road and rail network on the eastern approaches to Inverness.

It is likely that this expansion may provide for future expansion of city-wide bus services but there will continue to be a strong reliance on the car as the main mode of transport.

The development of Inverness is also likely to be the focus of future journeys from the adjoining corridors due to the lack of alternative major employment and shopping/leisure facilities within the region. This will lead to continuing pressure on the transport network within the city and particular during the busy tourist season.

What are the key problems associated with delivering the KSOs?

Journey times are forecast to remain an issue at the intersection of the corridors. This will be a particular problem during the tourist season. Outside these locations, the network performs satisfactorily but the expected growth in population and jobs will lead to extra pressure on the network.

Inverness is, and will continue to be, an important interchange between the A82 from Fort William, the A9 from Thurso in the north, the A9 from Perth to the south and the A96 from Aberdeen.

Over the period to 2022, congestion is forecast to worsen on all approaches to the urban area.

The public transport network within the city will be affected by any increases in the levels of congestion due to the lack of available space for bus priority measures. Improvements in the rail services are constrained by the limitations imposed by the infrastructure.

6.2 Perth

6.2.1 Setting the Context

Perth is a significant tourist destination in Scotland and is considered to be a 'gateway' to the Scottish Highlands and Islands. Perth is centrally located offering access to the Central Belt via the M9 and A9, to the north via the A9 and to Dundee and the east via the A90. Perth is currently home to about 44,000[290] people, and new housing planned for Perth will reinforce the city's current role as the population centre of the area[291]. The local economy is centred on the food and drink industries, tourism and agriculture as well as its administrative and retail centre functions. Average incomes are below the Scottish and UK averages[292], with around 14 per cent inactivity in the city.

While Perth city centre records an employment density of 3.8 strategic jobs per hectare, this is not considered to be particularly high compared to the density of other city centres. Figure 6.2.1 highlights the areas of particular relevance within the context of STPR.

[290] General Register Office for Scotland. Mid-Year 2004 population estimates.
[291] Perth and Kinross Structure Plan, 2003
[292] Scottish Economic Statistics 2006, table 4.20

Table 6.2.1: Summary of Socio-Economic Indicators

Indicator	Perth	Region TACTRAN	Scotland	UK
Population (2005)[293]	44,000	478,000[294]	5,078,000	60,000,000
Population (2022)[295]	37,400	458,900	5,118,000	62,400,000
Population Change (2005 – 2022)[295]	-15%	-4%	+1%	+4%
Employment (2005)[295]	25,900	201,300	2,330,900	27,900,000
Employment (2022)[295]	25,900	203,000	2,427,800	29,300,000
GVA per head (2004)[296]	£14,200	£14,500	£15,500	£16,200
Cars/Capita (2005)[297]	Figure Unavailable	0.43	0.39	0.42
Households with Car (2005)[298]	64%	68%	67%	75%

The proportion of Perth households (64 per cent) without access to a car is slightly below the Scottish national average of 67 per cent.

Overall, employment levels are projected to remain the same between 2005 and 2022 at 25,900. Median gross weekly earnings in the Perth and Kinross are 6 per cent below the national average for Scotland of £412.

Despite being the population and economic centre for the area, in national terms no specific concentrations of housing sites, major strategic industries or employers are located in Perth. As such, Perth is not considered as a nationally important concentration of economic activity.

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[293] General Register Office for Scotland Mid-2004 population estimates for town/city populations: http://www.gro-scotland.gov.uk/files1/stats/04mid-year-estimates-localities-table3.xls
[294] 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
[295] TELMoS
[296] Scottish Economic Statistics 2007
[297] STS No. 25 (2006)
[298] Scotland's Census 2001 www.scrol.gov.uk Table KS17

Figure 6.2.1: Setting the Context, Perth Strategic Node

6.2.2 Transport Network and Operations

Infrastructure and Services

As shown in Figure 6.2.1, Perth is at the crossroads of connections between the south (Glasgow and Edinburgh) and the north (Dundee, Aberdeen and Inverness).

Together, the M90 from Edinburgh, the A90 dual carriageway from Dundee and Aberdeen and the A9 dual carriageway from Glasgow, Stirling and Inverness form a bypass around the south and west of the city, allowing most long distance journeys between Dundee, Inverness and the central belt to be made without passing through Perth itself. This bypass is designed to dual carriageway or motorway standard. At-grade junctions on the A9 to the west provide for access into Perth from the bypass. To the south and east, access to and from Perth is available to and from the M90 / A90. The safety of the A90 route to Dundee has been improved recently by redesigned local access interchanges.

Perth is served by a railway station, located near the city's bus station on the south western edge of the city centre. There are direct main line rail services between Perth and Inverness, Aberdeen, Edinburgh, Glasgow, London and other stations in England. The routes to Edinburgh and Inverness both have significant lengths of single track. Perth Station is the 28th busiest in Scotland, handling 642,000 passengers per annum (2005)[299].

Service patterns are generally:

- 1 train every 2 hours between Perth and Inverness;
- 1 train every hour between Perth and Glasgow (from Aberdeen);
- 1 train every hour between Perth and Aberdeen;
- 1 train every 2 hours between Perth and Edinburgh;
- 1 train every day between Perth and London;
- 1 overnight sleeper service to London; and
- Various freight services.

Perth is the headquarters for Stagecoach and most city bus services in and around Perth are provided by Stagecoach Perth. The services provide good coverage of the city and the communities to the east of the River Tay at Gannochy and Scone.

Longer distance bus services are operated by Citylink to major centres such as Aberdeen, Inverness, Dundee, Edinburgh, Glasgow and Oban (summer only). Megabus operates to Aberdeen, Dundee, Edinburgh, Glasgow and on to England. There are also National Express services to England.

Service patterns are typically:

- 1 bus every hour between Perth and Inverness;
- 2 buses every hour between Perth and Glasgow; and

[299] Rail industry LENNON data (Station Usage 2004/2005)

- 1 bus every hour between Perth and Edinburgh.

At the Perth Park-&-Ride site (Broxden), there is a coach interchange hub for Megabus and Citylink services. Approximately 108,000 passengers per annum board or transfer from coaches at this site. Facilities include car parking, shelters, CCTV and good quality information.

Perth harbour is a small inland port around 30 miles from the North Sea, and handles coastal and dry bulk ships up to 90 metres in length. The main cargoes handled are animal feedstuffs, fertilisers, timber, chemicals and ore. Perth port does not cater for passengers although it had a throughput of 139,000 freight tonnes in 2005[300]. Much of this throughput completes its onward journey by road.

Integration of services in Perth is good for rural and long distance services. The Leonard Street Bus Station, used by most rural and many long distance services, is in the south west corner of the city centre adjacent to the railway station. Urban services are concentrated in the Mill Street and South Street areas. Mill Street is approximately 700 metres from the bus and railway stations and South Street is approximately 500 metres. Integration of rail or rural bus and most urban services is therefore less than satisfactory.

Integrated tickets in Perth are available in the form of the *PLUSBUS* ticket and the 'one-ticket'. *PLUSBUS* covers rail journeys into Perth and provides the addition of unlimited bus travel within the strategic node. The 'one ticket' gives unlimited travel on bus or bus and rail within designated zones radiating from Edinburgh towards Dundee, Perth, Stirling, Dunbar, Bathgate and Shotts.

Asset Management

Condition of the trunk road network pavement in Perth has been covered by the residual strength analysis of parts of Corridor 6 (Inverness to Perth, section 7.6.2), Corridor 9 (Glasgow to Perth, section 7.9.2), Corridor 11 (Perth to Dundee, section 7.11.2) and Corridor 12 (Edinburgh to Perth, section 7.12.2).

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

Demand Management

Perth and Kinross council operates a total of 28 charging car parks with a total of 2158 spaces and 20 free car parks providing a further 581 spaces. The centre of Perth is covered by a controlled parking zone where 1219 on street spaces are controlled by a pay and display charging system.

[300] STS No. 25 (2006) Table 10.3

Perth has dedicated bus lanes on Glasgow Road, Barrack Street and Strathmore Street. All city centre signals have a Bus Priority system whereby the traffic control system gives priority to buses that are travelling through the signals. This system of Bus Priority has been implemented at over 30 junctions throughout Perth to help reduce bus journey times[301].

There is a bus Park-&-Ride site at the M90 / A9 Broxden roundabout on the south west edge of the city with a dedicated limited stop bus running every 15 minutes. This has 250 car parking spaces. A smaller bus Park-&-Ride site at Scone is served every 10 minutes during the daytime, plus less regular rural services[302]. This has 50 car parking spaces. These are well used and provide high frequency public transport access to the city centre.

Programmed Schemes

There are no programmed infrastructure improvements for Perth.

[301] Perth and Kinross Council Website (http://www.pkc.gov.uk)
[302] Perth and Kinross Council: www.pkc.gov.uk

6.2.3 Travel patterns

Travel patterns in and around Perth are summarised in Figure 6.2.2 and Table 6.2.2. These patterns confirm the importance of the city as a strategic node for through travel between the central belt and northern Scotland. The dominant movements are Glasgow to Inverness and Dundee to Glasgow, each bypassing Perth city centre. No more than seven per cent of travel on any of the corridors is undertaken by public transport[303]. Considering trips to Perth, the largest flow is from Corridor 12 (Edinburgh to Perth) with a flow of 18,200 trips in 2005. This is forecast to reduce slightly by 2022, possibly as a result of increased employment opportunities in Corridor 9. Travel between Perth and Corridor 9 is forecast to increase by 41%. Public transport mode share is strong between Perth and Corridor 9 (Stirling) and Corridor 11 (Dundee). This may reflect the competitiveness of rail in trips between Perth and these corridors. However, by 2022 public transport mode share is forecast to decline considerably.

[303] TMfS05

Table 6.2.2: Summary of Demand (12 hour) and Public Transport Share[304]

Corridor Approach	2005		2022		Change	
	Total Trips	PT Share	Total Trips	PT Share	Total Trips	PT Share
Within strategic node	10,100	7%	17,600	4%	+75%	-2.3%
Between Perth and Corridor 6 (Inverness)	7,200	11%	5,400	12%	-24%	+0.6%
Between Perth and Corridor 9 (Stirling)	11,300	14%	16,000	7%	+41%	-7.5%
Between Perth and Corridor 11 (Dundee)	11,300	17%	10,700	8%	-6%	-8.9%
Between Perth and Corridor 12 (Edinburgh)	18,200	10%	17,600	5%	-3%	-4.8%
Corridor 6 (Inverness) to Corridor 9 (Stirling)	18,100	6%	16,900	7%	-7%	+0.5%
Corridor 6 (Inverness) to Corridor 11 (Dundee)	4,300	1%	4,700	1%	+10%	+0.5%
Corridor 6 (Inverness) to Corridor 12 (Edinburgh)	8,100	7%	7,400	5%	-9%	-1.6%
Corridor 9 (Stirling) to Corridor 11 (Dundee)	33,900	7%	41,300	6%	+22%	-1.1%
Corridor 9 (Stirling) to Corridor 12 (Edinburgh)	1,700	4%	2,800	2%	+61%	-1.3%
Corridor 11 (Dundee) to Corridor 12 (Edinburgh)	13,400	7%	17,000	6%	+27%	-1.7%
Total	137,600	9%	157,400	6%	14%	-3%

[304] TMfS05

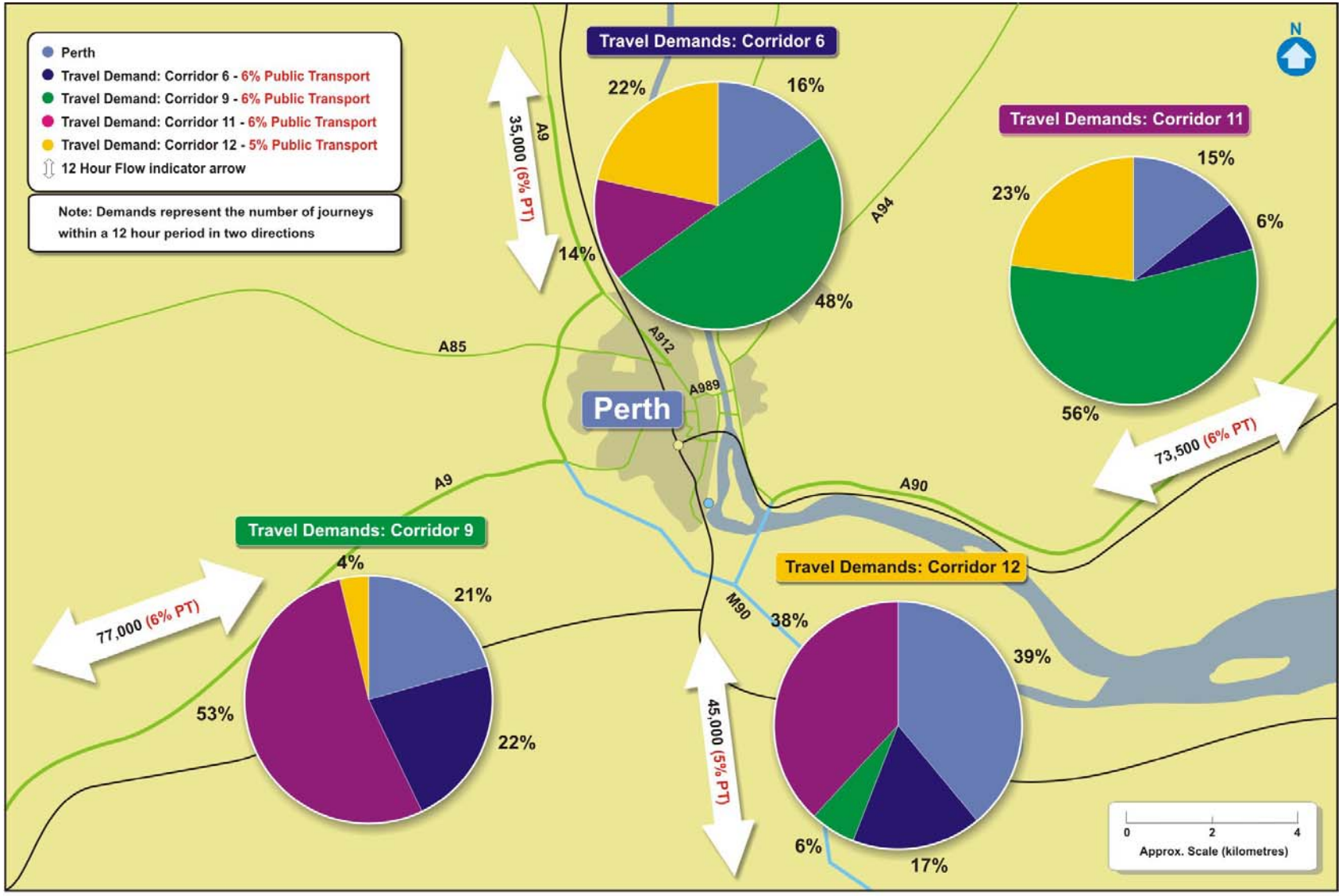

Figure 6.2.2: Travel Patterns to, through and around Perth (2022)

6.2.4 Performance Review

Network performance is considered within the context of the three KSOs:

- Improving journey times and connections;
- Reducing emissions; and
- Improving quality, accessibility and affordability.

Journey Times and Connections

The following paragraphs address the issues of:

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

Figure 6.2.3 shows current limitations and constraints on the transport network in and around Perth. Congestion at the M90 / A9 Broxden Roundabout and the A9 / A912 Inveralmond Roundabout is significant, and arises out of conflict between local access needs and long-distance travel demands between the central belt and the north of Scotland. However, recent work has been undertaken at these two roundabouts that included signalisation at Inveralmond Roundabout and realignment (north approach) and change in lane sharing (south approach) at Broxden Roundabout.

Single track rail sections on difficult profiles of curvature and / or gradient north and south of Perth are a significant constraint on the frequency and journey times of rail services between Perth, Inverness and Edinburgh. End-to-end journey times on these routes are also extended by the high number of intermediate stops. By way of comparison, average journey times from Perth to Edinburgh by rail are around 90 minutes, with one direct service every two hours; Dunblane is a similar distance to Edinburgh as Perth, has two direct services per hour with a journey time of around 60 minutes.

There are plans for the rail station to be remodelled on a more compact and accessible scale. The bus station is conveniently located close by, but separated by the Perth Inner Ring Road. Perth and Kinross Council have current plans to move the bus station alongside the railway station.

Road travel is highly competitive compared with rail for journeys between Perth and Edinburgh. This is a result of the infrequent service and longer journey times on the railway network.

The Network Rail Route Utilisation Strategy reports restricted maintenance opportunities at Perth railway station, largely due to midweek rolling stock stabling and servicing arrangements, and this acts as a barrier to improved services. However, Network Rail has recommended a new depot at Perth, subject to a qualified business case in their Route Utilisation Strategy, and they are committed to the renewal of signalling and telecoms in the Perth area[305].

Emissions (CO_2 only)

This section of the report addresses the issue:

- What is the level of transport based emissions within the strategic node?

CO_2 per person kilometre is forecast to rise from 163 tonnes / million person kilometres to 191 tonnes / million person kilometres between 2005 and 2022. The CO_2 per person kilometre is particularly high in this corridor due to the high percentage of trips made by private car. The forecast rise by 2022 is a result of CO_2 emissions rising at a far greater rate than person kilometres between 2005 and 2022[306], particularly due to further increases in private car trips.

The road based transport network produced approximately 16,500 tonnes of CO_2 in Perth in 2005[306]. This equates to less than one per cent of the total road based transport related CO_2 emissions in Scotland.

By 2022, it is forecast that CO_2 emissions in Perth will rise to approximately 19,500 tonnes, less than one per cent of Scotland's road based transport related CO_2 emissions in 2022

The rail network produced 500 tonnes of CO_2 in Perth in 2007. This equates to less than one per cent of the total rail based CO_2 emissions in Scotland [307].

Therefore, it is estimated that the road and rail based transport network produced 17,000 tonnes of CO_2 in Perth in 2005. This equates to less than one per cent of the total road and rail based transport related CO_2 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?
- How integrated is the transport network?
- Do capacity issues impact on public transport service? and
- How safe is the network?

[305] Network Rail Route Plans, Route 25 Highlands, March 2007
[306] TMfS:05
[307] AEA (2001) Rail Emission Model Final Report; www.nationalrail.co.uk; and www.networkrail.co.uk

Providing high quality, accessible and affordable transport services and networks in this area is driven by long distance travel demands between the central belt and the north, and how these demands are managed where they interact with local access needs to and from Perth city centre.

Although direct public transport services between Perth and other major Scottish cities exist, the relatively infrequent services, and in some cases, the length of journey, means that car travel options are much more competitive and this is forecast to continue into the future.

Perth railway station car park is currently operating at capacity. However, Network Rail is considering a programme of car park extensions in the central belt, which means the issue may be adequately resolved in the future, although no specific commitments have been made to date.

Summary of Infrastructure and Operational Constraints

Figure 6.2.3 highlights the areas of constraint on both road and rail network.

Points of congestion on the road network are the Inveralmond and Broxden interchanges, where there is conflict between long distance and local traffic.

In terms of the rail network, the constraints are on Perth to Corridor 12 with single track section between Hilton Junction and Ladybank. To the north Corridor 6, sections of single track to Inverness limit the frequency of services.

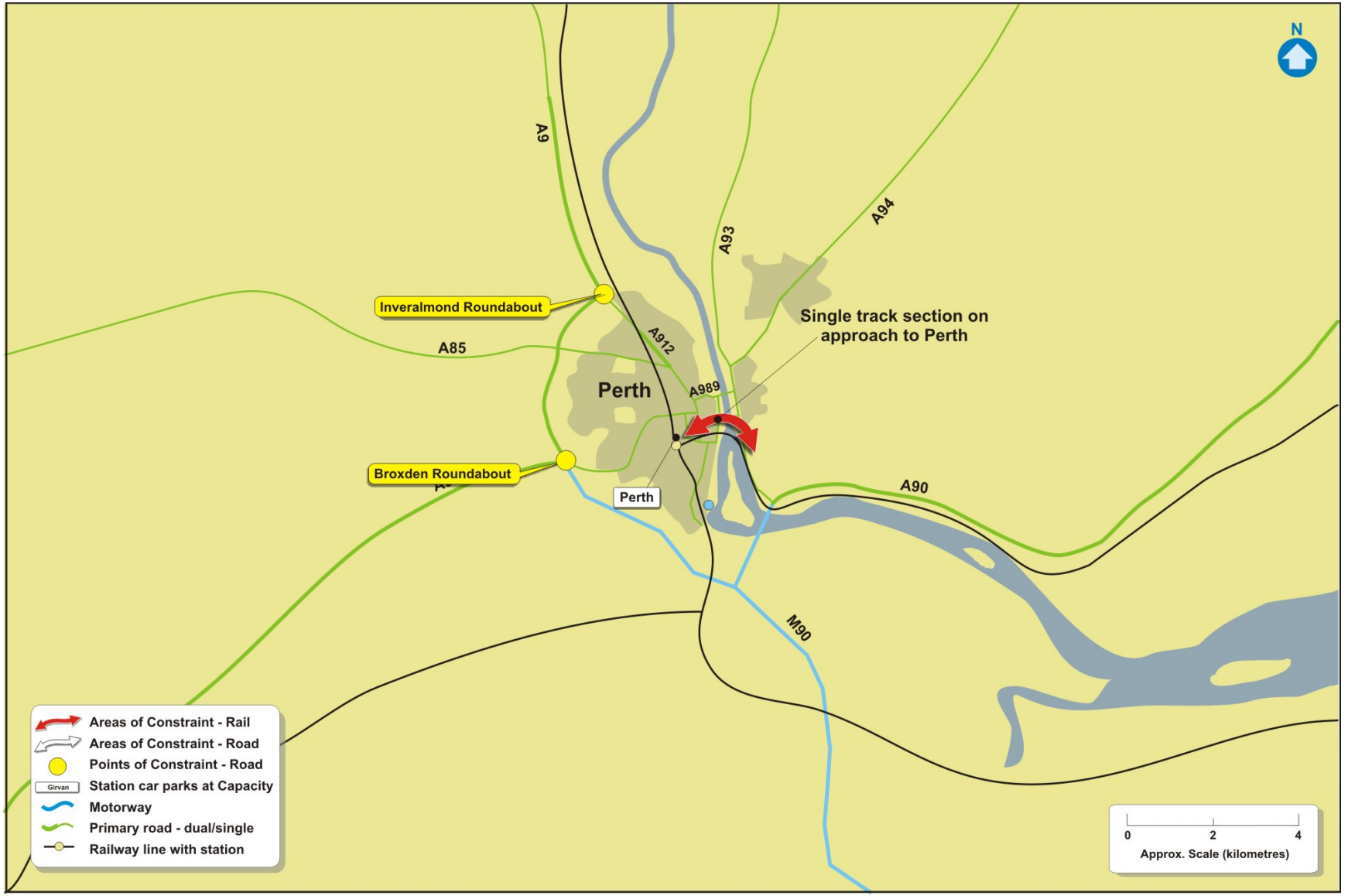

Figure 6.2.3: Areas of Constraint on the Network, Perth

6.2.5 Summary and Conclusions

Overall, how well does the transport network perform?

The road network in and around Perth operates well. Most of the corridor movements are on dual carriageway or motorway roads, which act effectively at removing national traffic from local roads within the city although through traffic can be constrained by congestion at the Broxden A9/M90 roundabout.

However, the rail network operates well for journeys to Dundee/Aberdeen and to Stirling/Glasgow, but service frequencies and journey times to Inverness and Edinburgh are constrained significantly by the slow line speeds and single track sections on these routes.

Public transport use in the area is limited, reflecting the competitiveness of the private car for longer journeys.

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

The road network is forecast to continue to offer a relatively good service in and around Perth. Any additional dualling of the A9 northwards would improve journey times and road safety.

The rail network will remain significantly constrained towards Edinburgh, although reasonably effective towards Glasgow, Inverness and Dundee/Aberdeen.

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

Economic growth in Perth will continue to add pressure to the conflict between local and national road traffic around the city. Long distance journey times to and from Inverness will be constrained by continued growth in the Highland population and economy.

What are the key problems associated with delivering the KSOs?

With road congestion not forecast to increase to significant levels on a widespread basis, the encouragement of a greater use of public transport will be dependent on investment that makes public transport more competitive, particularly on the rail network. The short term interventions of reducing journey times from Inverness, Aberdeen, Dundee and Perth to Glasgow and Edinburgh through revised stopping patterns along with timetable alterations to maximise the role of Perth as a key interchange station will greatly assist in this. So too will the medium term interventions in introducing an additional hourly commuter service from Perth to Edinburgh and introducing a faster hourly service between Glasgow/Edinburgh and Inverness.

Over the period to 2022, areas of congestion are forecast to intensify on the approaches to the urban area.