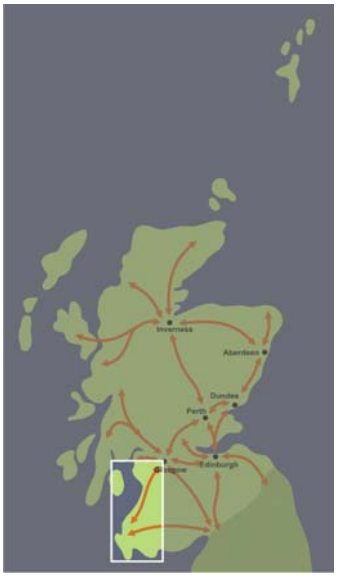
7.15 Corridor 15: Glasgow to Stranraer and South West

7.15.1 Setting the Context



Corridor 15 extends from the outskirts of Glasgow to Stranraer (approximately 136 kilometres) and from the west coast eastwards towards Corridor 18 (Glasgow to North West England), as shown in Figure 7.15.1. The corridor has a total population of 386,400[670] and connects the city of Glasgow with population centres in Ayrshire and the south west of Scotland. The main towns include Kilmarnock, Ayr, Irvine and Stranraer. Glasgow Airport is also located along this corridor, to the north of the M8 Motorway near the St James Interchange, however the impact of the airport is addressed in the Glasgow urban network, which can be found in Chapter 5.4.

The population in the corridor is forecast to decrease by approximately 9,100 people between 2005 and 2022, a decline of two per cent[670]. At the same time, the number of households in the corridor, centred on the core town areas (Ayr, Kilmarnock and Irvine), is forecast to increase by six per cent[670] and employment is expected to increase by approximately five per cent[670]. Inactivity rates within the corridor are forecast to decline by 14 per cent between 2005 and 2022[670]. Figure 7.15.2 shows the areas of changes in population and employment in this corridor.

Prestwick Airport, the Irvine Bay Regeneration Project and the ports along this corridor provide major economic activity and employment opportunities. The Irvine Bay Regeneration Project will encompass the five towns of Irvine, Saltcoats, Ardrossan, Stevenston and Kilwinning[671]. Action for this project is being focussed on providing new housing, improving the five town centres to attract new businesses, generating new employment, improving the environment and developing a clear role for the area within the wider Glasgow city-region.

In addition, there are significant transport hubs along this corridor including Hunterston, and the ports at Cairnryan and Stranraer. The ports of Cairnryan and Stranraer provide frequent and heavily used ferry services between Scotland and Northern Ireland. Stena Line, who currently use the port of Stranraer, are progressing with plans for a new ferry port development on Loch Ryan. Although these proposals are not yet finalised, a new port development would provide additional capacity for freight and passenger traffic and would continue the positive impact of Loch Ryan ferries on the Scottish economy. In addition to the major ports, there are smaller ports at Ayr and Girvan, as well as the ports of Troon and Ardrossan which provide ferry services. Each of these ports provides employment opportunities for this corridor.

[670] TELMoS
[671] Irvine Bay Regeneration Company www.irvinebayurc.co.uk

Figure 7.15.1: Setting the Context, Corridor 15 - Glasgow to Stranraer

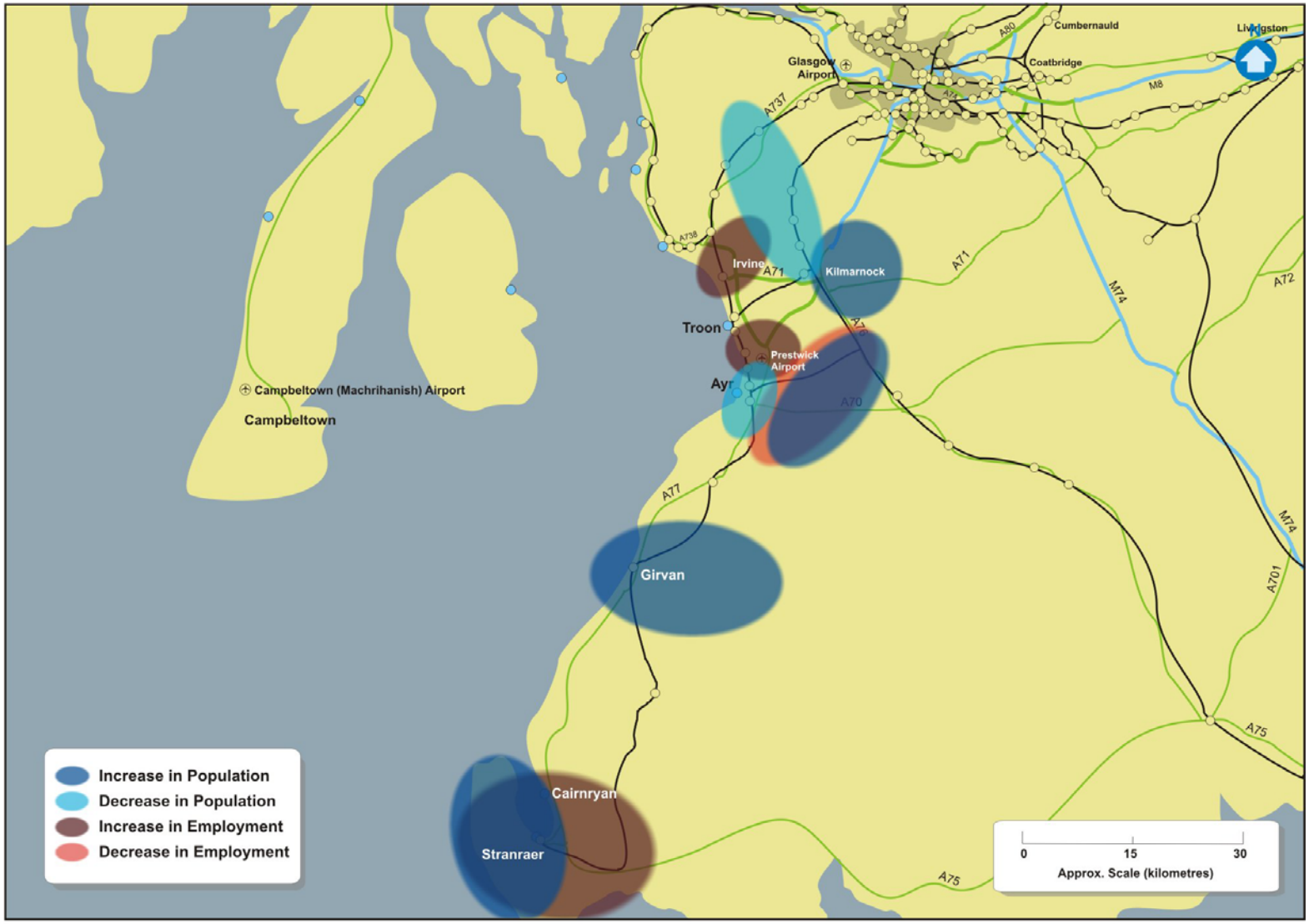


Figure 7.15.2: Changes in Population and Employment, 2005 & 2022, Corridor 15 - Glasgow to Stranraer

Income levels for the corridor are £412 per week in North Ayrshire, £417 per week in East Ayrshire, £486 per week in South Ayrshire and £380 per week in Dumfries and Galloway. This equates to 100 per cent, 101 per cent, 118 per cent and 92 per cent respectively of the average for Scotland (£412)[672].

Car ownership in the corridor varies around the national average of 67 per cent, with the more rural areas having a higher percentage:

- North Ayrshire: 66 per cent;
- East Ayrshire: 65 per cent;
- South Ayrshire: 71 per cent; and
- Dumfries & Galloway: 74 per cent[673].

7.15.2 Transport Network and Operations

Infrastructure and Services

The principal elements of the transport network that play a national strategic role are shown in Figure 7.15.1.

The M77 Motorway (dual two-lane carriageway between Glasgow (M8) and Fenwick) and the A77 Trunk Road (dual two-lane carriageway between Fenwick and Ayr and then single lane carriageway to Stranraer) form the main spine of the road network. The A76 forms a link to Dumfries from Kilmarnock. The road and rail links to Dumfries and Carlisle should be read in the context of the commentary in Corridor 18 (Glasgow to North West England).

Other important elements of the road network include:

- A737 Trunk Road (dual two-lane carriageway from M8 to Johnstone and single lane carriageway to Kilwinning) links North Ayrshire and Renfrewshire; and
- A70 and A71 (single lane carriageway) links Central Ayrshire with South Lanarkshire and the M74 Motorway.

The M77 and A77 between Fenwick and the southern end of Kilmarnock include grade separated interchanges; however junctions on other routes are at-grade. Access from the secondary network is therefore via a series of priority junctions and roundabouts, some of which are signalised. The roads serve a dual purpose in terms of access for communities to local employment and services, while also providing strategic connections for the movements of goods and people to Glasgow and the remainder of the trunk road network. This interaction between local and strategic trips through at-grade junctions impacts performance, particularly where the route runs directly through settlements, such as Dalry, Kilwinning, Maybole and Girvan.

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[672] Scottish Economic Statistics 2006, table 4.20
[673] Scotland's Census 2001 – www.scrol.gov.uk Table KS17

The corridor is well served by the rail network with electrified double track from Glasgow to Ayr, electrified single track branches to Ardrossan Harbour and Largs and a separate single track branch to Hunterston. South of Ayr, the rail line continues to Stranraer as single track with passing loops. The Glasgow to Carlisle via Kilmarnock and Dumfries line also passes through this corridor. This is single track with passing loops from Glasgow to Kilmarnock and Annan to Gretna and double track between Kilmarnock and Annan.

Service patterns on the corridor are generally:

- Two trains per hour between Glasgow and Ayr;
- One train per hour between Glasgow and Largs;
- One train per hour between Glasgow and Ardrossan Town (five trains per day extend to Ardrossan Harbour);
- Seven trains per day to Stranraer (from Glasgow and Carlisle) additional trips between Kilmarnock and Girvan;
- One train every hour between Glasgow and Kilmarnock; and
- Various freight services.

A significant local bus network operates within Ayrshire. There are a number of local operators, but most services are provided by Stagecoach Western. A number of express services are provided that link to Glasgow. Services patterns are generally:

- Two buses per hour between Glasgow and Ayr;
- Two buses per hour between Glasgow and Kilmarnock (one per hour extend to A76 corridor);
- Two buses per hour between Glasgow and Irvine; and
- One bus per hour between Glasgow and Ardrossan, Saltcoats, and Stevenston.

The corridor also provides access to Prestwick Airport and ports at Ardrossan, Troon, Cairnryan and Stranraer. Prestwick Airport has its own dedicated railway station on the Glasgow to Ayr line. Several bus services also call at the airport including direct routes to Glasgow.

The principal interchange locations on the corridor are:

- Paisley Gilmour Street (interchange between corridor rail services and those to Gourock and Wemyss Bay and local bus services including links to Glasgow Airport);
- Ayr (interchange between rail services to Stranraer / Kilmarnock and local bus services);
- Kilwinning (interchange between rail services on Ayr and Largs / Ardrossan lines);
- Ardrossan Harbour (interchange between rail and ferry services to Arran); and
- Stranraer (interchange between rail and ferry services to Larne and Belfast).

While the rail network provides good linkage to Glasgow, the destination of most of trips, however, travel to other corridors requires interchange within Glasgow or Paisley, reducing the attractiveness of rail for these journeys for some passengers. For example, passengers travelling from Stranraer to Edinburgh are required to travel by train from Stranraer to Glasgow Central before making a short trip across Glasgow City centre to Glasgow Queen Street station to board the train for Edinburgh. Whilst this involves only a short walk, taxi or free bus ride, some passengers find this to be an inconvenience thus reducing the attractiveness of rail.

There are bus stations in Ayr and Kilmarnock that are near the town centres; however they are not close to the railway stations in the towns resulting in poor integration between the modes. The rail service to Ardrossan Harbour and Stranraer Harbour provides good integration with the ferry services from those ports; however the ferry ports of Troon and Cairnryan are located some distance from the nearest railway stations resulting in poor integration between rail and ferry at these locations. Prestwick Airport has good integration with both rail and bus services from Stranraer.

Integrated tickets in the corridor are available in the form of the *PLUSBUS* ticket and the SPT ZoneCard. *PLUSBUS* covers rail journeys into Glasgow, Ayr and Kilmarnock 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 majority of the corridor.

Asset Management

In 2007, 11 per cent of the trunk road network pavement[674] 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[675]. The sections with the poorest residual strength are the A78 between Largs and Montefode and the A737 / A738 Kilbarchan to Kilwinning. However, under Transport Scotland's planned maintenance schedule, the net figure for the corridor is expected to fall to five 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 in the corridor. A strategic Park-&-Ride facility is provided at Shields Road subway station in Glasgow. It has a capacity of 800 spaces and is signed from the M77 on approach to the M8[676]. The major towns in the corridor have a mixture of free and paid parking. This mixture of provision and the charging regimes in place are such that parking is not used as a demand management measure in the same way as in Glasgow. There are no other demand measures within this corridor.

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[674] Transport Scotland SERIS Database
[675] STS No. 25 (2006) Table 5.5
[676] SPT: www.spt.co.uk

Programmed Schemes

The following are programmed schemes and developments in the corridor (highlighted in Figure 7.15.3):

- dualling of the A77 Trunk Road south of Whitletts;
- Glasgow Airport Rail Link;
- various minor improvements on the A77;
- various minor improvements on the A737; and
- Glasgow to Kilmarnock rail improvements.

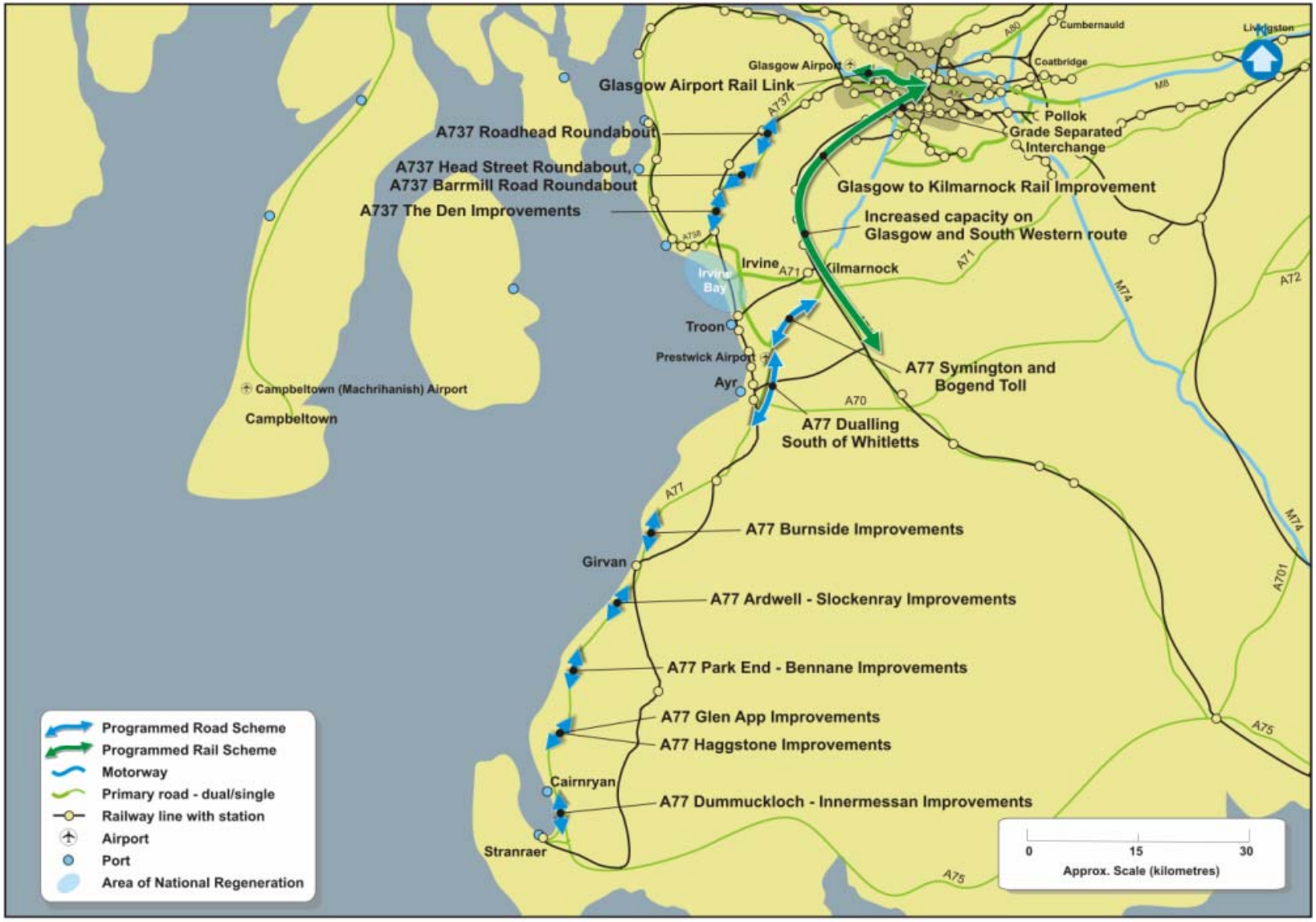

Figure 7.15.3: Programmed Transport and Land Use Developments, Corridor 15 - Glasgow to Stranraer

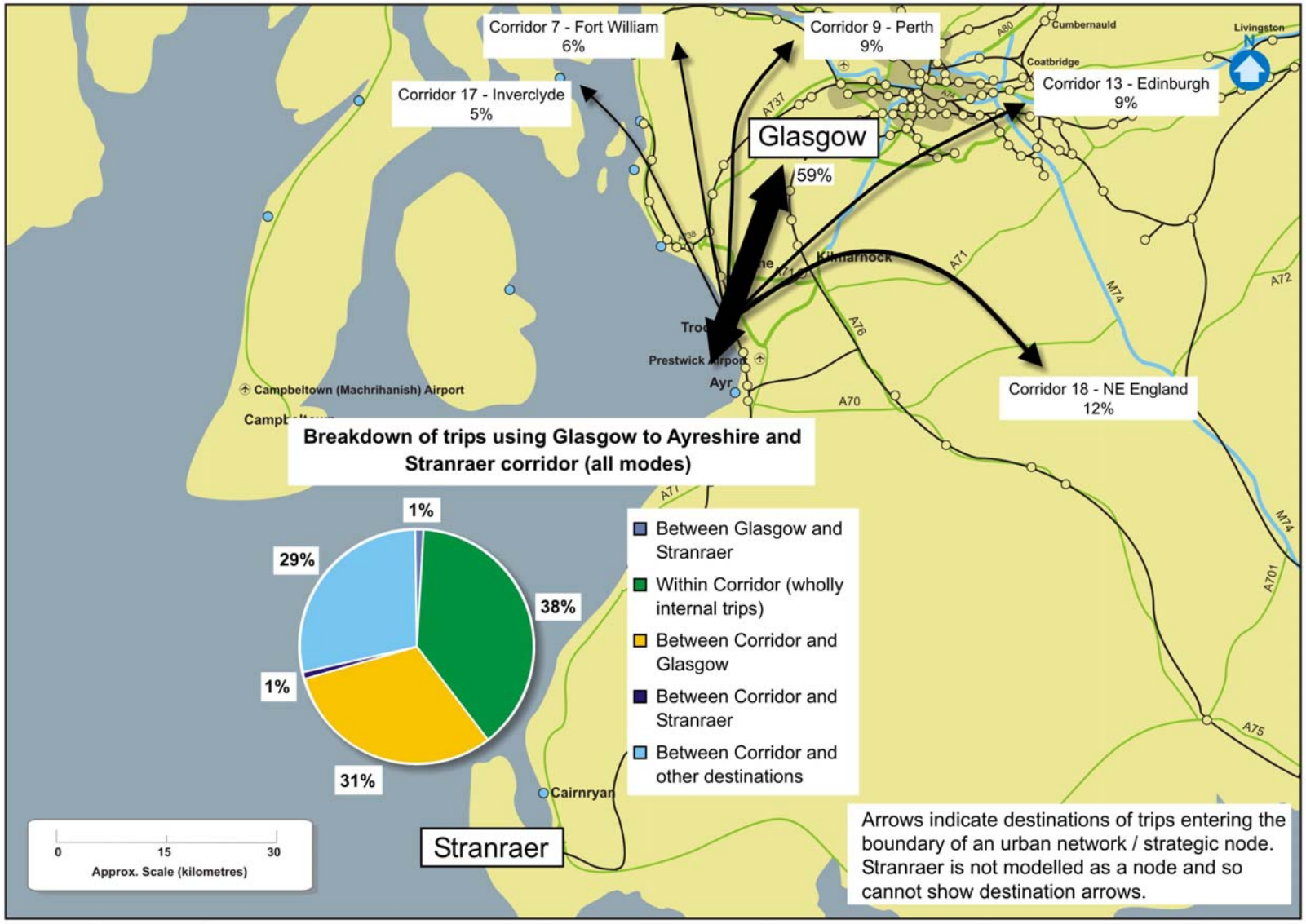

Figure 7.15.4: Travel Patterns 2022, Corridor 15 – Glasgow to Stranraer

7.15.3 Travel Patterns

Travel patterns for Corridor 15 are graphically presented in Figure 7.15.4. In addition a summary of the demand levels in the corridor and mode share is included in Table 7.15.1.

Table 7.15.1: Summary of Demand (12 hour) and Public Transport Share[677]

		Between Glasgow and Stranraer	Within Corridor	Between Corridor and Glasgow	Between Corridor and Stranraer	Between Corridor and other destinations	Total Trips
2005	Total Trips	3,200	136,300	116,900	1,000	95,600	353,000
	% of Corridor	1%	39%	33%	0%	27%	100%
	PT Trips	<100	9,200	22,300	<100	1,600	33,100
	PT Share	<1%	7%	19%	2%	2%	9%
2022	Total Trips	4,400	157,000	125,000	2,700	117,900	407,000
	% of Corridor	1%	38%	31%	1%	29%	100%
	PT Trips	<100	8,400	19,800	<100	1,700	29,900
	PT Share	<1%	5%	16%	2%	1%	7%
Change	Total Trips	+35%	+15%	+7%	+170%	+23%	+15%
	PT Trips	0%	-9%	-11%	0%	+6%	-10%

Glasgow is the main, single destination of trips from the corridor, representing 33 per cent of all trips. Just over a third of the trips are within the corridor accessing and supporting the local economy (38 per cent). When compared with the low level of trips between the corridor and Stranraer, these results show that the bulk of travel demand is focussed in the north of the corridor. Just under a third of the total trips are travelling between the corridor and other destinations outside the corridor, with some of these trips routing through Glasgow.

[677] TMfS:05

The biggest percentage of public transport trips (19 per cent) is between the corridor and Glasgow although that share is predicted to drop to 16 per cent by 2022. These figures reflect the degree of use of public transport services into the city as well as the importance of Glasgow as an interchange point for long distance rail and bus travel. The provision of electric rail services to Ayr during the 1980s represented a step change in service that has supported a significant commuter movement between Ayrshire and Glasgow. Around 28 per cent of all the public transport trips are wholly within the corridor, highlighting the importance of the local public transport services, particularly buses.

By 2022, car trips generally are forecast to increase by between 15 and 25 per cent and public transport trips are forecast to decrease by about 10 per cent overall[678]. This overall decrease is a combination of 10 per cent increase in rail trips and a decline in bus use. These projections are based on an unchanged level of bus service provision and as stated elsewhere in this report changes in the service provision made by operators could result in the public transport share being higher than is currently being forecast.

ATC data from the SRTDb gives a figure of approximately nineteen per cent HGV traffic on the A77 at Glen App, and of twelve per cent on the A77 at Kilmarnock. This route experiences a high percentage of HGV traffic and as such is important for freight[679]. There are a number of key generators of freight located on this corridor, which are important contributors to the regional economy. Freight movements from the Loch Ryan ports, and tourist and commercial travel to Northern Ireland via the various ferry terminals, as well as linkages to the M74 and Northern England via the A70, A71 and A726 Glasgow Southern Orbital route, impact on travel patterns within Corridor 15 generating bunching or platooning of traffic as HGVs arrive in convoys to and from the ferries. Limited overtaking opportunities south of Ayr compound this problem. In addition the movement of coal from Hunterston and timber from Troon impact on the operation of the network, as will be discussed later.

There is increasing demand for rail freight in western Scotland for both new and well established markets including coal, timber, chemical, intermodal and international freight. Transporting coal from Ayrshire to supply the UK power generation market is a key element of demand within the corridor.

The railway stations in this corridor have a total throughput of some 12.2 million passengers per annum (2005), with Paisley Gilmour Street and Ayr the busiest stations[680].

As well as the transportation of coal, other significant rail freight movements include chemicals from facilities in England delivered to the Roche plant in Dalry (Glasgow to Kilwinning route), china clay from Burngullow to the UPM Kymmene plant at Irvine, and Calcium Carbonate from Aberdeen to the UPM Kymmene Plant at Irvine (on the Kilmarnock to Troon route).

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[678] TMfS:05
[679] SRTDb
[680] Rail industry LENNON data (Station Usage 2004/2005) The total rail passenger trips do not include SPT zonecard trips

To accommodate the freight demand above, there are approximately 183 weekly freight movements planned northbound between Paisley and Kilwinning of which 82 are used on average. Additionally, 200 weekly freight movements are planned southbound, of which 89 are used on average, much of which is related to the movement of coal[681]. The planned paths are identified within the timetable, interspersed between passenger services. However, while there are generally paths available between Kilwinning and Paisley, paths are more restricted in the remainder of the country. It is the capacity of the rest of the network for freight that is the limiting factor. The Scottish Planning Assessment and the Scotland Route Utilisation Strategy both report lack of capacity on the Glasgow South West route due to the mixture of passenger and freight usage at certain points on the route. Double tracking of the Glasgow and South Western Railway is currently underway between Gretna and Annan and will be completed by early 2009.

Bus services within the corridor are an essential part of the network providing strategic services for commuters travelling to Glasgow. Within the corridor, there are approximately four million passenger trips using strategic services every year, which equates to around 11,000 passengers trips per day.

[681] Scotland Planning Assessment Part 1 Volume 2 (Drivers of Change) October 2005

As outlined the ferry ports within the corridor contain some of the busiest routes in Scotland. Passenger and car numbers for the busier routes in 2005 are detailed in Table 7.15.2.

Table 7.15.2: Ferry Loadings in Corridor 15[682]

Route	Passengers (annual)	Vehicles (annual)	Percentage Commercial Vehicles and Buses
Stranraer – Northern Ireland (Stena Line)	1,235,000	239,000 (cars)	N/A
Cairnryan – Northern Ireland (P&O)	602,000	140,000 (cars)	N/A
Troon – Northern Ireland (P&O)	214,000	56,000 (cars)	N/A
Largs – Cumbrae (CalMac)	699,000	141,000	4%
Ardrossan – Brodick (CalMac)	743,000	143,000	8%

Ferry ports in this corridor (Stranraer, Cairnryan, Troon, Ardrossan and Largs) handle over 3.5 million passengers and over 700,000 vehicles per year (approximately 2,000 journeys per day), while the ports at Stranraer, Cairnryan and Ayr handle nearly 4.9 million tonnes of freight per year[683]. In general, road access to the ports in this corridor is sufficient; however there are localised impacts, particularly at Troon and Ardrossan due to the location of the ports in the towns. There can also be a negative impact on the wider network as a result of concentrations of HGVs that can occur due to ferry operations. In terms of rail linkage, Stranraer, Ardrossan and Largs are well integrated however at Troon the port is remote from the railway station and Cairnryan is not on the railway network.

[682] STS No. 25 (2006) Table 10.12 and 10.14
[683] STS No. 25 (2006) Table 10.3

Prestwick Airport has a throughput of nearly 2.4 million passengers (which equates to an average of 7,000 trips per day and 30,000 tonnes of freight per year)[684]. The air passenger numbers are forecast to rise to between 4.5 and 6 million by 2013[685]. Prestwick Airport is one of Scotland's fastest growing airports[686].

7.15.4 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?

The average speed at which vehicles can progress through the network is a good indicator of the efficiency and reliability of the road network. As noted previously, in terms of the road network, this corridor includes the M77 and the A77, A737, A738 and A78 Trunk Roads. Figure 7.15.5 shows the current and forecast average speed for the main route within the corridor, the A77 / M77.

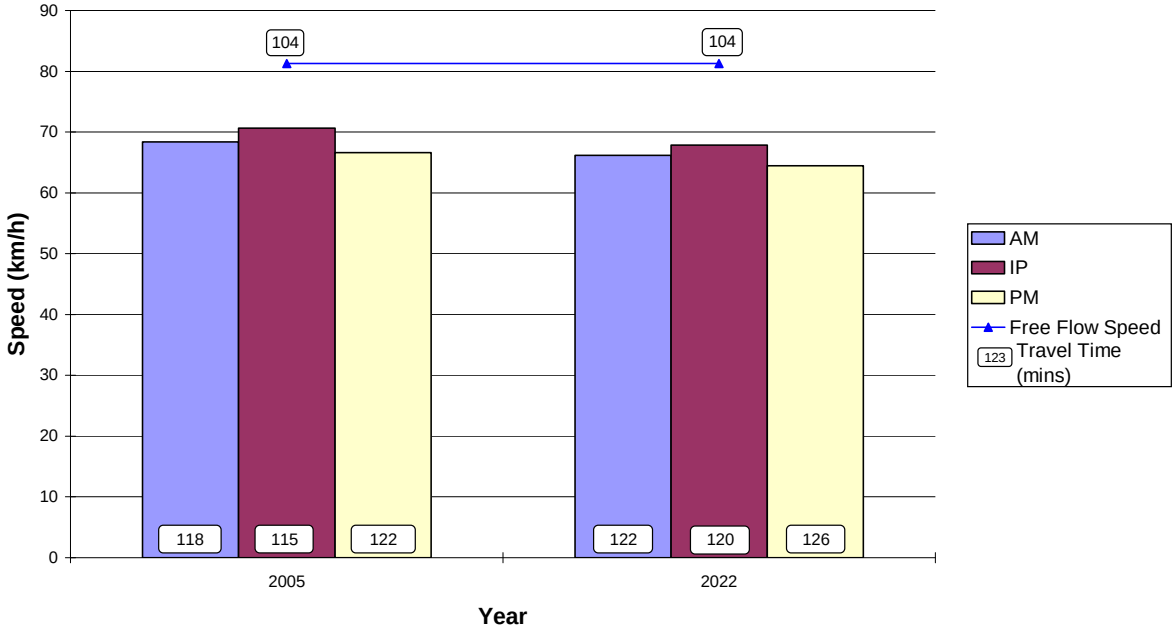

Figure 7.15.5: Average Road Speeds (Corridor 15)[687]

[684] STS No. 25 (2006) Table 9.6, 9.13
[685] Prestwick Airport Rail Study: August 2003
[686] STS No. 25 (2006) Chapter 9 Air Transport
[687] TMfS:05

Travel time along the corridor in 2005 is broadly similar across all time periods at 1 hour 55, 1 hour 58 and 2 hours 2 minutes for off peak, morning peak and evening peaks respectively. The free flow travel time is also similar at 1 hour 44 minutes. In 2022, the travel times are more similar at 2 hours, 2 hours 2 and 2 hours 6 minutes for off peak, morning peak and evening peak respectively. The free flow travel time in 2022 does not change from 1 hour 44 minutes.

The average speeds in the morning, inter-peak, and evening periods are expected to decline slightly between the years 2005 and 2022. However over the length of the corridor this is not considered to represent a significant decline in the reliability or efficiency of the network, with the average speed staying close to 68kph (43mph) during peak periods. This is considered reasonable for a road that is dual carriageway and motorway. However, while the corridor is generally forecast to perform well, there is some congestion caused as the strategic roads pass through local settlements in Ayrshire. In addition at the northern end of the corridor congestion at the junction of the M77 and the M8 is forecast to impact on the reliability of journey times (this is discussed in further detail under the Glasgow Urban Network).

A comparison of road and rail travel times is shown in Figure 7.15.6[688] for trips travelling to Glasgow along the corridor in the morning peak. This figure indicates that rail services are competitive against road travel. Train passenger loading information suggests that the perceived competitiveness extends further to Irvine, Ayr and Ardrossan and this would be consistent with the train loading being heavily influenced by commuters.

However, the line to Kilmarnock does not perform as well in providing a competitive journey time for rail against road. The M77 is highly accessible from this area and single track operating constraints on the rail line result in the rail journey time being almost double that of road.

Travelling the full length of the corridor, again travel by bus and train are not competitive when compared to journey time by car. However the rail service south of Ayr is operated at a lower frequency than the northern part of the corridor. This results in the longer distance rail services being less competitive reflected in the very low number of public transport trips travelling the full length of the corridor. In terms of journeys by bus, travel time is generally competitive with car from the significant population centres of Ayr and Kilmarnock, however further south there are no direct services by bus available. Bus journeys from Girvan and Stranraer towards Glasgow travel via Ayr. In addition there is no rail service available from Stranraer that arrives in Glasgow within the morning peak.

Rail service reliability is measured as the percentage of trains actually run in the last 12 months, split into seven service groups. The reliability of the services in Corridor 15 is:

- Strathclyde Passenger Transport Authority 94.1 per cent (target 94 per cent); and

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

- First ScotRail South West 91.8 per cent (target 92 per cent)[689].

[689] http://www.firstgroup.com/scotrail/content/aboutus/ourperformance.php

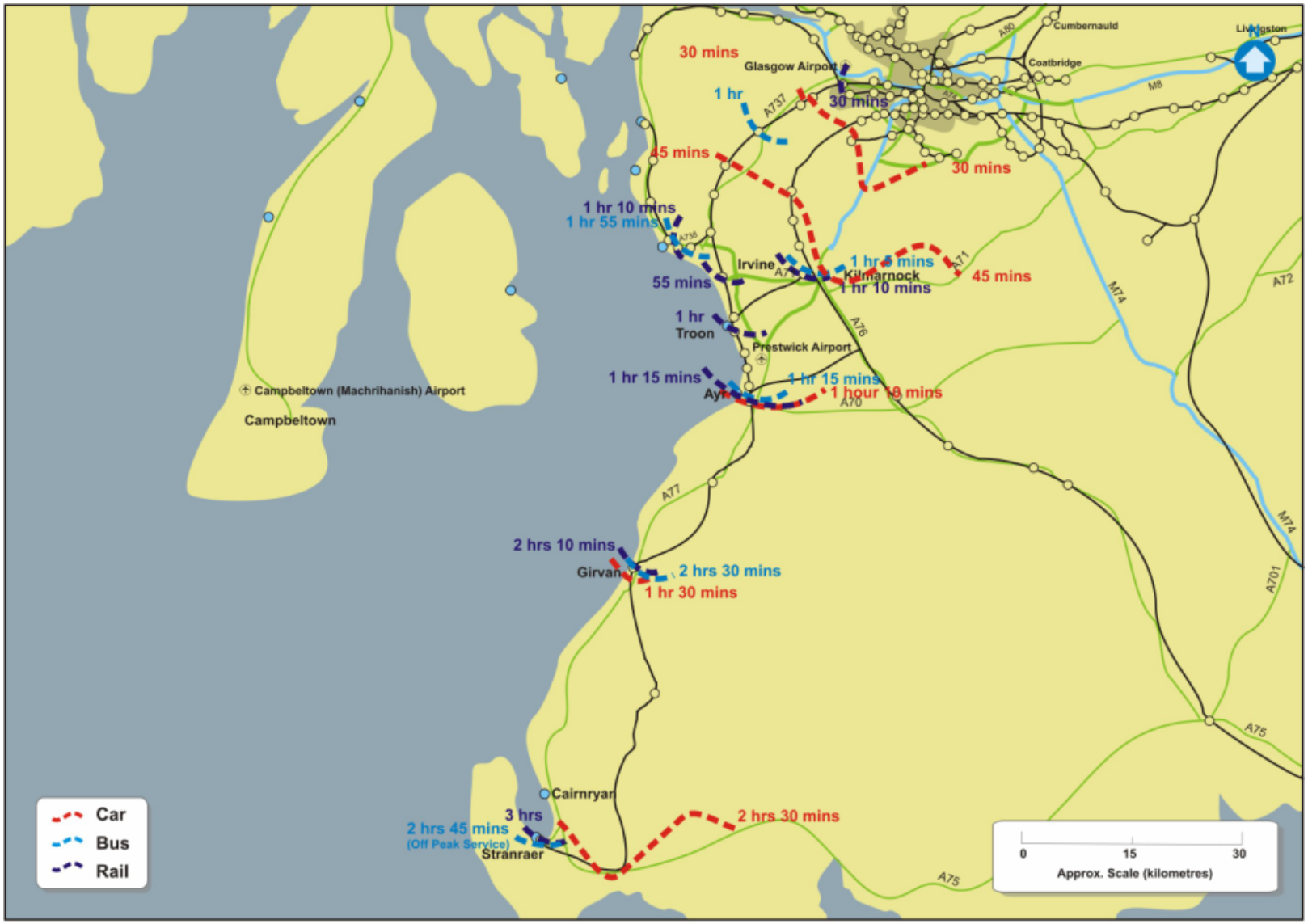

Figure 7.15.6: Journey Time to Glasgow City Centre by Road/Rail (2005 AM peak), Corridor 15 - Glasgow to Stranraer

Based on the projected change in population and employment, resulting in an increase in demand, it is forecast that there will be delays experienced at the following locations along this corridor[690]:

- The A737 between the M8 St James Interchange (Junction 29) and Beith;
- The M77 north of Junction 4 (discussed in the Glasgow Urban Network);
- The M8 to the east of St James Interchange (discussed in the Glasgow Urban Network);
- The periphery of Ayr to the south of the A77 Whitletts Roundabout;
- At Dutch House Roundabout, where the A78 and A77 Trunk Roads intersect; and
- Where strategic routes pass through settlements, such as Maybole or Dalry.

The link capacity on the A77 / M77 corridor is adequate between the major population centres in the north of the corridor and Glasgow but there are key junctions, such as Dutch House noted above, that are at-grade intersections of both local and strategic roads that are operating close to capacity during peak periods.

In the morning and evening peak hours, congestion is experienced on the Ayr Bypass and at Dutch House Roundabout. Heavy congestion is also experienced in the morning and evening peak hours on approach to Glasgow due to the large volumes of traffic merging from both the M8 and M77 at Junction 22 (Plantation). The opportunities for passing slower moving vehicles on the single carriageway sections of the A77 south of Ayr are limited with the majority of the route experiencing a lack of overtaking opportunities. The limited overtaking opportunities can lead to bunching of vehicles.

Peak demand on the rail network is at or near capacity on the Ayr to Glasgow line. In the morning and evening peaks, the congestion both in terms of passengers and train paths is more concentrated on the approach to Glasgow from Paisley. The mix of regular passenger services and scheduled freight services reduces capacity on the network in the corridor, e.g. on the Glasgow and South western route.

The strategic bus services catering for commuters to Glasgow are nearing capacity and are also subject to the congestion experienced on approach to Glasgow city centre.

Emissions (CO_2 only)

This section of the report addresses the issue:

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

CO_2 per person kilometres are forecast to rise from 134 tonnes / million person kilometres to 144 tonnes / million person kilometres between 2005 and 2022 in this corridor. This is a result of CO_2 emissions rising at a slightly greater rate than person kilometres between 2005 and 2022.[691]

The road based transport network produced 474,500 tonnes of CO_2 in Corridor 15 in 2005. This equates to approximately seven per cent of the total road based transport related CO_2 emissions in Scotland.

By 2022, it is forecast that CO_2 emissions in Corridor 15 will rise to around 583,000 tonnes, remaining at around seven per cent of Scotland's road based transport related CO_2 emissions in 2022.

The rail network produced 13,500 tonnes of CO_2 in Corridor 15 in 2007. This equates to approximately 16 per cent of the total rail based CO_2 emissions in Scotland. Electrified lines are estimated to produce no CO_2[692].

Therefore, it is estimated that the road and rail based transport network collectively produced 488,000 tonnes of CO_2 in Corridor 15 in 2005. This equates to approximately seven 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?
- Do capacity issues impact on public transport service?
- How safe is the network?

As outlined previously, demand in this corridor is largely made up from two distinct categories, local trips within the corridor and trips to and from Glasgow. In terms of the STPR it is the latter grouping that is considered to be the most significant. This element of demand is catered for by rail by almost 100 trains per day; there are 40 rail services per day between Glasgow and Ayr, 18 rail services per day between Glasgow and Kilmarnock and 37 rail services per day between Glasgow and Ardrossan. This is augmented at peak periods with additional services. This gives an estimated public transport capacity of 1750 seats per hour for the corridor. When compared to demand, it is estimated that approximately 80 per cent of public transport capacity is being used, although the concentration of trips within the corridor and between the corridor and Glasgow suggest that higher peak time loading occurs.

The electrified rail line from Glasgow offers good competitiveness with car for journeys to Kilwinning, Irvine, Ayr and intermediate settlements, both in terms of frequency and journey time. However, the diesel service from Kilmarnock is less competitive than the car.

[691] TMfS:05
[692] AEA (2001) Rail Emission Model Final Report; www.nationalrail.co.uk; www.networkrail.co.uk

The infrastructure and service provision provides sufficient circumstances for effective business interaction between and among Glasgow and Ayrshire. In other words, commuting opportunities allow suitable return journeys to be made within a working day.

Public transport to and from Stranraer is served primarily by rail due to the limited bus coverage; this does not provide effective business interaction between Glasgow and Stranraer. It does however provide effective business interaction between Stranraer and other centres along the corridor.

Around two per cent of the corridor population are people without cars in the East Ayrshire areas of Drongan, Catrine, New Cumnock and Dalmellington, with a greater dependency on public transport to meet their needs. Public transport accessibility in these areas is very low, suggesting that transport-related social exclusion occurs. This is forecast to continue in the future.

Turning to the issue of capacity constraints on the public transport network, Table 7.15.3 shows the projected morning passenger peak load factors (ratio of demand to supply) on the rail services in the corridor for the various years, as reported in Network Rail's Route Utilisation Strategy. As these figures are averages across a number of train services, it suggests that some peak trains will suffer overcrowding in the future. This tends to suggest that rail will continue to offer a competitive journey time for many trips, but when considering this in combination with the growth in general trips between the corridor and Glasgow of around seven per cent by 2022, the quality of service in terms of accommodation for passengers is likely to be a constraint as capacity is reached.

Table 7.15.3: Rail Peak Load Factors[693]

	Base	2011	2016	2026
South West Electrics	0.87	0.85	0.86	0.93
Strathclyde Diesel – Barrhead	0.78	0.78	0.80	0.87

There are bus stations in Ayr and Kilmarnock which are near the town centres; however they are not close to the railway stations in the towns resulting in poor integration between the modes. The rail service to Ardrossan Harbour and Stranraer Harbour provides good integration with the ferry services from those ports; however the ferry ports of Troon and Cairnryan are located some distance from the nearest railway stations resulting in poor integration between rail and ferry at these locations. Prestwick Airport has good integration with both rail and bus services.

[693] Network Rail Scotland Route Utilisation Strategy March 2007

Bus services in the corridor include commuter services from Glasgow to Ayrshire, longer distance services from Glasgow to Stranraer, and local services between the settlements in the corridor. Table 7.15.4 provides an assessment of bus service quality on the strategic long distance services in the corridor. All factors have been identified as good, with the exception of value which is considered average[694].

Table 7.15.4, 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'.

[694] Bus Users UK

Table 7.15.4: Assessment of Bus Service Quality[695]

Operators	Annual Bus Journeys	Reliability	Frequency	Simplicity	Value	Coverage	Vehicle Quality
Citylink, Stagecoach	75,700	4	4	4	3	4	4

Finally, on the issue of safety, the accident rate on the M77 is lower than the national rate for motorways, and the fatal accident rate on this section of road (0.02 fatal accidents per 100MVkm) is the same as the national rate. Initial analysis of severe accident clusters identified a number of locations in the corridor with safety issues. These locations are on the M77, A77, A737, A760 and A761 Trunk Roads[696]. SPECS average speed cameras were installed in summer 2005 on the A77 between Girvan and Bogend Toll, north of Prestwick. While the initial results of this are positive, the short time of operation means that no valid statistical comparison with previous accident history can be made[697].

Regarding security of users on public transport, women on the whole felt more 'unsafe' than men, and both sexes felt more unsafe on a rail journey in the evening. Within Ayrshire and East Renfrewshire, between 11 per cent and 28 per cent of female bus users expressed a view that they felt either 'not safe' or 'not particularly safe' on buses. This is lower than the national average of 30 per cent. The corresponding figures for rail in Ayrshire and East Renfrewshire which are between 24 per cent and 50 per cent are higher than the national average of 21 per cent. Responses from male passengers were generally in line with the national averages. Within Ayrshire and East Renfrewshire, eight to nine per cent of male bus users expressed a view that they felt either 'not safe' or 'not particularly safe' on buses. This is lower than the national average of 16 per cent. The corresponding figures for rail in Ayrshire and East Renfrewshire which are between nine per cent and 22 per cent are higher than the national average of eight per cent[698].

695 Bus Users UK (Qualititative Assessment – 1:very poor; 5: excellent)
696 Transport Scotland SERIS database
697 A77 Safety Group
698 Scottish Household Survey 2003/2004 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 7.15.7 including:

- M77 / M8 Junction;
- A77 Bellfield Junction;
- A77 Dutch House Junction;
- A737 through Dalry;
- Station car parks at capacity;
- Lack of additional train paths between Glasgow and Kilwinning;
- Lack of additional train paths on the Glasgow to Kilmarnock line;
- Lack of additional train paths between Barassie and Kilmarnock;
- Lack of capacity on Glasgow and South Western Railway route for Anglo-Scottish coal traffic;
- Lack of additional train paths between Ayr and Mauchline; and
- Lack of passenger capacity on services between Ayrshire and Glasgow.

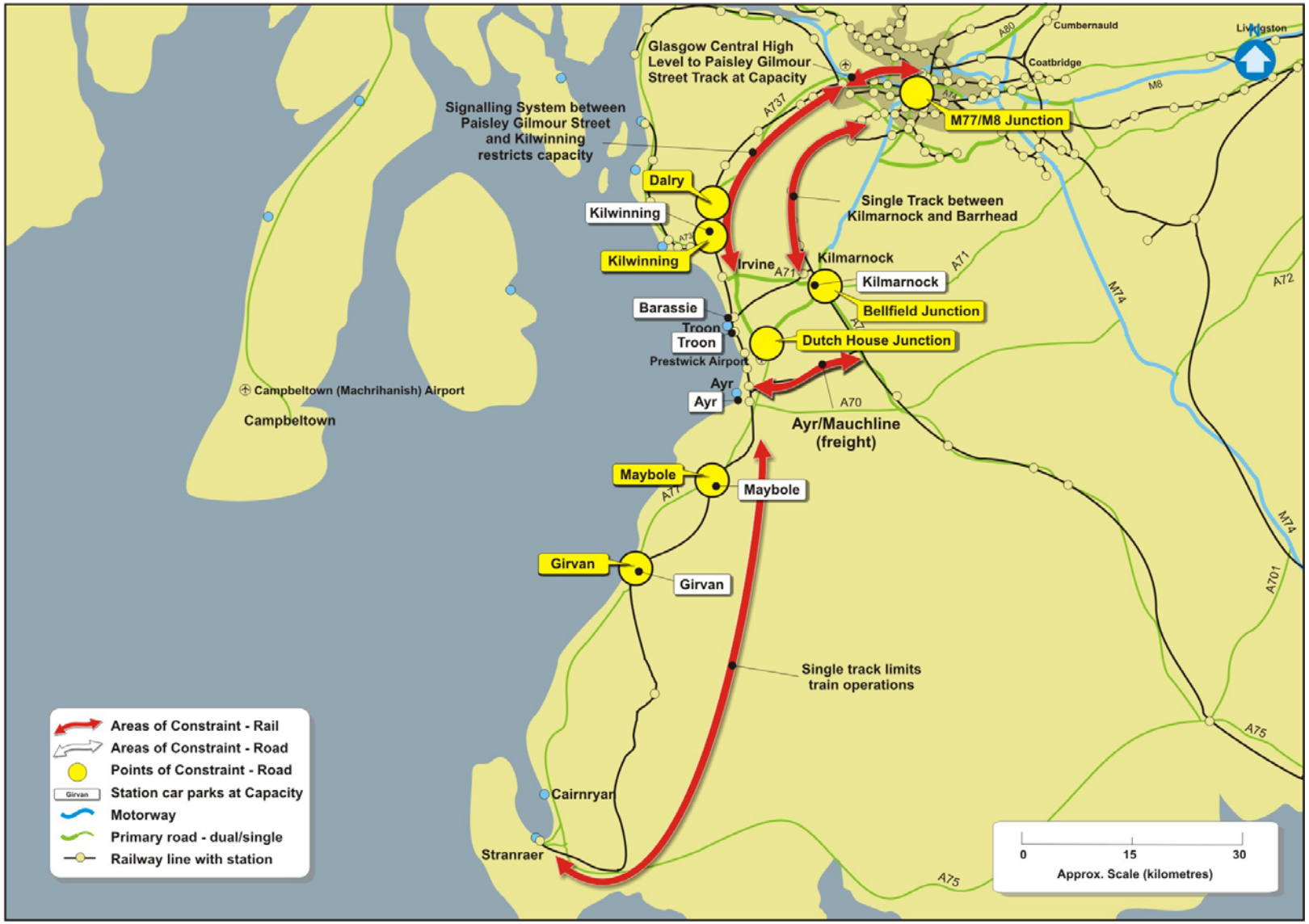

Figure 7.15.7: Areas of Constraint on the Network, Corridor 15 - Glasgow to Stranraer

7.15.5 Summary and Conclusions

Overall, how well does the transport network perform?

There was a significant improvement in the quality of the road link joining the corridor with Central Scotland through the extension of the M77 to Fenwick (north of Kilmarnock), which is important given that over half of the trips from the corridor have a destination that is either in or beyond Glasgow. In general, the road network within the corridor operates efficiently and there are no journey time reliability issues during most of the day and the core Ayrshire road network has adequate link capacity, although there are isolated locations where junctions act as constraints during times of peak demand. This is exacerbated by the high levels of local trips, particularly in and around Ayr. There are also impacts on local communities where the strategic network passes through the community, forming part of its road network.

Likewise the rail network operates well during most of the day but there is overcrowding in the peak, caused by the high volume of commuting trips. Capacity constraints between Paisley Gilmour Street and Glasgow Central are expected to be mitigated with the completion of the Glasgow Airport Rail Link. There are also capacity constraints on the railway line between Barrhead and Glasgow Central that are a result of the route being single track. The passenger carrying capacity of the trains on the electrified services to Ayr is a key constraint.

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

The road network is expected to continue to operate effectively, with strategic journey times on the main route, the A77 / M77, increasing by only a few per cent by 2022. Localised congestion is, however, expected to continue to impact on the operation of the network, particularly at locations where the strategic traffic mixes with local traffic.

On the A737 a key constraint and congestion point is when the route passes through Dalry. It is also forecast that there will be delays experienced on the A737 between the M8 St James Interchange (Junction 29) and Beith based on the projected changes in population and employment.

The opportunities for passing slower moving vehicles on the single carriageway sections of the A77 south of Ayr are limited with the majority of the route experiencing a lack of overtaking opportunities. The limited overtaking opportunities can lead to bunching of vehicles.

Rail overcrowding is a problem that is forecast to worsen in the future. This may constrain potential growth in patronage. Transport Scotland and Network Rail are working together to tackle this problem with the proposed extension of platforms and improvements to services between Glasgow and Kilmarnock including an extension of the existing loop at Lugton to provide increased capacity. This issue of overcrowding, in combination with the lack of available Park-&-Ride capacity, may constrain the ability of the rail network to support the general economic growth of Ayrshire and in particular the focus of regeneration activity and the international gateways. The current rail system capacity is also unlikely to be able to offer adequate service for future development of the port facility at Hunterston.

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

The future plans for Ayrshire include a significant amount of new housing, but there is not predicted to be a similar increase in population. This indicates some degree of population dispersal, which combined with the locations of new developments, may mean that providing effective access to public transport services becomes more difficult.

Passenger numbers at Prestwick Airport are expected to nearly treble to six million per year by 2013. This will lead to an increase in travel demand in the corridor, thereby resulting in additional congestion in the vicinity of the airport.

Providing effective access to Scotland's external links will have a key part to play in shaping future transport performance in this corridor, given the focus on ports and Prestwick Airport.

The identified issue of accident clusters together with the perceived safety performance of the A77 south of Ayr are likely to continue to make safety a key driver for performance.

What are the key problems associated with delivering the KSOs?

This corridor encompasses significant differences in road standard, population dispersal and travel demand along its length, which may impact on the viability of corridor-wide interventions.

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 without further enhancements to the capacity of the rail network. This in turn is likely to impact on modal split and emissions e.g. platforms on the Ayrshire route prevent the running of nine-car trains.

The likely increase in population dispersal makes providing effective access to public transport a key issue, particularly given the focus of population growth relative to the transport corridors and the existing high level of transport related social exclusion in East Ayrshire.