

7.9 Corridor 9: Glasgow to Perth

7.9.1 Setting the Context

Corridor 9 extends from the outskirts of Glasgow to Stirling and on to the city of Perth, as shown in Figure 7.9.1. It connects population centres located in the corridor with Glasgow and also, indirectly, with Edinburgh, via both road and rail. This corridor forms part of the main route connecting the Highlands with the Central Belt and beyond. The corridor is approximately 92 kilometres in length. The main towns and their populations are indicated in Figure 7.9.1.

The main road and rail network in the corridor performs a number of roles, with the southern section (between Glasgow and Stirling) being mainly urban in nature and serving commuter traffic to Glasgow and other areas of employment within the corridor, and the northern section (between Stirling and Perth) being more rural.

The total population within the corridor was approximately 304,200 in 2005⁵²¹. By 2022 the population is projected to increase by approximately two per cent⁵²². In general there is a population decrease in the south of the corridor and a population increase in the north.

Figure 7.9.2 shows the projected changes in population and employment over the period from 2005 to 2022. It is projected that there will be an increase in employment of approximately nine per cent⁵²¹ across the corridor with no areas showing a significant decrease in employment.

Within the corridor the highest level of economic inactivity is in the North Lanarkshire area, where the economic inactivity rate is approximately 23 per cent, compared to the national rate of 21 per cent⁵²³. East Dunbartonshire has a relatively low inactivity rate of approximately 17 per cent, with the rates in Perth and Kinross and Stirling similar to the national average⁵²³.

The median gross weekly earnings for the three council areas in the corridor are:

- East Dunbartonshire: £492;
- North Lanarkshire: £375;
- Stirling: £456. and
- Perth and Kinross £388

This equates to 120 per cent, 91 per cent, 111 per cent and 94 per cent respectively of the national average for Scotland (£412)⁵²³.

⁵²¹ TELMoS

⁵²² Transport Scotland SERIS database

⁵²³ Scottish Economic Statistics 2006, table 4.3, 4.20

The national average for car ownership, measured as a percentage of households with access to a car, is 67 per cent. Within the corridor, car ownership, with the exception of North Lanarkshire, is well above average with implications for trip making by car:

- East Dunbartonshire: 79 per cent;
- North Lanarkshire: 64 per cent;
- Stirling: 76 per cent; and
- Perth and Kinross: 74 per cent⁵²⁴.

⁵²⁴ Scotland's Census 2001: www.scrol.gov.uk, Table KS17

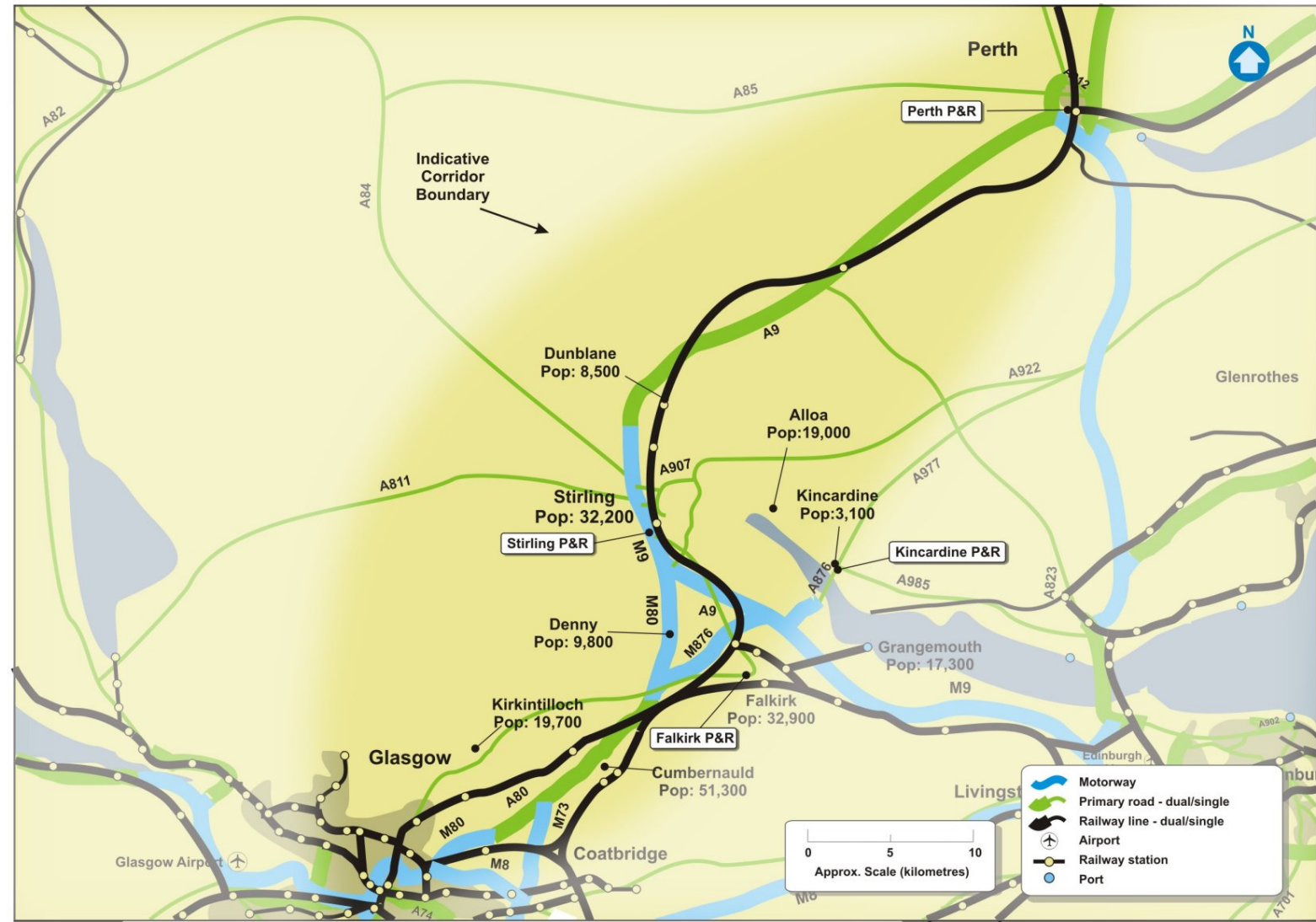


Figure 7.9.1: Setting the Context, Corridor 9 - Glasgow to Perth

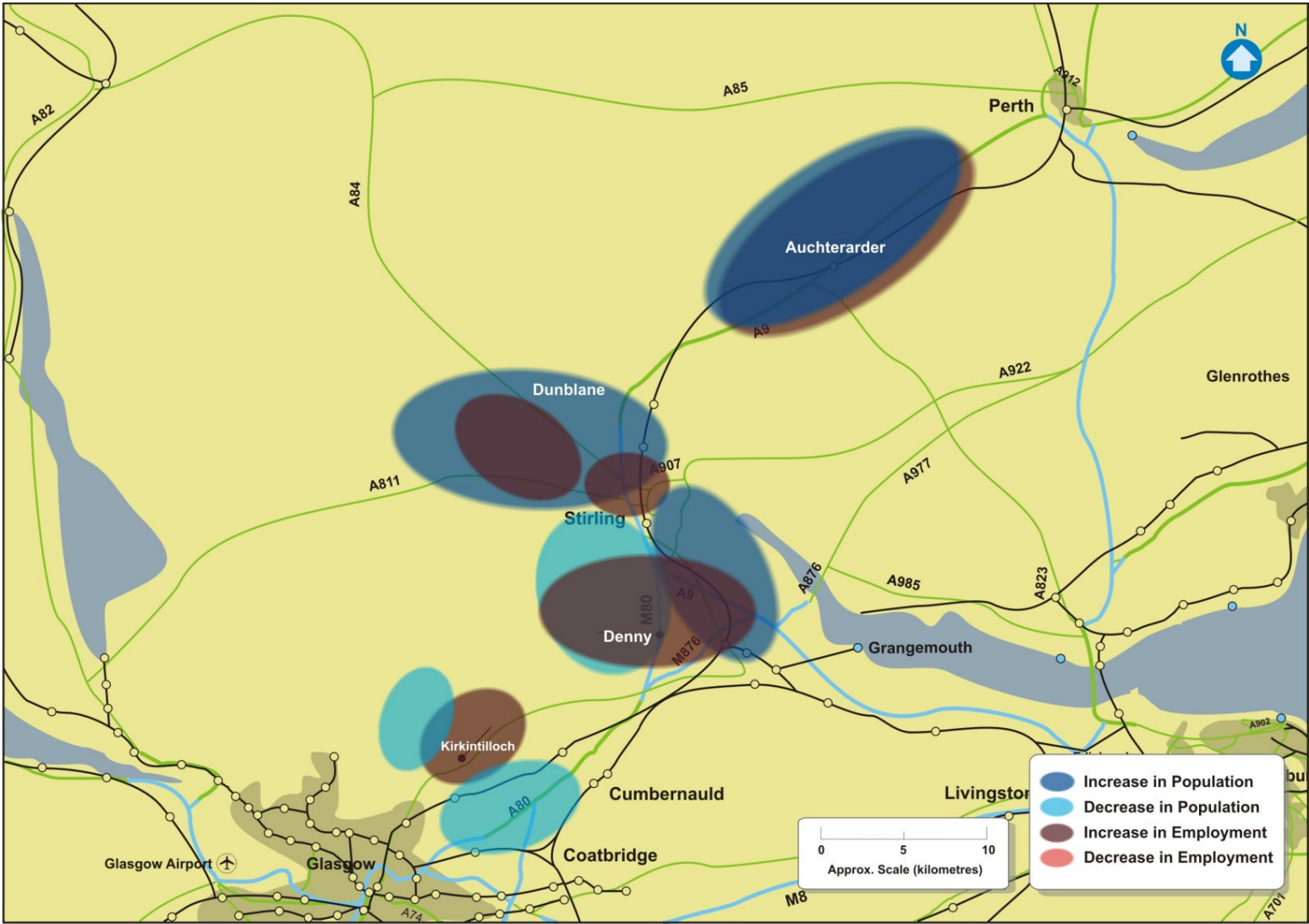


Figure 7.9.2: Changes in Population and Employment, 2005 & 2022, Corridor 9 - Glasgow to Perth

7.9.2 Transport Networks and Operations

Infrastructure and Services

The principal elements of the transport network that play a national strategic role are shown in Figure 7.9.1.

A number of key strategic road routes are connected to this corridor. The M9 and M876 provide links from the M80 east towards Falkirk, Grangemouth and the Kincardine Bridge, and the M73 provides links from the A80 south towards the M8 / A8 and M74. The main strategic road routes within the corridor are the A80, M80, M9 and A9. They are a mixture of motorway and all-purpose dual carriageway trunk roads. The dual carriageway routes include both at-grade and grade separated junctions. Other important road routes within the corridor include:

- The A803 between Glasgow and Falkirk; and
- The A872 between Denny and Stirling.

The corridor is well served by rail. Express services connect Glasgow with Perth and beyond towards Dundee, Inverness and Aberdeen. There are also local services from Glasgow to Stirling and Dunblane. The planned reopening of the Stirling - Alloa - Kincardine rail line will allow for new passenger and freight services to the east of Stirling, including a new station in Alloa. The western section of the main Glasgow to Edinburgh route, via Falkirk, is also included in this corridor. Service patterns are generally:

- One train per hour between Glasgow and Perth (to Aberdeen or Inverness);
- Two trains per hour between Glasgow and Stirling / Dunblane;
- Two trains per hour between Glasgow and Cumbernauld (alternatives extend to Falkirk Grahamston); and
- Four trains per hour between Edinburgh and Glasgow via Falkirk High.

Inter-urban bus services in the corridor operate about twice per hour during the peak periods, with half the buses serving Cumbernauld, Stirling, Dunblane and other towns not on the main M80 / M9 / A9 route.

Good integration between services is provided at Stirling where the bus station is located adjacent to the railway station and both are located close to the town centre.

Integrated tickets in the corridor are available in the form of the *PLUSBUS* ticket and the SPT ZoneCard. *PLUSBUS* covers rail journeys into Glasgow, Stirling and Perth and provides the addition of unlimited bus travel within the destination. The SPT ZoneCard is widely used and gives unlimited travel on bus, rail, subway and certain ferry services within designated zones in the SPT area which covers the southern section of the corridor.

Asset Management

In 2007, 20 per cent of the trunk road network pavement⁵²⁵ 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 cent⁵²⁶. The sections with the poorest residual strength are the A80, M9 between its junction with the M80 and its junction with the A9 and the M876 between its junction with the M80 and Kincardine. Under Transport Scotland's planned maintenance schedule, the net figure for the corridor is expected to fall slightly to 19 per cent by 2012.

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

Demand Management

Park-&-Ride opportunities are provided at most of the railway stations on the corridor. An enlarged station car park is located at Croy, which serves the west of Cumbernauld. The car park at Croy is currently at capacity; however an extension to it is programmed and is likely to mitigate this issue. There is a Park-&-Ride site at Broxden, on the southern approach to Perth, offering 250 free car parking spaces and frequent dedicated buses to the city centre⁵²⁷. Broxden is also used as an interchange by long-distance buses serving most major Scottish cities. Park-&-Ride facilities are also located near Springkerse Industrial Estate to the east of Stirling city centre⁵²⁸. Parking provision in the major towns on the corridor is in general controlled and paid. In Glasgow, payment levels for on-street and off-street parking controlled by the council are used as a demand management measure.

Programmed Schemes

The following are programmed schemes in Corridor 9 (Figure 7.9.3):

- A80 upgrade to motorway standard between Stepps and Haggs;
- Second Upper Forth Crossing;
- Kincardine Bridge refurbishment;
- Platform extensions at Bishopbriggs railway station;
- Car park extension at Croy railway station;
- Stirling - Alloa - Kincardine rail reopening; and
- Major signalling upgrade Larbert to Stirling.

⁵²⁵ Transport Scotland SERIS Database

⁵²⁶ STS No. 25 (2006) Table 5.5

⁵²⁷ Perth and Kinross Council: www.pkc.gov.uk

⁵²⁸ Stirling Council: www.stirling.gov.uk

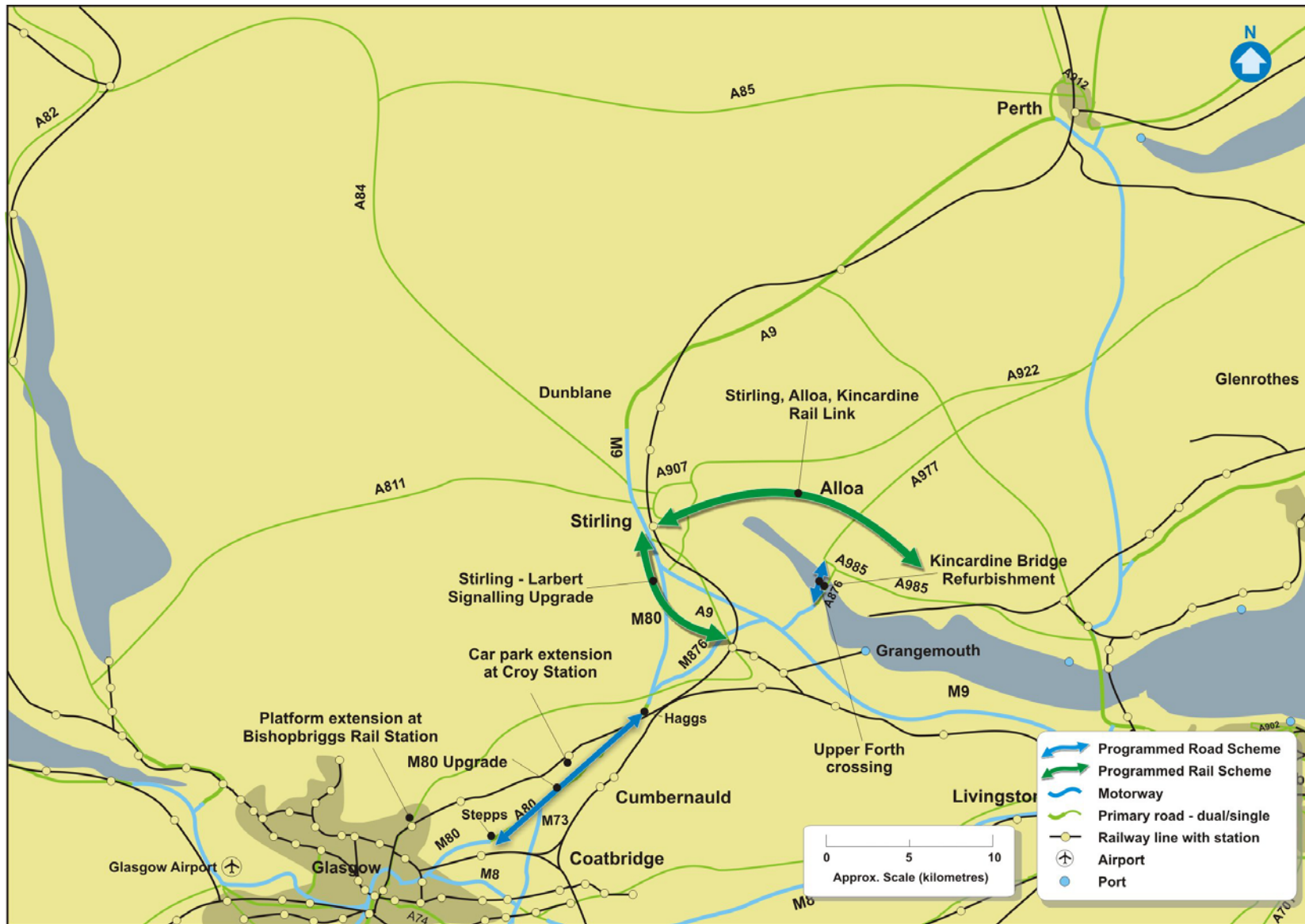


Figure 7.9.3: Programmed Transport and Land Use Developments, Corridor 9 - Glasgow to Perth

7.9.3 Travel Patterns

In 2005, during a typical 12 hour working day, there were just over 500,000⁵²⁹ trips made within the corridor, of which about nine per cent were made using public transport. It is forecast that by 2022 the total trips will increase to just over 600,000, but the number of public transport trips will decrease. Figure 7.9.4 graphically presents demand patterns within the corridor, while Table 7.9.1 details the breakdown of total trips and public transport trips within the corridor.

Table 7.9.1: Summary of Demand (12 hour) and Public Transport Share⁵²⁹

| | | Between Glasgow and Perth | Within Corridor | Between Corridor and Glasgow | Between Corridor and Perth | Between Corridor and other destinations | Total Trips |
|---------------|---------------|---------------------------|-----------------|------------------------------|----------------------------|---|-------------|
| 2005 | Total Trips | 26,800 | 204,100 | 53,300 | 2,300 | 230,400 | 516,900 |
| | % of Corridor | 5% | 40% | 10% | 0% | 45% | 100% |
| | PT Trips | 3,300 | 17,300 | 8,800 | 100 | 16,100 | 45,600 |
| | PT Share | 12% | 8% | 17% | 4% | 7% | 9% |
| 2022 | Total Trips | 29,200 | 222,800 | 60,300 | 2,900 | 300,200 | 615,400 |
| | % of Corridor | 5% | 36% | 10% | 0% | 49% | 100% |
| | PT Trips | 3,400 | 13,900 | 7,500 | 100 | 16,500 | 41,400 |
| | PT Share | 12% | 6% | 12% | 3% | 5% | 7% |
| Change | Total Trips | +9% | +9% | +13% | +26% | +30% | +19% |
| | PT Trips | +3% | -20% | -15% | 0% | +2% | -9% |

A large proportion of travel on the corridor (40 per cent) includes trips that remain within the corridor. In addition to local trips, this will include a significant level of commuter travel between Stirling, Cumbernauld and Falkirk. Glasgow represents the single most popular destination for trips, with 10 per cent of all trips in the corridor travelling to or from the city.

The movement between the corridor and Glasgow has the highest share of public transport use at around 17 per cent, while public transport mode share for trips between Glasgow and Perth is 12 per cent.

⁵²⁹ TMfS:05

ATC data from the SRTDb gives a figure of approximately nineteen per cent HGV traffic on the M73 at Gartcosh, and of twenty per cent on the A80 at Cumbernauld⁵³⁰. This route experiences a high percentage of HGV traffic and as such is important for freight.

By 2022, total trips within the corridor are expected to have increased by approximately 19 per cent from 2005 reflecting the increase in both population and employment in the corridor. Within the same time period the percentage of those trips that are made by public transport is projected to decrease from approximately nine per cent to seven per cent of total trips. These changes are based on an unchanged level of bus service provision, which given the levels of projected development, is likely to underestimate future usage. In contrast, rail trips are forecast to increase approximately 30 per cent over the same period.

Analysis of the projected 2022 trip movements indicates that over half of the trips travelling northbound at the northern extent of the corridor towards Perth will continue east towards Dundee, and a further 20 per cent to Inverness. This highlights the significant level of demand between Glasgow and locations to the north and east of Perth. It also emphasises the fact that this particular corridor is only one section of the long distance route between the Central Belt and the north of Scotland. Of the southbound trips at the southern extent of the corridor towards Glasgow, the majority travel into Glasgow (76 per cent) with 10 per cent and 12 per cent respectively travelling to Corridor 15 (Ayrshire) and Corridor 18 (Lanarkshire and the South). This confirms the significance of Glasgow as a generator of demand.

The main railway stations in this corridor have a total throughput of some 5.4 million passengers per annum (2005), with most of the passenger trips passing through Stirling⁵³¹.

Perth port does not cater for passengers. Perth port had a freight throughput of 139,000 tonnes in 2005⁵³². Much of this throughput completes its onward journey by road.

⁵³⁰ SRTDb

⁵³¹ Rail industry LENNON data (Station Usage 2004/2005) The total rail passenger trips do not include SPT zonecard trips

⁵³² STS No. 25 (2006) Table 10.3

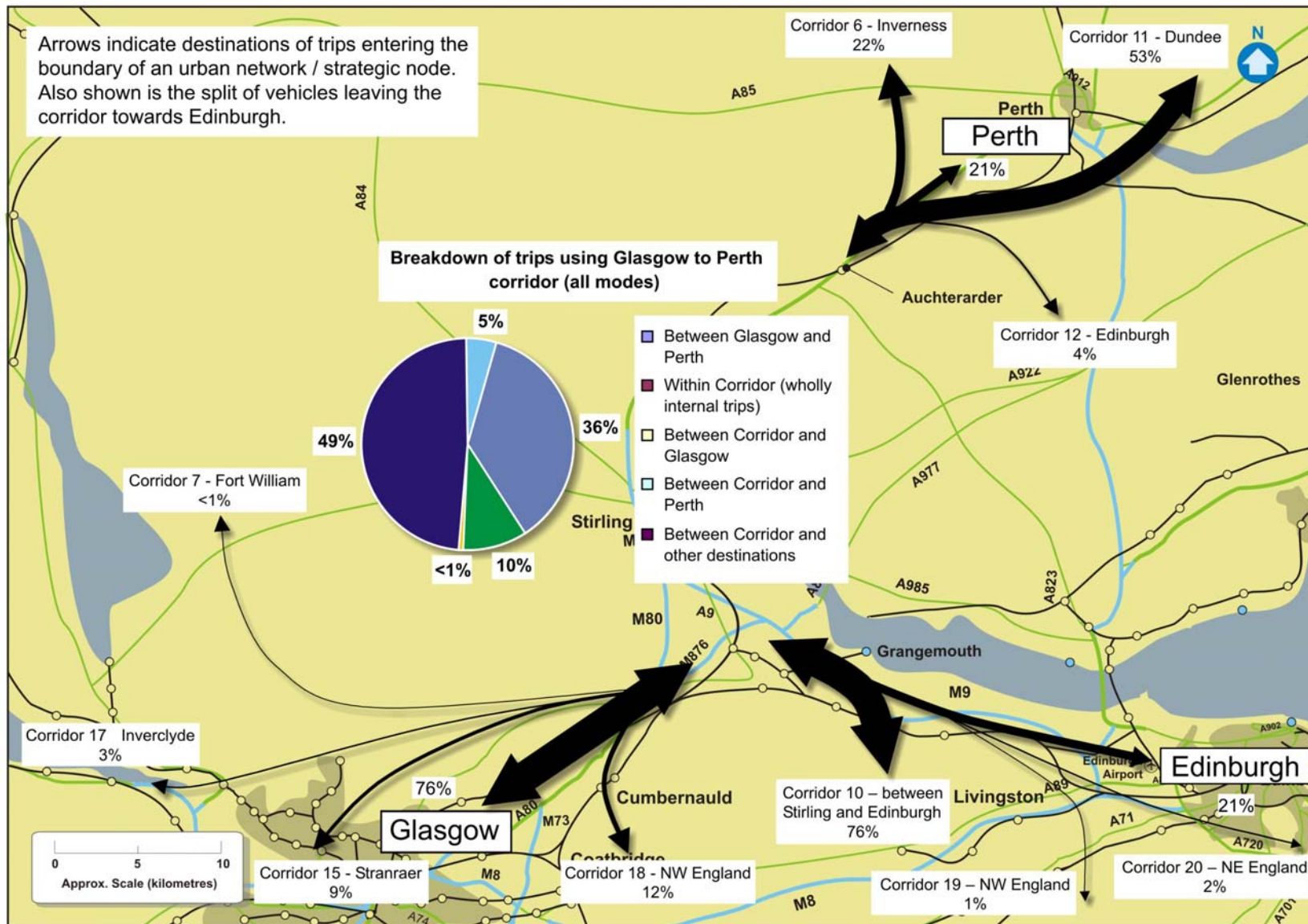


Figure 7.9.4 Travel Patterns 2022, Corridor 9 – Glasgow to Perth

7.9.4 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 7.9.5 shows the average speeds in comparison with free speeds on the corridor at 2005, and 2022. The travel time for a centre to centre trip is also shown.

The projected increase in free flow speed between 2005 and 2012 is as a result of the M80 Steps to Haggs improvement project.

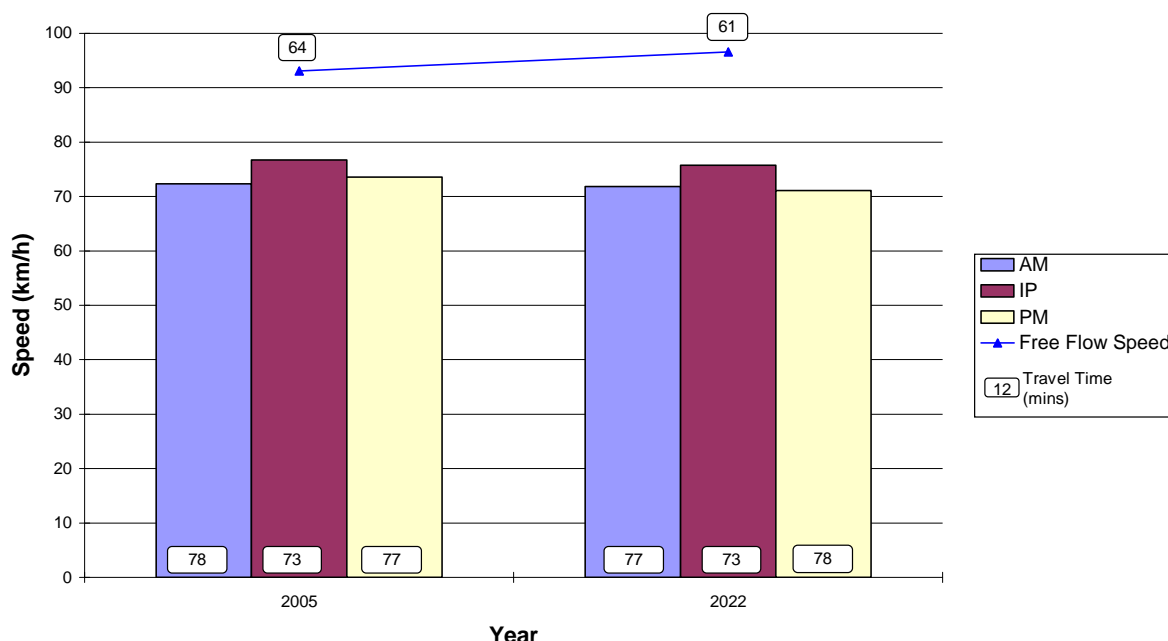


Figure 7.9.5: Average Road Speeds (Corridor 9)⁵³³

The average speed is greater than 70kph during peak periods, which is considered acceptable for this corridor with a mixture of standards from non-grade separated dual carriageways to motorways. A projected increase in average speeds between 2005 and 2012 can be attributed to the planned upgrade of the A80 to motorway standard between Stepps and Hags. Despite this increase in average speeds on the corridor, some delays will continue to be experienced by traffic merging with motorways (M8 and M876) on adjacent corridors.

In general most of the road network in this corridor is operating effectively and reliably, but the A80 is operating above capacity. The traffic levels in 2005 reached up to 74,000 vehicles per day on the M80 / A80 and up to 30,000 per day on the A9⁵³⁴. These levels can result in significant congestion hot spots and bottlenecks throughout the corridor. Observed journey times can vary from 36 to 69 minutes between Glasgow and Stirling, indicating the level of variability in journey times, particularly during the peak periods. Travel times from Glasgow to Perth range from 73 minutes to 78 minutes.

Travel time along the corridor during the morning and evening peak is relatively similar at 1 hour 18 minutes and 1 hour 17 minutes respectively. Travel time during the off peak is quicker at 1 hour 13 minutes although this is noticeably slower than the free flow travel time of 1 hour 4 minutes. By 2022 the travel times are broadly similar with the morning and evening peaks taking 1 hour 17 and 1 hour 18 minutes respectively, and the off peak remaining consistent at 1 hour 13 minutes. The free flow travel time does however decrease to 1 hour 1 minute.

⁵³³ TMfS:05

⁵³⁴ Transport Scotland: Scottish Roads Traffic Database

Figure 7.9.6⁵³⁵ shows travel time isochrones for trips to Glasgow along the corridor in the morning peak, and provides a comparison of car, bus and rail travel times. This indicates that rail journey times are comparable with road for journeys between Glasgow and around Falkirk⁵³⁵. For Perth, journeys by rail are around five minutes longer than those by car at 100 minutes. Rail services offer competitive journey times between Glasgow and Stirling, but travelling by car is faster for journeys to the east of Stirling and for destinations between Stirling and Perth. This is reflected in the relatively high proportion of public transport trips travelling to and from Glasgow. Bus journeys are considerably less competitive than both car and rail journeys.

⁵³⁵ Journey times for bus/rail include a 20 minute walk/wait time

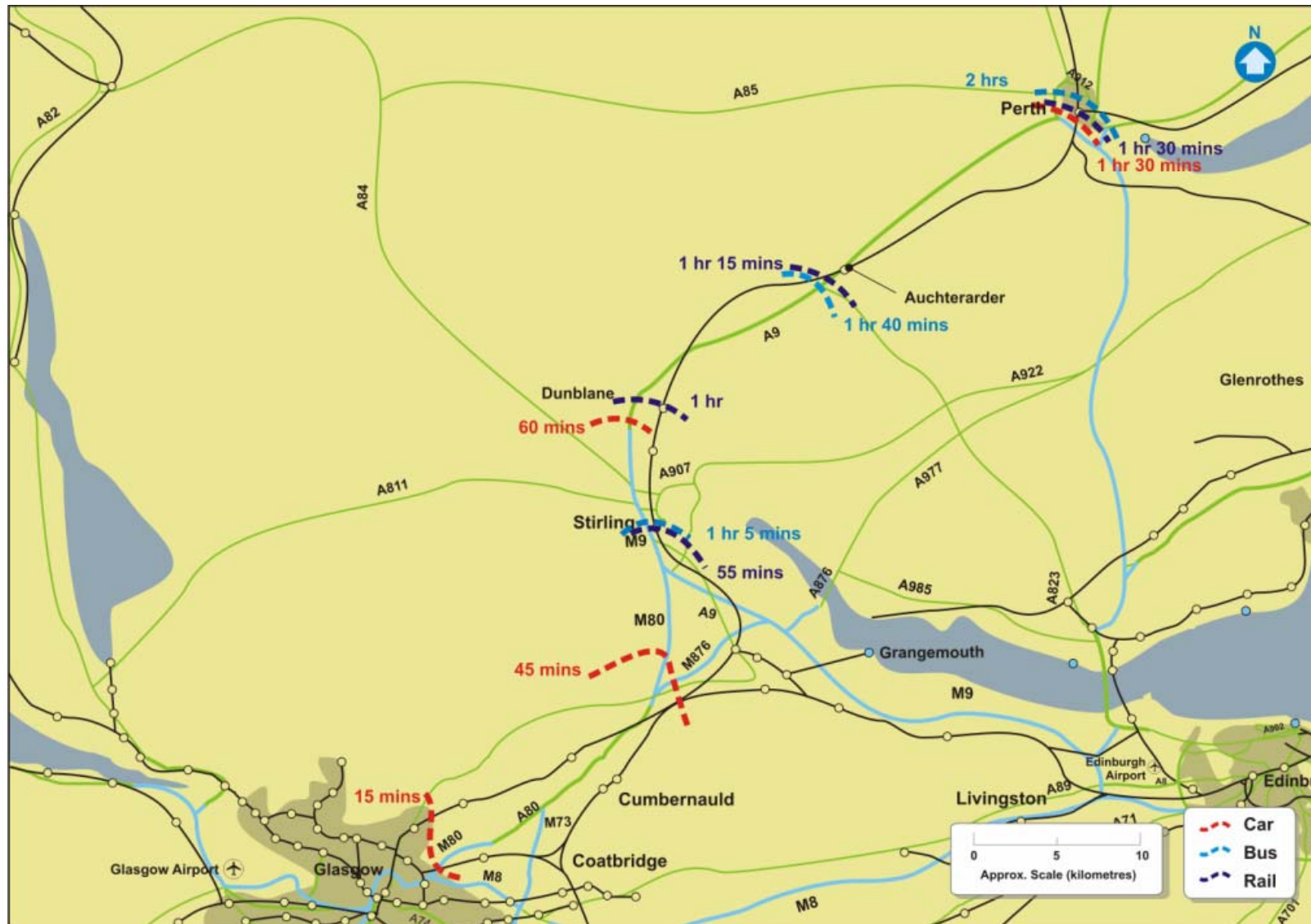


Figure 7.9.6: Journey Time to Glasgow City Centre by Road/Rail (2005 AM peak), Corridor 9 - Glasgow to Perth

Emissions (CO₂ only)

This section of the report addresses the issue:

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

CO₂ per person kilometres are forecast to rise from 145 tonnes / million person kilometres to 155 tonnes / million person kilometres between 2005 and 2022 in this corridor. This is a result of CO₂ emissions rising at a slightly greater rate than person kilometres between 2005 and 2022⁵³⁶.

The road based transport network produced 550,500 tonnes of CO₂ in Corridor 9 in 2005. This equates to approximately eight per cent of the total road based transport related CO₂ emissions in Scotland.

By 2022, it is forecast that CO₂ emissions in Corridor 9 will rise to around 709,000 tonnes, approximately nine per cent of Scotland's road based transport related CO₂ emissions in 2022.

The rail network produced 10,000 tonnes of CO₂ in Corridor 9 in 2007. This equates to approximately 12 per cent of the total rail based CO₂ emissions in Scotland⁵³⁷.

Therefore, it is estimated that the road and rail based transport network collectively produced 560,500 tonnes of CO₂ in Corridor 9 in 2005. This equates to approximately eight per cent of the total road and rail based transport related CO₂ 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?
- How safe is the network?

Public transport provision in the corridor generally meets the patterns of demand, particularly in terms of providing for public transport commuters to Glasgow. Bus travel is not very competitive with car in this corridor, a situation forecast to continue into the future. However, rail travel, particularly for longer journeys, is more competitive with car and increased public transport competitiveness at some locations are forecast, Stirling and Bridge of Allan in particular. Planned rail infrastructure enhancements are the main contributory factors.

⁵³⁶ TMfS:05

⁵³⁷ AEA (2001) Rail Emission Model Final Report; www.nationalrail.co.uk; and www.networkrail.co.uk.

The infrastructure and service provision provide for effective business interaction between the centres of this corridor, with commuting opportunities by public transport and private car allowing suitable return journeys to be made within a working day.

Around one per cent of the corridor population are people without cars living in Social Inclusion Partnership areas of Clackmannan, New Sauchie, Bowhouse, Alloa and Kildean, where access to key services by public transport is very low. For these people, this suggests that some transport-related social exclusion occurs due to lack of either private or public transport options. This is forecast to continue in the future.

Table 7.9.2 shows the projected morning peak load factors on the rail services in the corridor for the various years, as reported in Network Rail's Route Utilisation Strategy (RUS). The results are averages across a number of train services.

Table 7.9.2: Peak Load Factors (Rail)⁵³⁸

| | 2006 | 2011 | 2016 | 2026 |
|--|------|------|------|------|
| Strathclyde Diesel – Stirling Corridor including inter-urban | 1.04 | 1.06 | 1.09 | 1.20 |
| Glasgow – Edinburgh via Falkirk | 0.88 | 0.88 | 0.93 | 0.99 |

These load factors are high, as Network Rail calculates that, in general, some peak services will suffer overcrowding if the load factor averaged over the whole morning peak exceeds 70 per cent. Several train services within the corridor currently experience high levels of overcrowding and are expected to continue to be affected in future. Overcrowding exists on services between Glasgow and Bishopbriggs and Lenzie, to the northeast of the city. The levels of overcrowding are likely to constrain use of the train for trips during peak periods.

Capacity constraints at Glasgow Queen Street cause delays to peak services to / from Glasgow. Capacity constraints at railway station car parks on the corridor also impact on connections within and beyond the corridor by train and reduce Park-&-Ride opportunities.

At the southern end of the corridor the A80 / M80 upgrade and the increasing rail congestion contribute to a projected decline in public transport competitiveness. However, average speeds on the corridor as a whole are likely to experience a marginal increase between 2005 and 2012, journey times of bus services will also benefit from increased speeds, on the network.

Table 7.9.3 provides an assessment of the quality of bus services in the corridor on a scale of one to five, with one being 'poor' and five being 'excellent', including commuter services from Glasgow to Stirling and longer distance services from Glasgow to Perth.

⁵³⁸ Network Rail Scotland Route Utilisation Strategy March 2007 Table 8

Table 7.9.3: Assessment of Bus Service Quality⁵³⁹

| Service Numbers | Annual Journeys | Reliability | Frequency | Simplicity | Value | Coverage | Vehicle Quality |
|-------------------------------------|-----------------|-------------|-----------|------------|-------|----------|-----------------|
| M8, M9, M10 (Citylink & Megabus) | 63,700 | 3 | 4 | 4 | 3 | 4 | 2 |
| X37, X39, 24, 27 (First) | | | | | | | |

The southern section of the corridor is not considered to have any significant road safety issues, with accident rates and fatal accident rates on the M80, M876 and M9 being below the national rates for similar road types⁵⁴⁰.

A particular issue on the A9 is the number of severe accidents attributed to manoeuvres through gaps in the central reserve. Reductions in the number of at-grade accesses on the route are to be considered as part of the routes long term strategy, whilst speed enforcement and warning signs at targeted locations have already been implemented. Initial analysis of severe accident clusters indicated safety issues on the A9 at Auchterarder, and its junctions with the B9141 (Dalreoch) and B934 (Upper Cairnie / Forteviot)⁵⁴¹.

Surveys show that safety and security fears discourage individuals from using public transport, particularly in the evening. Of particular significance in this corridor is the perception by females in North Lanarkshire that they felt 'unsafe' on the railway (32 per cent compared to 21 per cent nationally)⁵⁴².

⁵³⁹ Bus Users UK (Qualitative Assessment – 1: very poor; 5: excellent)

⁵⁴⁰ Transport Scotland SERIS Database

⁵⁴¹ TMfS:05

⁵⁴² Scottish Household Survey 2003/04: Perceptions of safety from crime during evening bus/rail travel

Summary of Infrastructure and Operational Constraints

Key constraints and congestion points are shown in Figure 7.9.7 including:

- A80 Old Inns to M80 / M876;
- Keir Roundabout;
- Broxden Roundabout;
- Glasgow Queen Street capacity;
- Platform length at Bishopbriggs station;
- Overcrowding on rail services;
- Signalling capacity constraints between Larbert Junction and Stirling; and
- Lack of passing loops between Larbert and Perth.

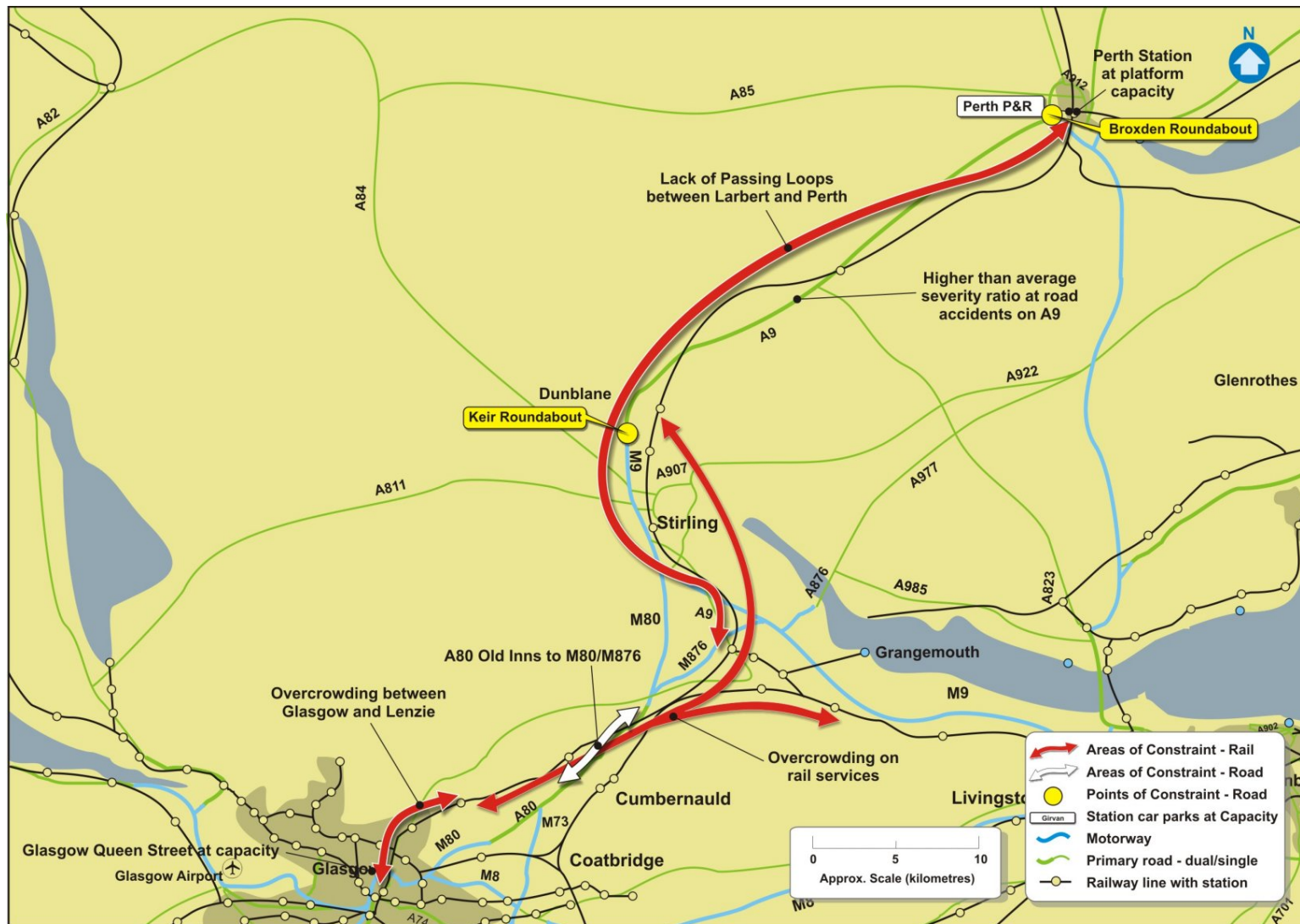


Figure 7.9.7: Areas of Constraint on the Network, Corridor 9 - Glasgow to Perth

7.9.5 Summary and Conclusions

Overall, how well does the transport network perform?

A large proportion of trips from Corridor 9 have a destination beyond the boundary of the corridor. This highlights the role the corridor plays in providing a link between the north and northeast of Scotland and Glasgow, and beyond, towards other parts of Scotland and the north of England.

While a number of locations on the A80 between Stepps and Haggs currently experience congestion and delay, there are no journey time reliability issues in the majority of this corridor.

Rail times are reasonably competitive with road. In addition, the rail network on the corridor suffers from extensive overcrowding in the peaks at the southern end of the corridor, on the approach to Glasgow. There are also capacity constraints at Glasgow Queen Street and at Perth.

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

The proposed improvements to the M80 will improve journey time, reliability and safety. This will allow the M80 to continue to function well as a through corridor linking Perth and the north of Scotland with the Central Belt of Scotland and on to northwest England. Key network locations close to or within the Glasgow city centre will continue to be a constraint on demand, such as the M8 / M80 junction.

Rail overcrowding on the Strathclyde diesel services (Stirling / Dunblane) is high and is projected to increase further. This is likely to act as a constraint to achieving growth in public transport usage, particularly during the peaks.

The proposed platform extension at Bishopbriggs is likely to alleviate some overcrowding on services, as it will allow for an increase in train length available on the most heavily used services.

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

The effect of the high volume of commuter trips between the corridor, and in particular the southern part and Glasgow is likely to continue to be a major driver into the future.

On the northern part of the corridor, the concentrations of severe accidents suggests that safety is a key driver for this part of the corridor.

Given the high level of use on current peak rail services, the location of new employment opportunities within the city relative to effective public transport access from the corridor is likely to impact on future performance by impacting on the ability of public transport to offer an effective alternative.

What are the key problems associated with delivering the KSOs?

Despite fairly competitive public transport options for major settlements in this corridor, there are several socially deprived areas where poor public transport accessibility may be contributing to social exclusion.

The proposed improvements to the M80 are projected to make a significant positive impact on the operation of the network and will benefit a high proportion of the trips made within the corridor. By 2022, the network is projected to have more trips on it but the projected journey times and speeds are expected to be around current levels. This suggests that link capacity may be becoming an issue on certain parts of the network.

It will be difficult to accommodate a meaningful proportion of the predicted increase in demand for travel between the corridor and Glasgow on the rail network, given the current and predicted level of passenger loading. This in turn is likely to impact on modal split and emissions.

The current levels of overcrowding on rail services in the corridor at peak times have a significant impact on the quality of service that can be offered. This in turn is likely to have a negative impact on the attractiveness for new users and could ultimately result in poorer levels of modal share for public transport.