7.20 Corridor 20: Edinburgh to North East England and beyond

7.20.1 Setting the Context

Corridor 20 extends from the south and east outskirts of Edinburgh through East Lothian to the Scottish Border with Northumberland. The corridor is approximately 90 kilometres in length and includes East Lothian and eastern parts of Midlothian and the Scottish Borders, as shown in Figure 7.20.1. The corridor had a total population of 86,500[793] in 2004. The towns within the corridor are small; the main centres are Haddington (population 8,600), North Berwick (population 6,400) and Dunbar (population 7,300)[794].

The A1 Trunk Road provides a strategic road link from Edinburgh to the north east of England for passenger and freight traffic as well as a commuter route from East Lothian and Midlothian to Edinburgh. The A68 is also a key road on the corridor. The strategic East Coast Main Line railway also runs through the corridor providing an Edinburgh to northeast of England connection as part of longer distance services.

The population in the corridor is projected to increase by approximately 5,000 (five per cent) between 2005 and 2022[793]. Much of this growth will be in the more rural eastern sector of the corridor. At the same time, the number of households in the area is forecast to increase by over 5,000, a rise of 14 per cent[793]. In addition, there will be an impact on population distribution from the 'South East Wedge', a significant development located on the south east periphery of Edinburgh and Midlothian areas which has been identified for 4,000 new homes and 30 hectares of business use over the next 15 years[795].
Figure 7.20.2 shows the expected areas of changes in population and employment over the period to 2022. Employment is expected to remain fairly constant at 26,000 jobs[793].

Income levels for the corridor are £366 per week in Midlothian, £440 per week in the East Lothian and £385 per week in the Scottish Borders. This equates to 89 per cent, 107 per cent and 94 per cent of the average for Scotland (£412)[796].

Car ownership in the corridor, measured as a percentage of households with access to a car, is above the Scottish average of 67 per cent, which is typical of more rural areas:

- East Lothian: 73 per cent;
- Midlothian: 72 per cent; and
- Scottish Borders: 76 per cent[797].

[793] TELMoS
[794] 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
[795] Edinburgh and the Lothians Structure Plan 2015
[796] Scottish Economic Statistics 2006, table 4.20
[797] Scotland's Census 2001: www.scrol.gov.uk Table KS17

Figure 7.20.1: Setting the Context, Corridor 20 - Edinburgh to NE England and Beyond

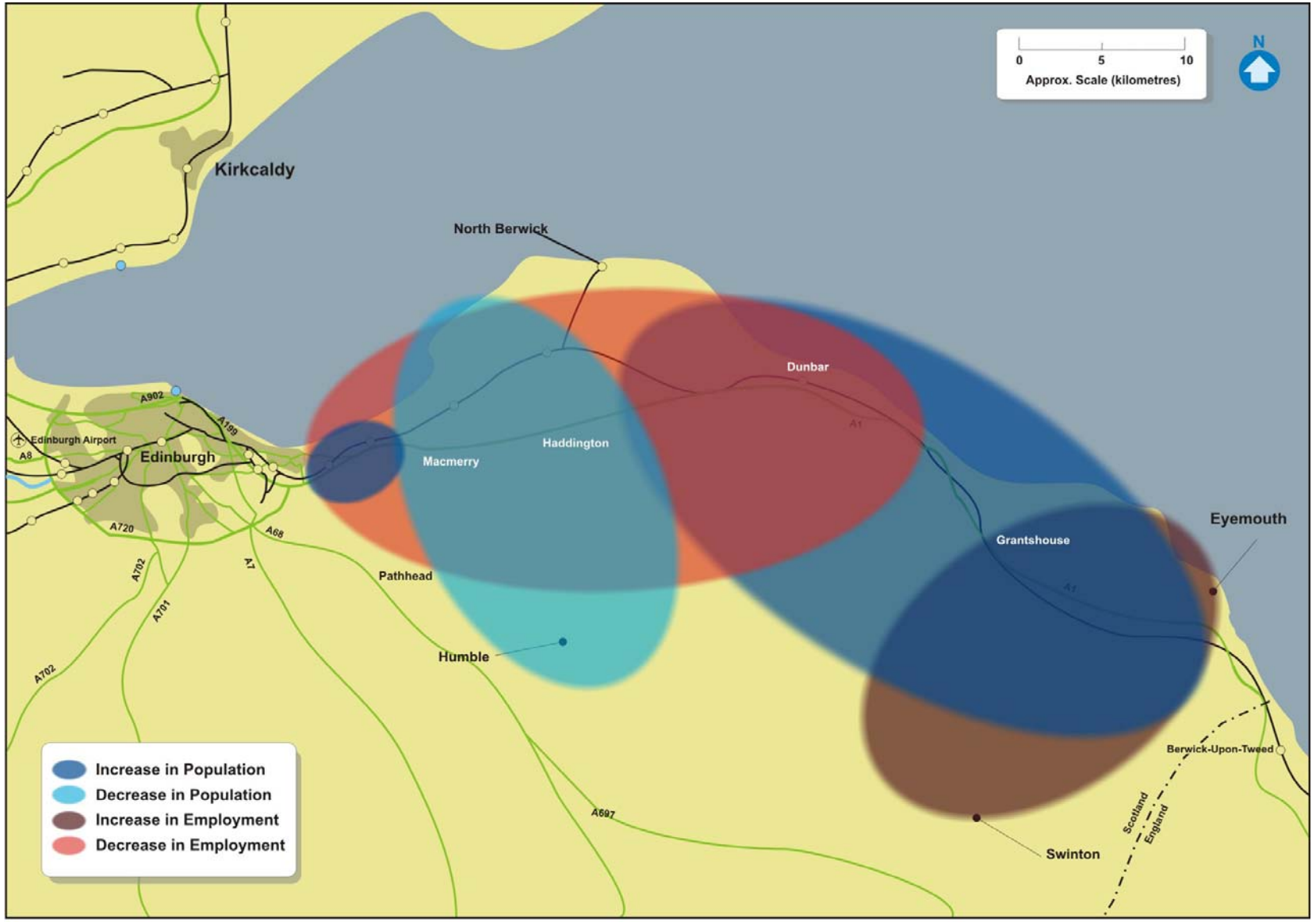

Figure 7.20.2: Changes in Population and Employment, 2005 & 2022, Corridor 20 - Edinburgh to NE England and Beyond

7.20.2 Transport Network and Operations

Infrastructure and Services

Figure 7.20.1 shows the national strategic routes on the corridor.

The A1 and A68 Trunk Roads form the main spine of the road network between Edinburgh and the border with the former being the principal route south. Other important elements of the road network include:

- The A697 (non-trunk) from the A68 to the A1.

The A1 is dual carriageway from Edinburgh to Dunbar, following the opening of the Haddington to Dunbar section in 2004. South of Dunbar, the route is predominantly single carriageway with some sections of two-plus-one to facilitate overtaking. The A68 is predominantly single carriageway.

The East Coast Main Line rail route runs the length of the corridor from Edinburgh to the English border and beyond. Dunbar is served by long distance trains to / from London and Birmingham. The current weekday service includes 14 southbound calls, and 11 northbound towards Edinburgh. Fewer trains call at weekends. Some long distance services on the corridor extend beyond Edinburgh to Glasgow, Aberdeen and Inverness. The corridor is also served by local rail services between North Berwick and Edinburgh, which call at a number of smaller East Lothian settlements on the route. Train services on the North Berwick route are generally hourly, with additional services in the peaks and on Saturdays. Coal and cement freight are carried on the East Coast Main Line. Service patterns are generally:

- One or two services per hour between Edinburgh and London (National Express East Coast);
- One service every hour between Edinburgh and Leeds, Sheffield and Birmingham (Arriva Cross Country); and
- One service per hour between Edinburgh and North Berwick.

Midlothian and a large part of the Scottish Borders is not rail connected. Bus services in the corridor include routes between Edinburgh and the East Lothian and Midlothian towns, longer distance services from Edinburgh into the borders and to England and local services between the settlements in the corridor.

Integrated tickets in the corridor are available in the form of the *PLUSBUS* ticket and the 'One-Ticket'. *PLUSBUS* covers rail journeys into Edinburgh and provides the addition of unlimited bus travel within the urban network. 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

In 2007, seven per cent of the trunk road network pavement[798] 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[799]. Under Transport Scotland's planned maintenance schedule, the net figure for the corridor is expected to rise to eight per cent by 2012.

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

Demand Management

Stations on the rail line to North Berwick have total station car park facilities for approximately 400 cars[800]. The Borders Rail Link proposal has station car parks at several stations on the route.

Bus journeys into Edinburgh from the corridor benefit from bus priority measures with bus lanes provided on the A1[801]. These have a greater beneficial impact for the shorter commuting journeys into Edinburgh from the corridor. As there are no bus priority measures at present in the rest of the corridor, bus journeys in these areas are therefore affected by road congestion to the same extent as the car. City of Edinburgh Council has adopted a policy of discouraging parking provision within the city centre for commuters to encourage public transport use[802]. A bus based Park-&-Ride car park is due to open in late 2007 at Sheriffhall for access from the south to Edinburgh city centre[803].

Programmed Schemes

The following programmed schemes and developments in the Corridor (highlighted in Figure 7.20.3) include:

- A68 Pathead to Tynehead Project;
- A68 South Soutra to Oxton Project;
- A68 Northern Dalkeith Bypass;
- Borders Rail Link from Edinburgh to Tweedbank, near Galashiels; and
- South East Wedge / Shawfair.

[798] Transport Scotland SERIS Database
[799] STS No. 25 (2006) Table 5.5
[800] First ScotRail Station Facilities: www.firstgroup.com/scotrail
[801] The City of Edinburgh Council: Greenways and Bus Lanes: www.edinburgh.gov.uk
[802] The City of Edinburgh Council: Local Transport Strategy
[803] The City of Edinburgh Council: "Easy Park & Ride": www.edinburgh.gov.uk

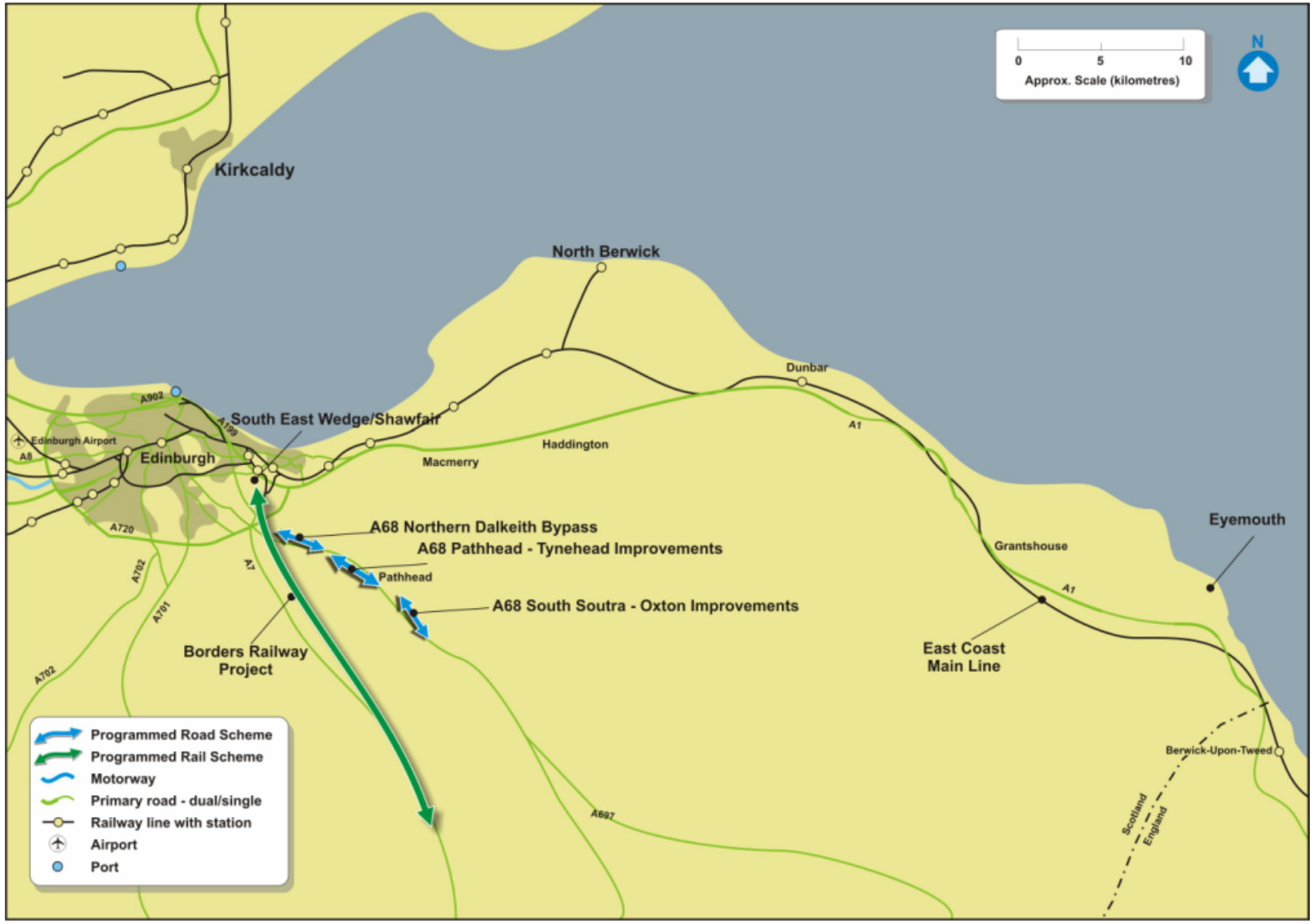

Figure 7.20.3: Programmed Transport and Land Use Developments, Corridor 20 - Edinburgh to NE England and Beyond

7.20.3 Travel Patterns

Travel patterns for the corridor are graphically presented in Figure 7.20.4. A summary of demand and mode share in the corridor is shown in Table 7.20.1.

Edinburgh is the main single destination from the corridor (47 per cent) reflecting the commuting belt around the north of the corridor. This pattern is forecast to remain largely unchanged to 2022. Approximately 14 per cent of the trips pass through the corridor between Edinburgh and England, most of which use the main strategic routes, the A1 and the East Coast Main Line.

Table 7.20.1: Summary of Demand (12 hour) and Public Transport Share[804]

		Between Edinburgh and England	Within Corridor	Between Corridor and Edinburgh	Between Corridor and England	Between Corridor and other destinations	Total Trips
2005	Total Trips	15,200	12,900	49,300	10,600	17,600	105,600
	% of Corridor	14%	12%	47%	10%	17%	100%
	PT Trips	3,600	1,100	8,100	100	300	13,100
	PT Share	23%	9%	16%	1%	2%	12%
2022	Total Trips	15,000	11,300	53,800	10,100	19,000	109,200
	% of Corridor	14%	10%	50%	9%	17%	100%
	PT Trips	3,900	800	7,600	200	400	12,900
	PT Share	26%	7%	14%	2%	2%	12%
Change	Total Trips	-1%	-12	+9%	-5%	+8%	+3%
	PT Trips	0%	-27%	-6%	+100%	+33%	-6%

Total trips in the corridor are expected to increase from 105,600 in 2005 to 109,200 in 2022, a three per cent rise. Public transport trips are forecast to decrease from 13,100 in 2005 to 12,900 in 2022, a two per cent reduction.

Mode share analysis in the corridor indicates that nine per cent of the total corridor trips are made by public transport, which reflects the rural nature of much of the corridor. The majority (84 per cent) of total corridor public transport trips are between the corridor and Edinburgh, utilising both the commuter rail service and the available bus services[805]. The total public transport trips are forecast to reduce by six per cent by 2022 despite a forecast rise of approximately 15 per cent on the railway network.

[804] TMfS:05

[805] This is a border area in TMfS:05. As such, the total travel demand and the modal shares for trips to areas outside of Scotland, must be viewed as being only broadly indicative. Journeys on public transport are underestimated in this corridor.

The AADT on the A1 varies from 7,000 vehicles at Grantshouse in the rural centre of the corridor, to 50,000 vehicles approaching the A720 Edinburgh Bypass and on the A68 from 7,000 vehicles in the rural areas to 17,000 vehicles approaching the A720 at Edinburgh[806].

ATC data from the SRTDb gives a figure of approximately nineteen per cent HGV traffic on the A1 at Grantshouse[807]. This route experiences a high percentage of HGV traffic and as such is important for freight. The majority of the HGV traffic are strategic trips from Edinburgh and beyond to England.

The railway stations in this corridor have a total throughput of some 1.4 million passengers per annum (2005), with North Berwick and Dunbar the busiest stations. [808]

[806] Transport Scotland: Scottish Roads Traffic Database
[807] SRTDb
[808] Rail industry LENNON data (Station Usage 2004/2005)

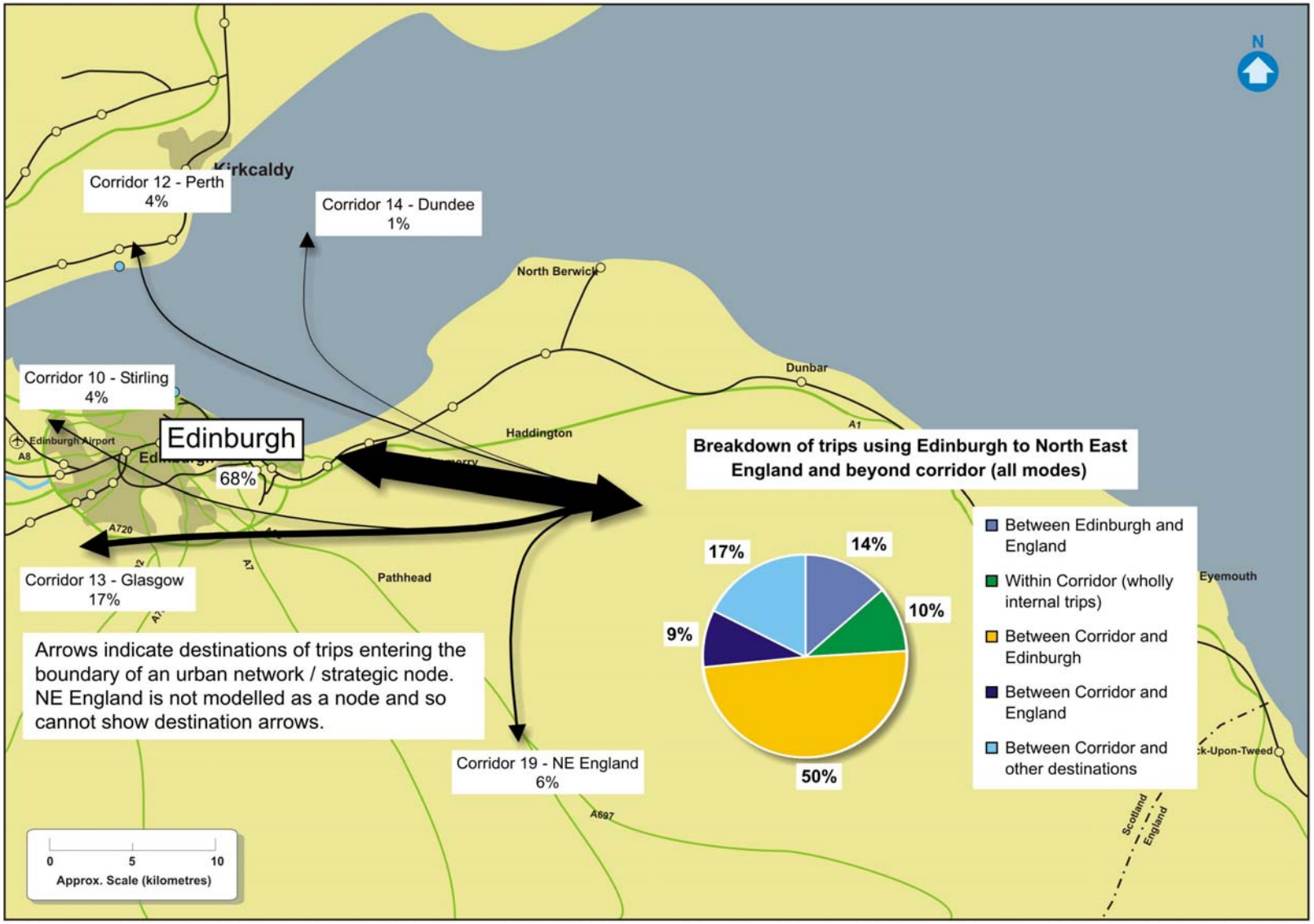

Figure 7.20.4 Travel Patterns 2022, Corridor 20 – Edinburgh to NE England and beyond

7.20.4 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 main road within the corridor is the A1, which is a mix of dual carriageway and single carriageway. Figure 7.20.5 shows the current and forecast average speed on the A1 within the corridor between Edinburgh and the English border. Travel times for a typical trip from the centre of Edinburgh to the end of the corridor are also shown.

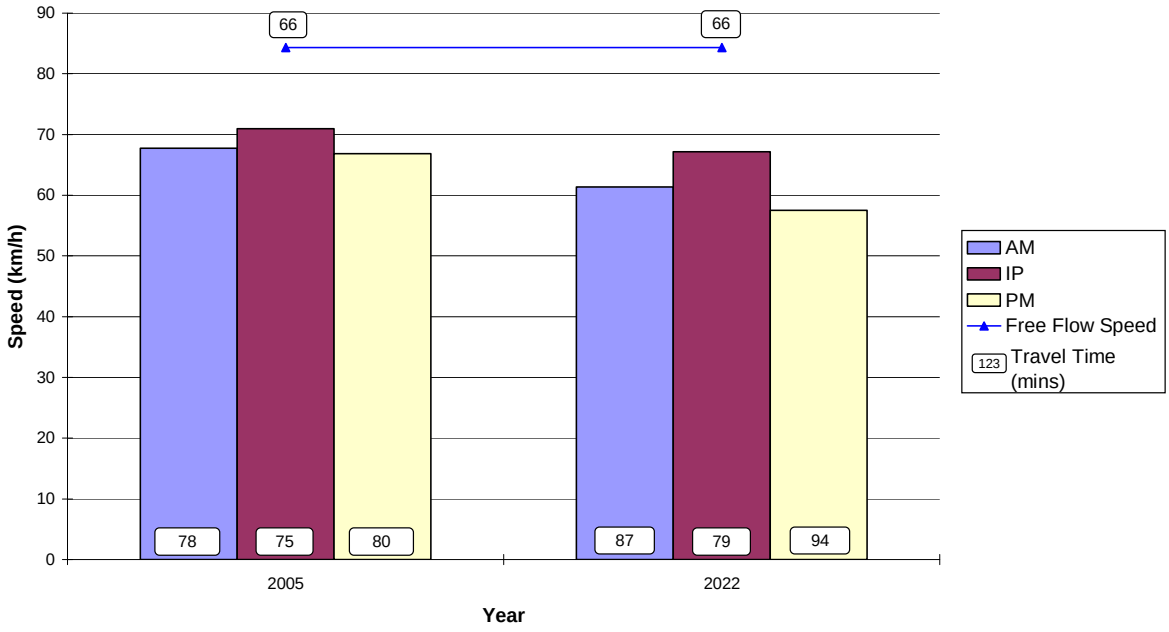

Figure 7.20.5: Average Road Speeds (Corridor 20)[809]

Travel time along the corridor in 2005 is broadly similar across all time periods at 1 hour 15, 1 hour 18 and 1 hour 20 minutes for off peak, morning peak and evening peaks respectively. The free flow travel time is quicker at 1 hour 6 minutes. In 2022, the travel times differ by more at 1 hour 19, 1 hour 27 and 1 hour 34 minutes for off peak, morning peak and evening peak respectively. The free flow travel time in 2022 does not change from 1 hour 6 minutes.

[809] TMfS:05

The average speeds in the morning, inter-peak and evening periods are forecast to decline between 2005 and 2022. The decline is most significant in the evening period, resulting in a 20 per cent increase in journey times. Average speeds are affected by significant congestion on the approaches to Edinburgh on the A1 and on the A720 Edinburgh Bypass.

The East Coast Main Line from Edinburgh offers a competitive alternative to car for longer distance services to England as shown in Figure 7.20.5[810]. Rail is less competitive in journey time against car for the commuter journeys to North Berwick and intermediate settlements which show journey times being similar or marginally quicker by car. The rail service becomes more competitive by 2022 due to the impact of increased congestion on the road network and the introduction of the Borders Railway.

Bus offers a competitive alternative over car for the shorter distance commuting out of Edinburgh given the bus priority measures in place. This competitiveness reduces further east where no priority measures are available and congestion is less of an issue.

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

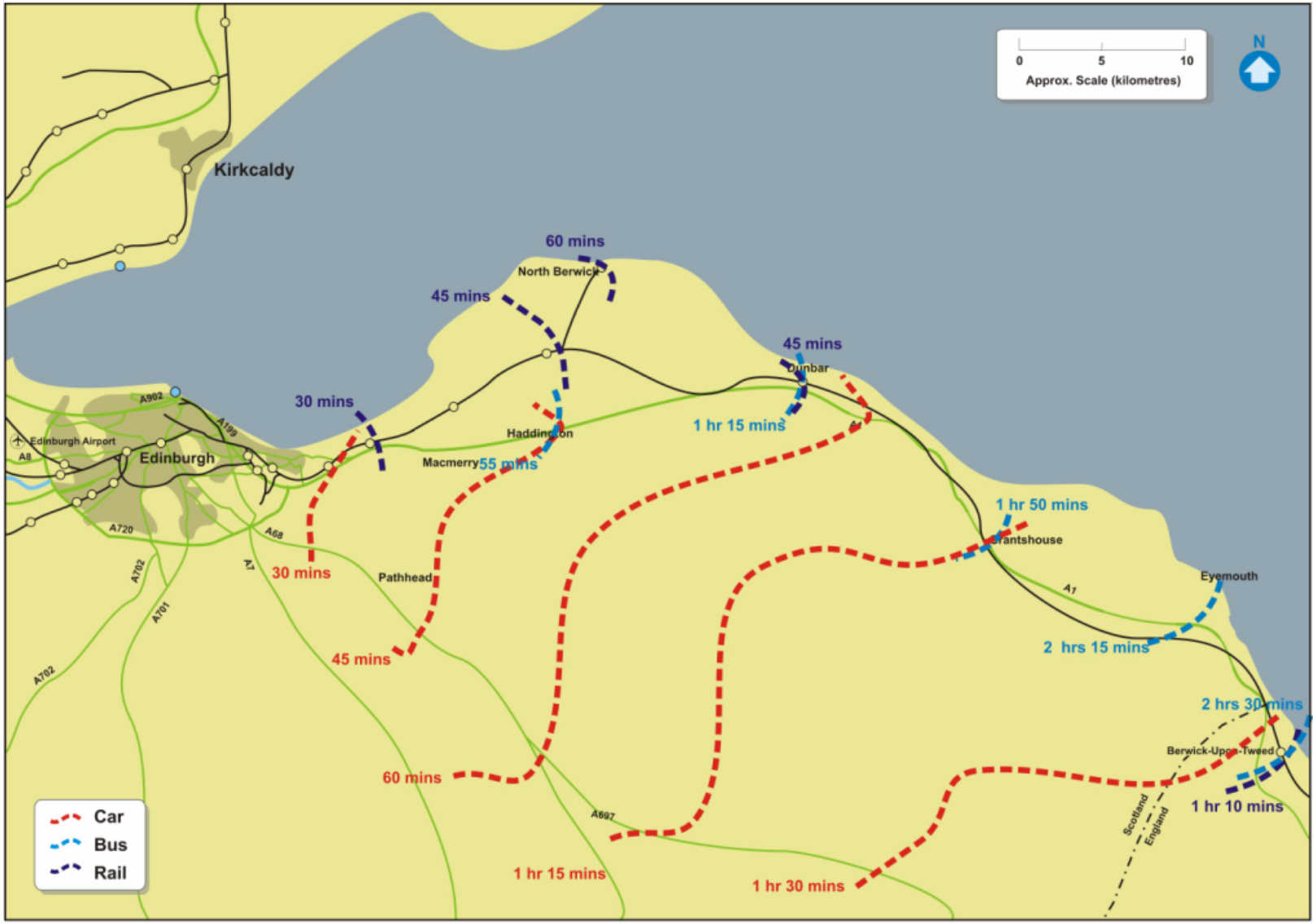

Figure 7.20.6: Journey Time to Edinburgh City Centre by Road/Rail (2005 AM peak), Corridor 20 - Edinburgh to NE England and Beyond

Over most of its length, the road network in this corridor is operating effectively and reliably and within its design capacity. There is some peak congestion at the northern end of the A1 and on the A720 Edinburgh Bypass. This congestion causes journey time reliability issues especially when approaching Edinburgh[811] which result in journeys being 15 – 20 per cent or 20 – 30 minutes longer than the daily average[812]. The AADT levels reflect the commuting trips from the corridor into Edinburgh which use the A1 as their main route. Congestion at the A1 / A720 Junction and on the A720 Edinburgh Bypass is also impacted by long distance traffic from Scotland to northeast England which passes through this route.

The North Berwick line has 32 rail services per day between Edinburgh and North Berwick giving approximately 300 seats per hour in each direction. Car parks at stations on the North Berwick route are now full by the end of the morning peak. A rail service is also provided between Newcraighall and Edinburgh as part of the Edinburgh Crossrail route. This service is half hourly (average 32 trains each way per day, except Sundays), again providing 300 seats per hour in each direction.

The mainline rail services on the East Coast Main Line provide a total of 66 rail services per day through the corridor that provide approximately 30,000 seats. The mainline trains stopping at Dunbar are well used by corridor residents for access to Edinburgh. 74 long distance bus services per day use the corridor on services between Edinburgh and England, giving a capacity of approximately 250 seats per hour in each direction.

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 20 is:

- First ScotRail East 88.6 per cent (target 90 per cent)[813].

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 expected to rise slightly from 136 tonnes / million person kilometres to 146 tonnes / million person kilometres between 2005 and 2022 in this corridor[814].

The road based transport network produced 140,000 tonnes of CO_2 in Corridor 20 in 2005. This equates to approximately two per cent of the total road based transport related CO_2 emissions in Scotland.

[811] Congestion on Scottish Trunk Roads, 2003 and 2004, Transport Scotland
[812] http://scottishexecutive.itisholdings.com/
[813] http://www.firstgroup.com/scotrail/content/aboutus/ourperformance.php
[814] TMfS:05

By 2022, it is forecast that CO_2 emissions in Corridor 20 will rise to around 153,500 tonnes, approximately two per cent of Scotland's road based transport related CO_2 emissions in 2022.

The majority of the rail network within Corridor 20 is electrified.

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?

With the exception of areas served by rail on the North Berwick route, public transport is not very competitive with car. In these rail served areas, public transport will become more competitive as road congestion makes car travel increasingly costly.

The infrastructure and service provision provide for effective business interaction between the centres of the corridor, although its geography makes longer distance commuting unattractive.

Table 7.20.2, provides an assessment of the quality of strategic bus services within the corridor on a scale of one to five, with one being 'poor' and five being 'excellent'. Simplicity and coverage have been identified as good, with all other factors average. Journey times on the bus services will be impacted by the change in average speeds over time.

Table 7.20.2: Assessment of Bus Service Quality[815]

Service Numbers	Annual Journeys	Reliability	Frequency	Simplicity	Value	Coverage	Vehicle Quality
253, 383, 534, 591, X6, X8, Megabus	26,163	3	3	4	3	4	3

[815] Bus Users UK (Qualititative Assessment – 1:very poor; 5: excellent)

Integrated tickets in the corridor are available in the form of the *PLUSBUS* ticket and the 'One-Ticket'. *PLUSBUS* covers rail journeys into Edinburgh and provides the addition of unlimited bus travel within the urban network. 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.

Accident and fatal accident rates on the A1 and the A68 are lower than the national rates for non built up A Class trunk roads. Initial severe accident cluster analysis indicated safety issues on the A1 near Tranent and on the bend on the A1 near Burnmouth. A cluster was also identified at the bend on the A68 near the B6368 Junction south of Fala[816].

Summary of Infrastructure and Operational Constraints

Key constraints and congestion points are shown in Figure 7.20.7, including:

- Peak congestion on the A1 on approach to Edinburgh and on the A720 Edinburgh Bypass;
- No railway directly serving Midlothian or the Scottish Borders;
- Overcrowding on rail services during peak periods west of Prestonpans;
- Inadequate supply of parking at stations on the commuting line into Edinburgh[817];
- The northern part of the reopened Borders Rail Link is forecast to be at or over capacity by 2017;
- Line capacity constraint on the railway single line junction between Portobello Junction and Niddrie South Junction at Newcraighall;
- Inadequate loading gauge prohibits the conveyance of high cube containers on standard wagons on the East Coast Main Line; and
- Newcraighall Park-&-Ride service frequency.

[816] Transport Scotland SERIS Database
[817] Transport Scotland: Scottish Planning Assessment: Part 2 Report August 2006, Table 7.1

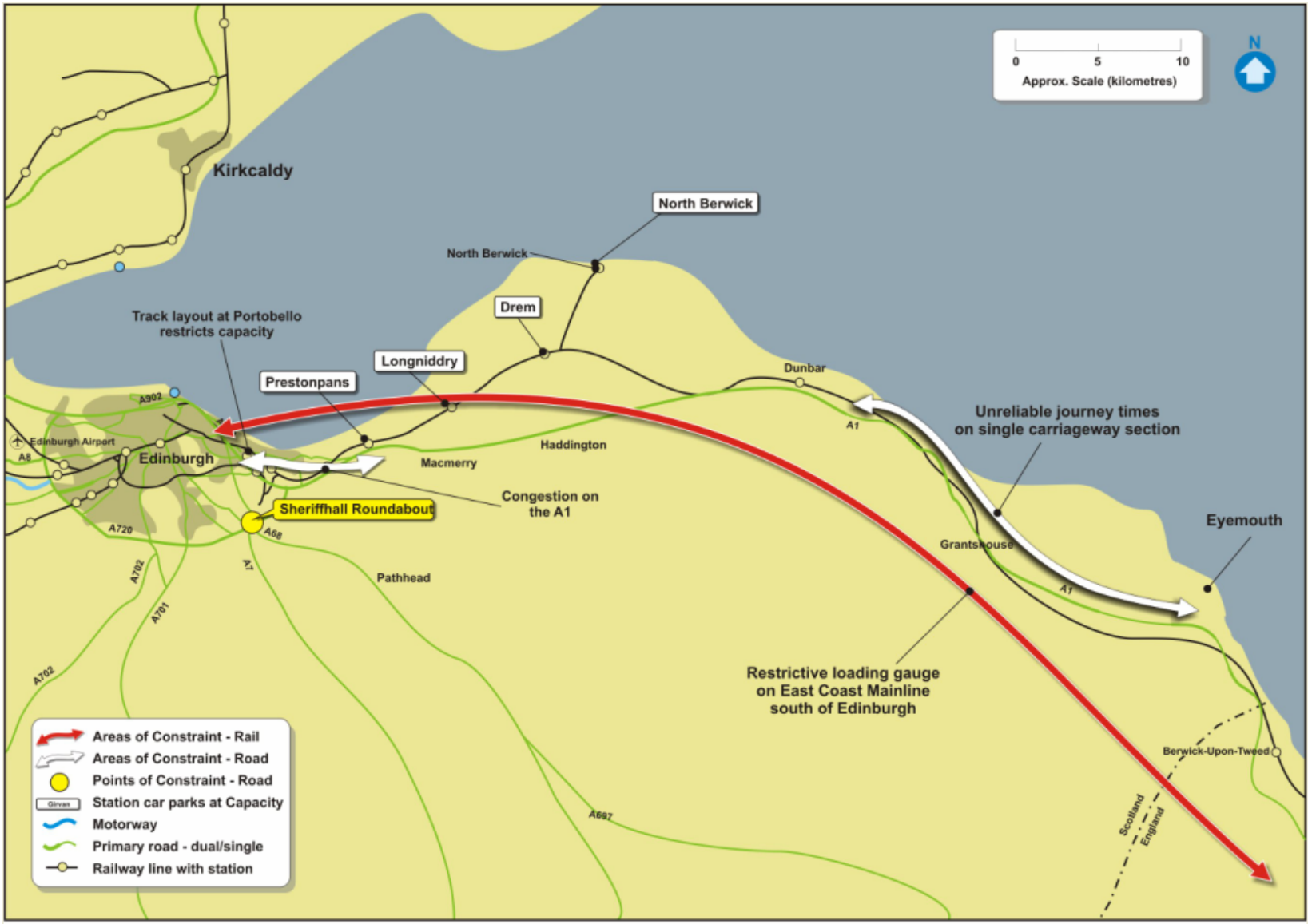

Figure 7.20.7: Areas of Constraint on the Network, Corridor 20 - Edinburgh to NE England and Beyond

7.20.5 Summary and Conclusions

Overall, how well does the transport network perform?

The corridor currently enjoys relatively safe, efficient transport operations and experiences few journey time reliability issues, despite some capacity constraints and congestion points.

Traffic volumes on the A1 increase towards Edinburgh with significant commuter traffic from East Lothian and Midlothian into Edinburgh. The A1 is a single carriageway road south of Dunbar, resulting in limited overtaking opportunities.

At the northern end of the corridor, the road network is affected by congestion on the A720 Edinburgh City Bypass and on routes into the city centre.

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

A modest level of demand growth is expected on the corridor, leading to a small decrease in average speeds on the road network. Congestion is forecast to worsen in the future and this will lengthen journey times for road based trips.

The introduction of the Borders Rail Link will increase rail capacity but much of this will be taken up by 2022 from the proposed development at the 'South East Wedge'. The introduction of a Park-&-Ride site at Sheriffhall will increase the potential access for public transport into Edinburgh.

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

Increased employment within the corridor and in areas of Edinburgh outside the city centre will result in increased demand for trips both into the corridor and destinations in Edinburgh other than the city centre. These have traditionally been poorly served by public transport and will place further reliance on car based trips.

What are the key problems associated with delivering the KSOs?

There is limited capacity on the East Coast Main Line to operate additional services, particularly on the shared use route between Edinburgh and Drem, where the North Berwick line branches off. The railway is further constrained in its freight carrying capacity by a limited loading gauge. It is likely, however, that KSOs can be achieved by optimising operations within the existing infrastructure asset base.