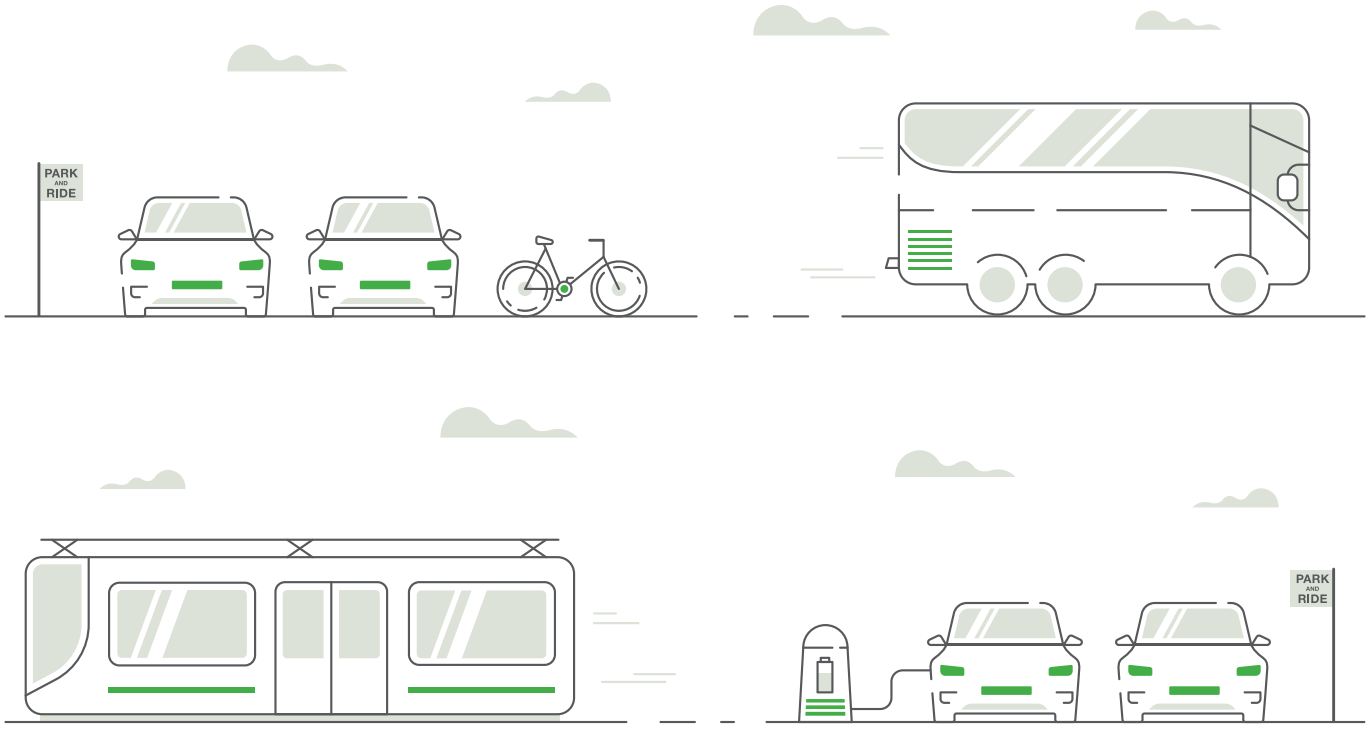
SOUTH EAST OF SCOTLAND TRANSPORT PARTNERSHIP

SEStran Regional Park and Ride Strategic Study

Study Report

Final | March 2020



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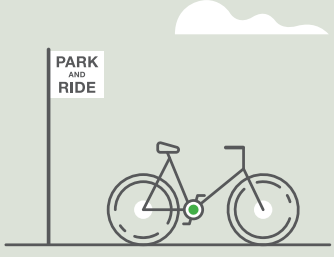
Contents

Study Overview



1 Study Overview

Introduction

This study is aimed at informing an update to the existing SEStran Park and Ride Strategy of 2009, presenting an evidence based review of current Park and Ride provision within the SEStran region. This strategic study will help inform future investment priorities for enhancement of Park and Ride facilities, as an essential part of a more sustainable transport network and shape the development of the next Regional Transport Strategy (RTS). It is important to note that this is not a strategy in itself but provides contextual analysis which will form the baseline from which to develop and plan delivery through the RTS.

In developing the evidence base, the study considered the existing transport network and region's travel characteristics and policy context for Park and Ride, before assessing the performance of the current provision. Site audits of existing Park and Ride facilities were carried out to establish key features and levels of utilisation, headlining key attributes for future site selection.

A Park and Ride model was prepared to examine existing travel to work demands and network travel times by mode, to establish likely intercept rates for existing and proposed Park and Ride sites. The model outputs have been used to compare and 'score' sites in terms of generalised time and cost relative to private car use.

Google data has also been utilised to highlight peak period journey times, relative to off-peak conditions to illustrate 'congestion' and constraints across the strategic and local road network.

Policy Context

A review of existing policy relevant to the strategic Park and Ride network was carried out during the desktop review stage. Documents reviewed and analysed included key national, regional and local transport, environment and planning policy associated with the geography of the SEStran region. Key themes were identified from these policy documents in order to inform the Park and Ride strategy development.

National policy reviewed includes Scotland's *National Transport Strategy 2* and the *National Planning Framework (2014)* for Scotland. Both policies outline key challenges facing the transport sector such as the increase in rail demand, decline in bus travel, reliance on private vehicular trips particularly in rural areas but not only (see Table 2.1 which indicates car reliance for travel to work across the region) and increased ambition to reduce transport related emissions. Both documents also outline strategic aims such as improving transport connectivity nationwide, and encouraging active and sustainable travel through prioritising investment which reflects the '*Sustainable Travel Hierarchy*'[1].

Regional policy and key documents analysed as part of this study comprises of the SEStran Regional Transport Strategy (2015), *SESplan Cross Boundary Report (2017)* and the *City Region Deal- Edinburgh and South East Scotland*. These studies and investment plans focus on improving collaboration between local authorities and identifying areas of investment that consider cross-boundary movements across the SESplan region, which benefits a large part of but not the whole SEStran region.

[1] National Transport Strategy 2, Transport Scotland, 2019

Areas of investment include increasing accessibility of existing sites by active travel modes, expanding park and ride sites located in strategic areas where appropriate, provision of sustainable transport measures connecting neighbouring local authorities with Edinburgh and bringing forward cross-boundary initiatives. One example of this is the Edinburgh Orbital Bus Link as identified in the SEStran RTS from both 2008 and 2015.

Local policy focuses on conditions specific to each local authority, with consideration of the high-level aims set out within national policy. Local Development Plans and Local Transport Strategies have been analysed for each local authority and used to gather local context and identify development and transport proposals. Local Development Plans were utilised to collate proposed Park and Ride sites and extensions to existing facilities, which allowed for identification of investment priorities. Overall, local policy focussed on improving active travel infrastructure and public transport provision within each local authority area. The majority of local authorities across the region subsequently identified park and ride investment as a way of encouraging more sustainable travel and reducing private car trips.

Background

To inform this strategic study of Park and Ride provision, cognisance is given to the existing (2020) infrastructure, network coverage and site utilisation, whilst recognising the changing environment in terms of attitudes and objectives for future travel choices. At the time of preparation, the national transport agenda was under review with the publication of the National Transport Strategy (NTS2), planning legislation going through a reform with the National Planning Framework (NPF4) along with a national infrastructure review with ongoing engagement for the second iteration of the Strategic Transport Project Review (STPR2). At a local level, the City of Edinburgh Council, the region's city and main hub of employment, has published a number of strategy documents including *the Edinburgh City Centre Transformation, City Plan 2030* and *City Mobility Plan*, which reflect the changing emphasis and urgency to influence travel choices and user experience, transforming the transport network within the city centre and improving the day to day lives for residents, communities and visitors.

As policy evolves, day to day travel demands continue to challenge the existing physical and operational infrastructure, with weekday peak period congestion and overall network resilience issues under constant review. National transport statistics[2] illustrate an increase in both car and rail-based modes of transport, absorbing a shift from bus travel which was showing to decline. These findings support the Park and Ride site audits which informed this study, with a significant proportion of rail station car parks observed as operating at capacity during the morning peak periods, with evidence of overspill demand.

The SEStran RTS approved in 2015 identified key themes which have been taken forward as part of this Park and Ride Strategic Study. These reflect regional support to **improve access to public transport** and provide better **connectivity** across the transport network, creating good **access to the wider labour market** to contribute to a successful **economy**. Within the context of these themes, the Park and Ride study outlines the regional response to ensuring Park and Ride provision and planning is undertaken in a holistic and co-ordinated manner, addressing the cross-boundary travel issues and bringing together a collaborative study.

[2] Scottish Transport Statistics, No.38, 2019 Edition

One of the challenges for the next iteration of the study is to establish a framework which prioritises investment in Park and Ride improvement and optimisation (as opposed to mere extensions and new infrastructure) without compromising policy objectives by encouraging increased car kilometres. Park and ride is an important element of the regional transport network, however it is recognised that park and ride is not the only solution. This study highlights how Park and Ride should be integrated within the regional transport network, to compliment other modes and targets.

In the context of a Sustainable Investment Hierarchy (Figure 1.1), Park and Ride facilities branch across a number of sustainable transport modes and support the investment hierarchy envisaged and set out within then NTS2.

Figure 1.1 Sustainable Investment Hierarchy[3]

Based on the existing provision and utilisation, Park and Ride clearly has an important role to play in defining the regional transport network. This study aims to outline the future direction of Park and Ride both in terms of demand and supporting policy.

The study has been informed using a range of data sources, reference material and analytical assessments, ensuring a contemporary view of the existing travel demands and network operation. Building on the 2009 park and ride strategy, an updated site inventory has been prepared, accounting for new and extended sites.

[3] National Transport Strategy 2, Transport Scotland 2019 (Figure 15)

Our catchment analysis utilised Conveyal software to map Census 2011 population data and develop an understanding of potential for travel while deriving travel time catchments. The catchment assessment also considers drive time catchments versus public transport accessibility, which has been utilised in a comparative assessment tool to score site performance and understand the weighting of site location in terms of use.

An additional multi-criteria assessment was prepared, applied to both existing and potential 'new' Park and Ride sites, again showing a relative score in terms of suitability and likely performance based on current Park and Ride operation.

What is Park and Ride

The term 'Park and Ride' is frequently referenced and can be used to describe a number of different facilities, in terms of land use and associated infrastructure. As part of this study development, reference to 'Park' has been noted to reflect the prominent use by car-based travel, however it is important to acknowledge that they are often used as drop-off locations or points of modal interchange.

For the purpose of this study, and for consistency with the 2009 strategy, the term 'Park and Ride' is considered to represent:

- facilities where parking is provided and actively encouraged as a means to access the public transport network, and
- rail stations where there is no car parking, but the station is accessible for active travel and other modal interchange opportunities

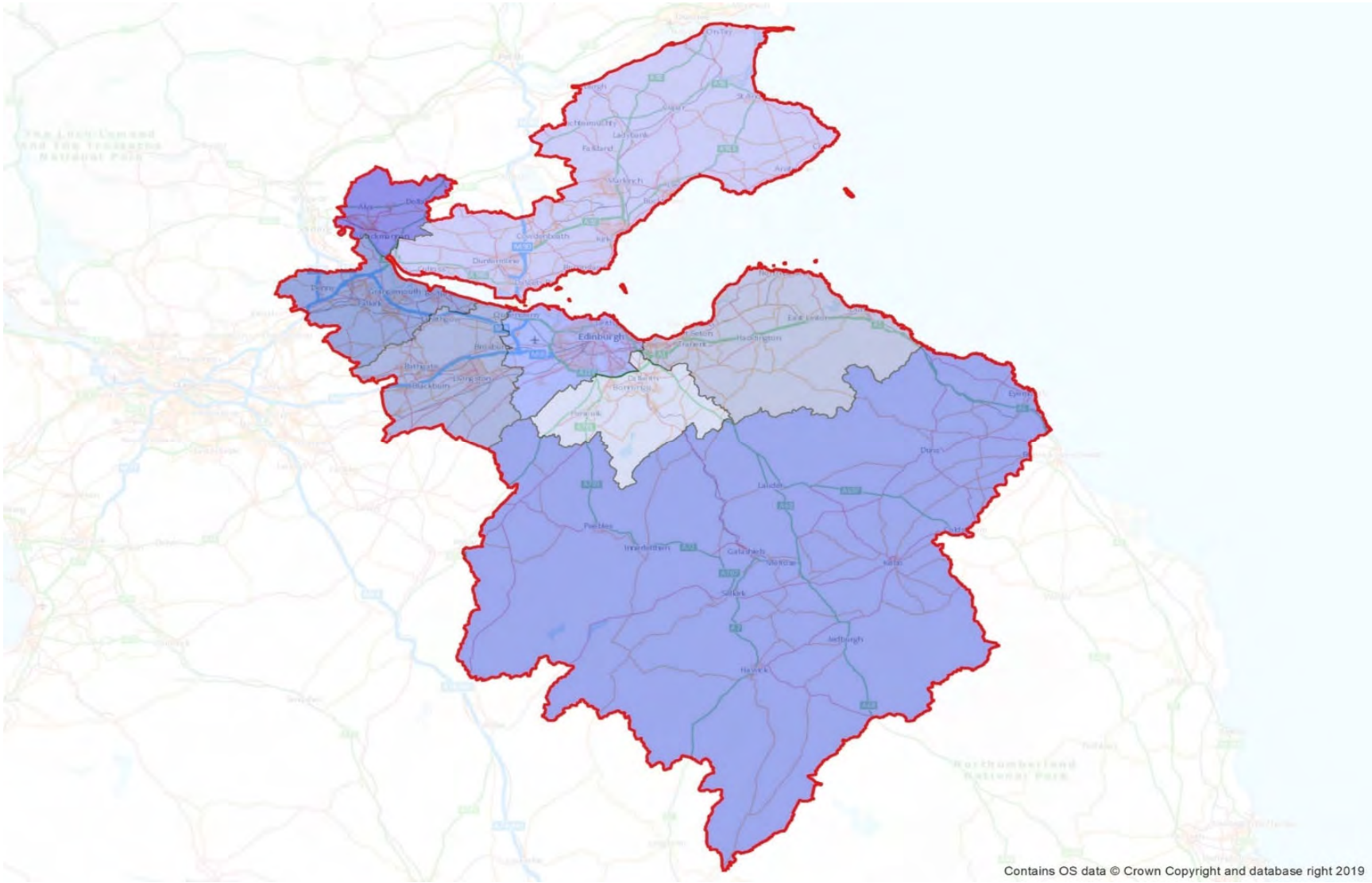
The study excludes on-street parking, retail car parks, and large public car parks which are not directly associated with direct linkages to public transport.

Applying the above criteria, a total of 69 sites have been identified within the SEStran region, an increase of 15 sites from 2009. Across all existing sites, there is approximately 13,000 car parking spaces, with an average of 4% of spaces reserved as disabled parking. In addition, there are over 1,000 cycle storage spaces (including a mix of standard 'Sheffield' stands type facilities and secure storage boxes).

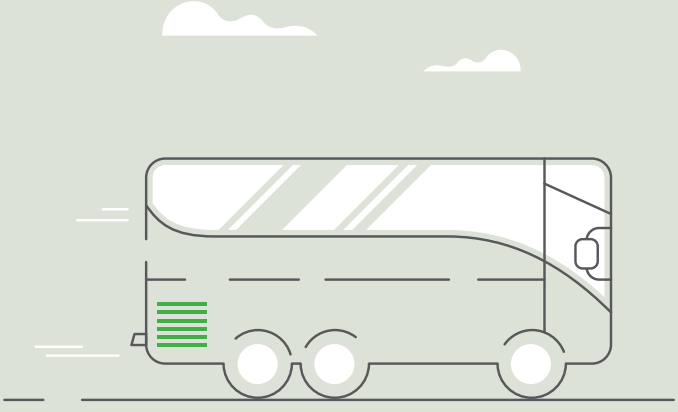
Across the SEStran region, user experience of Park and Ride varies considerably as sites are delivered independently, with sites varying in age, quality, scale and location. While the provision of ancillary services and facilities at Park and Ride sites are likely to contribute to user perception, many of the sites were observed as operating over capacity, which will undoubtedly impact on site and mode choice.

Figure 1.2 illustrates the SEStran region coverage, and local authority boundaries.

Figure 1.2 SEStran Region Map



SEStran Regional Travel Demands

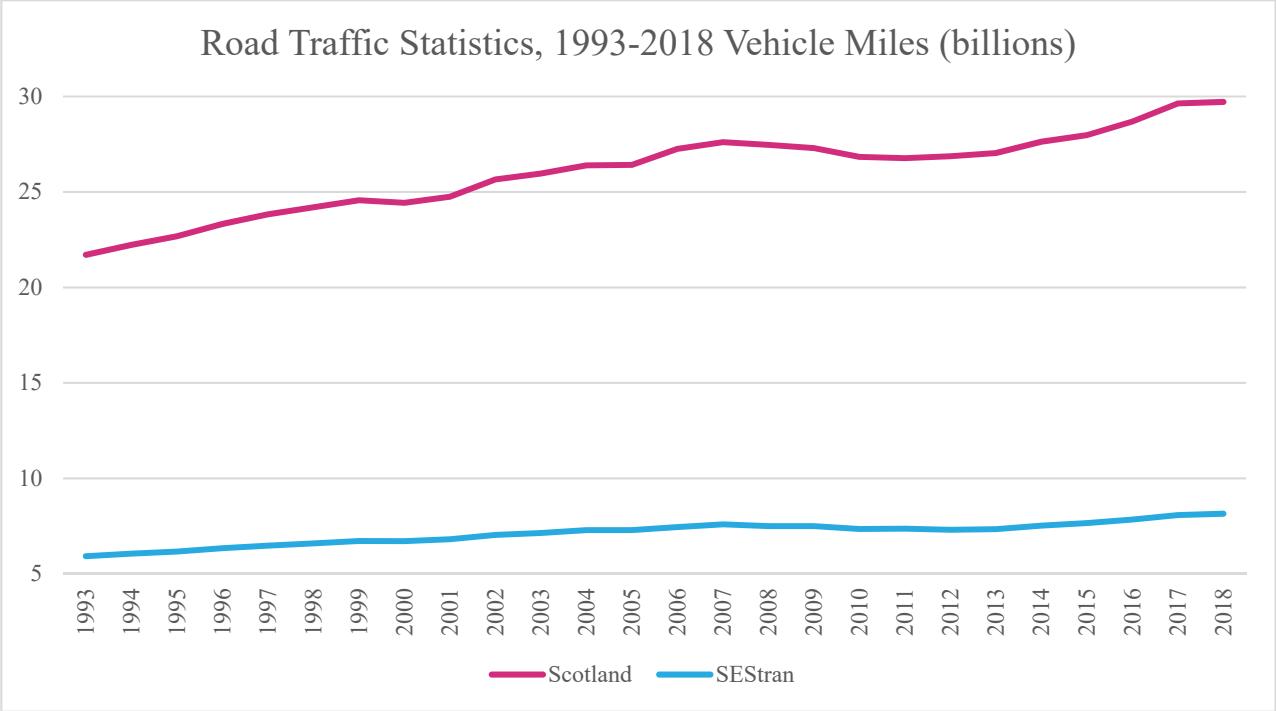


2 SEStran Regional Travel Demands

National transport movements and demands continue to evolve, responding to the growth in population and expansion of housing development, and the resulting travel demand which impact network performance, and influence travel choices. Peak period demand on key corridors has increased, initially rebounding from the economic downturn during 2008, with a general upward trend in car-based movements.

Scottish National Statistics provides a useful benchmark from which to assess the SEStran transport network characteristics relative to national trends. The SEStran region resident population (mid-2018 figures) amounts to 29% (1,596,690) of the Scottish population (5,438,100). Within the SEStran region there is 7.1 km per 1,000 residents of road network, less than the Scotland-wide ratio of 10.4 km per 1,000 residents, which reflects the higher density catchments in and around Edinburgh.

Figure 2.1 Annual Vehicle Miles, Comparison of Scotland and SEStran Region



Travel to work statistics highlighted the continuing trend in private car use, with 2018 data reporting 67.7% of trips undertaken by car (including both driver and passenger). In comparison, the data identified a decrease in bus passenger numbers of approximately 10% over the past 5 years, with rail passenger figures increasing by 13% over the same period.

Access to a car continues to challenge individual travel choices, the number of licensed vehicles in Scotland in 2018 was approximately 3 million, representing a ratio of 550 cars per 1,000 residents. Across the SEStran region the ratio drops to approximately 500 cars per 1,000 residents, again likely to be influenced with a lower car ownership within Edinburgh City Centre.

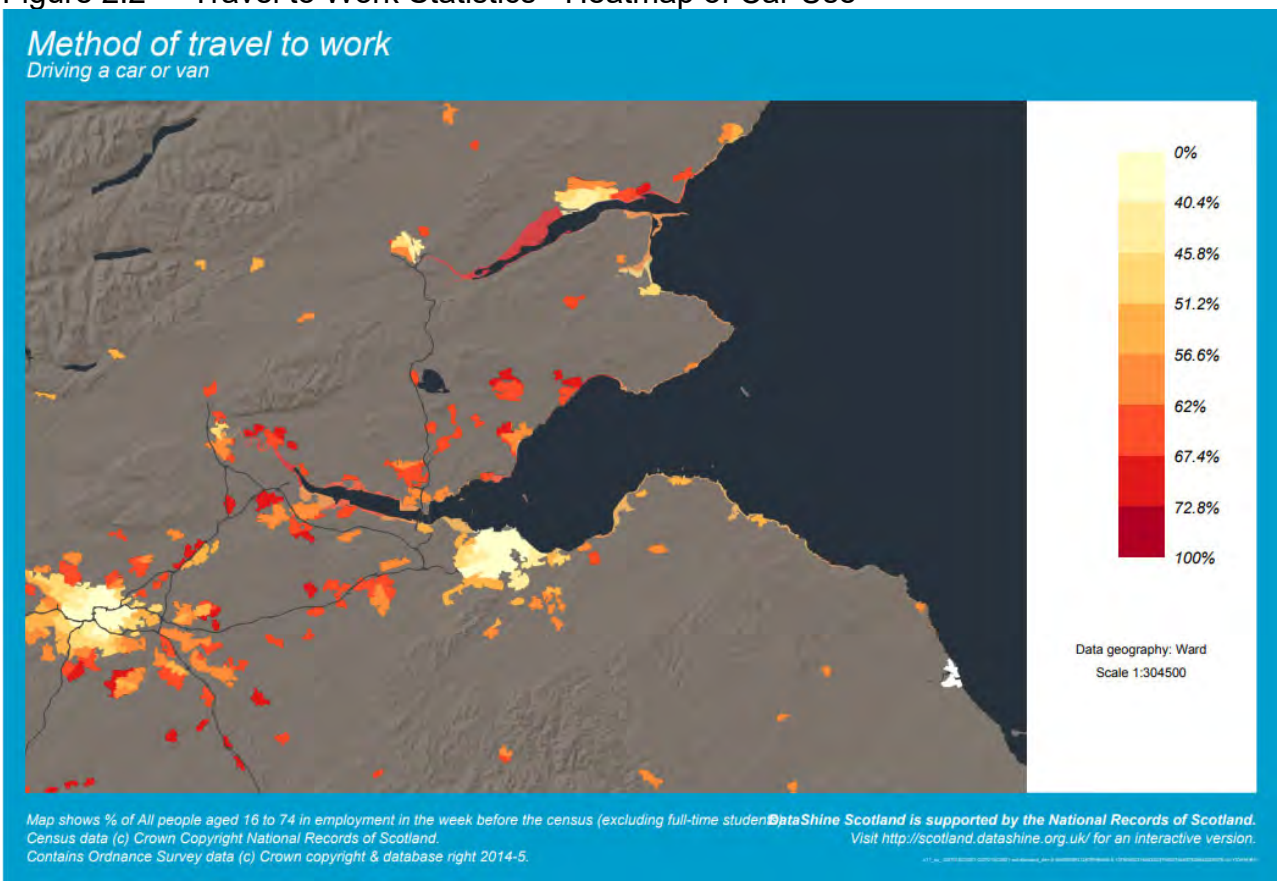
Travel to Work Data

The SEStran region includes a diverse range of settlements, with a considerable proportion of the area being rural in nature with a mix of employment opportunities. This geographical spread of population creates a challenge for authorities and operators to maintain a high level of service provision. Table 2.1 illustrates the variation in mode choice for travel to work across the SEStran region, relative to the Scottish average.

Table 2.1 SEStran Travel to Work Mode Choice (Census 2011)

	Car (inc passenger car pools and taxis)	Train	Bus	On-foot	Other	Work from home
Edinburgh	40.3%	1.9%	**25.6%**	**16.3%**	5.5%	10.3%
West Lothian	71.2%	4.6%	7.3%	6.1%	1.7%	9.1%
East Lothian	62.2%	**5.4%**	11.1%	7.6%	2.5%	11.2%
Midlothian	63.9%	0.4%	18.2%	6.4%	2.2%	9.0%
Scottish Borders	65.2%	0.6%	3.2%	13.4%	2.0%	**15.7%**
Fife	70.1%	3.4%	6.5%	7.9%	2.5%	9.6%
Falkirk	72.5%	5.2%	5.6%	6.5%	2.2%	8.0%
Clackmannanshire	**73.8%**	2.3%	4.9%	7.3%	2.2%	9.5%
SCOTLAND	**62.4%**	**3.7%**	**10%**	**9.9%**	**3.1%**	**10.8%**

Figure 2.2 Travel to Work Statistics - Heatmap of Car Use



The Census 2011 data pre-dates the opening of the Borders Railway (2015) and therefore a higher proportion of rail travel may be envisaged from the Scottish Borders. Outside of Edinburgh, the proportion of car trips increases considerably, with West Lothian, Fife, Falkirk and Clackmannanshire all reporting over 70% of travel to work trips made by car, compared to the just over 40% within the boundary of Edinburgh.

SEStran Rail Network

A model was created to show for all services in the SEStran region the number of services and estimated number of seats over the past 3 years. To assess the rail network within the study area, the model includes the following assumptions:

- Services in the SEStran area – all ScotRail services into Edinburgh Waverley have been included. No other Train Operating Companies services have been assessed.
- Train numbers – publicly available data provided by Network Rail has been used to source the number of planned services per railway period. A new timetable is introduced each May & December with a representative 4-week period included here.
- Usual Booked Train – shows the type and size of train most commonly planned in each service group for each timetable period. This will not be an exact science as it can vary throughout the day but will give a good indication of where additional capacity has been created.
- Estimated Seats per Period – a multiplier of train numbers and usual booked train

Change in Train Services

There has been a 10% increase in the number of ScotRail services calling at Edinburgh Waverley in the past 3 years. The majority of these were introduced in December 2018:

- Glasgow Queen Street to Falkirk Grahamston services were extended into Edinburgh Waverley
- Arbroath services were added as new services
- Glasgow- Edinburgh Express via Falkirk High & Shotts services increased as the level of engineering access declined and services could run later into the evening and on Sundays. This was not possible in previous years due to the amount of electrification works ongoing.

Table 2.2 Annual Train Services by Route

	2017/18		2018/19		2019/20	
	May	Dec	May	Dec	May	Dec
Aberdeen to Edinburgh	644	644	644	604	686	644
Borders to Edinburgh	1,624	1,624	1,624	1,624	1,624	1,624
Falkirk Grahmston or Dunblane to Edinburgh	3,503	3,500	3,624	3,791	3,779	3,856
Fife to Edinburgh	2,748	2,745	2,748	2,795	2,796	2,796
Glasgow to Edinburgh to Inverness	575	562	574	557	562	562
Glasgow to Edinburgh Express via Falkirk High	3,224	3,170	3,225	3,224	3,272	3,272
Glasgow to Edinburgh via Shotts	1,582	1,541	1,514	1,558	1,702	1,700
North Berwick to Edinburgh	1,306	1,302	1,310	1,304	1,352	1,352
Arbroath to Edinburgh or Glasgow (all stoppers)	-	-	-	736	736	763
TOTAL	15,206	15,088	15,263	16,193	16,509	16,569

Rail Capacity Assessment

The ScotRail timetable strategy (known as Revolution in Rail) has increased seating capacity by 20% across Scotland. Many of these are in the SEStran area so Edinburgh services have seen a greater benefit with 48% more seats available into Edinburgh than 3 years ago.

Table 2.3 Summary of Change in Rail Seating Capacity 2017 to 2019

Train Service Code	Difference	% Change
Aberdeen to Edinburgh Intercity	34,132	29%
Borders to Edinburgh	0	0%
Falkirk Grahamston or Dunblane to Edinburgh	405,188	63%
Fife to Edinburgh	9,435	2%
Glasgow or Edinburgh to Inverness Intercity	29,786	29%
Glasgow to Edinburgh Express via Falkirk High	613,612	52%
Glasgow to Edinburgh via Shotts	177,608	103%
North Berwick to Edinburgh	211,994	61%
Arbroath to Edinburgh or Glasgow (all stoppers)	141,192	New Service
Total	1,622,947	48%

The lines with the greatest percentage increase are from Dunblane, Shotts and North Berwick which are now all serviced by Class 385 electric trains. The Edinburgh Glasgow Express via Falkirk High has seen the biggest increase in numbers of actual seats as it is now formed of 8-car Class 385 trains as opposed to 6-car Class 170 trains. Capacity on the Intercity routes to Aberdeen and Inverness has also increased as these are now serviced by High Speed Trains (HSTs) which have far greater capacity than previous trains.

The only services into Edinburgh which have not seen a substantial increase in capacity in the past 3 years are from the Borders and Fife.

ScotRail should have 26 refurbished HSTs in service but a delay by the supplier in the delivery of the refurbished trains has impacted the intercity capacity with a knock-on impact to Fife and Borders. There is still doubt about when all refurbished HSTs will be in service, however once all 26 HSTs are delivered this will boost capacity on Intercity, Fife and Borders routes.

Intercity routes will all be serviced by HSTs with 5 coaches as opposed to the current situation where they are run as a HST with 4 coaches or a 3-car Class 170

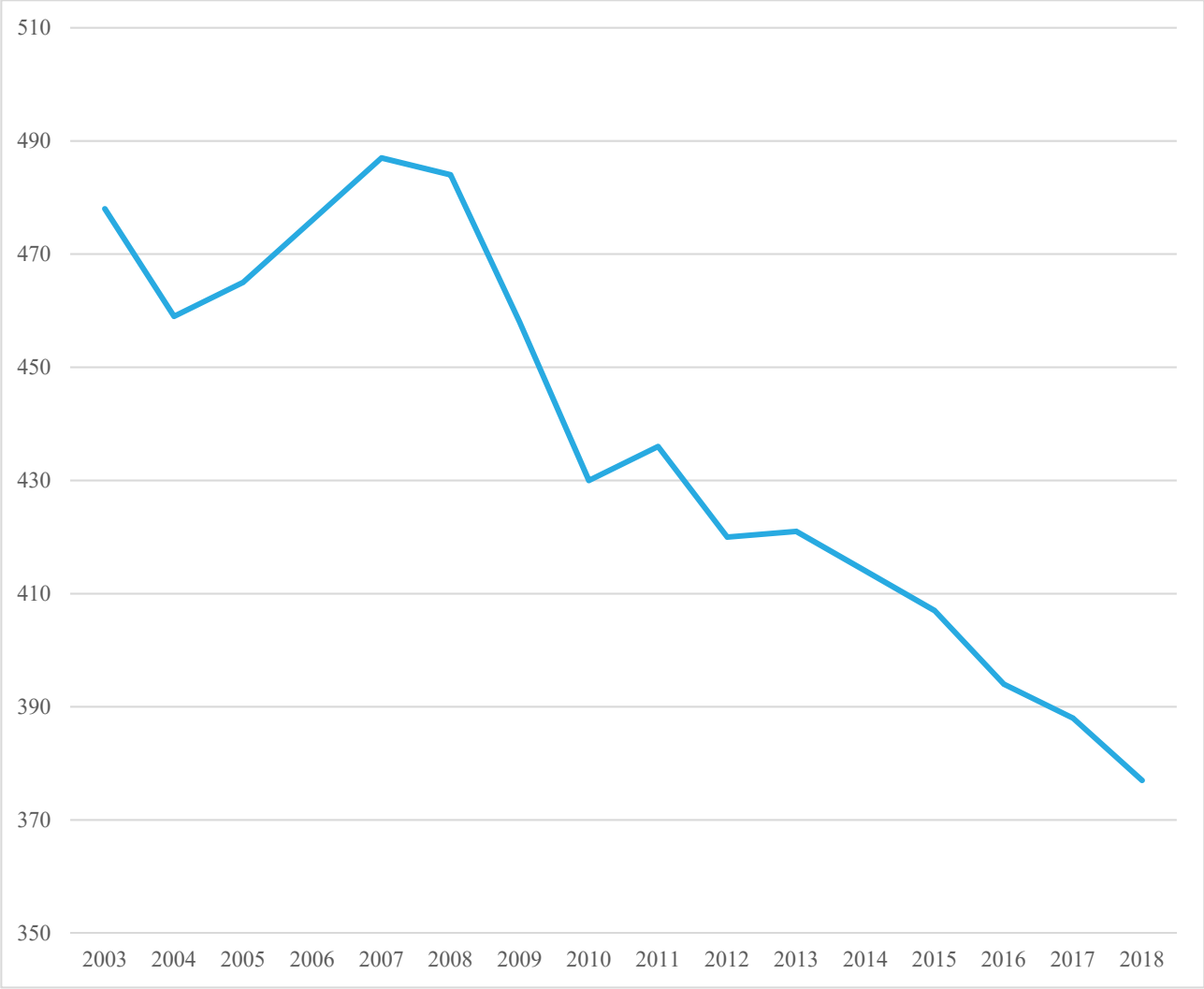
Fife and Borders will see a large increase in capacity (between 25%-50%) as trains will be able to run as 6-car Class 170s as opposed to the current 3-car Class 170s or Class 156

In summary, ScotRail have increased capacity on the majority of routes into Edinburgh. This varies from 29% on the Intercity services to 103% on Shotts services. Once all 26 refurbished HSTs are delivered by Wabtec this will allow capacity on Borders and Fife Routes to increase by similar levels seen elsewhere.

SEStran Bus Passengers

According to the Scottish Transport Statistics, Bus and Coach travel is in decline in Scotland with journey numbers, vehicle kilometres, bus fleet sizes and staff employed all decreasing by 5%, 5%, 11% and 1%, respectively, between 2010 and 2015. (source: https://www.transport.gov.scot/publication/scottish-transport-statistics-no-35-2016-edition/sct01171871341-05/)

Figure 2.3 Total Number of Passenger Journeys (Million) on All Bus Services in Scotland



Source: https://statistics.gov.scot/data/public-transport

The total number of passenger journeys on all bus services in Scotland has been in decline since 2011. Figure 2.3 outlines this decline with a 22.6% drop from a maximum of 487 million in 2007 to a low of 377 million in 2018.

Figure 2.4 outlines the accessibility of the bus network in the SEStran region with service frequency indicated through line thickness. It is clear that the majority of services are concentrated in the Edinburgh City area, along with the majority of frequent services. Park and Ride locations tend to follow routes where bus service frequency is high, however there are gaps in areas such as the Fife Coast and in East Lothian.

Figure 2.4 Bus Routes and Peak Time Average Frequency

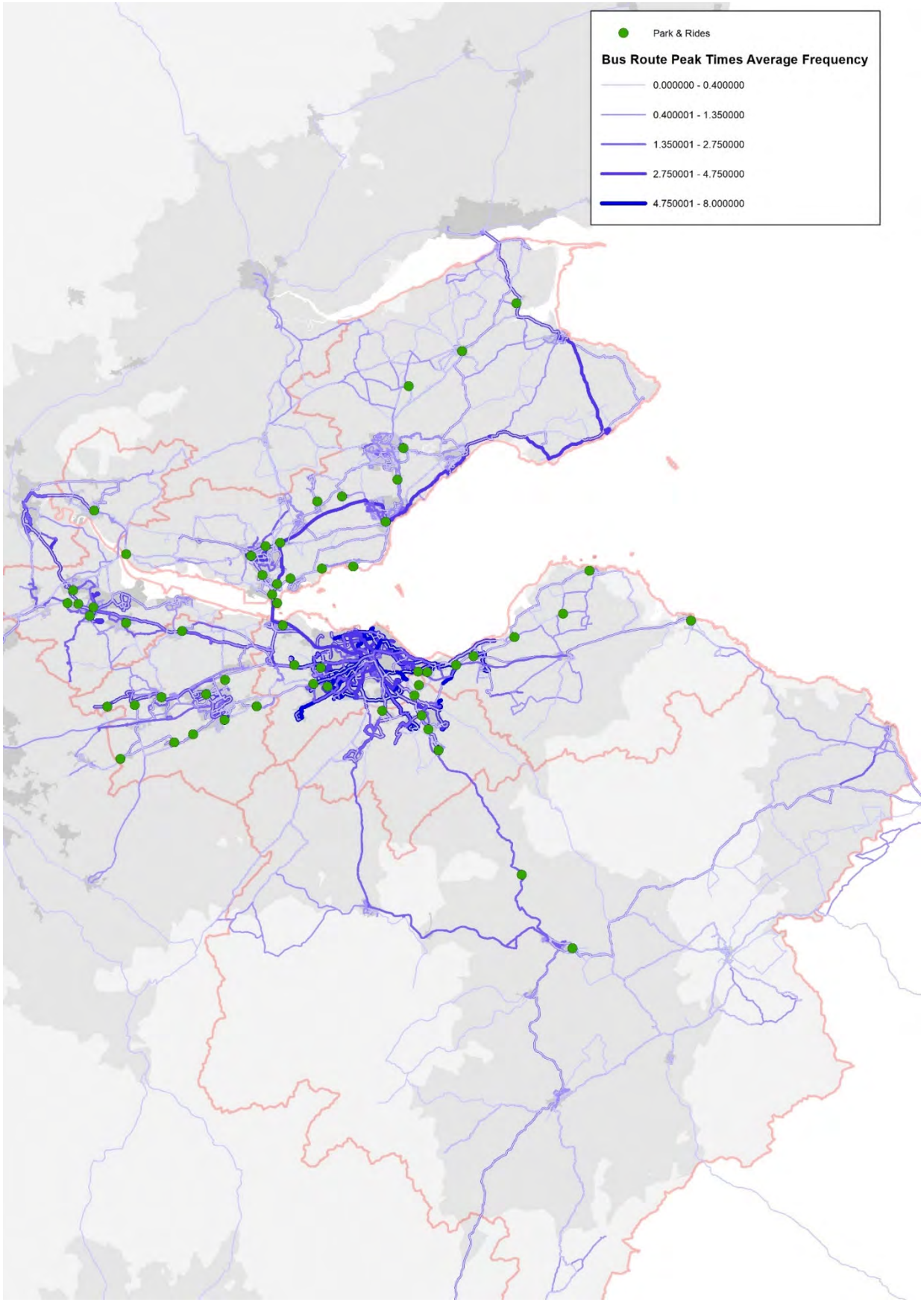
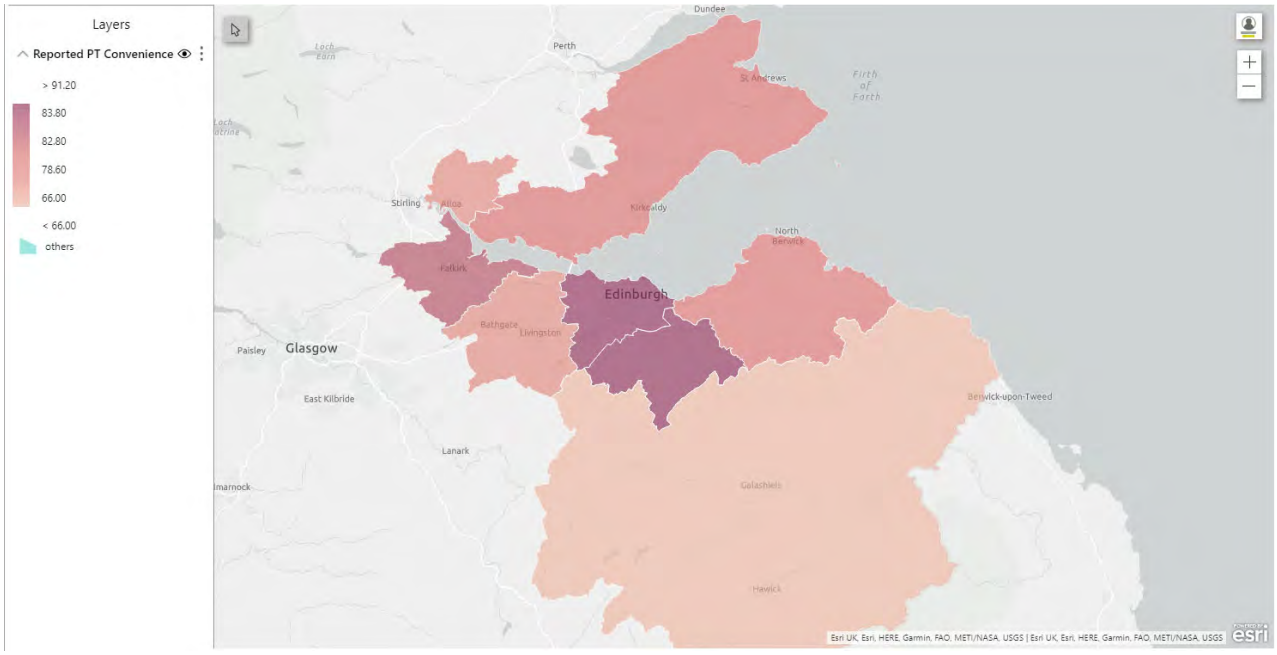


Figure 2.5 shows the percentage of adults that reported that public transport was convenient or fairly convenient for them. As expected, this figure mirrors the levels of accessibility and service frequency seen in Figure 2.4. The highest levels of convenience are seen in the more populous areas are Edinburgh and Midlothian, with low levels of convenience in more rural areas such as the Scottish Borders.

Figure 2.5 Percentage of Adults Reporting that Public Transport is Convenient



Regional Demographics

DataShine Scotland was used to obtain regional demographics on age, health, economic activity and social depravation. These demographics are summarised in Figures 2.6 to 2.9.

Within Edinburgh and larger towns, the population is shown to be younger than more rural settlements, which represents a key challenge in maintaining a high level of public transport accessibility to the more elderly residents over a larger area. Similarly, economic activity is shown to be strong within Edinburgh, but falling away as we move out of the city centre and into neighbouring authority area, this is also representative of household deprivation, with contracting conditions across the SEStran region. These varying conditions highlight the need for a flexible transport network, which is supportive to the dispersed nature of some local authority geographies.

Figure 2.6 Average Age

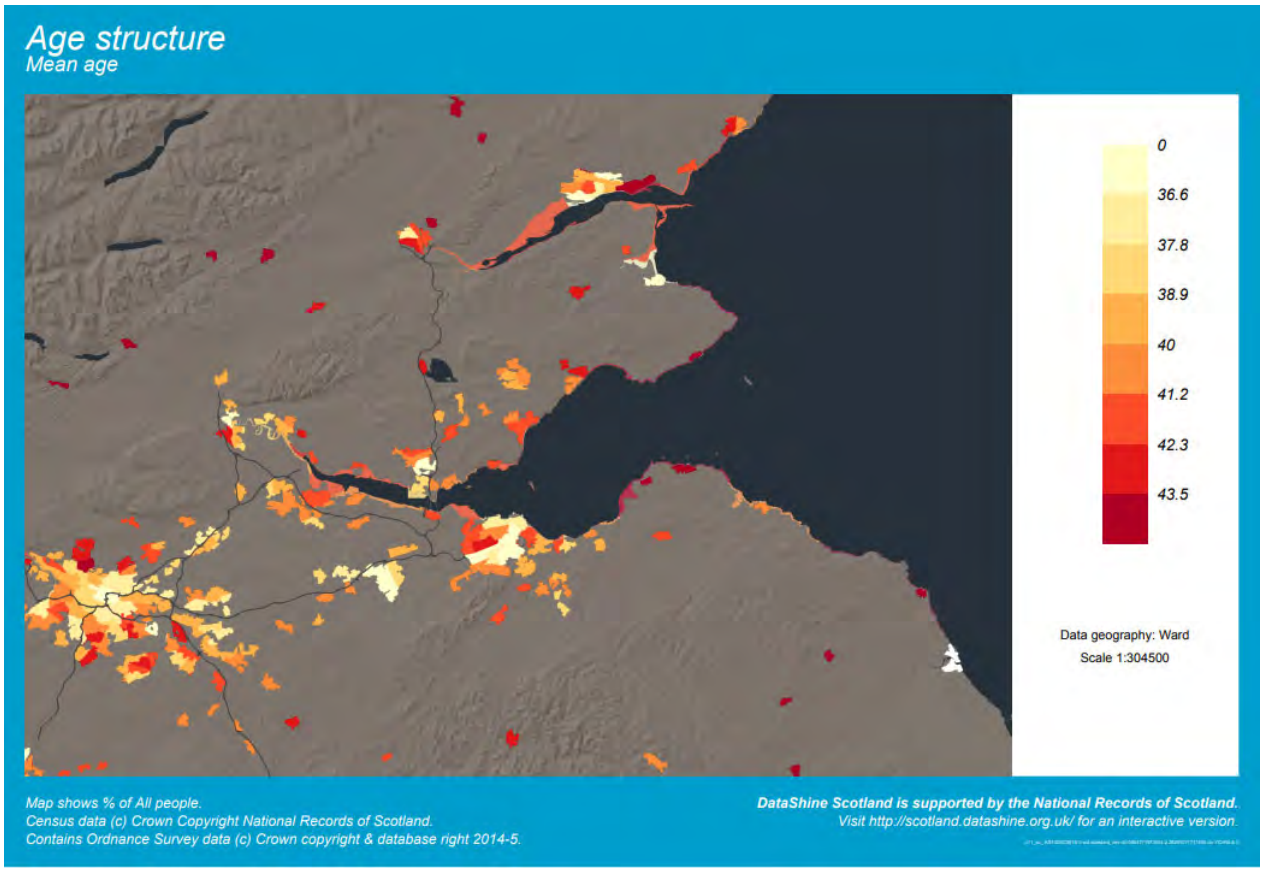


Figure 2.7 General Health

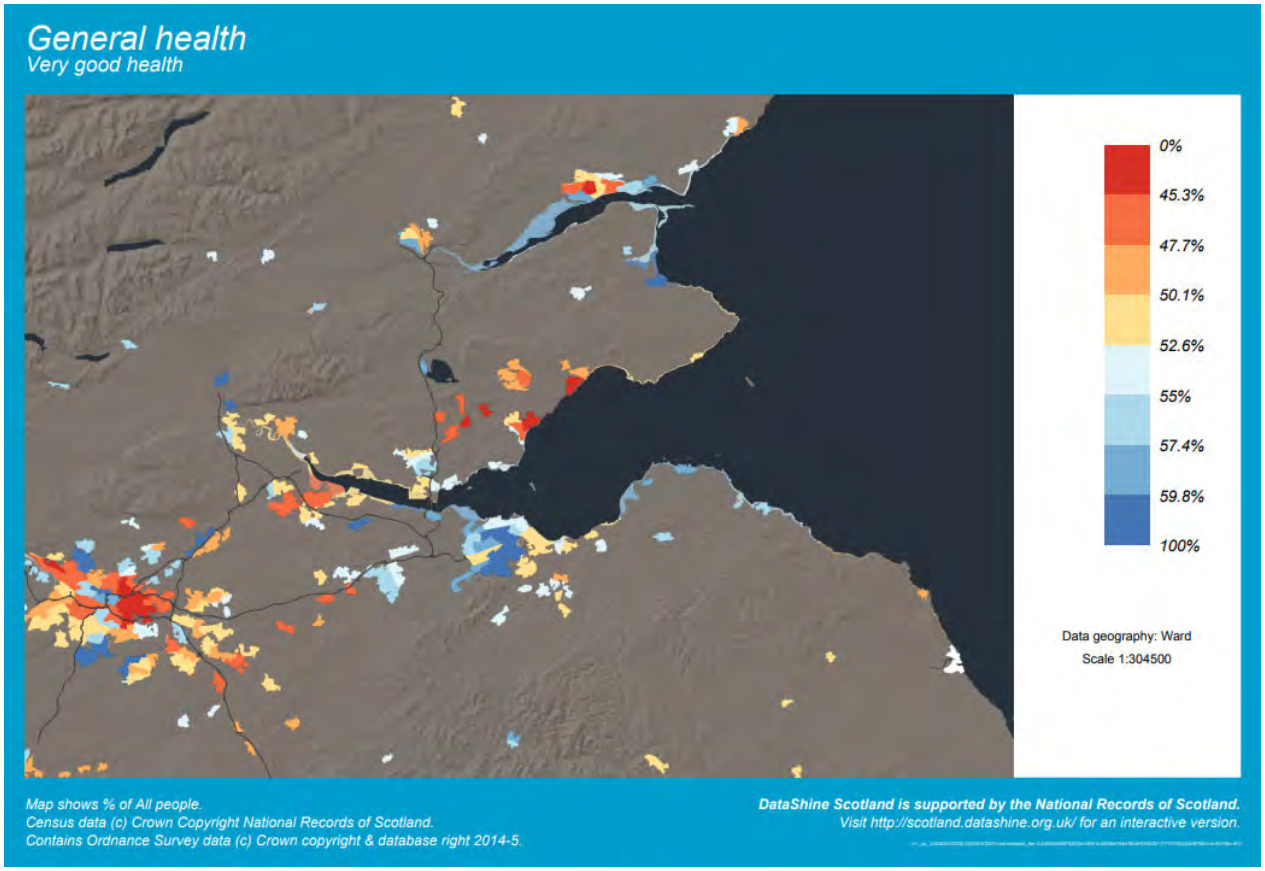


Figure 2.8 Economic Activity

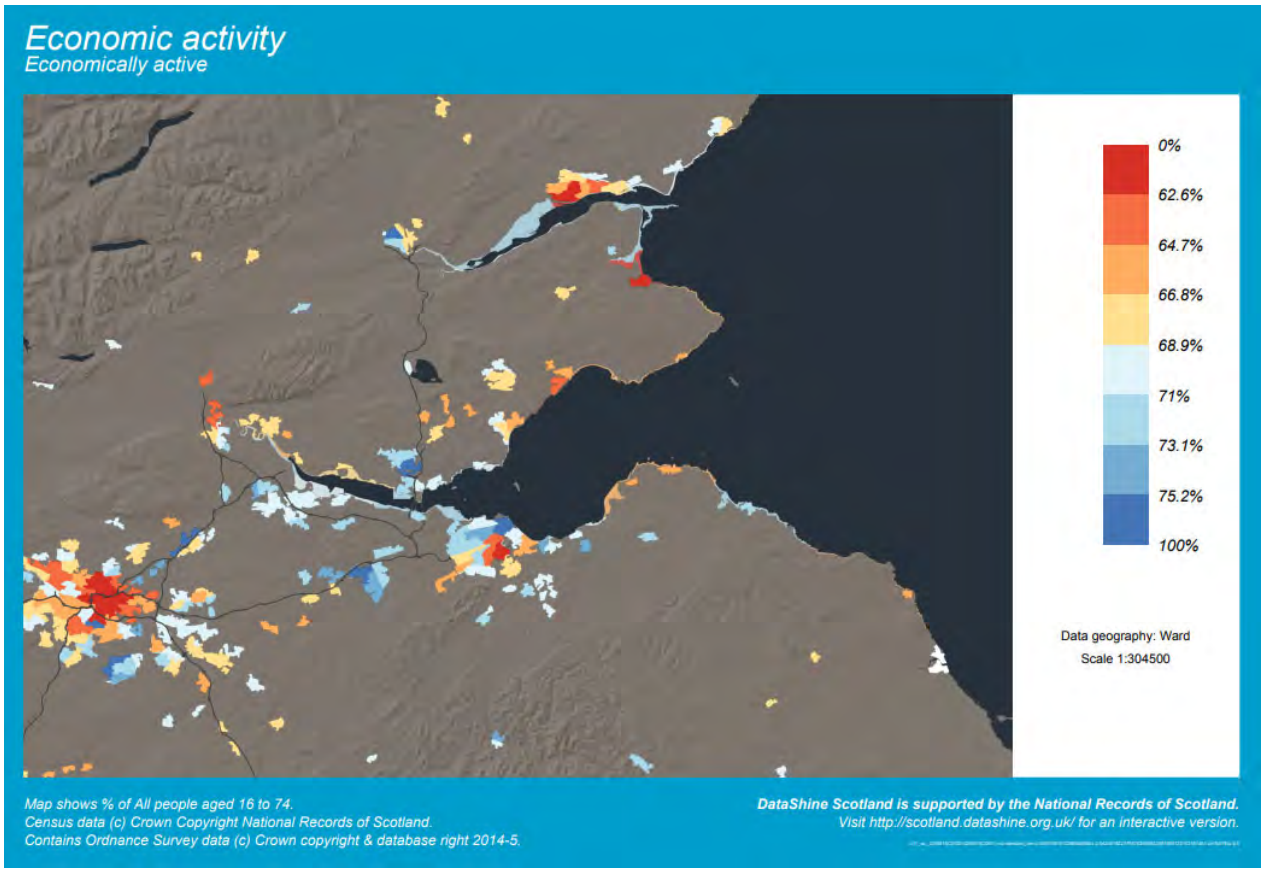
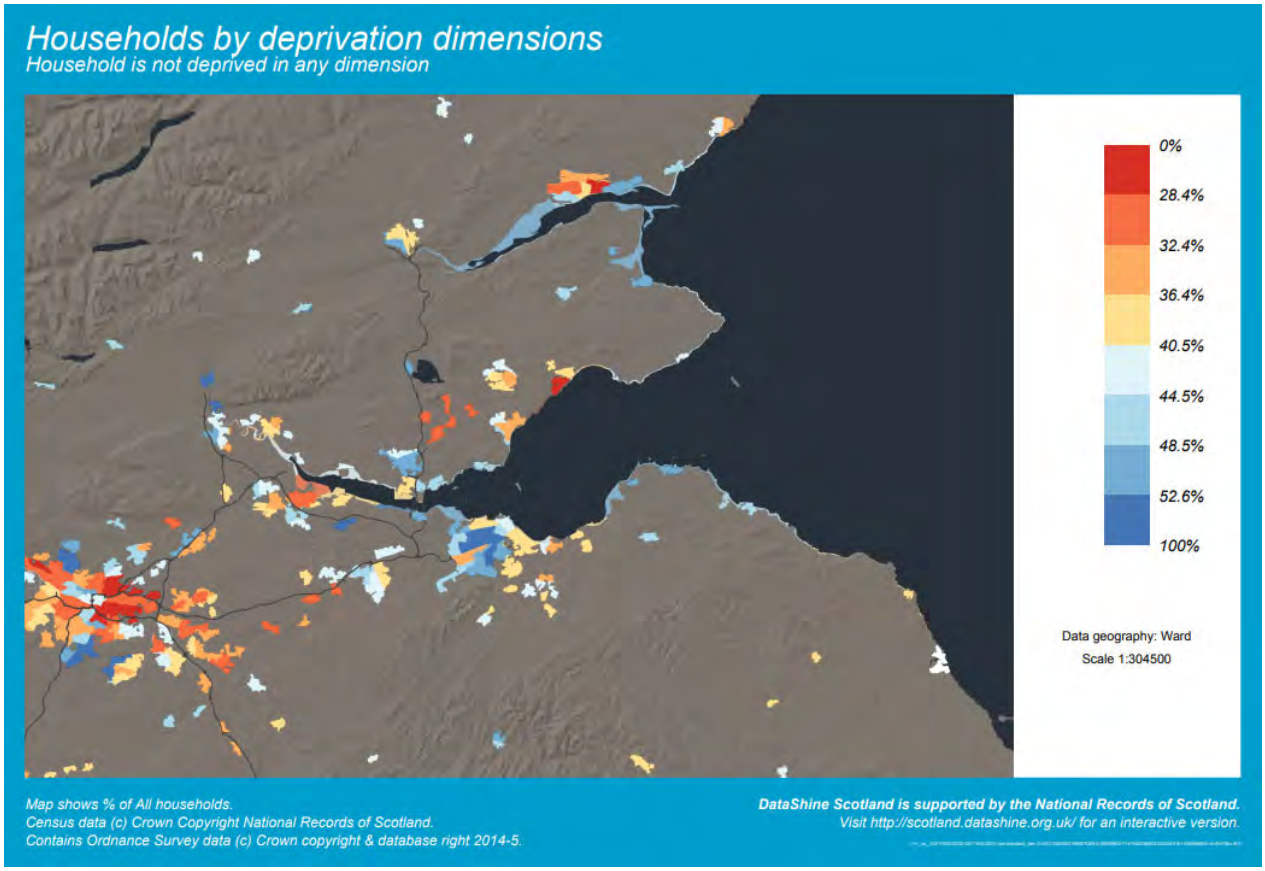


Figure 2.9 Household Deprivation



SEStran Regional Changes

Based on a review of the adopted and published development plan information, there is scope for substantial new developments across the SEStran region, generating more potential for travel to work, education and leisure. In the context of the park and ride strategic study, cognisance was given to the scale and location of major new developments and associated transport interventions which are currently identified to mitigate impacts and address existing network constraints.

Table 2.4 Major New Development Sites (Larger than 1,000 Housing Units)

Site Reference/Location	Proposal / Allocation
West Edinburgh	Housing and Commercial – International Business Gateway, West Craig's and Cammo Housing, 2,000 Units.
Leith Waterfront Western Harbour	Housing - 49 hectares, 3,000 Units.
Central Leith Waterfront	Housing - 61 hectares, 2,720 Units.
Leith Waterfront Salamander Pl	Housing - 13 hectares, 1,500 Units.
Forth Quarter	Housing - 45 hectares, 1,800 Units.
Granton Harbour	Housing - 38 hectares, 1,980 Units.
Central Development area - Granton Waterfront	Housing - 41 hectares, 2,050 Units.
Brunstane - Newcraighall	Housing - 48 hectares, 1,300 Units.
Almondell (East Calder)	Housing - 147.2 hectares, 2,200 Units.
Bangour Village	Housing - Application for 1,000 Units.
Gavieside Farm	Housing - 121.2 hectares, 1,900 Units.
Glendevon (Winchburgh) CDA	Housing - 175.2 hectares, 1,929 Units.
Polkemmet	Housing - 66.9 hectares, 2,700 Units.
Shawfair	Shawfair Masterplan - 4,000 Units.
Cupar North SDA	Mixed-use development - 113.7 hectares, 1,400 Units.
Crail Airfield	Mixed use development- 145.6 hectares.
Dunfermline	Strategic Land allocation- mixed use development 326.7 hectares, 4,200 Units.
North Dunfermline SDA	Mixed use development- 2,850 Units.
East Ochils	Forestmill mixed use development- 121.65ha, 1,250 Units.
Musselburgh Cluster	Housing - 5,000 Units, Commercial – 80 hectares.
Blindwells	Housing - 1,600 Units, Commercial – 10 hectares.
North Berwick Cluster	Housing - 1,200 Units, Commercial – 4 hectares.
Dunbar Cluster	Housing – 1,350 Units, Commercial - 34 hectares.
Haddington Cluster	Housing – 1,550 Units, Commercial – 24 hectares.
Tranent Cluster	Housing – 1,500 Units, Commercial - 72 hectares.

As illustrated in the above table, there are substantial housing sites which may come forward, many of which include retail and employment uses as part of a wider masterplan. The larger sites also trigger infrastructure works to mitigate impacts and/or encourage alternative uses. Based on the SEStran region, a significant number of new housing allocations are shown to the West and East of Edinburgh, contributing to growth in demand where Park and Ride provision and accessibility will be pivotal is realising the potential of these and other sites.

While Transport Scotland is progressing with STPR2, which may generate new strategic transport intervention which benefit cross boundary travel demands, and impact on emerging development plans, Table 2.5 present a summary of the key Park and Ride based infrastructure intervention which are either under planned or aspirational.

Table 2.5 Major New Infrastructure Projects (specific to park and ride provision)

Site Reference/Location	Proposal / Allocation
Edinburgh Tram	Safeguard long term extensions to Granton Waterfront, south east and Newbridge.
EGIP Safeguards	Almond Chord to the West, Abbeyhill branch line to East
Safeguard rail halts	Safeguard future re-use of Portobello, Piershill and Meadowbank halts.
South Suburban Rail Line	Safeguard future re-use of existing abandoned halts.
Orbital Bus Route	Disused railway line between Danderhall and City Bypass at Straiton is safeguarded.
Musselburgh, Wallyford, Prestonpans, Drem and Longniddry Stations	Car park expansion and platform lengthening.
East Linton and Dunbar Stations	New station at East Linton and car park expansion/platform extensions at Dunbar Station.
Addiewell Station	Bus Interchange, parking and improved footpath from town.
Kirknewton Station	Park & Ride and bus interchange.
Kilpunt, Broxburn	Safeguard land for Park & Ride to support Broxburn CDA.
Winchburgh	Land reserved for Dalmeny Chord.
Broxburn CDA	Land reserved for Edinburgh Tramline extension to Broxburn, Uphall and Livingston.
West Calder Station	Bus interchange and parking at station.
Cowhill	Express coach service, with associated Park & Ride.
Winchburgh CDA	Land reserved for rail station and associated Park & Ride.
M9 at Duntarvie	Land reserved for new motorway junction on M9.

The LDPs include reference to a range of 'mitigation' proposals for network and junction capacity improvements, in addition to the above measures, where the above focuses on interventions which are directly linked to the planning and delivery of Park and Ride provision.

Table 2.6 Identified P&R Interventions and Actions

Name	Development	Modes	Status
Newbridge	New	Bus/Tram	Future aspiration
City Centre-Queensferry Corridor	New	Bus	Future aspiration
Ingliston Park and Ride	Extension	Bus/Tram	Feasibility Stage
Hermiston Park and Ride	Extension	Bus	Planning Permission granted
Curriehill Station	Extension	Rail	Future Aspiration
Dalmeny Station	Extension	Rail	Future Aspiration
South Queensferry (Echline Jn)	New	Bus	Aspiration
Gilmerton/Lasswade	New	Bus	Feasibility Stage
Bankton	New	Bus	land allocated
Musselburgh Station	Extension	Rail	land safeguarded
Longniddry Station	Extension	Rail	land safeguarded
Drem Station	Extension	Rail	land safeguarded
East Linton	New	Rail	land safeguarded
Prestonpans-Drem	New	Rail	Future aspiration
Old Craighall	New	Rail/Bus	Feasibility Stage
Sheriffhall Park and Ride	Extension	Rail/Bus	Committed development
Lothianburn	New	Bus	Committed development
Shawfair (North A68 Newton Farm)	New	Bus	Committed development
Redheugh	New	Rail	Future Aspiration
Lasswade Road	New	Bus	Edinburgh Orbital Bus project
Millerhill	New	Bus	Edinburgh Orbital Bus project
Kilpunt	New	Bus	land safeguarded
Winchburgh	New	Rail	land safeguarded
Kirknewton Station	Extension	Rail	Development Proposal
Armadale Station	Extension	Rail	Future aspiration
West Calder Station	Extension	Rail	Development Proposal
Addiewell Station	Extension	Rail	Development Proposal
Charlesfield Rd, West Livingston	New	Bus	Future aspiration

M9 (J3) Park and Ride	New	Bus	Development Proposal
Heartlands, Whitburn	New	Bus	Development Proposal
Livingston (J3)	New	Bus	Future aspiration
Reston	New	Rail	Future aspiration
Alloa Station	Extension	Rail/Bus	land safeguarded
Clackmannan	New	Rail	land safeguarded
Cambus	New	Rail	land safeguarded
Tay Bridgehead	New	Bus	land safeguarded
Leuchars station	Extension	Rail/Bus	Committed development
Levenmouth Station	New	Rail	SEStran proposal
Inverkeithing	Extension	Rail	Feasibility stage
Dalgety Bay Station	Extension	Rail	Feasibility stage
Pitreavie/Roysth	New	Bus	STPR Proposal

Approach to Study

3 Approach to Study

Basic approach to the strategy and methodology for appraisal

The park and ride strategic study utilised a range of data sources and reference material to model current travel patterns before assessing the performance of the existing provision in accommodating and encouraging travel by public transport. This same modelling has been applied to the proposed sites, which are currently identified across the SEStran region, from which any 'gaps' in provision could be derived.

Site Audit Findings

Site Audits were carried out across the region on Thursday 30th January 2020, covering key park and ride sites across all local authorities and key strategic routes. Site Audit findings were recorded digitally using the 'Collector for GIS' app on tablets/ smartphones. Questions were formulated prior to site audits that required a combination of numerical and textual responses, which allowed for both quantitative and qualitative analysis of site audit findings. The key criteria that auditors were tasked with recording related to site busyness, interchange mode, accessibility, proximity to the strategic network, active travel infrastructure and place-making.

Overall, park and ride facilities where site audits were carried out generally operated as expected. Key observations identified are as follows:

- The vast majority of rail-based sites are operating at/above capacity, leading to overspill in nearby residential streets and illegal parking
- Many rail-based car parks are at capacity immediately after the AM peak hour and remain at capacity throughout the day
- Bus-based Park and Ride facilities tend to operate at between 50-100% of capacity, therefore are not as well used as rail-based sites
- Cycle parking is generally acceptable, however provision across sites visited is inconsistent with little usage evident
- There is considerable scope to improve active travel infrastructure, such as walking and cycling links/routes leading to Park and Ride sites to encourage greater uptake
- There are clear gaps and inconsistencies in Electric Vehicle charging provision – issues include ongoing management of use and that vehicles park and plug on arrival and stay all day
- The quality of on-site facilities is generally acceptable across the board, issues raised tend to be related to capacity and available onward destinations.

Stakeholder Workshop

Prior to undertaking the modelling, a stakeholder workshop was undertaken during February 2020, with the primary objective of establishing a greater appreciation of local issues and the potential impact of policy changes on cross-boundary travel. The workshop allowed for local authority representatives, transport operators and key interest groups to express their views regarding existing Park and Ride provision and the role of park and ride across the South East Scotland transport network. This workshop therefore gave stakeholders the opportunity to feed into the establishment of the park and ride strategy for the region.

The workshop consisted of 3 breakout sessions: 1) *Review of existing P&R and associated infrastructure; 2) Key characteristics of 'successful' P&R sites; 3) How the SEStran regional P&R network should respond to new transport/environmental policies.* This approach allowed for structure and ensured that outputs were comprehendible and conclusions could be effectively derived.

Key themes identified from each breakout session are as follows:

1) Review of existing Park and Ride and associated infrastructure:

- Integration between modes could be better. Buses pass park and ride sites often enough, however there are issues with timetable coordination and users are unable to easily transition between modes
- Active travel facilities aren't as well used, often because walking and cycling routes aren't taking users to park and ride sites
- Rural areas present a significant challenge in terms of Public Transport uptake
- Expansion of the existing rail network must be considered, however there are only small windows of opportunity because of existing rail network capacity

2) Key characteristics of 'successful' park and ride sites:

- Location – relative to resident population, employment zones and strategic road network
- Frequency and quality of services (the general consensus was that if frequency and quality of service is high, on-site facilities are supplementary)
- Incorporation of sustainable modes of transport such as walking and cycling
- Bus priority measures (areas identified include Queensferry Rd and Hermiston-Livingston)
- Destinations – improvement in cross-city links as the focus should not only be Edinburgh city centre – this outlines the importance of proposals such as the orbital bus route in serving areas out-with Edinburgh city centre
- Inclusivity – engagement with accessibility groups before producing infrastructure such as park and ride
- Tackling the first mile- how do people get to park and ride in the first place?
- Improved timetable coordination between different services and modes

3) How the SEStran regional park and ride network should respond to new transport/environmental policies. This element focused on the potential impact on cross-boundary travel in the context of the sustainable transport hierarchy, and in particular The City of Edinburgh Council plans for reducing car travel to and within the city.:

- Participants were sceptical regarding the impact of individual policy changes, as there was limited data from which to gauge the impact. Stakeholders were not convinced the impact will be noticeable at a local authority level.
- Existing public transport operators noted the challenges faced in connecting more park and ride sites, and that a balance is required between improving existing sites versus providing new park and ride facilities.
- Existing bus operators consider improving bus priority would be better received than creating lots of new park and ride sites.
- It was agreed that cumulative policy changes could have a meaningful impact on travel demands and mode choice, but policy changes need to be supported with investment in alternative modes to ensure there is a realistic choice.
- It was acknowledged that the existing public transport network would struggle to accommodate the current private car trips which enter Edinburgh on a daily basis without significant investment.
- City of Edinburgh Council representatives stated the intention is to work collaboratively with neighbouring local authorities, with a phased transition towards non-car travel in Edinburgh city centre
- Stakeholders agreed that achieving behavioural change is a challenge, and that providing further ‘carrot’ measures (park and ride facilities) alone would not be sufficient to make people change their travel behaviour. More stringent policy interventions, combined with a well connected park and ride network could however stimulate behaviour change.

Conclusions/ recommendations drawn by stakeholders-

- All park and ride sites must be coherent and follow key criteria such as consistent rail/bus timetable coordination, active travel infrastructure, quality of facilities and accessibility.
- Park and rides must be a viable alternative to private car journeys, therefore the transport sector must up their offering in terms of public transport
- Expansion of car parking supply is not necessarily the answer, as demand would rise alongside supply at most sites – decision makers must be clever with infrastructure changes and investment decisions.
- Park and ride investment has to be planned strategically with a regional approach, and reflect cross boundary demands.
- Holistic, joined-up thinking such as cross-sectoral (housing, transport, retail), cross – boundary, stakeholder collaboration and coherent policy is essential.

Park and Ride Modelling / Google Travel Time Data

One determinate for the likely interception rates for existing and proposed Park and Ride facilities is the cost of Park and Ride versus driving, to determine this a logit function-based Park and Ride model using generalised cost was utilised. Analysis areas were defined for this project based on the Scottish Census, Intermediate Zones 2011, these are the smallest geographical area offered by the Scottish Census Data warehouse which has origin to destination travel to work data. To reduce the number of areas, intermediate zones within the SEStran area were grouped such that one would encompass one town and the immediate surrounding area. The focus was on creating analysis areas with a distinct geographical area, allowing for analysis to pick up on movements displayed by smaller towns and rural areas. They are not equally sized populations or areas.

The analysis areas were manually defined based upon linking the Intermediate Zones with the National Records of Scotland's, "Localities 2016 Boundaries" and the regions council boundaries, in order to represent different communities. Edinburgh, as the largest city in the region, was split into eight areas; the central zone representing the extent of the controlled parking zone and the priority parking areas. The others are based upon the current constituency boundaries (MSP/MP) and aim to show how people commute from the outskirts into Edinburgh. Again, this was done manually and due to the shape of Intermediate Zones will not exactly match the boundaries.

The rest of Scotland is also grouped into areas from the Intermediate Zones, these are based on boundaries of cities and towns from the National Records of Scotland's, "Localities 2016 boundaries" and council areas; a priority on getting smaller areas (in population and areas) in the council areas surrounding SEStran such as nearby towns in North/South Lanarkshire which are nearby to road routes into Edinburgh or Glasgow. These were based upon the towns of the largest populations in the council areas. Cities such as Glasgow, Dundee, Perth, Stirling and Aberdeen have been preserved as a single area. Larger areas existing for the rest of Scotland are these less populated regions that are less connected to the region and would not be expected to be using park and ride facilities within the SEStran region.

Figure 3.1 SEStran Intermediate Zones

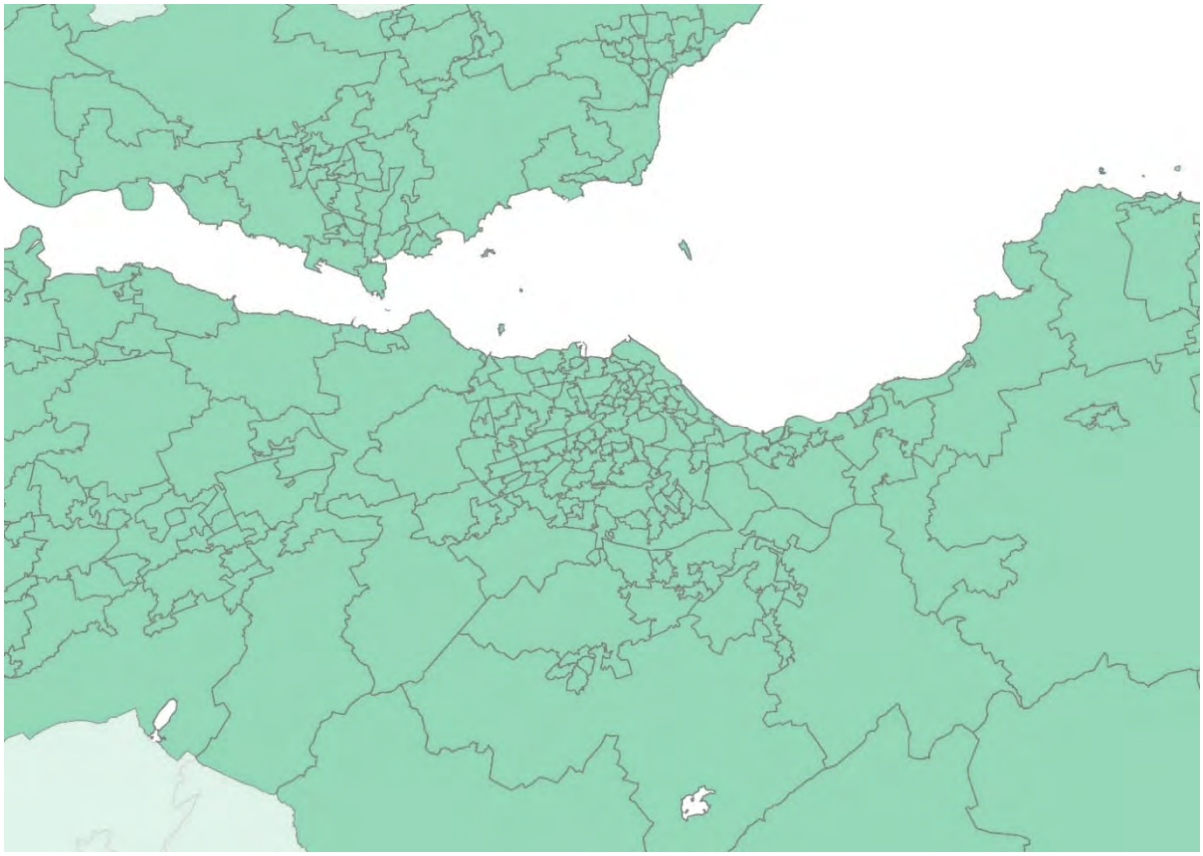


Figure 3.2 SEStran Analysis Zones within park and ride model

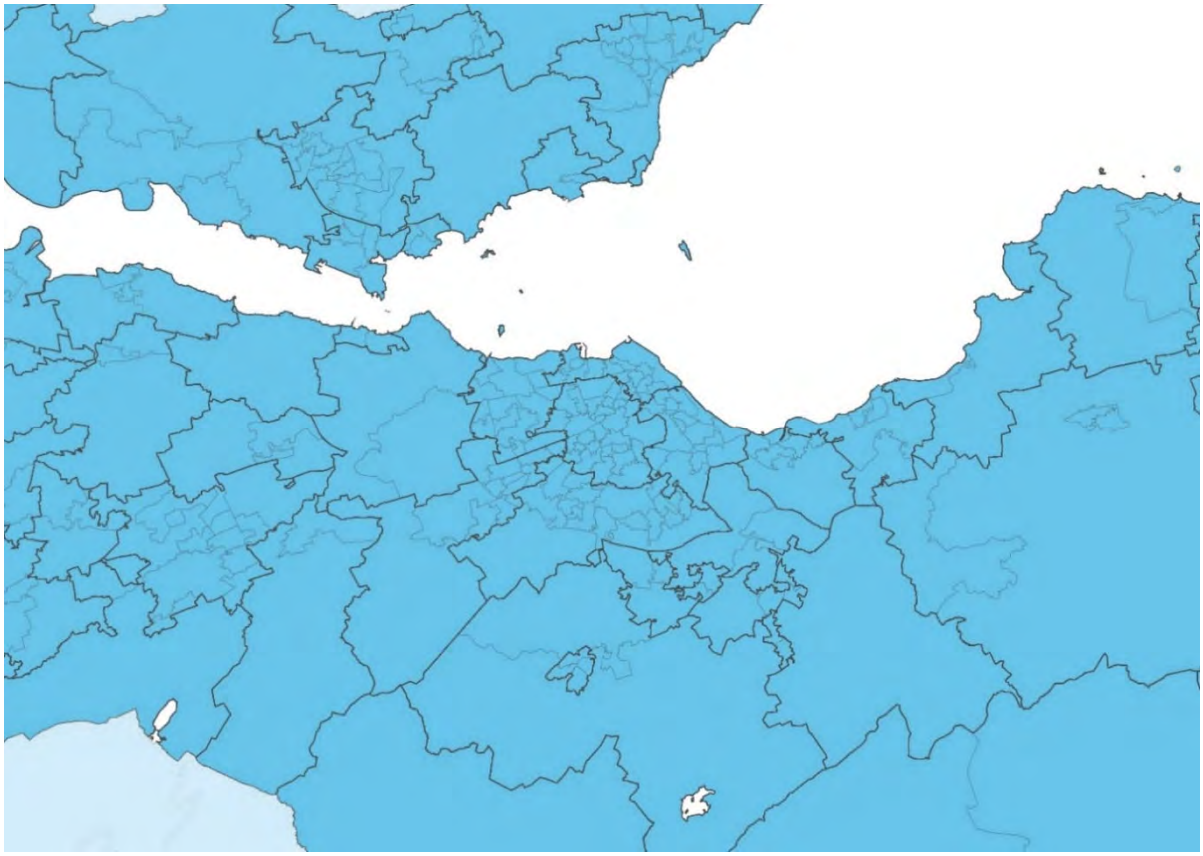
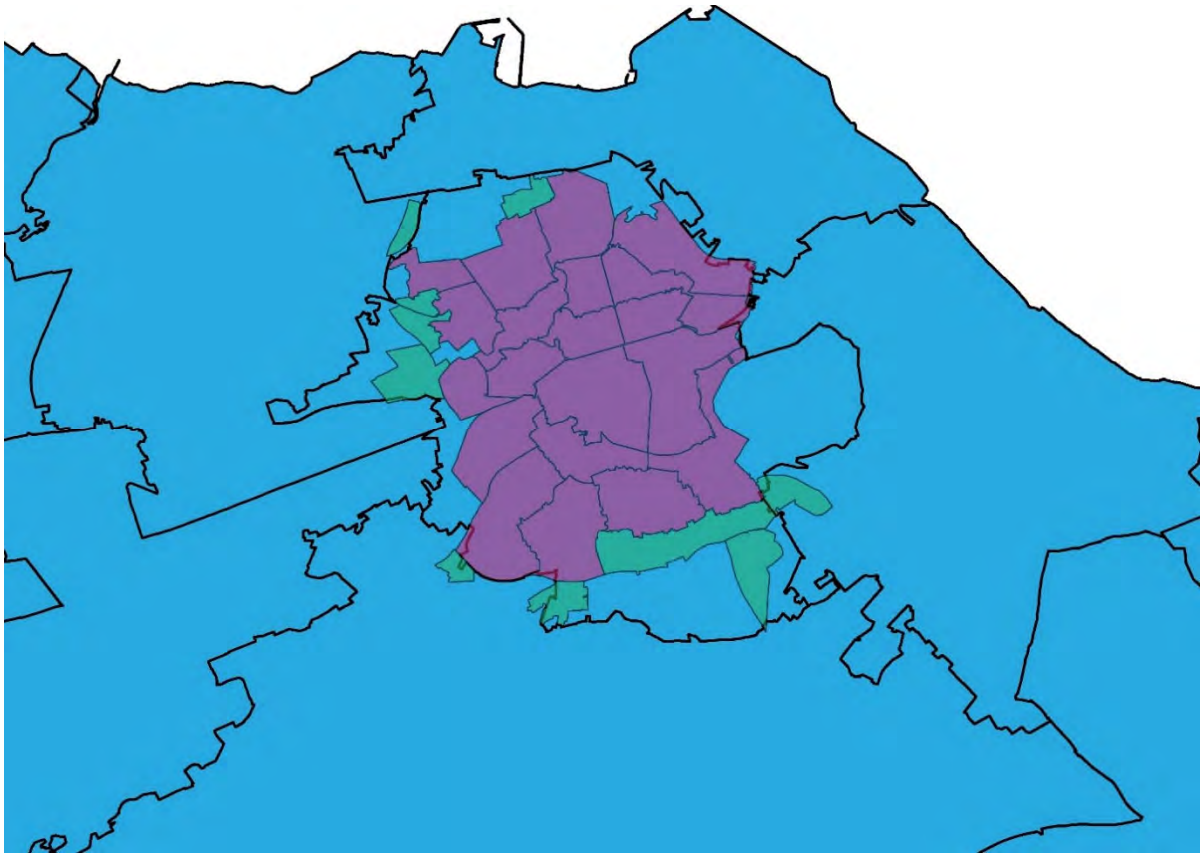


Figure 3.3 SEStran Analysis Zones Edinburgh Central (Control Parking Zone)



Google Directions API:

The analysis zones were used to define the Origin Destination pairs to gather data on average distance and duration of travel at peak periods between zones. The Google directions API reads coordinates for each origin and destination, before collecting travel time data in real time based on user's smart phone tracking. The Google API outputs define the best route between each origin destination pair as well as the duration when leaving at that point in time. To check and validate the outputs a geoprocessing tool was used to move the centroid point of the analysis zone polygons to the closest road.

To inform the modelling data from Google as output for all analysis zones within the region going to all other analysis zones in Scotland. This formed a matrix of 75 x 94, (6,975 pairing in total). In addition, data on all the existing park and rides in the region alongside the identified, proposed sites between the analysis areas, the existing or proposed sites and vice versa. This generated four matrixes, two for the existing of 75 x 69 zones (10,350 pairings) and two for the proposed of 75 x 44 zones (6,600 pairings).

The data was extracted for Thursday the 5th of March 2020, at 8:30am for the AM Peak, 13:00pm for the midday value and at 17:00pm for the PM Peak.

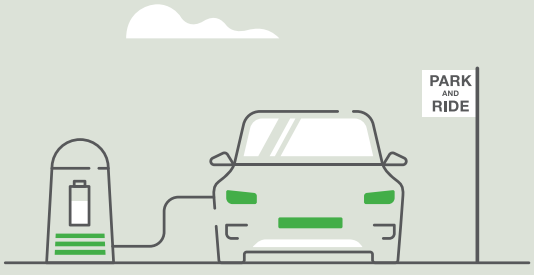
A visualisation of the congestion in the road network was produced by taking the received data and associating a speed based upon the time to travel the route and the distance of the segment. The segments for the peaks were then linked to the midday which acts as a value to represent a less congested, free-flow road conditions. A congestion values is calculated by the percentage difference between the midday and the peak.

Multi-criteria appraisal process

Due to the mix of both quantitative and qualitative data from which to appraise the operation and success of Park and Ride facilities, a multi-criteria appraisal process has been undertaken. This process aimed to summarise the key features and scale of provision, characteristics in terms of physical and location relative to key origins and destinations, before 'scoring' each facility based on corridor specific parameters.

Further details of the multi-criteria appraisal, and approach are detail in Section 5.

SEStran Transport Corridors

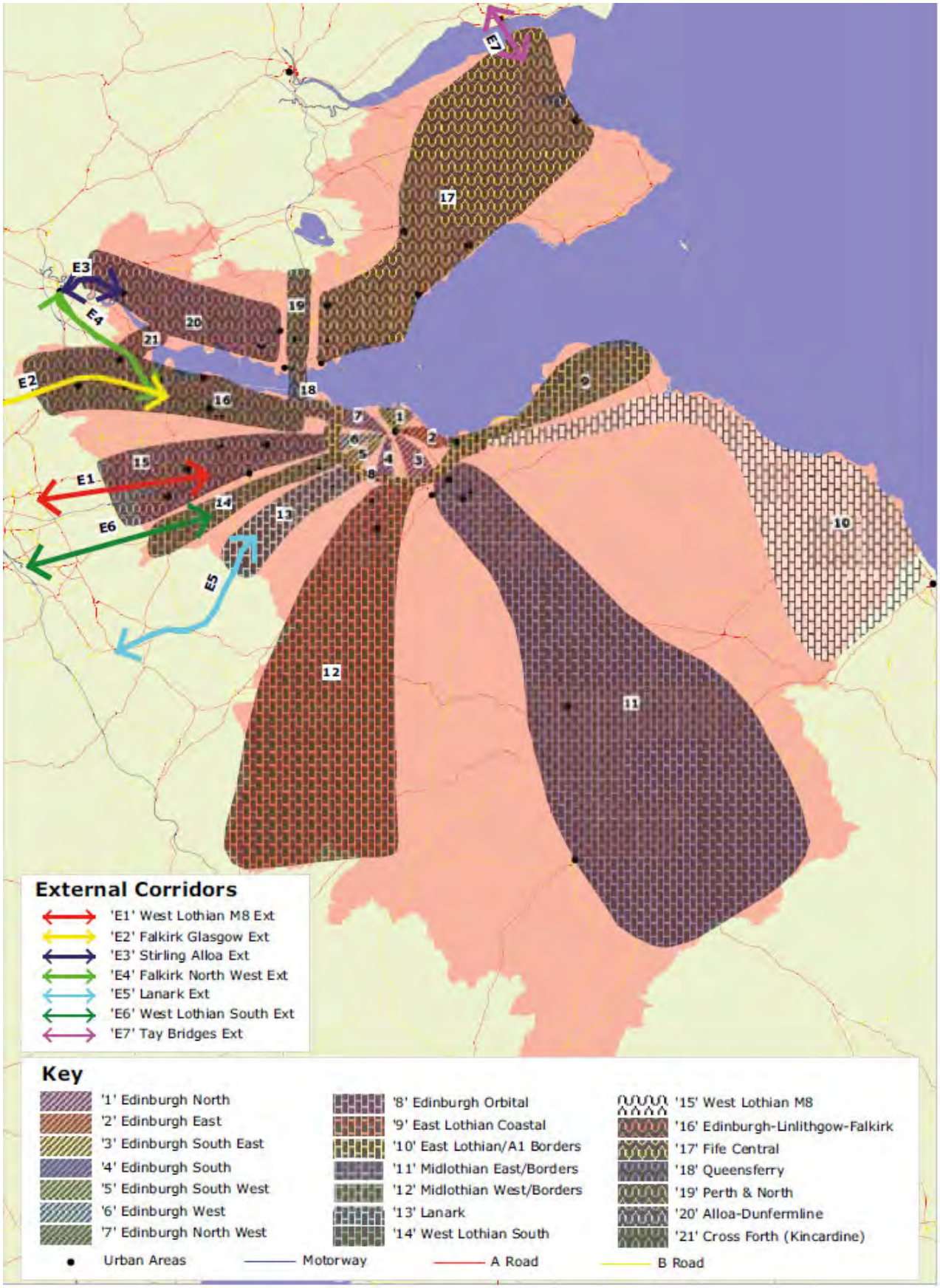


4 SEStran Transport Corridors

Background

The RTS subdivides the SEStran area into 21 ‘Regional Transport Corridors’, which define and provide focus to the development of targeted improvements in public transport towards the main regional corridors of commuting travel within SEStran and between SEStran and its neighbouring areas. The main purpose of this RTS theme is to provide improved labour market accessibility in terms of public transport. By doing so, this:

- makes public transport more attractive to those who currently drive, and provides an improved service for current users of public transport;
- expands labour markets from an employer’s perspective, giving them a wider pool of labour to choose from;
- can open up new employment opportunities for employees, improving their earning potential and improving regional economic efficiency; and
- reduces the reliance and dependence on the private car as a means of travel to work across the SEStran region.


External Corridors
'E1' West Lothian M8 Ext
'E2' Falkirk Glasgow Ext
'E3' Stirling Alloa Ext
'E4' Falkirk North West Ext
'E5' Lanark Ext
'E6' West Lothian South Ext
'E7' Tay Bridges Ext
Key
'1' Edinburgh North
'2' Edinburgh East
'3' Edinburgh South East
'4' Edinburgh South
'5' Edinburgh South West
'6' Edinburgh West
'7' Edinburgh North West
'8' Edinburgh Orbital
'9' East Lothian Coastal
'10' East Lothian/A1 Borders
'11' Midlothian East/Borders
'12' Midlothian West/Borders
'13' Lanark
'14' West Lothian South
'15' West Lothian M8
'16' Edinburgh-Linlithgow-Falkirk
'17' Fife Central
'18' Queensferry
'19' Perth & North
'20' Alloa-Dunfermline
'21' Cross Forth (Kincardine)
Urban Areas
Motorway
A Road
B Road

Transport Corridors 1 to 7: Edinburgh

Edinburgh is the key economic urban centre of the region, with the highest population and employment density within South East Scotland. Edinburgh has a wide-ranging geography, which includes a UNESCO World Heritage Site in the city centre, inner city neighbourhoods such as Leith and Gorgie, and coastal locations including Cramond and Portobello.

The Edinburgh transport network consists of comprehensive public transport provision, pedestrian and cycle routes and road networks. Strategic active travel routes include National Cycle Network (NCN) routes 1 and 75, and the bus network primarily consists of Lothian Bus services that run throughout the city. Tram services currently operate from Edinburgh West to the city centre, and rail services include local services such the Fife and East Lothian lines and strategic services such as the East Coast mainline and the high-speed line connecting Edinburgh and Glasgow. Furthermore, the strategic road network includes the A71 (west), A70 (west), A1 (east) and A701 (south).

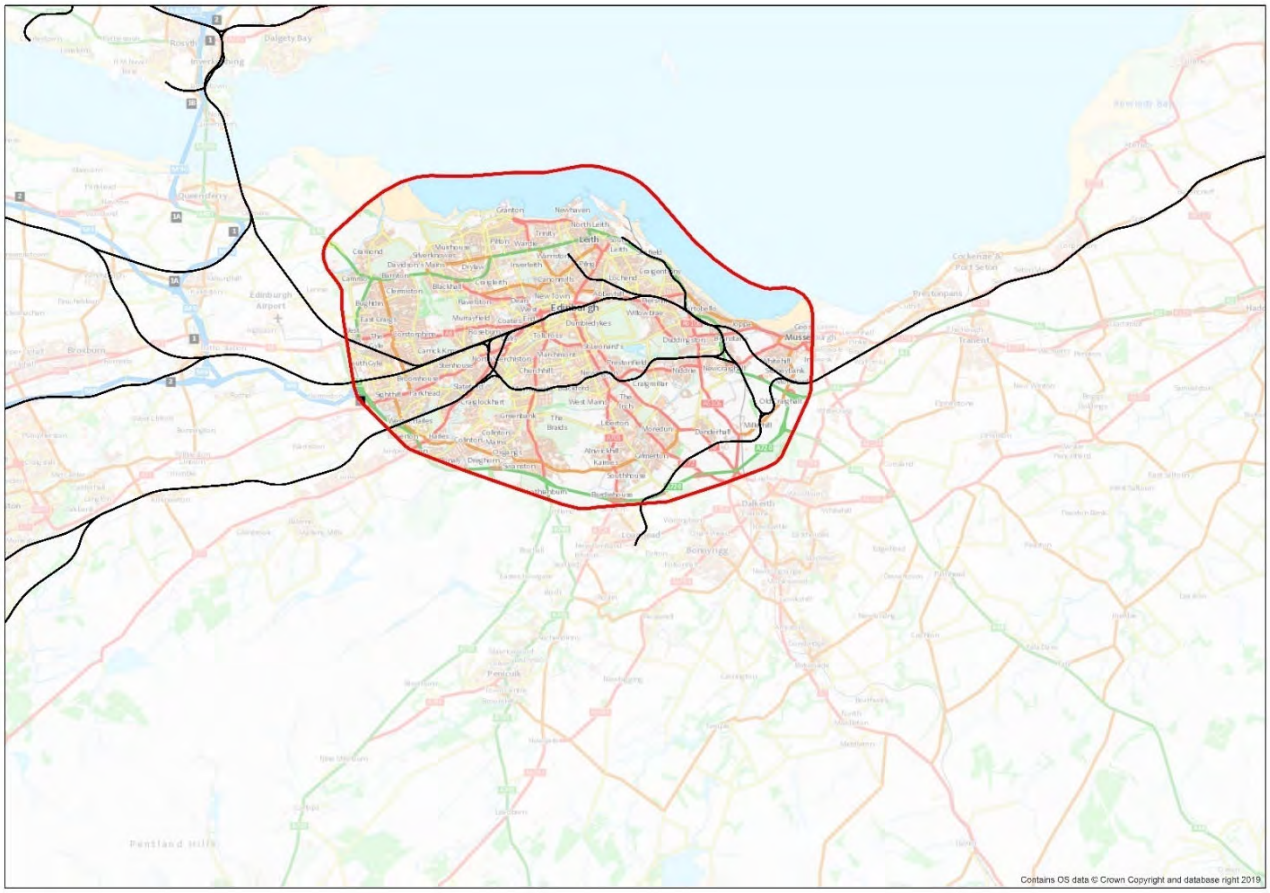
Currently, the Edinburgh transport network revolves around the city centre, with a lack of cross-city links. The majority of cycle networks and strategic roads all lead to the city centre, and public transport such as bus, rail and tram services generally focus on key city centre locations such as Princes Street, the Royal Mile and Haymarket. In addition, transport users have limited integration opportunities between modes. Users can buy an integrated ticket called one-ticket for use on all Lothian buses and Edinburgh trams, however these tickets do not extend to other bus operators and rail services. There are also integration hubs for buses, however only within central locations.

There is currently significant development ongoing across the Edinburgh city boundary, with key areas for development including the city centre, Edinburgh North (Leith/Granton Waterfront) and Edinburgh West (Gyle/ Edinburgh Park). Ongoing city centre developments include the St James Centre redevelopment, Haymarket development and Ross Pavilion. There are also many housing developments occurring within Edinburgh North, such as Granton Harbour and Central Leith Waterfront. Edinburgh West is also an area of significant housing and mixed-use development with associated infrastructure.

There are many transport projects and initiatives ongoing across Edinburgh. The Waverley station masterplan comprises of mixed-use development and aims to improve accessibility and the overall attractiveness of the station. Additionally, ongoing construction of the Edinburgh Tram extension from York Place (city centre) to Newhaven is expected to improve connectivity to the north of the city. There are also future aspirations to continue tram extensions to other areas of Edinburgh such as Granton and Newbridge.

The Edinburgh City Centre Transformation (CCT) plan identifies initiatives such as the rolling out of smart integrated ticketing as a way of improving public transport uptake and affordability. The rolling out of integration hubs at key strategic locations has also been recognised as a way of improving Edinburgh’s public transport network.

The implementation of transport and environmental policies moving forward such as the CCT, Low Emission Zones (LEZ) and Workplace Parking Levy (WPL) are anticipated to limit private vehicle travel to the city centre and subsequently impact the nature of movement across and into Edinburgh.


Edinburgh
Leith
Musselburgh
Penicuik
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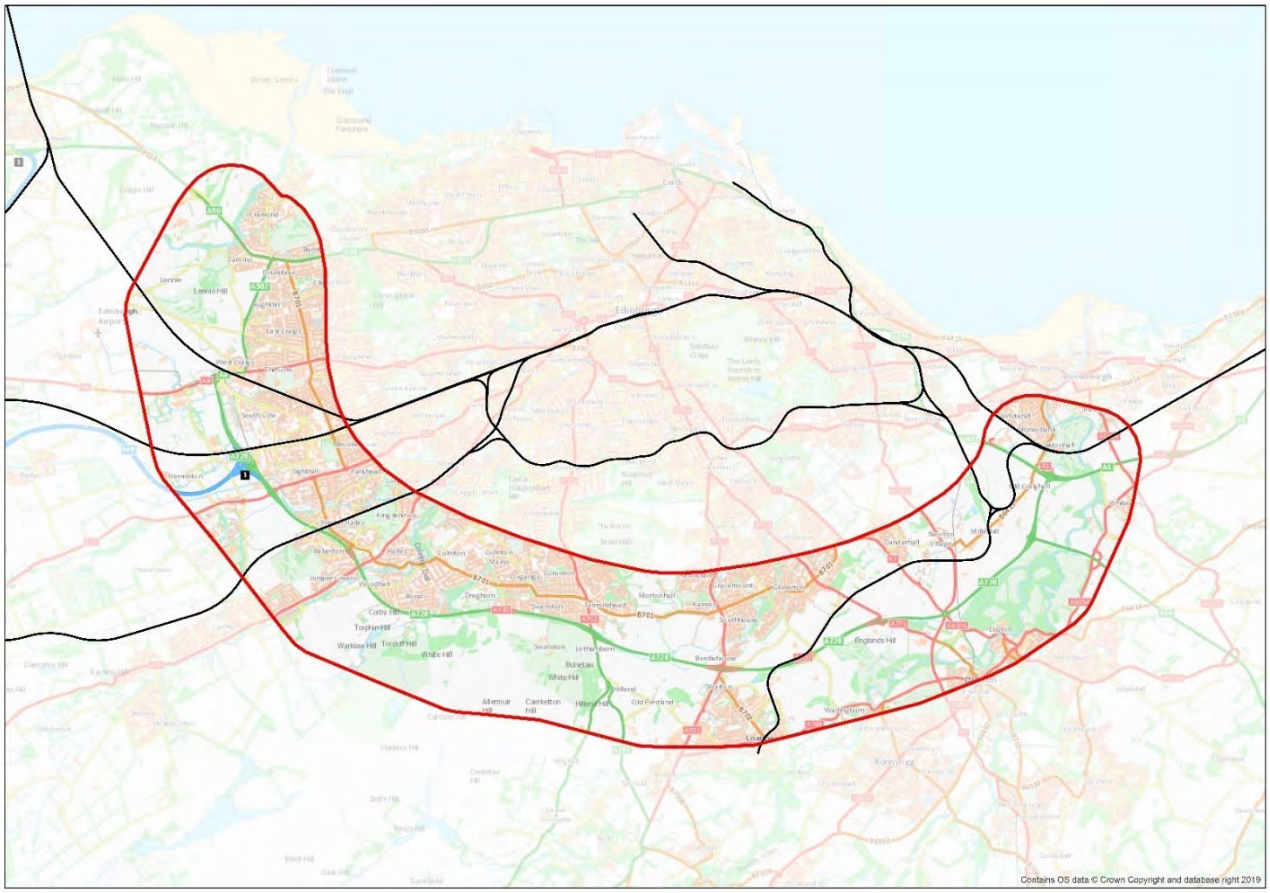
Transport Corridor 8: Orbital

This corridor is primarily an urban area that surrounds the Edinburgh city boundary. Key settlements across this location include Newcraighall to the east, Straiton to the south and Gogar to the north. This corridor is dominated by road movement along the Edinburgh City Bypass, which consists primarily of private vehicular travel and offers very little in terms of public transport movement.

The key aspirational proposal for this corridor is the Edinburgh Orbital bus route. This would create a cross-city link, which has been identified within stakeholder discussions as an area with scope for improvement in terms of public transport provision across Edinburgh. Key sites identified to form part of the orbital bus route include existing Park and Ride sites at Straiton and Sheriffhall, alongside proposed sites such as Millerhill and Lasswade Road.



Transport Corridor 9: East Lothian Coastal

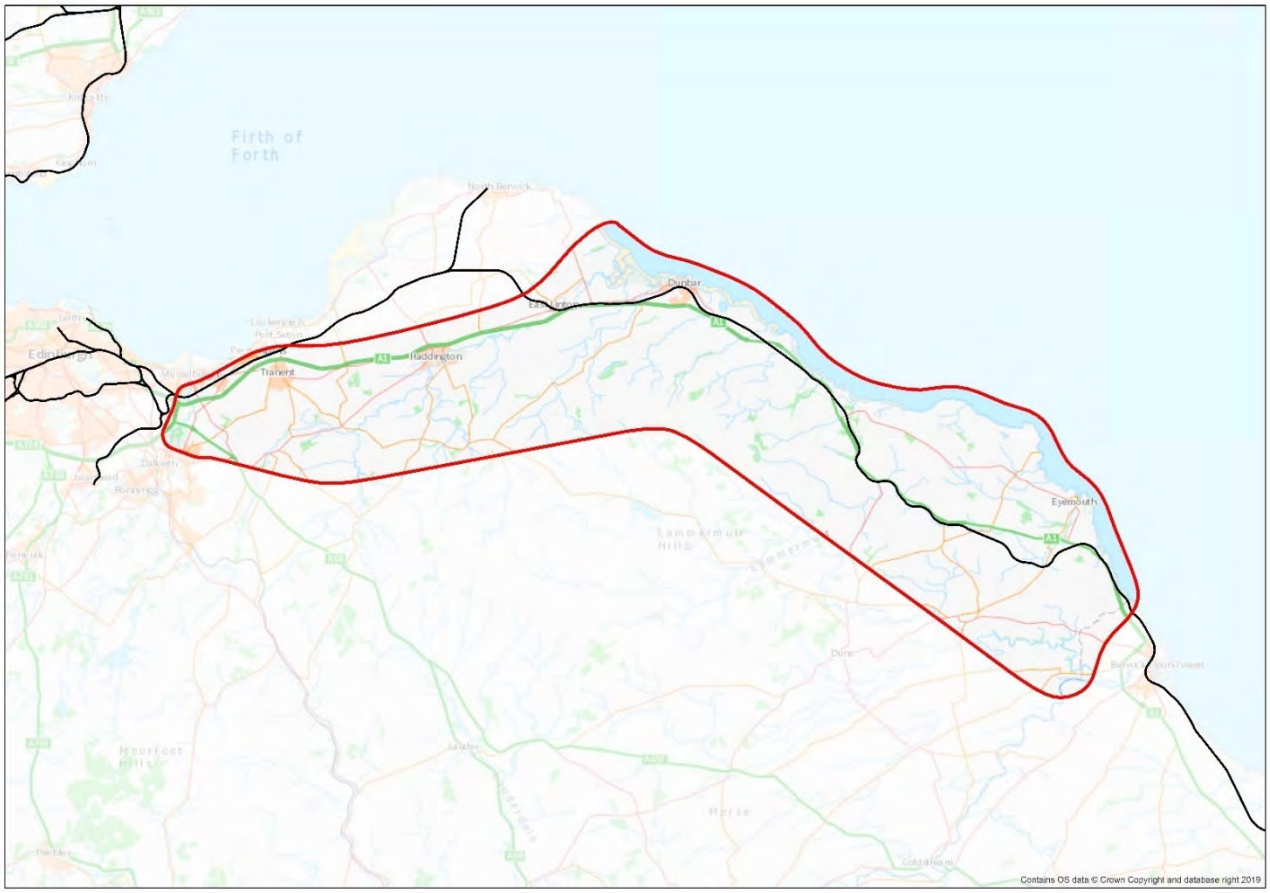
This is primarily a rural location to the northern coast of East Lothian, with key settlements including Wallyford, Longniddry and North Berwick. The transport network for this area includes rail movement such as the North Berwick line, which provides rail connections to Edinburgh from key locations such as Drem and Longniddry. The road network consists of local and coastal roads to the north of the corridor and the A1 to the south, which provides a strategic connection to Edinburgh by road travel.

New development has been proposed for this corridor, such as major housing and commercial development in North Berwick. Transport development proposals include the expansion of car parking and platform lengthening at Drem, Longniddry, Prestonpans and Wallyford rail stations.

Transport Corridor 10: East Lothian/ Borders

This corridor is a rural area that comprises of the south of East Lothian and the Scottish Borders. Key settlements include Haddington, Dunbar and Eyemouth. The transport system for this area centres around the road and rail movement. The rail network within this corridor encompasses the East Coast Mainline, however the only existing stop on this route is Dunbar station. The road network centres around the A1 due to land topography restricting road provision. The A1 facilitates cross-boundary movement between the Borders, East Lothian, Midlothian and Edinburgh.

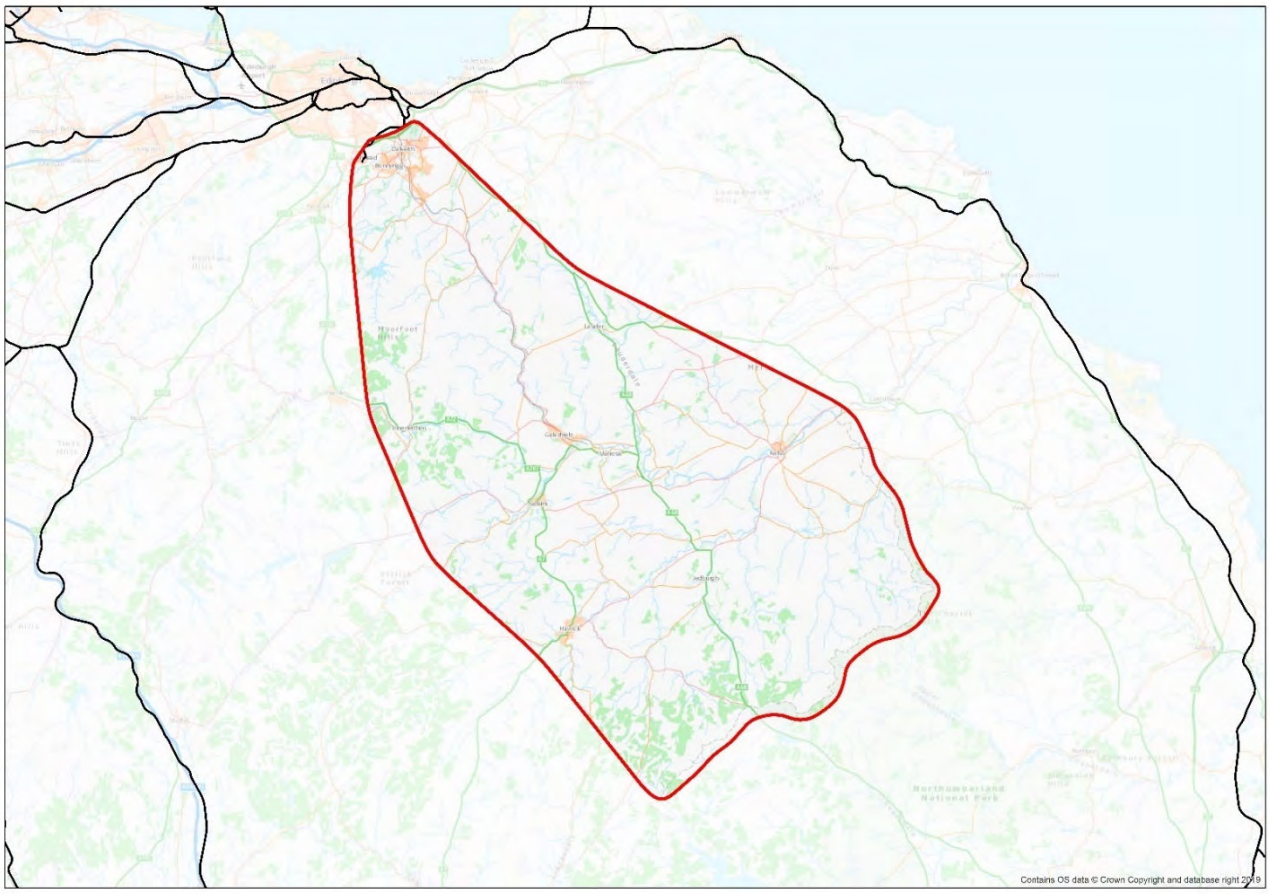
There is a significant amount of development proposed across this corridor. The new town of Blindwells consists of new housing, commercial space and associated transport infrastructure that ensures connectivity to key locations. It is anticipated this development will have a significant impact on the surrounding transport network. Housing and commercial development are also planned for Tranent, Haddington and Dunbar. Furthermore, transport developments include new rail stations located at East Linton and Reston, with both stations joining the East Coast Mainline, improving connections to Edinburgh and the rest of the UK. Extensions to car parking at Dunbar rail station has also been proposed.



Transport Corridor 11: Midlothian East/ Borders

This corridor runs to the south of the region and consists of urban locations to the north towards Edinburgh and a rural setting to the south towards the Borders. Key settlements include Gorebridge and Galashiels. Transport movement is predominantly road and rail, with the rail network including all sites within Midlothian and the Scottish Borders, which has benefited from significantly improved rail access with the new Borders Railway line, with direct access to Edinburgh city centre. The road network centres around the A7 and A68 main roads, which both provide a direct connection from the Borders to Midlothian and Edinburgh.

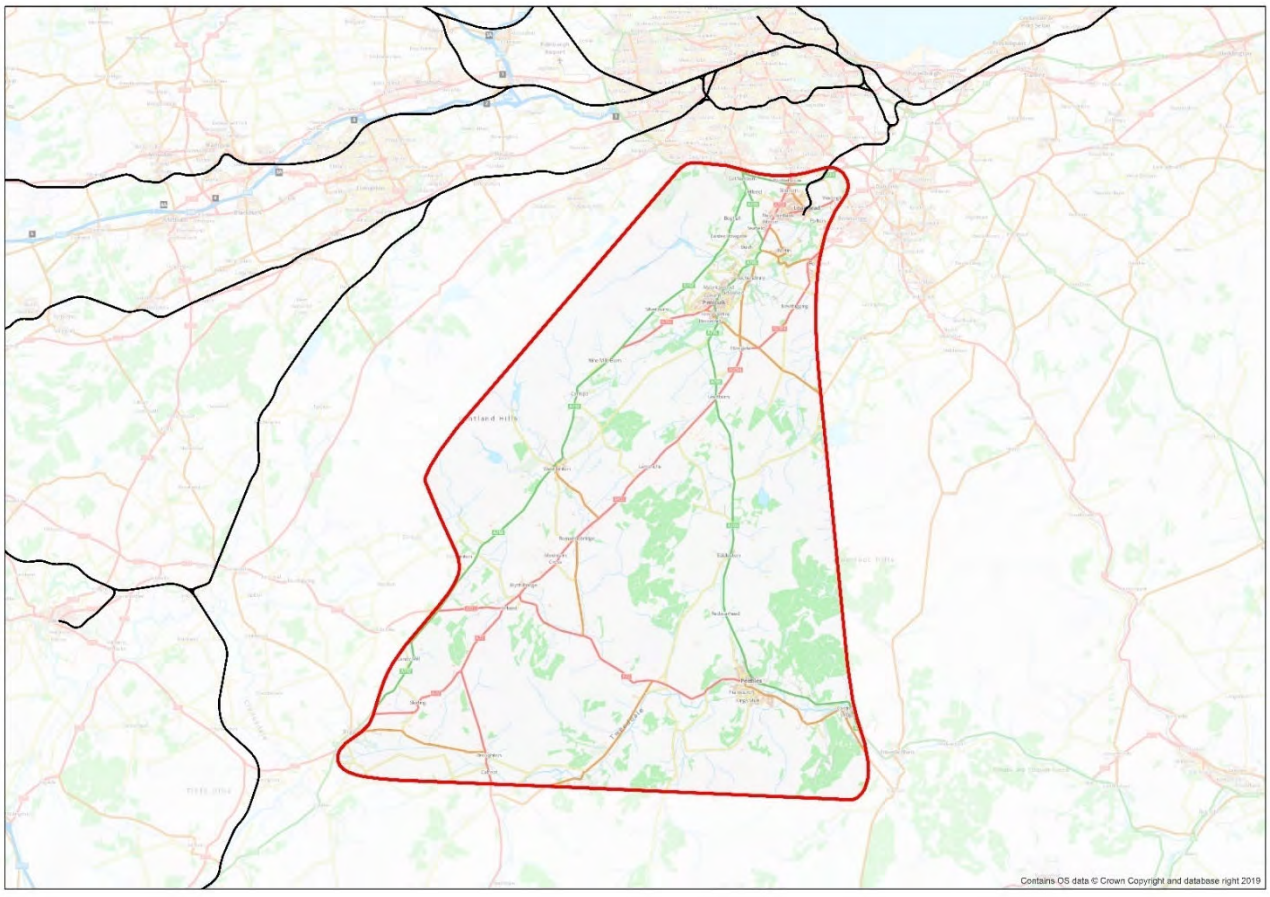
The key development for this corridor comprises of the Shawfair masterplan. This consists of major housing and commercial development and will be served by transport infrastructure such as Bus Park and Ride site at Newton farm (A68 north). This is a committed development with planning permission granted and is anticipated to have a sizeable impact on the surrounding transport network. Other aspirational transport development within this corridor includes a new rail station at Redheugh, which is currently at the feasibility stage and would form part of the Borders Railway line if brought forward. It is also anticipated that an Edinburgh Orbital bus network may impact movement on this corridor.



Transport Corridor 12: Midlothian West/Borders

The geography of this corridor consists of an urban setting to the north towards Edinburgh and Midlothian and rural to the south towards the Borders, with locations including Penicuik and Peebles. The transport system for this corridor is road-intensive, with main roads such as the A701, A702, A703 and A720 (Edinburgh City Bypass) providing direct connections to Edinburgh and Midlothian. The public transport network is currently bus only, with Straiton park and ride providing the only strategic public transport option.

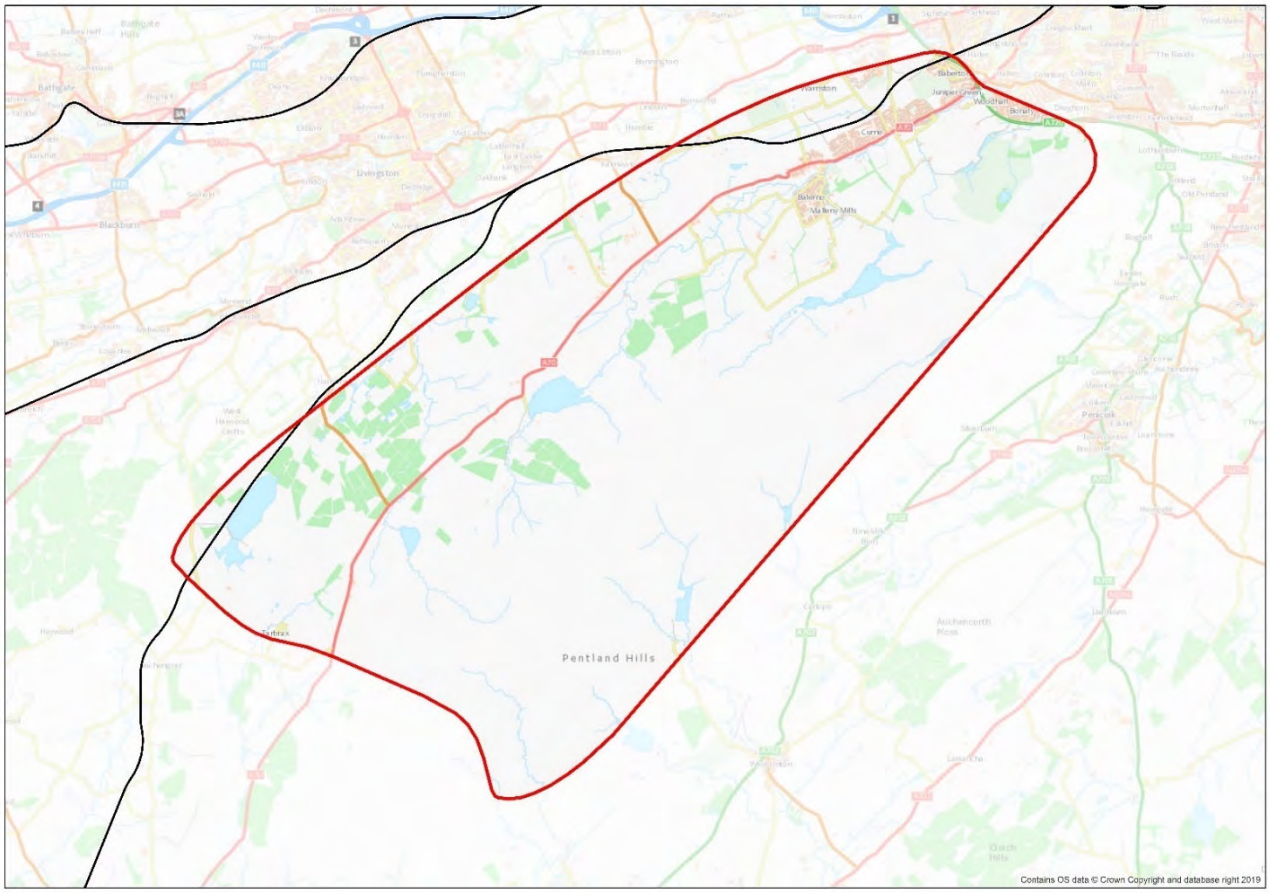
Committed development within this corridor includes a bus park and ride facility at Lothianburn, which is anticipated to function in the same way as existing sites within this corridor such as Straiton Park and Ride. Furthermore, the Edinburgh Orbital bus network is likely to have an impact on movement within this corridor.



Transport Corridor 13: Lanark

This corridor consists of rural agricultural land to the west and suburban urban settlements- such as Balerno, Currie and Juniper Green- to the east. The transport network for this corridor is dominated by road movements along the A70, which provides strategic connectivity from South Lanarkshire and the south of West Lothian to Edinburgh. The corridor is subsequently dominated by private vehicular movements, with the only public transport movements coming from Lothian bus routes running through Currie, Balerno and Juniper Green.

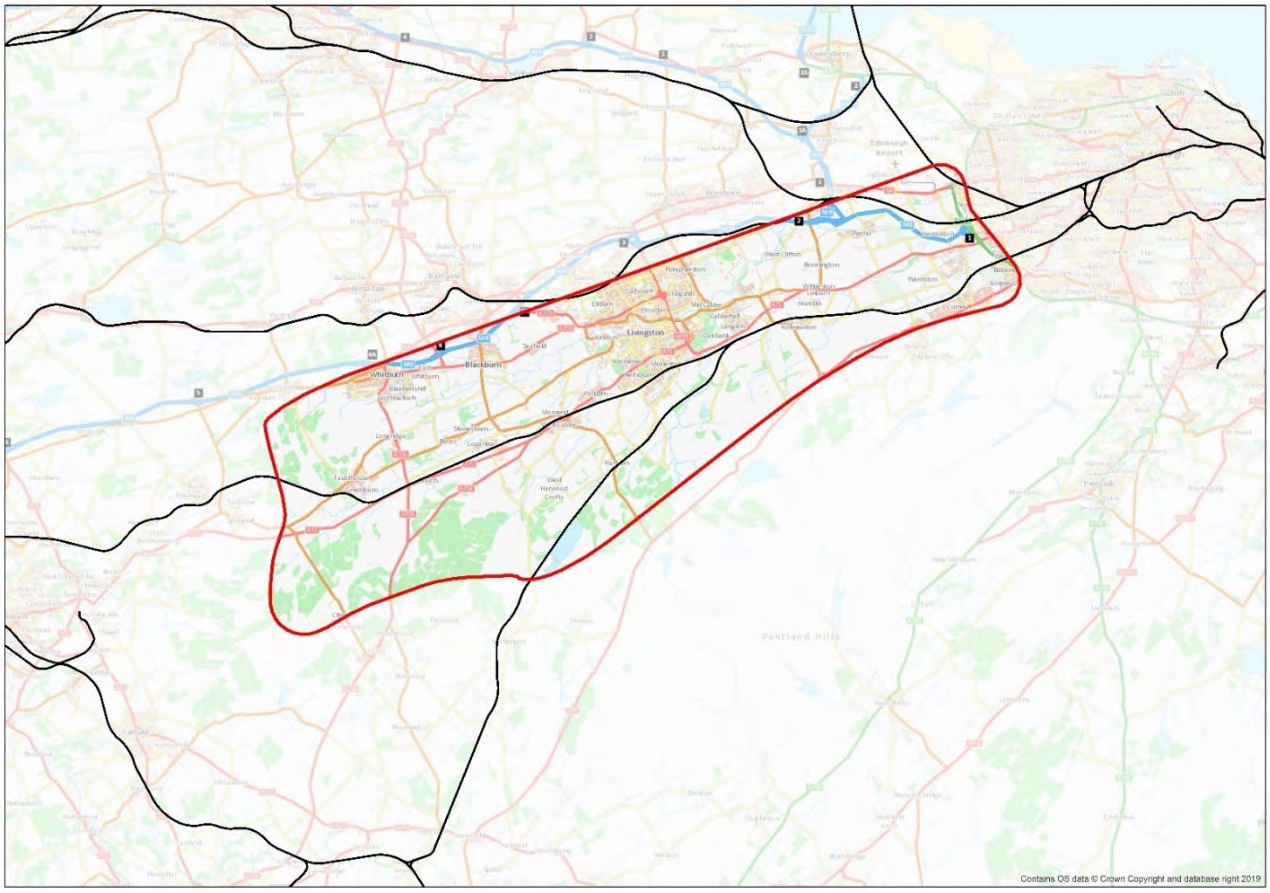
The only infrastructure development of note within this corridor includes the extension of the 63 Lothian bus route to Currie and Balerno, which will improve connectivity from these residential areas to key employment locations within Edinburgh West such as South Gyle and Edinburgh Park.



Transport Corridor 14: West Lothian South

This corridor is located to the south of West Lothian, with the geography of this area being a mix of urban and rural locations. The strategic transport network encompasses rail and road travel, with local buses generally serving individual locations. The rail network comprises of the Edinburgh-Glasgow via Shotts, including stations such as West Calder, Livingston South and Curriehill. The road network is centred around the A71, which provides a direct connection to West Edinburgh.

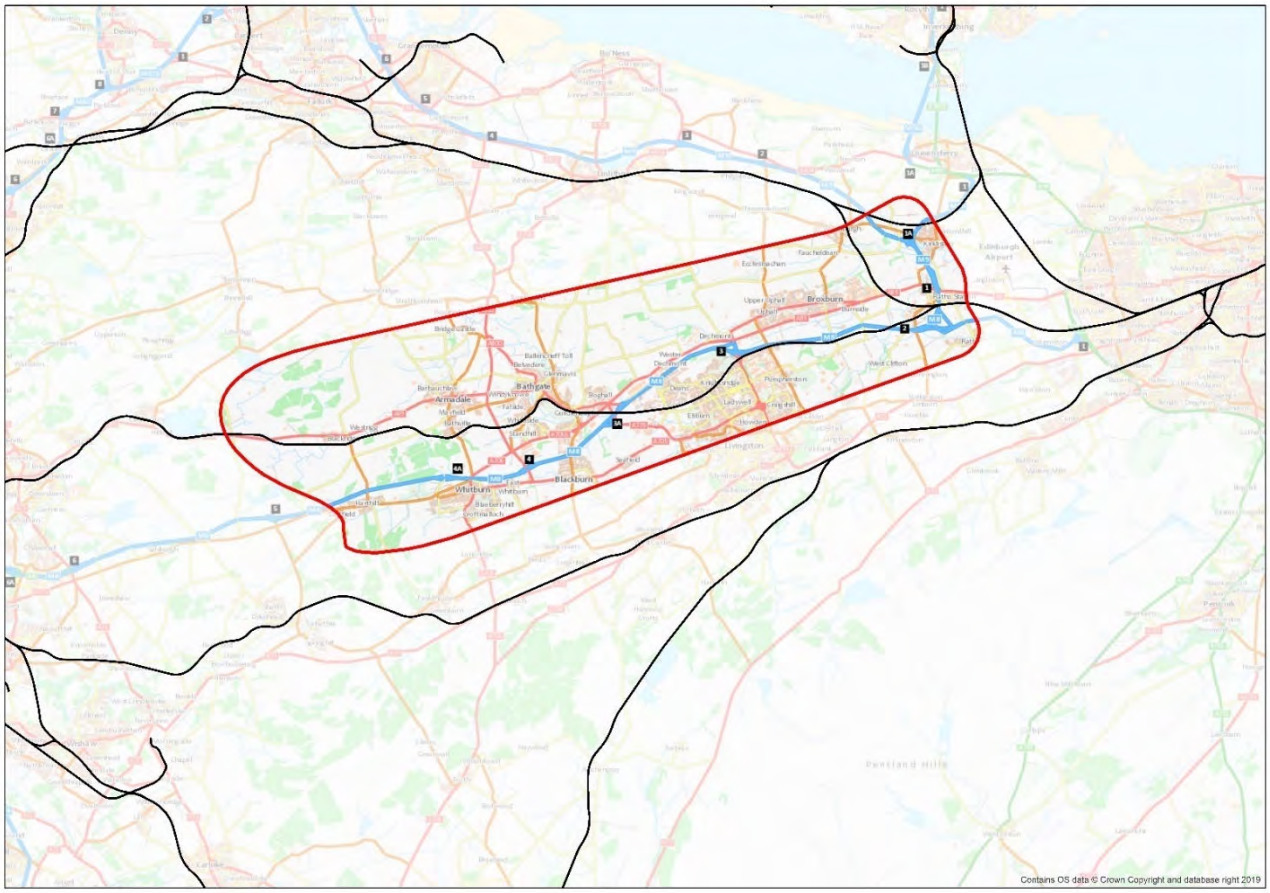
Proposed development within this corridor includes major housing developments at Almondell (East Calder) and Gavieside farm (West Calder). There are a wide range of Transport proposals for this corridor. Rail enhancements include redevelopment and extensions to Addiewell, West Calder and Kirknewton station car parking. Bus propositions include an extension to Hermiston P&R. Additionally, a Bus P&R has been put forward in Charlesfield Road, Livingston as a future aspiration to serve the A71 route to Edinburgh West.



Transport Corridor 15: West Lothian M8

This corridor is primarily urban locations with high populations to the north of West Lothian, with key settlements including Bathgate, Livingston and Broxburn. The existing transport network focuses on rail and road movement. The rail network consists of the Edinburgh-Bathgate line, with Uphall, Livingston North and Armadale being the key stations. The road network encompasses the M8 motorway and A89, which both provide strategic connectivity to Edinburgh West.

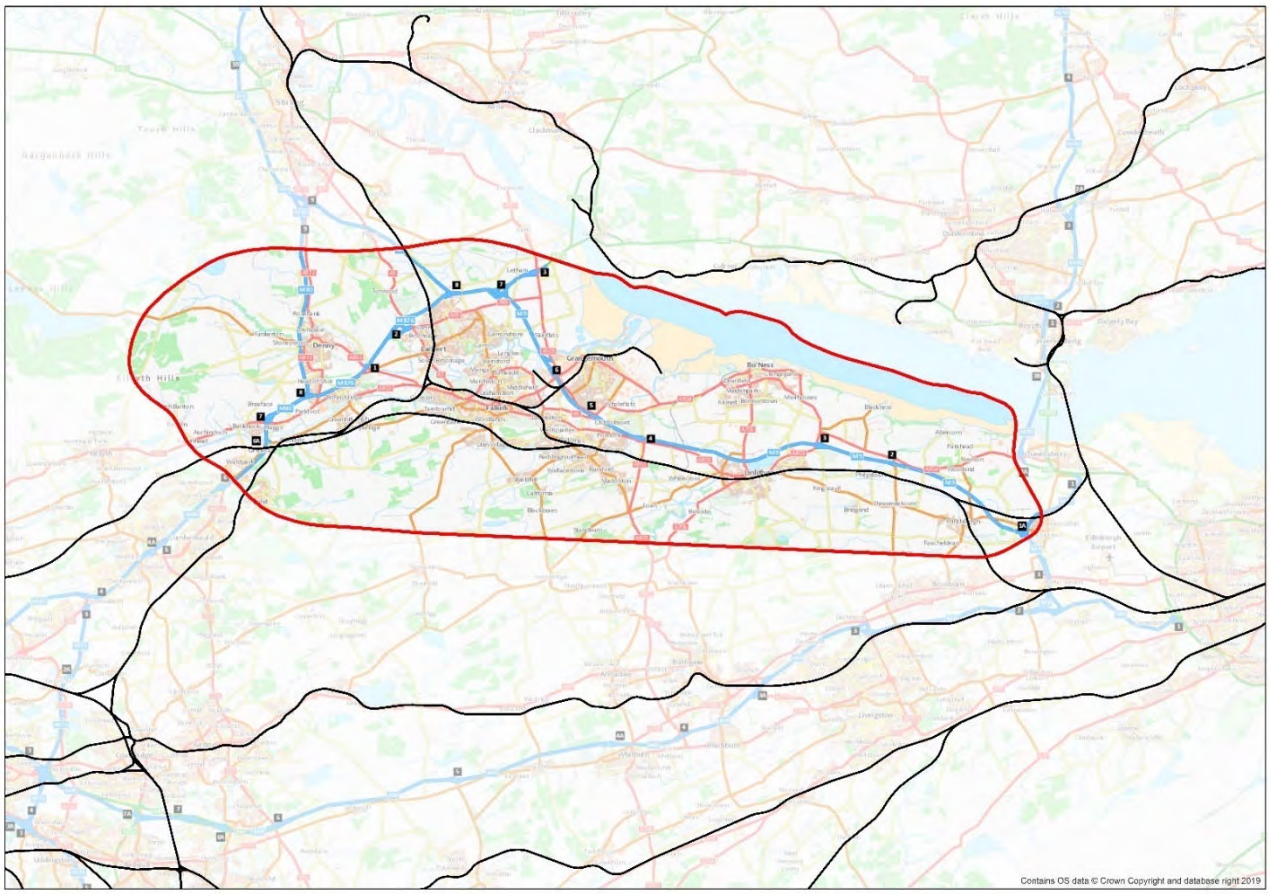
There is a significant amount of proposed development across this corridor, including major housing developments proposed for Polkemmet and Bangour village to the west of the corridor. Transport proposals are wide-ranging and comprise of both rail and bus improvements. Rail improvements include car parking extensions to Armadale station, whilst Bus Park and Rides are proposed for Kilpunt, Livingston J3 and Whitburn (Heartlands) to serve the M8. Furthermore, land is reserved to extend the existing tramline from Ingliston to Broxburn, and a Park and Ride site at Newbridge is proposed for this extended tram network to serve.



Transport Corridor 16: Edinburgh-Linlithgow-Falkirk

This corridor comprises of West Lothian to the East and Falkirk to the West. The area is a combination of urban and rural settlements, which include Newton, Linlithgow and Falkirk. This corridor primarily focuses on rail and road movements. The rail network includes strategic high-speed rail lines from Edinburgh-Glasgow and Edinburgh-Stirling, with key locations including Linlithgow, Polmont and Falkirk stations. The road network focuses on the M9 motorway which provides a strategic connection to the north-west of Edinburgh. There are also relatively direct rural routes such as A803-A904 from Falkirk to South Queensferry and the B8080 from Linlithgow to Kirkliston.

The key area of development within this corridor is Winchburgh, which will comprise of a significant amount of housing, alongside a rail station and associated Park and Ride. It is anticipated that Winchburgh will subsequently become a key transport hub within this corridor, with high quality active travel and public transport connectivity. Other public transport proposals include a coach Park and Ride within close proximity of M9 Junction 3 and new railway stations at Bonnybridge and Grangemouth. Furthermore, land is currently reserved for the construction of a new M9 junction at Duntarvie.



Transport Corridor 17: Fife Central

This corridor covers a large area with a combination of urban and rural locations. Settlements include Inverkeithing and North Queensferry to the south and Cupar and Leuchars to the north. The transport system is focussed on rail and road movement. The rail network consists of the local Fife Circle line- including stations such as Kirkcaldy and Glenrothes with Thornton and the strategic cross-boundary line which provides inter-city connections between Edinburgh, Dundee and Aberdeen. The road network includes local routes and main roads such as A92 which provide strategic connectivity from Fife to Edinburgh and other locations.

The main development proposals within this corridor are the Cupar north and Crail Airfield mixed-use developments, which both include a combination of housing and commercial space. Transport infrastructure proposals include new rail stations at Levenmouth and Bawbee Bridge (Leven), car parking extensions to Leuchars and Dalgety Bay rail stations, alongside a new Bus Park and Ride at Tay Bridgehead to serve Dundee and locations within Fife.

Transport Corridor 18: Queensferry

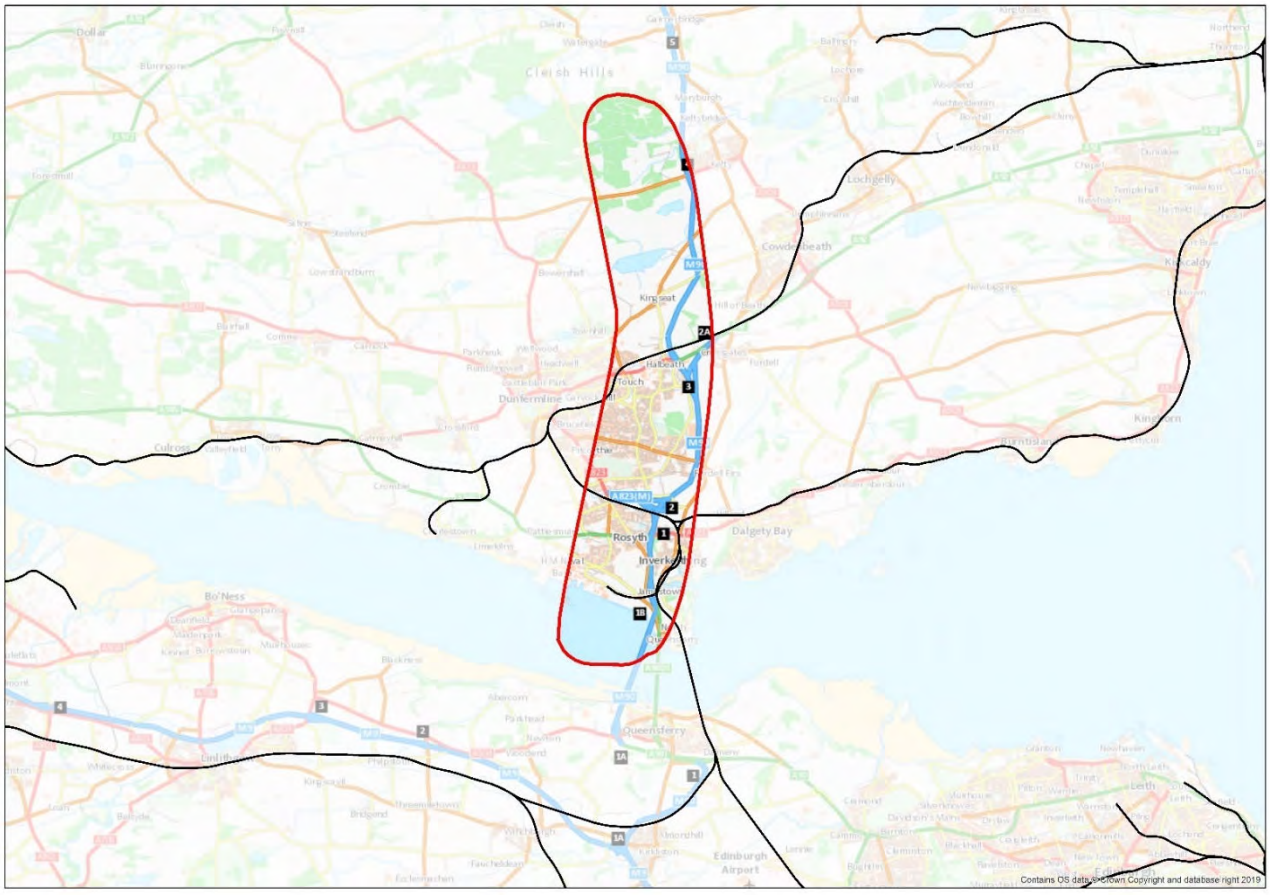
This corridor is relatively small in area, however is becoming a hub for transport movement. The area is primarily urban, with a rising population due to previous and ongoing development. The transport network is varied, with rail, bus and road travel all widely used. The bus network primarily consists of Lothian bus services, which serve Edinburgh city centre and other key locations. The rail network includes Dalmeny and Edinburgh Gateway, which both provide a high-speed, efficient connection into Edinburgh city centre. Tram services also serve this corridor from Edinburgh Gateway and Ingliston Park and Ride. Furthermore, the road network includes key strategic routes such as the A90, M9, M8 and A8 (Glasgow Road).

This corridor is an area of significant ongoing development within Edinburgh. Major housing and commercial development are proposed, including the International Business Gateway, West Craig's and Cammo Housing. Transport proposals include extensions to Dalmeny station and Ingliston Park and Ride car parking. New Bus Park and Ride sites have also been identified in South Queensferry as future aspirations, one on A90 strategic route into Edinburgh city centre and the other at the Echline junction within close proximity of the Queensferry Crossing.

Transport Corridor 19: Perth and North

This corridor is primarily an urban setting. The transport network is road-intensive and centres around the M90, which is one of the key strategic corridors serving Edinburgh from Fife and Perth and Kinross council areas.

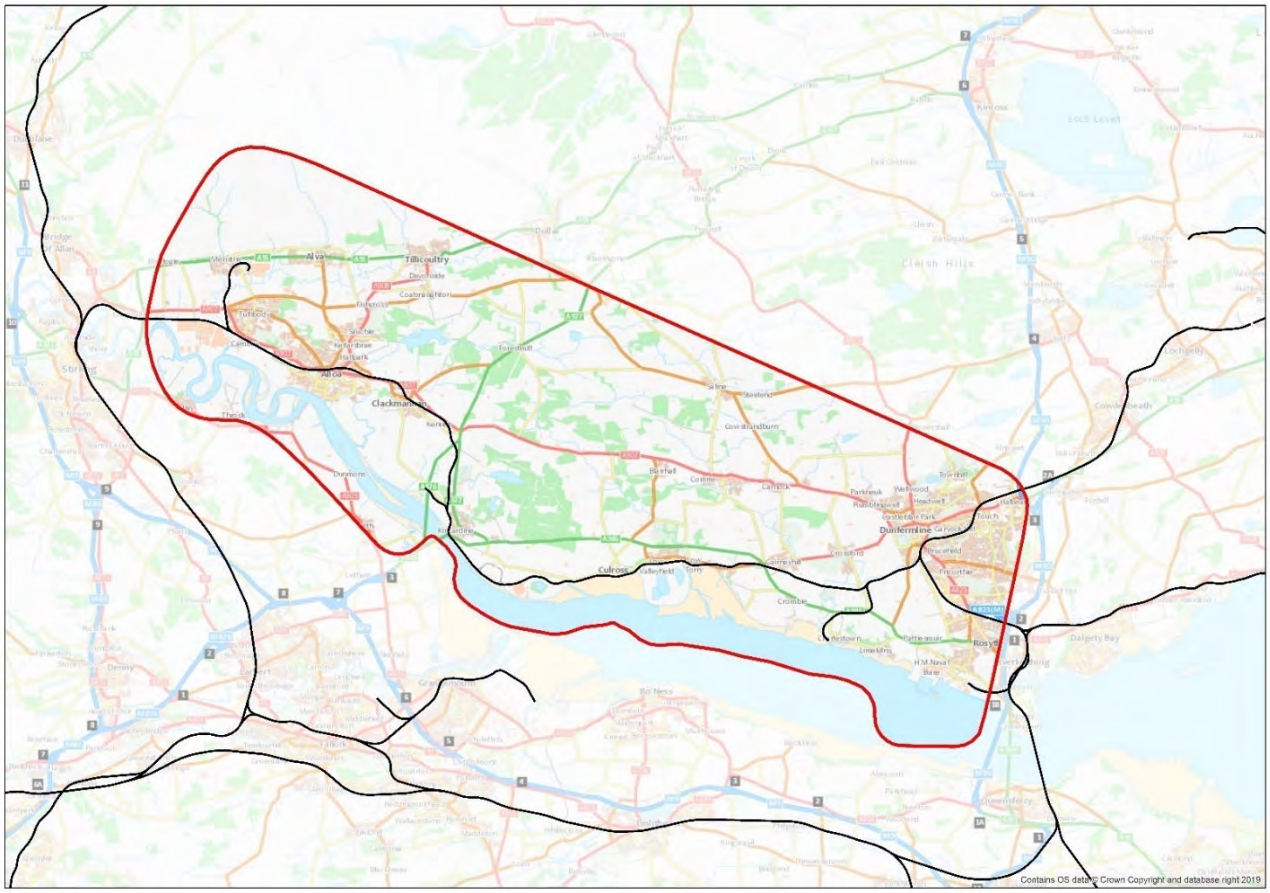
Key development proposals to consider for this corridor include the two major mixed-use developments around Dunfermline. It is anticipated these developments will have an impact on this transport corridor.



Transport Corridor 20: Alloa-Dunfermline

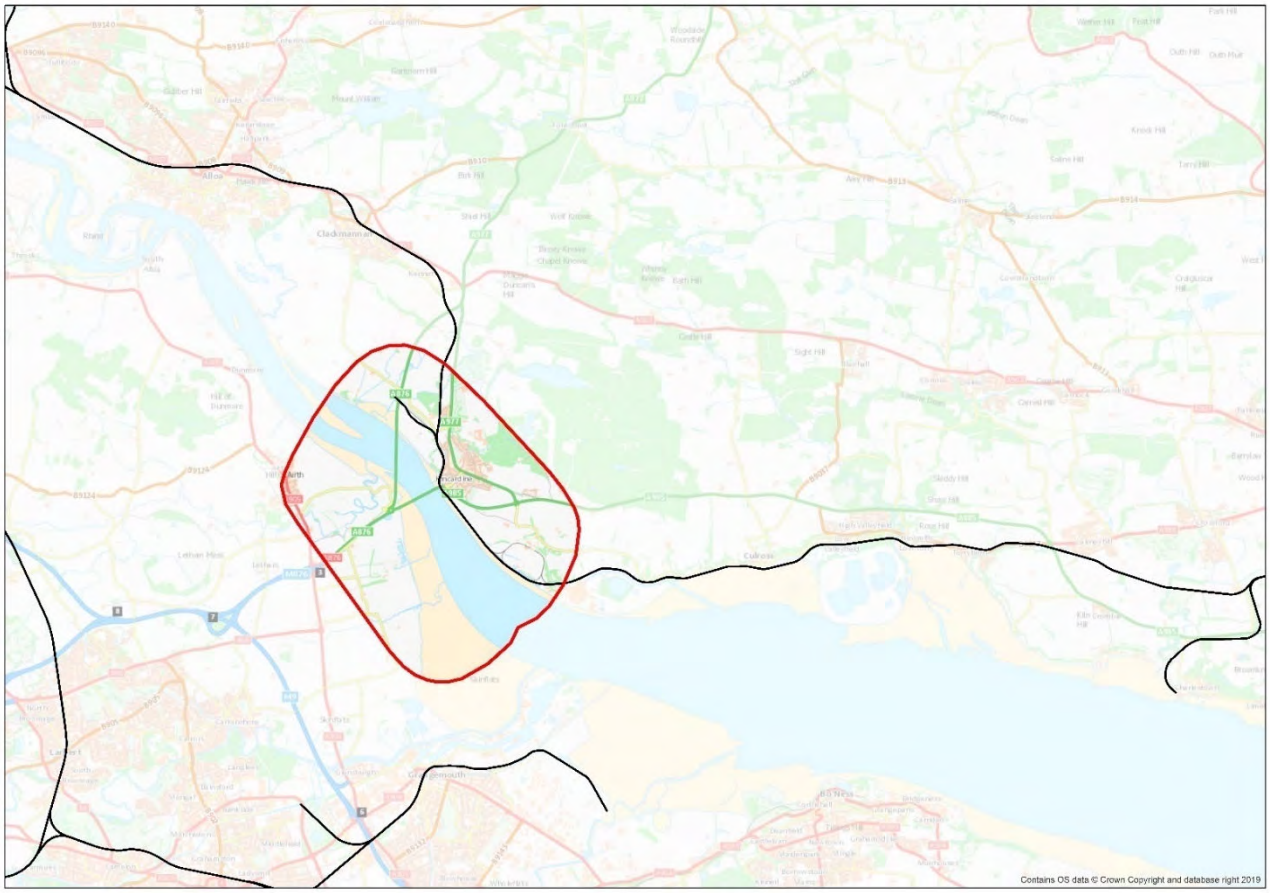
This corridor has a large area and provides a link between Western Fife and Clackmannanshire. The area is primarily rural land with key urban centres such as Dunfermline, Rosyth and Alloa. The existing transport network focuses on rail and road movement. The rail network consists of 2 main lines; the Eastern Fife Circle line and the Stirling-Edinburgh line. However, these rail links do not connect with one another. The road network mainly consists of local routes, with the main road connecting Clackmannanshire/Western Fife and Edinburgh being the A925.

Transport infrastructure improvements include extensions to car parking at Alloa rail station. Land has also safeguarded for new rail stations at Clackmannan and Cambus, with these stations joining the Stirling-Edinburgh rail line. There is also a new Bus Park and Ride proposed for Pitreavie/ Rosyth.



Transport Corridor 21: Cross Forth (Kincardine)

This corridor is primarily within the urban setting of Kincardine and provides a link between Falkirk and Clackmannanshire and Western Fife. The transport network is centred around road travel, with limited bus demand and car forming the predominant mode. The road network comprises of the Kincardine Bridge and A876 (Clackmannanshire bridge). These routes effectively link Clackmannanshire and Western Fife to strategic routes such as M9 and M876 that link to Edinburgh and Glasgow respectively.



SESTRAN REGIONAL PARK AND RIDE STRATEGY

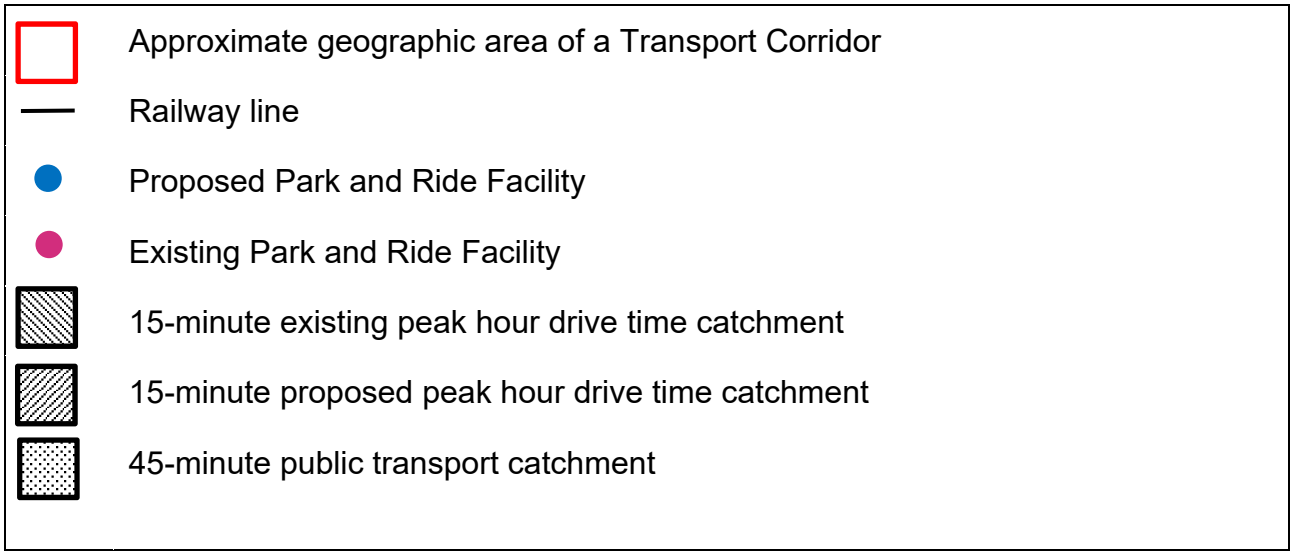
Transport Corridor Appraisal

5 Transport Corridor Appraisal

This chapter presents the multi-criteria analysis of each of the transport corridors

Transport Corridors 8 and 13 have no existing or proposed Park and Ride facilities, consequently they have been omitted from this chapter.

Key for analysis maps



The drive time and journey time catchments have been derived using Conveyal, software that uses open source data including public transport route and timetable data, to facilitate the interrogation and understanding of a geographic area. For public transport journeys assumptions have been made in relation to;

- walk time from car to the station (5-minutes);
- an allowance for a 5-minute wait prior to service departure at journey origins.; and
- Single interchange between services.

Key for the multi-criteria analysis tables

Table Heading	**Description**
Population catchment	Population residing within 15-minute drive time of named Park and Ride facility, based on 2011 census statistics.
Spaces per population	Ratio of total spaces in stated Park and Ride facility in relation to population catchment.
Employment catchment	Existing jobs located within the 45-minute public transport journey time of the named Park and Ride facility.
Time	Time saving based on vehicle mileage as a result of switching to public transport to central Edinburgh.
Cost savings	Monetary Savings based on vehicle mileage as a result of switching to public transport to central Edinburgh.
Environmental	Represents carbon/emission saving potential as a result of switching to public transport to central Edinburgh.
Table Content	**Description**
To standardise the range of results with the multi-criteria analysis, the results for each criteria have been ranked from minimum to maximum value to reflect distribution along a 5-point scale from ‘very low’ to ‘very high’.	
	Very high
	High
	Medium, representing the average situation
	Low
	Very low
★	Represents where no data is available, aspirations or ongoing proposal.

The scaling methodology detailed in the multi-criteria assessment tables is based on ranking all values for a given metric and then sub-dividing them into five equal parts. Thus, a facility that scores the average value within a given range, sits at the midpoint (50%) and is allocated a ranking of ‘Medium’. This approach has been adopted in the absence of justifiable benchmarks to categorise each of the metrics considered. A key benefit of this approach is that it allows a visual understanding of whether a facility is scoring well when compared with all SEStran facilities.

Transport Corridor 1-7: Edinburgh

Table 5.1 Transport Corridors 1 to 7 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing		Proposed
	Brunstane	Shawfair	Millerhill
	Edinburgh Park	Sheriffhall	Old Craighall
	Kingsknowe	Slateford	Shawfair
	Musselburgh	South Gyle	Lothianburn
	Newcraighall	Wester Hailes	

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Brunstane	0	0	14	●			5	●											
Edinburgh Park	0	0	35	●	●	●	30	●	●										
Kingsknowe	0	0	10	●			5	●											
Lothianburn	500	★	★		★		★	★									★	★	★
Millerhill	★	★	★		★		★	★						★	★		★	★	★
Musselburgh	122	6	8	●			6	●											
Newcraighall	565	30	56	●	●		5	●											
Old Craighall	★	★	★	★	★		★	★						★	★		★	★	★
Shawfair	53	3	20	●			6	●											
Shawfair (bus)	★	★	★		●		★	★						★	★		★	★	★
Sheriffhall	561	15	★		●		6	●											
Slateford	0	0	6	●			5	●											
South Gyle	63	1	0	●			7	●		●									
Wester Hailes	38	0	0	●			5	●	●	●		●							

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
160,500	56%	9%	6%	15%	5%	9%

The nature of the Park and Ride facilities located within the A720 Edinburgh City Bypass can be divided into two categories, as summarised in the Table 5.2.

Table 5.2 Edinburgh Park and Ride Facility User Category

Park and Ride Facility	Status	Local	Strategic
Brunstane	Existing	●	
Edinburgh Park	Existing	●	
Kingsknowe	Existing	●	
Millerhill	Proposed		★
Musselburgh	Existing		●
Newcraighall	Existing		●
Old Craighall	Proposed		★
Shawfair	Existing		●
Sheriffhall	Existing		●
Shawfair (bus)	Proposed		★
Slateford	Existing	●	
South Gyle	Existing	●	
Wester Hailes	Proposed	★	

Local Park and Ride Facilities

Park and Ride facilities defined as local have minimal if no car parking but have cycle parking provision and are well connected to the local residential areas by footways and cycleways. Local sites are also linked to strategic active travel routes such as the National Cycle Network (NCN) that provides walking and cycling connections to key destinations across Edinburgh and out-with the city boundary. For example, Wester Hailes and Slateford stations effectively link to NCR 75, whereas Brunstane station connects to NCR 1.

Those with car parks offer limited opportunities for commuters from outside of the City Bypass, as the main roads linking to these sites are typically congested which when considered in conjunction with parking and public transport costs (time and monetary) offer marginal benefits to commuters. Other opportunities outside of the Edinburgh parking zones, close to busy routes are considered to form a more attractive option to the strategic commuter trips.

Edinburgh Park with its high frequency of services offers opportunity for trip transfer between modes however, these services are focussed on accessing the City Centre and offer minimal opportunity to transfer to alternative transport corridors within the City.

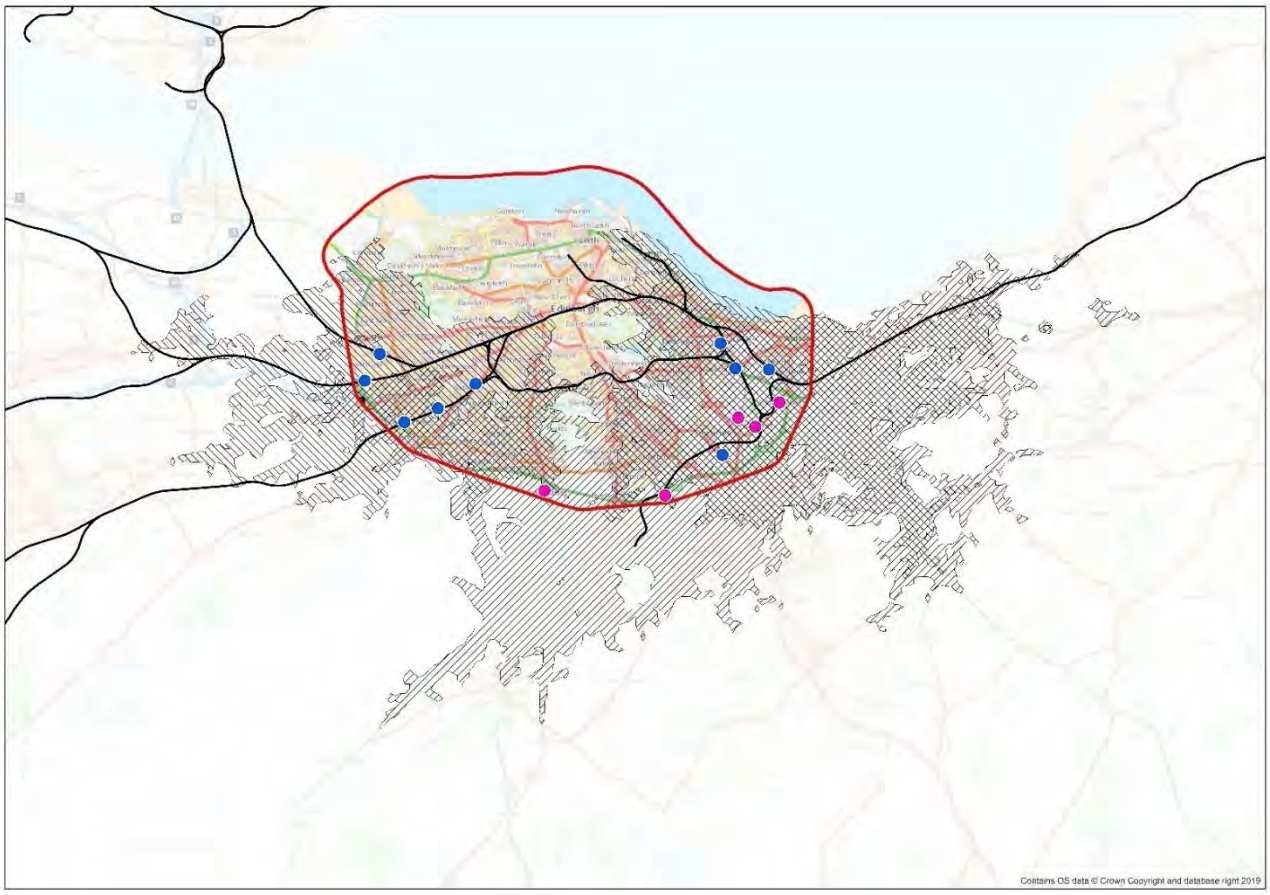
Based on available information South Gyle and Wester Hailes (proposed) are not associated with any cycle facilities. Other local sites within Edinburgh are also limited in terms of active travel facilities. For example, Slateford station currently has only 6 cycle storage spaces with no shelter or CCTV. Therefore, in light of the nature of the catchment, consideration should be given to improved facilities for cyclists at the site and the quality and nature of the pedestrian and cycle linkages within the local residential catchment.

Strategic Park and Ride Facilities

Within the Edinburgh Transport Corridors, a number of large Park and Ride facilities are located which have sizeable car parks with regular bus and rail services. These Park and Ride facilities are strategically located immediately adjacent to key arterial routes into Edinburgh to provide an attractive mode of travel for commuters and visitors into the City Centre.

The attractiveness of these sites is supported by the model in financial and in environmental terms when driving and public transport are compared, it is shown that these strategic facilities provide benefits to users. However, due to the nature of local train services car use continues to be more efficient in terms of time.

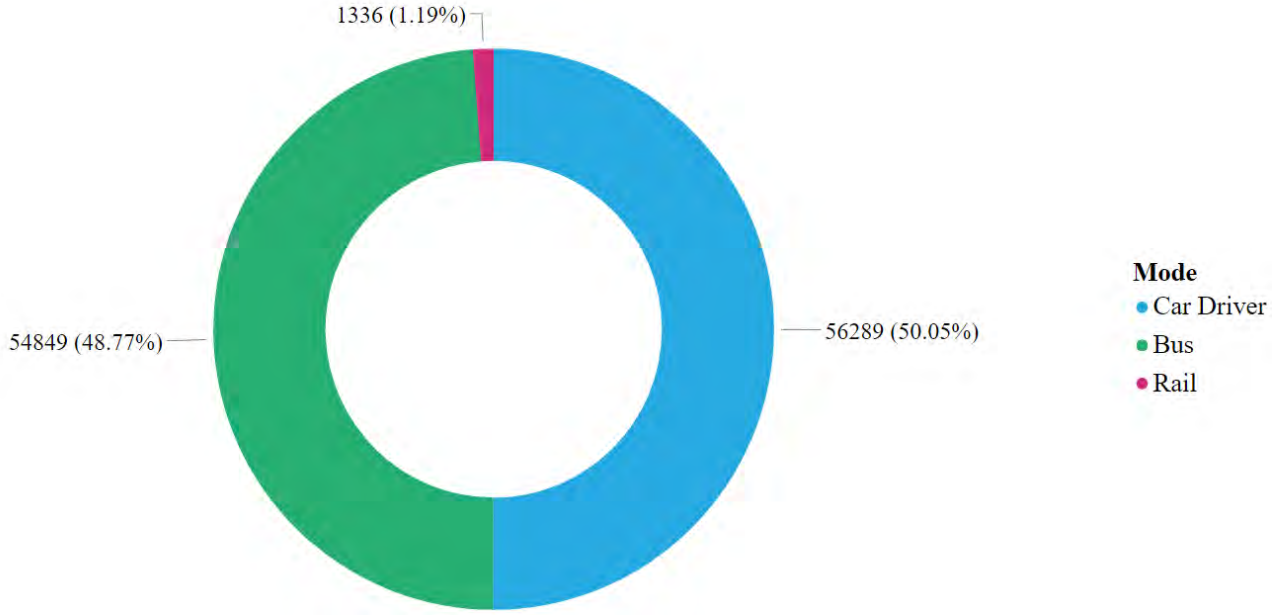
Figure 5.1 Edinburgh 15-minute peak hour drive times to proposed and existing Park and Ride facilities



The existing Park and Ride facilities are currently all located on the rail network with the exception of Sheriffhall, which is served only by bus. All facilities connect directly to Edinburgh City Centre, with limited connectivity to other key areas of employment. As shown in the above figure, the eastern and western areas of Edinburgh are well served by Park and Ride facilities. New sites are proposed on the southern periphery to capture trips from the Midlothian, Lanark and East Lothian corridors.

Edinburgh has a well-developed bus network focussed on moving passengers in and out of the City Centre. However, the opportunities for passengers to travel outside of the arterial corridors is limited due to the lack of cross-city bus routes in conjunction with high interchange penalties, associated with transferring between services.

Figure 5.2 Travel to Work (To Central Edinburgh) Mode Shares for Edinburgh Transport Corridor. Source: Scotland's Census 2011



Journeys to work in the Edinburgh Transport Corridor are dominated by Car and Bus, despite the provision of rail stations to the East and West of the City. The extensive local bus services provided by Lothian Buses within Edinburgh are an attractive option for commuters with large sections of population in central, North and South Edinburgh not served by a Park and Ride. It should also be noted that the tram is not included in this analysis as the 2011 Census predates the opening of the tram.

Rail stations at Brunstane, Edinburgh Park, Kingsknowe and Slateford do not provide any car parking provision so may struggle to encourage a modal shift. The high mode split for car of over 50% is high for an area that contains the focus of major employment.

Summary: Transport Corridors 1-7

The transport corridors within Edinburgh are formed by a mix of local and strategic Park and Ride sites. There are currently four strategic Park and Ride sites two are rail-based and are located in Musselburgh and Shawfair, and two are bus-based and are located in Newcraighall and Sherriffhall. These sites provide low time benefits for commuters transferring from car, due to the nature of local train and bus services car continue to be more efficient in terms of time, particularly when mode transfer walk times and service headways are accounted for.

Two new Park and Ride sites are proposed at East Linton and Reston, which will be served by the local cross-border train services that operate between Newcastle-Upon-Tyne and Edinburgh.

Four further Park and Ride facilities are proposed at Millerhill, Old Craighall, Shawfair and Lothianburn. Each of these facilities will be served by bus, although Old Craighall will also be served by rail. These new facilities are located are associated with high population catchments and will improve the mode choice available to local residents.

Access to employment destinations within Edinburgh is currently focussed on the centre of Edinburgh. Journey to work statistics indicate that 56% of Edinburgh commuters associated with this transport corridor work in central Edinburgh. Edinburgh South West and East form the second and third most popular destinations for commuters. Commuter trips with destinations in these areas are subject to a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work.

The existing park and ride facilities provide a mix of opportunity for active travel connections from local residential areas, some are well connected to local cycle routes such as Brunstane whilst others provide no cycle parking infrastructure such as at South Gyle and Wester Hailes stations. Consequently, consideration of improvements to footways and cycleways in conjunction with the provision of cycle parking at the existing and proposed park and ride facilities should form part of any improvement/ development plans for park and ride facilities within this transport corridor.

Table 5.3 Transport Corridors 1-7 Summary Table

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh Park and ride facilities are well located to local population Mix of public transport options for local and strategic commuters	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Limited cross-region routes, particularly within Edinburgh. Strategic commuter facilities located on rail lines.

Transport Corridor 9: East Lothian Coastal

Table 5.4 Transport Corridor 9 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing		Proposed
	Drem	Prestonpans	Bankton
	Longniddry	Wallyford	Prestonpans/Drem
	North Berwick		

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Bankton	★	★	★		★		★	●						★	★		★	★	★
Drem	68	3	20	●			4	●											
Longniddry	73	3	20	●			4	●											
North Berwick	96	3	18	●			2	●											
Prestonpans	165	11	22	●			4	●											
Prestonpans - Drem	★	★	★	★			★	★						★	★		★	★	★
Wallyford	389	16	18	●			4	●											

Journey to Work Statistics

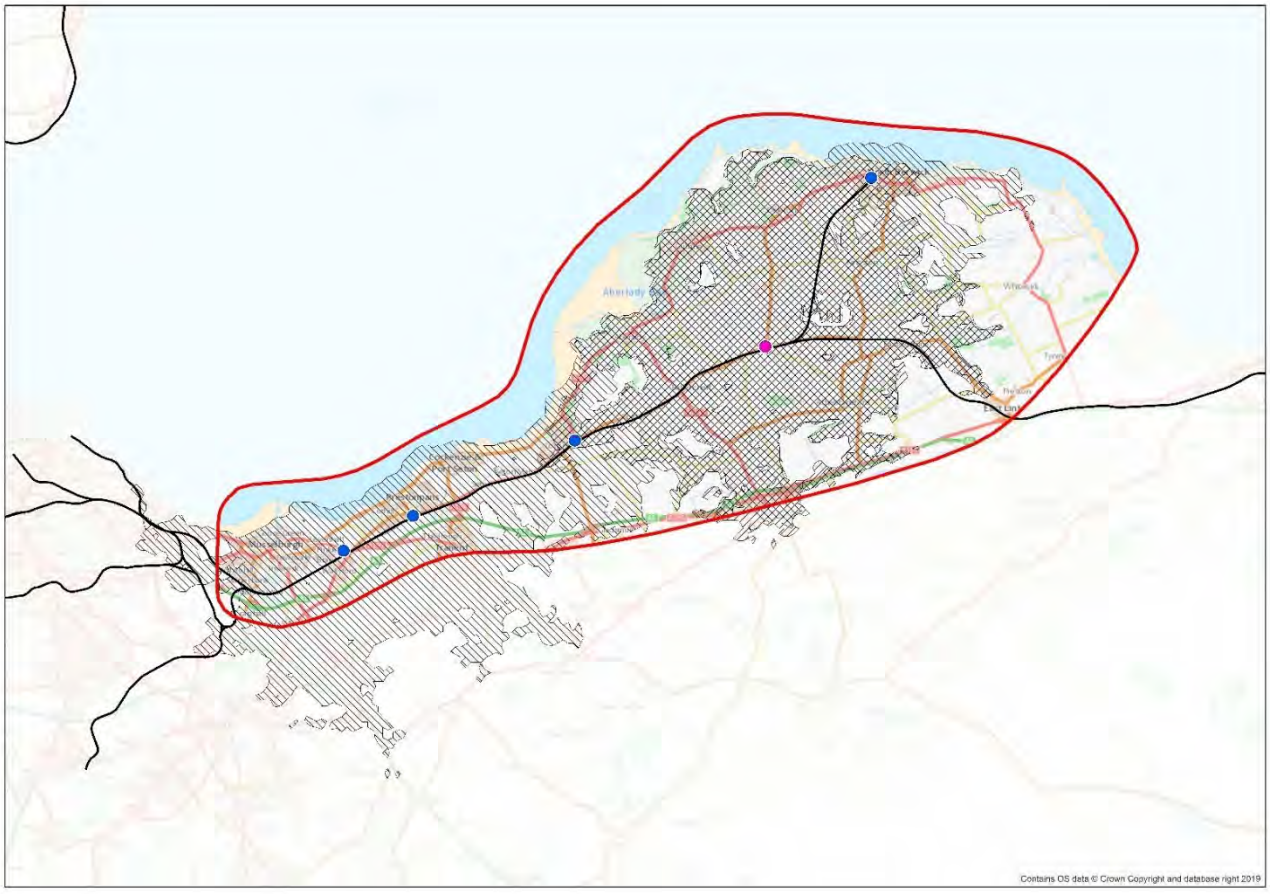
Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
7,500	51%	21%	4%	11%	3%	10%

The East Lothian Coastal corridor is well provided for with regards to travel into Edinburgh City Centre, with all sites centred at rail stations. The allocation of spaces per population within this corridor is average for the SEStran region although peak hour service frequency is low, varying between one service every 30 minutes to 15 minutes.

The location of the sites adjacent to the coast, is reflected in the low levels of population located within a 15-minute peak hour drive time of the sites however, the distribution of sites as shown in the following map, does provide a high level of Park and Ride choice for residents. The proposed Park and Ride facility in Wallyford has a very high population catchment due to its proximity to Musselburgh however, it is anticipated that this site would capture trips from the wider geographic area and from the A1.

Based on journey to work statistics, of those who currently work in Edinburgh, 51% work in the immediate vicinity of Edinburgh City Centre, whilst 24% work in Edinburgh South West.

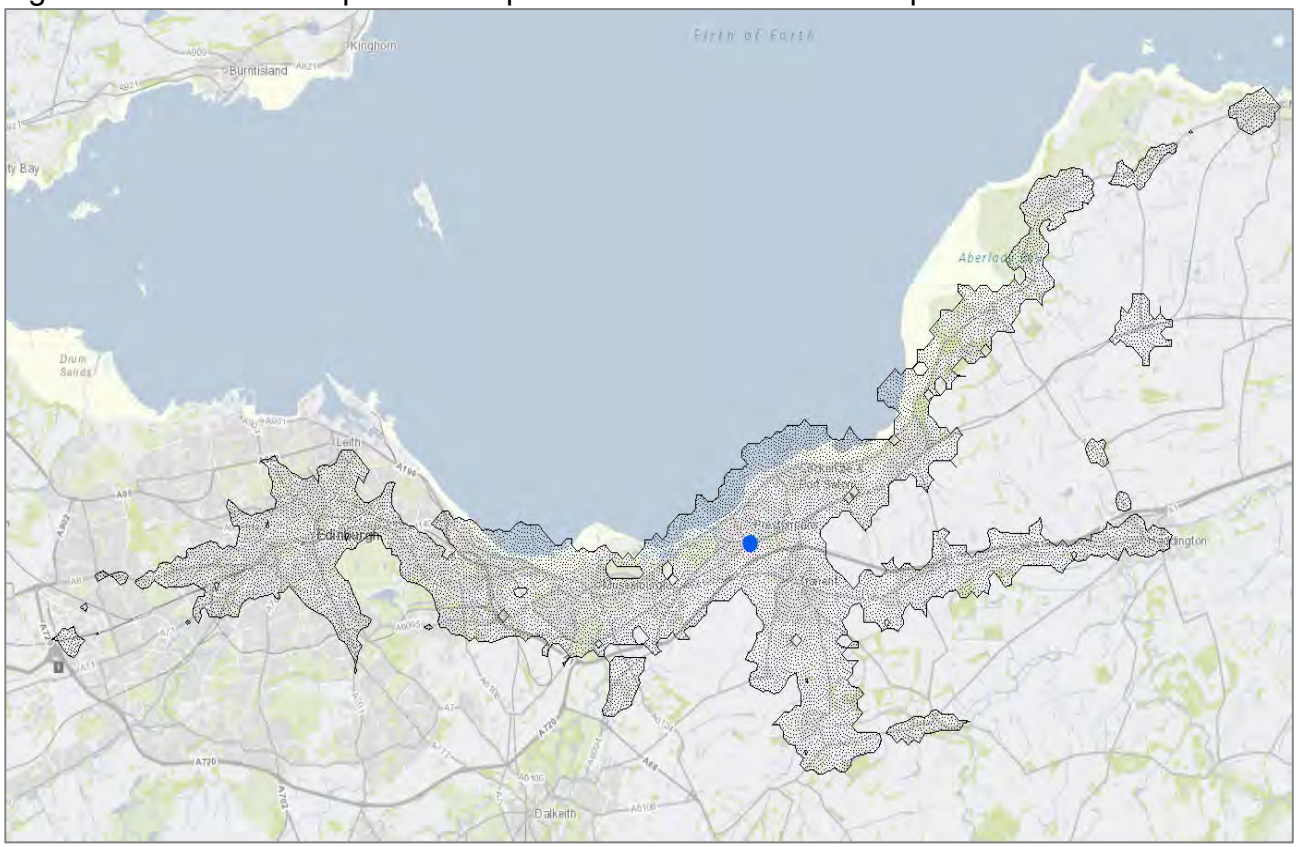
Figure 5.3 East Lothian coastal 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities



The 45-minute public transport catchment from Prestonpans indicates that Edinburgh Central is highly accessible, in comparison to Edinburgh South-West. Thus, for the majority of the local population, switching from car to public transport will provide a more efficient journey time into Edinburgh City Centre. The introduction of interchanges to improve cross-city connectivity would provide further benefits to encourage modal shift.

Environmental benefits are considered lower within this corridor due to the lower levels of congestion associated with travel to jobs within Edinburgh and the East Lothian area such as North Berwick which has a high employment catchment.

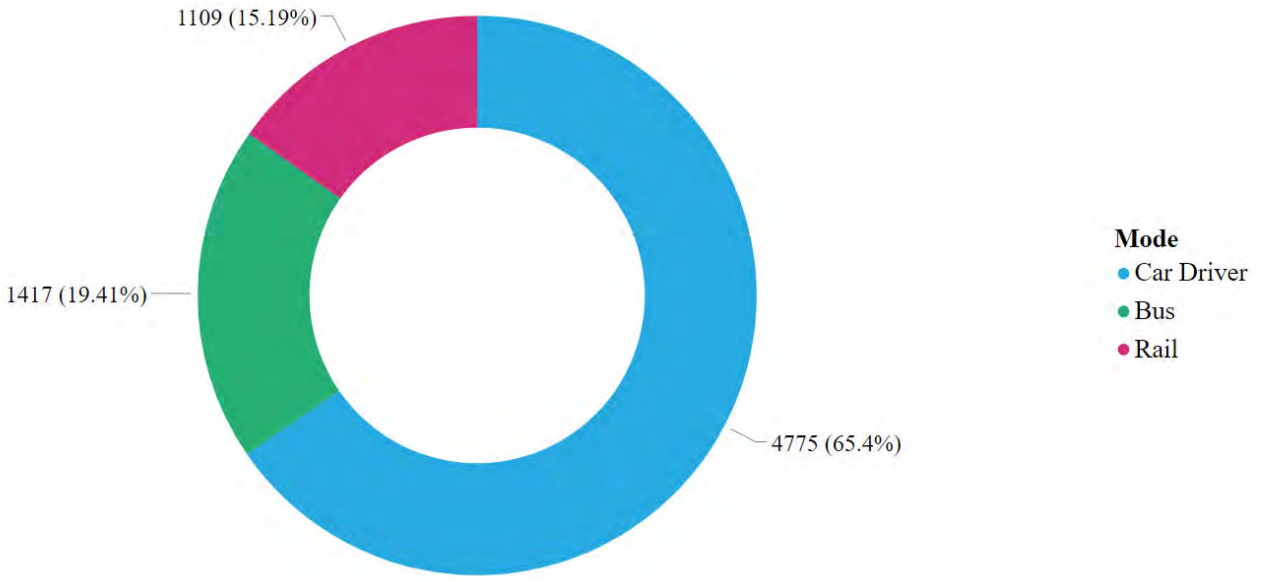
Figure 5.4 45-minute public transport catchment from Prestonpans Park and Ride



Two new facilities are proposed for this transport corridor:

- The Prestonpans-Drem facility will be formed by a new rail station, served by the East Lothian coastal line. A specific location has yet to be identified for this site, however it is anticipated that it will be accessed from the A198 and will serve local towns such as Aberlady and Ballencrieff.
- Bankton has been identified as a possible bus park and ride development proposal documented within the local transport strategy for East Lothian. The site is on the A1 main road and is likely to capture users from this strategic route. The proposed development is within close proximity of Tranent and a 10-minute drive from Haddington.

Figure 5.5 Travel to Work (To Central Edinburgh) Mode Shares for East Lothian Coastal Transport Corridor. Source: Scotland's Census 2011



Despite Bankton being the only Park and Ride facility in the corridor to provide bus services, the modal share for bus is higher than that for rail suggesting that bus services to Edinburgh are accessible enough by foot for a good portion of the population. However, driving is the mode of choice for the majority of commuters.

Summary: Transport Corridor 9

The East Lothian Coast transport corridor has five Park and Ride facilities, which are served by the North Berwick Line. These facilities are served by regular peak hour services to Edinburgh.

Two new Park and Ride facilities are proposed at Bankton and Prestonpans-Drem, these will be served by bus and rail respectively. Improving the choice of and access to public transport opportunities into Edinburgh.

Access to destinations within Edinburgh is currently limited to the stations served by the railway and is focussed on central Edinburgh. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the Park and Ride facilities within this corridor. Journey to work statistics indicate that 51% of Edinburgh commuters associated with this transport corridor work in central Edinburgh. Edinburgh East and South West form the second and third most popular destinations for commuters. Commuter trips with destinations in these areas are subject to a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work.

The existing Park and Ride facilities have on average a high level of provision of cycle spaces to the proportion of local population. However, consideration of improvements to footways and cycleways in conjunction with the provision of cycle parking at the existing and proposed park and ride facilities should form part of any improvement/development plans for park and ride facilities within this transport corridor.

Table 5.5 Transport Corridor 9 Summary Table

Current Strengths	Current Issues & Gaps
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 10: East Lothian/ A1 Borders

Table 5.6 Transport Corridors 10 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing	Proposed
	Dunbar	East Linton Reston

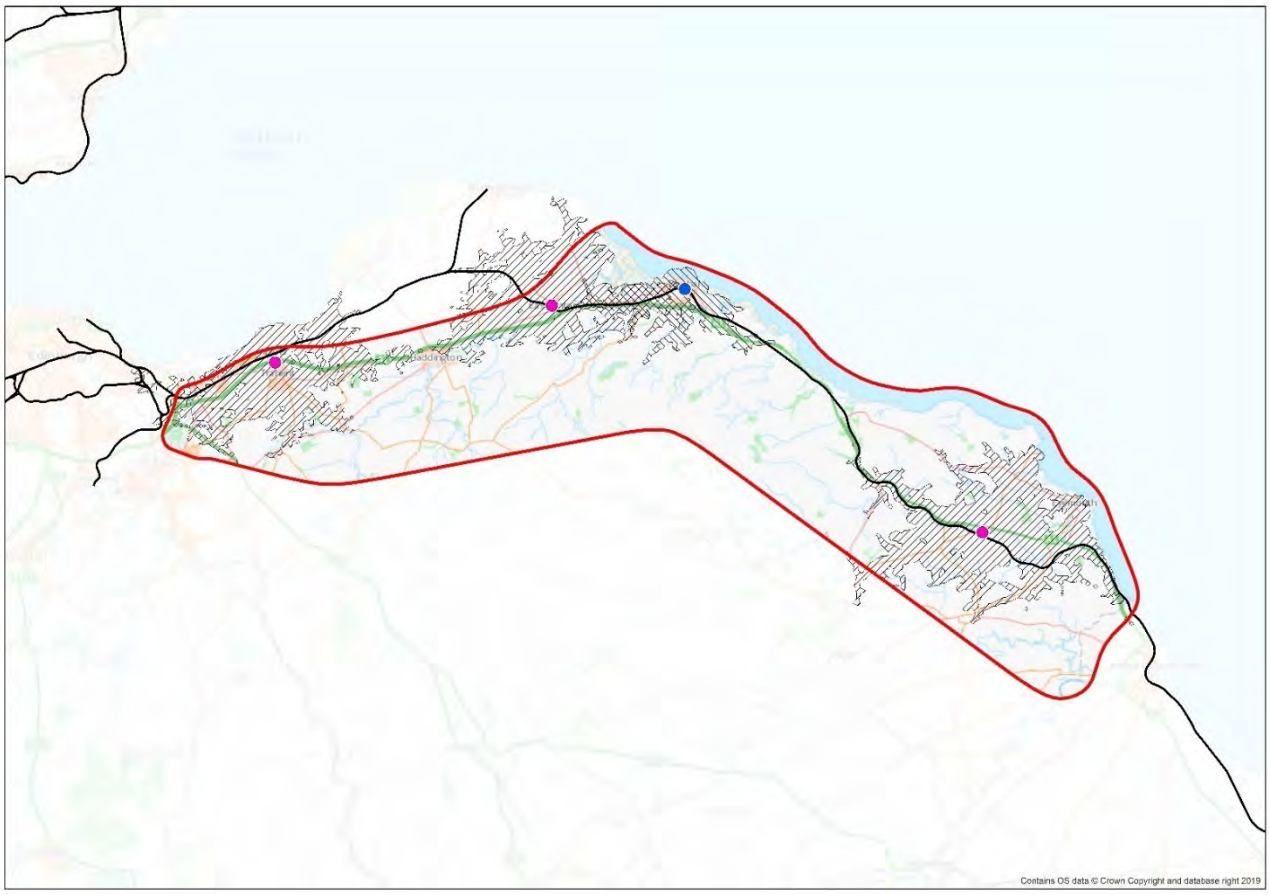
	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Rail	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Dunbar	76	6	48	●			4	●		●									
East Linton	★	★	★	●			★	●						★	★		★	★	★
Reston	★	★	★	●			★	●						★	★		★	★	★

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
4,500	55%	16%	8%	11%	4%	6%

Dunbar is a major station, served by the East Coast Mainline route between Scotland and England. Rail journey times between Dunbar and Edinburgh are approximately 20 minutes, providing a high level of service to local residents accessing jobs in Edinburgh. However, for travel beyond Edinburgh there is limited mode choice with car being the favoured option due to connections with the strategic road network in the form of the A720 City By-pass and M8 corridor if accessing West Lothian or beyond.

Figure 5.6 East Lothian/A1 Borders 15-minute peak hour drive times (Existing & Proposed Park and Ride Facilities)

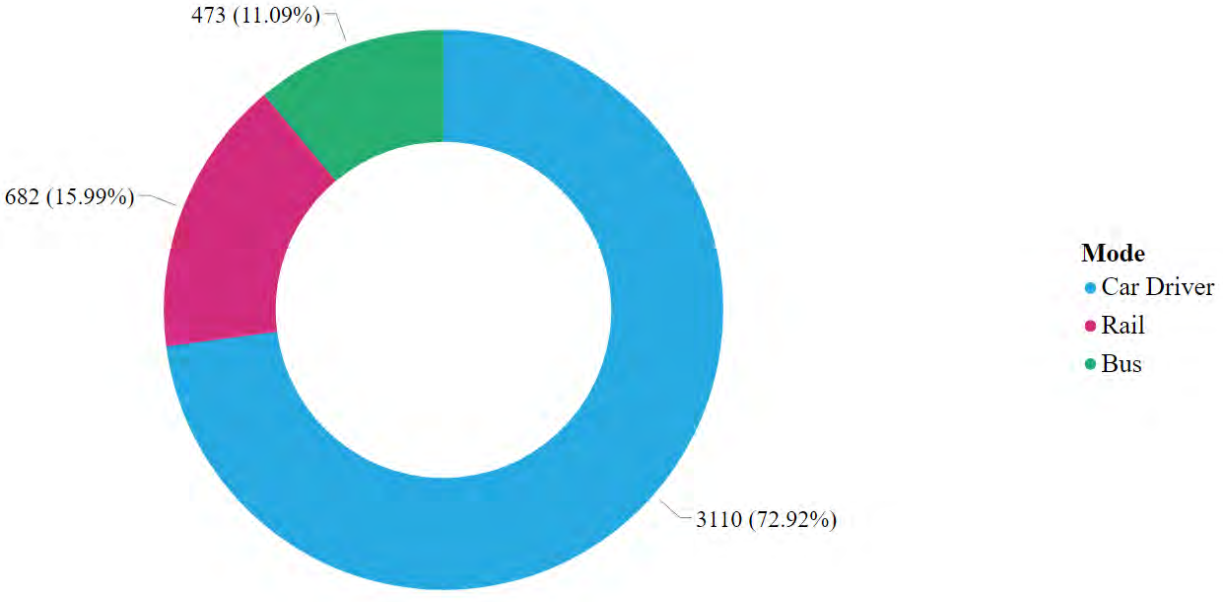


The proposed East Linton and Reston Park and Ride facilities will be located on the East Coast Mainline however, the level of rail services serving these new stations have not been determined and may not reflect those stopping at Dunbar station. Each of these sites have limited population catchments, due to their rural coastal locations. However, they are well located in relation to the A1 and are likely to attract trips from a wider area beyond the 15-minute peak hour drive time catchments shown on the above map.

The Google API data, used to derive peak period congestion, identifies minimal delays along the corridor, which is a challenge for encouraging mode shift prior to reaching the city centre boundary or Controlled Parking Zone. The major influencer for using Park and Ride will be future parking control in the city centre and the opportunity to connect with cross-city or orbital services to access the west of Edinburgh from this corridor.

Figure 5.7 Corridor 10 AM Peak Period Congestion (Based on Google API data)

Figure 5.8 Travel to Work (To Central Edinburgh) Mode Shares for East Lothian / Borders Transport Corridor. Source: Scotland's Census 2011



As with the East Lothian Coastal corridor, driving is still the mode of choice for most commuters with rail being more popular than bus. There are no bus park and ride facilities.

Summary: Transport Corridor 10

The East Lothian/ A1 Borders transport corridor has a single park and ride facility at Dunbar Station. This facility is located on the East Coast Mainline and is served by local and national cross-border train services, that all connect directly to Edinburgh.

Two new park and ride sites are proposed at East Linton and Reston, which will also be served by rail and are anticipated to be served by the local cross-border train services that operate between Newcastle-Upon-Tyne and Edinburgh. It can be assumed that the popularity of rail will only increase with the introduction of new stations at Reston and East Linton.

Access to destinations within Edinburgh is currently limited to the stations served by the railway and is focussed on central Edinburgh. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the park and ride facilities within this corridor. Journey to work statistics indicate that 55% of Edinburgh commuters associated with this transport corridor work in central Edinburgh. Edinburgh East and South West form the second and third most popular destinations for commuters. Public transport commuter trips with destinations in these areas are subject to a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work.

Opportunities for public transport opportunities are limited, as this settlement lies outside of the 15-minute drive time isochrones of the existing and proposed park and ride facilities. The local population are limited to using local bus services or driving towards Edinburgh prior to transferring mode at a convenient location such as Newcraighall.

The existing Dunbar park and ride facility has a high level of provision of cycle spaces to the proportion of local population. However, consideration of improvements to footways and cycleways in conjunction with the provision of cycle parking at the existing and proposed park and ride facilities should form part of any improvement/development plans for park and ride facilities within this transport corridor.

Table 5.7 Transport Corridor 10 Summary Table

Current Strengths	Current Issues & Gaps
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. The existing Park and Ride facility is focussed on using trains for onward travel. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 11: Midlothian East/ Borders

Table 5.8 Transport Corridor 11 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing		Proposed
	Eskbank	Newtongrange	Lasswade Rd
	Galashiels	Stow	Redheugh
	Gorebridge	Tweedbank	

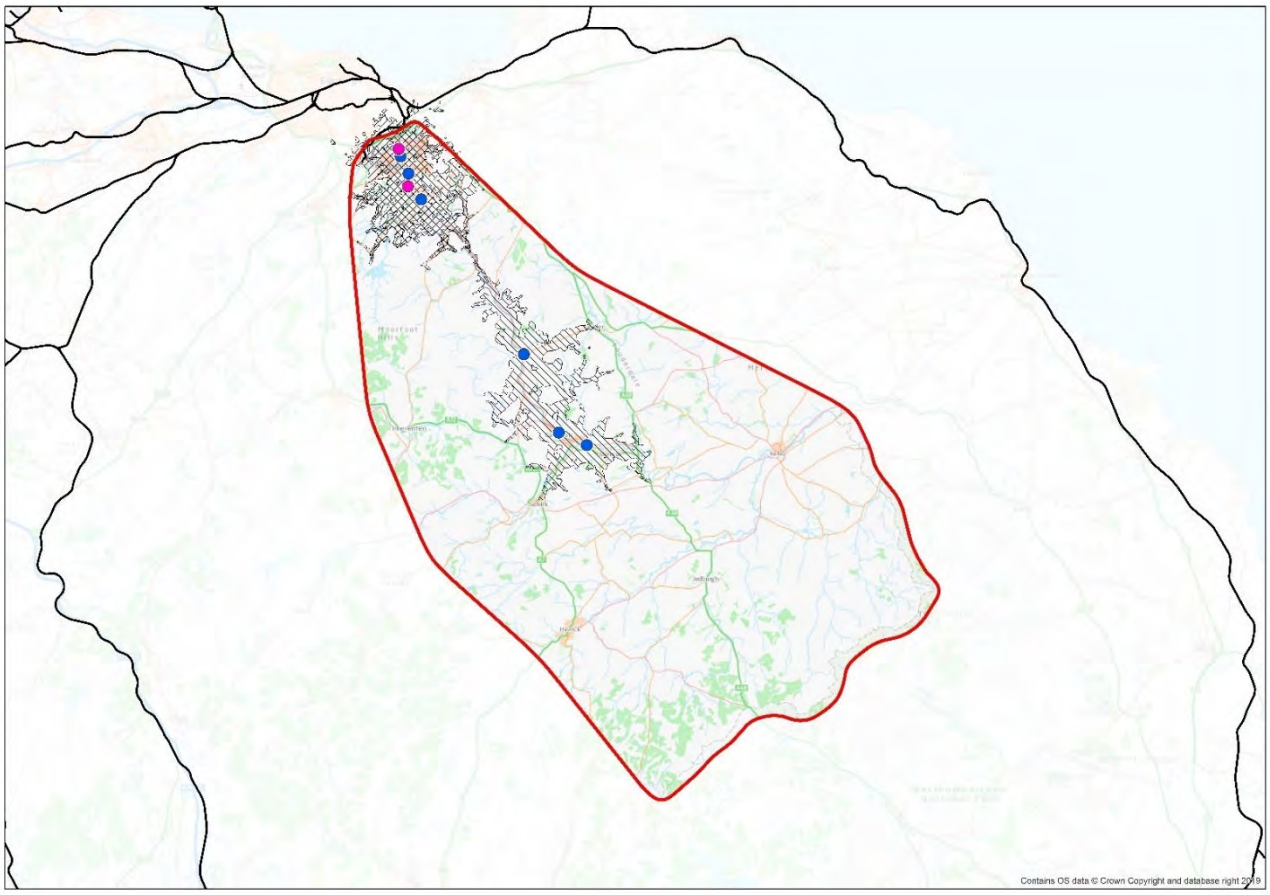
	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Rail	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Eskbank	248	11	30	●			5	●											
Galashiels	28	2	20	●	●		20	●		●		●							
Gorebridge	73	5	20	●			5	●											
Lasswade Rd	★	★	★	★			★	★						★	★		★	★	★
Newtongrange	53	3	20	●			5	●											
Redheugh	★	★	★		★		★	★						★	★		★	★	★
Stow	33	3	20	●			4	●											
Tweedbank	235	12	20	●			4	●											

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
10,250	50%	15%	9%	15%	4%	6%

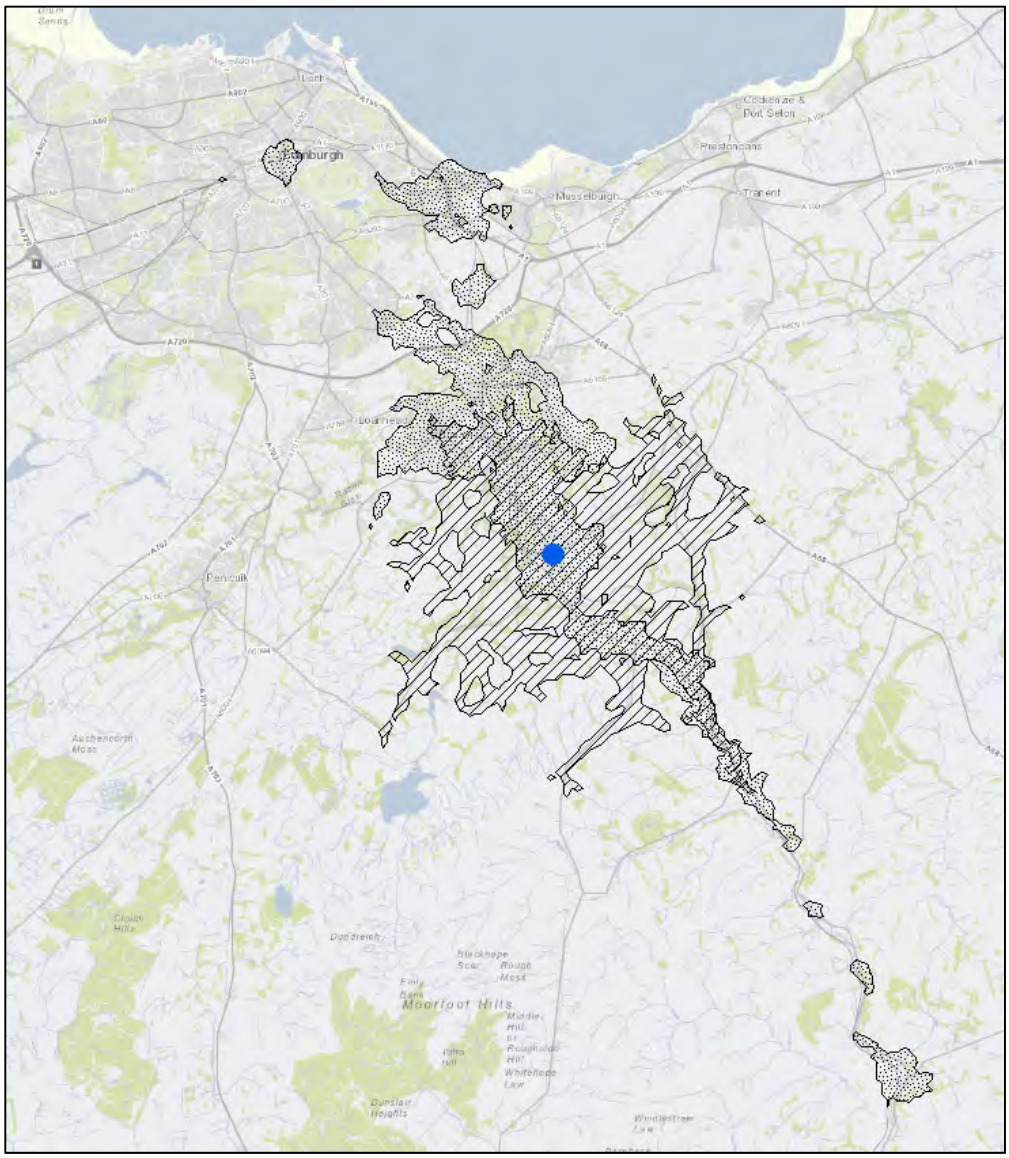
Each of the existing Park and Ride facilities in the Midlothian East/ Borders corridor are served by the Borders railway, which provides 5 services per hour to and from Edinburgh. The access to employment reflects the level of local employment as well as access to jobs in Edinburgh. This is clearly demonstrated in the map for Gorebridge. Journey to work statistics for this transport corridor indicate that this corridor generates over 10,000 trips into the City area accounting for 4.26% of the total journey to work trips for the City. Ranking as the fourth busiest transport corridor in the SEStran region. Statistics for Edinburgh-bound commuters from this transport corridor show that 50% have destination in Central Edinburgh, whilst 15% are accessing jobs in the East and 15% in the South West. Connectivity for public transport to areas outside of the City Centre are limited, resulting in a high proportion of car-based trips associated with this corridor.

Figure 5.9 Midlothian East/ Borders 15-minute peak hour drive times (Existing and Proposed P&R sites)



The benefits of transferring from car to public transport are more consistent for this transport corridor than others within the SEStran area, with time and money benefits greater for those travelling the greatest distances through this corridor.

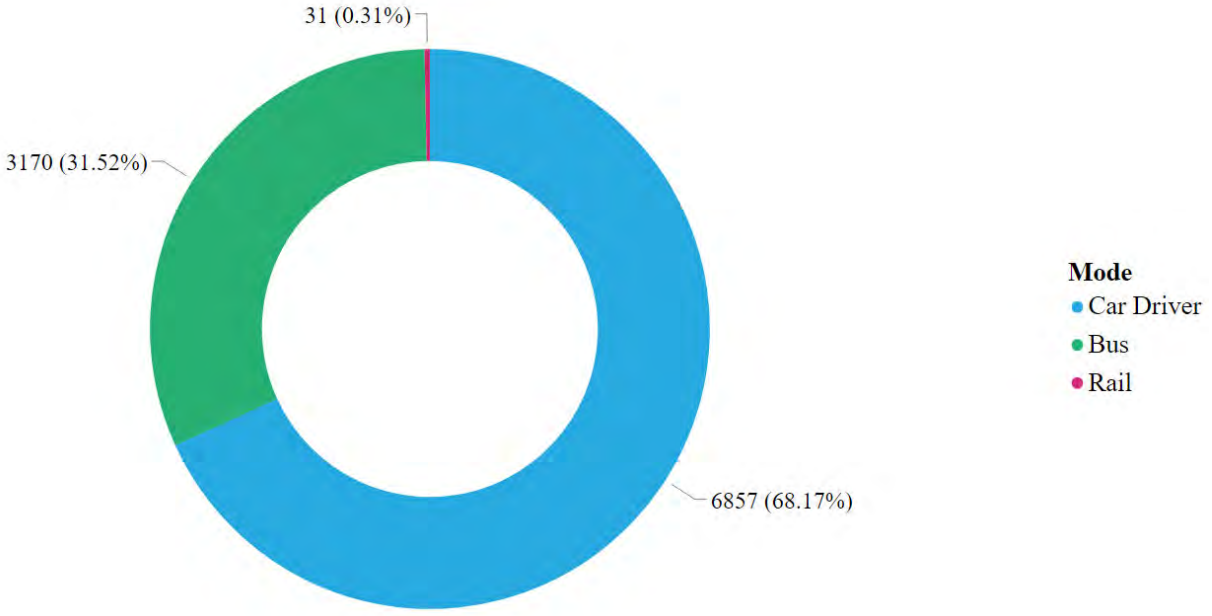
Figure 5.10 Conveyal 45-minute Accessibility Plot – Gorebridge Station



Two new facilities are proposed for this corridor are:

- The Lasswade Road proposals would form part of an Edinburgh orbital bus route, ideally placed due to its proximity to the Edinburgh City Bypass (A720). The catchment for users would be predominantly the Midlothian/ East Borders transport corridor, capturing users prior to the congested Sheriffhall roundabout.
- The Redheugh site, which lies within the Midlothian council boundary. This site is likely to attract users from throughout Midlothian, both from rural and urban areas of the council boundary. The anticipated catchment includes Bonnyrigg, Newtongrange and Gorebridge, which are all within a 10-minute drive of the proposed site.

Figure 5.11 Travel to Work (To Central Edinburgh) Mode Shares for Midlothian East/ Borders Transport Corridor. Source: Scotland's Census 2011



The vast majority of journey to work trips are taken by car in this corridor, with an almost negligible amount of rail trips. However, with the borders railway only opening in 2017 this will not be a true reflection of the situation today. The 2021 census will provide a clearer picture.

Summary: Transport Corridor 11

Currently the Midlothian East/ Borders transport corridor is served by six park and ride facilities. Each of these facilities are served by the Borders Railway line which provides a regular peak hour service for commuters travelling into Edinburgh.

It is proposed that a new park and ride facility is introduced at locations in the vicinity of Lasswade Road and Redheugh. Both of these facilities will be served by buses. These proposed facilities aim to maximise the benefits of park and ride opportunities available to the Dalkeith/ Eskbank area supporting transport choice to the local population whilst providing accessible opportunities for commuters from the wider transport corridor area.

Access to destinations within Edinburgh is currently limited to the stations served by the railway and is focussed on central Edinburgh. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the park and ride facilities within this corridor. Journey to work statistics indicate that 50% of Edinburgh commuters associated with this transport corridor work in Edinburgh, whilst a further combined 30% work in Edinburgh East and South West.

The proportion of commuters in this transport corridor using public transport is 30%. To encourage a greater uplift in public transport mode share, consideration should be given to provide time-efficient bus services to employment centres in the East and South West areas of Edinburgh. The volume of trips to these destinations from this corridor is approximately 1,500 trips to both areas respectively, with similar volumes associated with

commuters in the neighbouring Midlothian West/ Borders transport corridor. Developing a park and ride strategy to serve both of these corridors could result in reduction in traffic volumes on the A720 and at key junctions such as Sherriffhall.

The existing park and ride sites have on average a reasonable level of provision of cycle spaces to the proportion of local population. However, consideration of improvements to footways and cycleways in conjunction with the provision of cycle parking at the existing and proposed park and ride facilities should form part of any improvement/development plans for park and ride facilities within this transport corridor.

Table 5.9 Transport Corridor 11 Summary Table

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 12: Midlothian West/ Borders

Table 5.10 Transport Corridor 12 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing	Proposed
	Straiton	Gilmerton/ Lasswade

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Rail	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Gilmerton-Lasswade	600	★	★		★		★	★									★	★	★
Straiton	600	37	0		●		6	●											

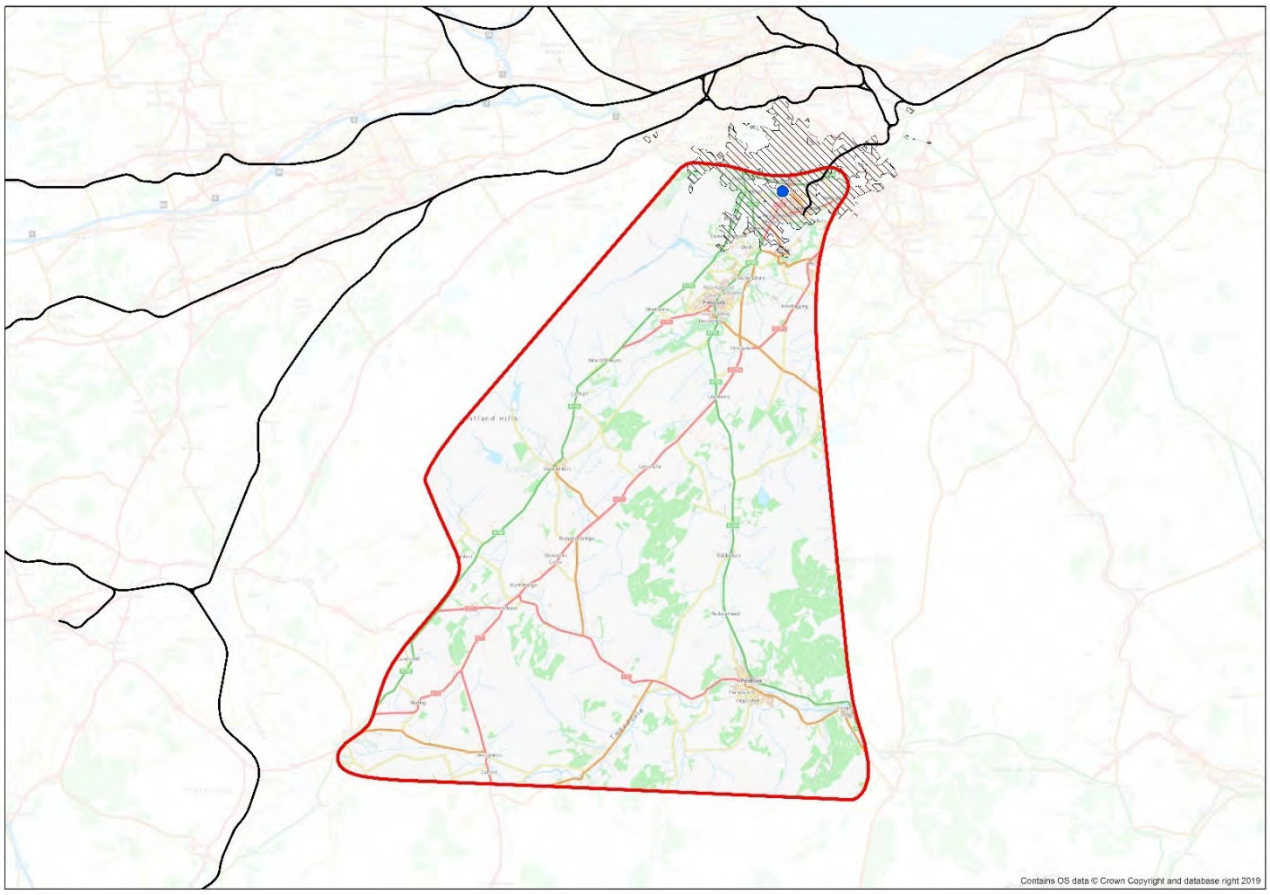
Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
10,000	51%	15%	10%	15%	3%	6%

The A701 connects Straiton Park and Ride to Edinburgh City Centre and is served by a number of bus services. During weekday AM and PM peak periods, buses experience road congestion delays in the vicinity of the City Bypass as no bus priority measures are provided on this key link. Greenways and bus lane enforcement cameras support consistent public transport journey times approaching Edinburgh City Centre on the northern side of the City Bypass. Journey time benefits offered by this infrastructure is offset by the stopping patterns of bus services, with greater time savings offered by limited stop services.

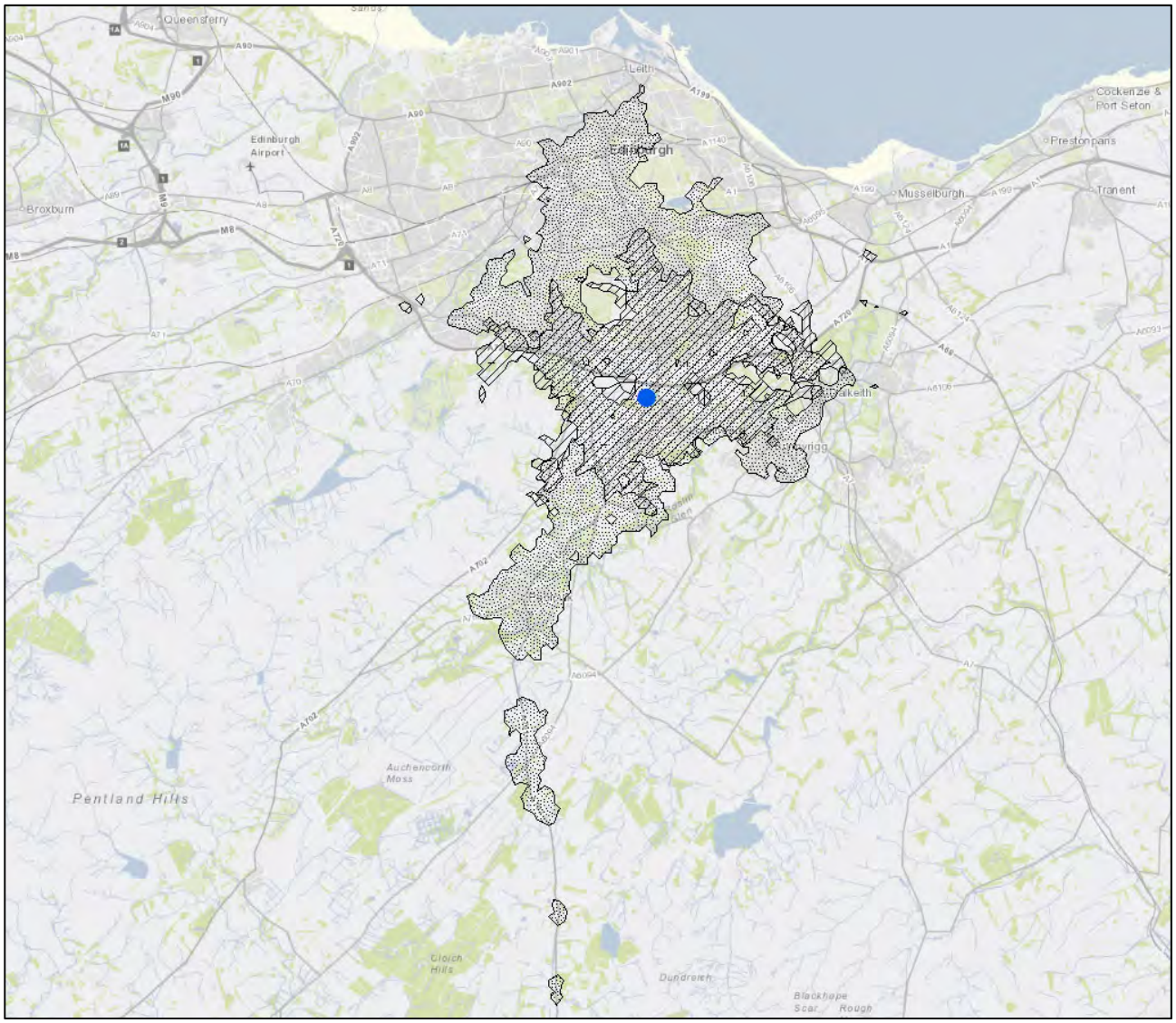
Transport Corridor 12 is associated with almost 10,000 work related trips into the Edinburgh area. Approximately 50% of these trips are based within the Central area, whilst 15% are accessing jobs in the East and the South West respectively. Connectivity for public transport to areas outside of the City Centre are limited, resulting in a high proportion of car-based trips associated with this corridor. This lack of connectivity is supported by the very low time savings produced by the Park and Ride model.

Figure 5.12 Midlothian West/ Borders 15-minute peak hour drive times (Existing and Proposed Park and Ride Facility)



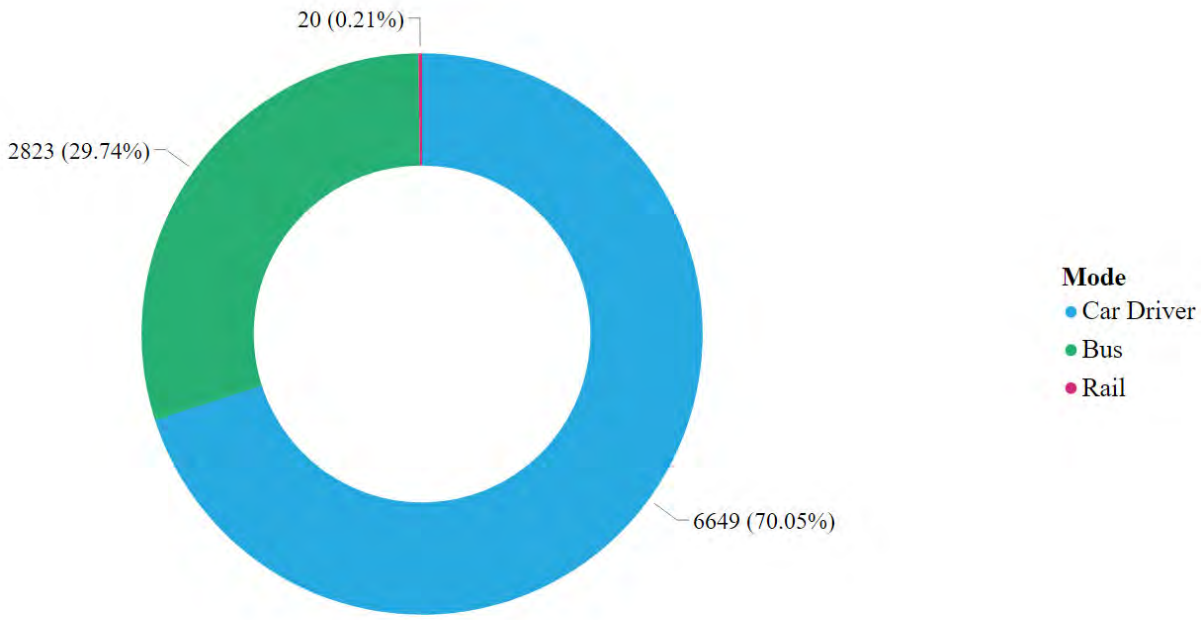
The Park and Ride modelling, which assigned values to time, monetary and environmental benefits associated with mode transfer to public transport from private cars, identified that the greatest benefits occur when the majority of the trip is undertaken on a congested network. For example, a trip from Peebles to central Edinburgh utilises free flow links for approximately 80% of the distance travelled, in comparison to the final 20% of the journey. Consequently, maximising the benefits to Park and Ride users are focused on the strategic placement of facilities close to congested links and junctions which is consistent with placing park and ride facilities as close to but on the outside periphery of the congested areas.

Figure 5.13 Conveyal 45-minute Accessibility Plot – Straiton Park and Ride



The proposed Gilmerton/Lasswade facility will comprise of a bus Park and Ride. The site is within close proximity to Edinburgh City Bypass (A720) and its user catchment will originate within the Midlothian West/ Borders corridor. Capturing passengers prior to them entering the congested Edinburgh network allowing the last portion of their trips to be undertaken by public transport and in turn, benefit from the more reliable journey times afforded by bus priority measures within the Edinburgh area.

Figure 5.14 Travel to Work (To Central Edinburgh) Mode Shares for Midlothian West / Borders Transport Corridor. Source: Scotland's Census



The majority of journey to works trips are taken by car in this corridor. Population in the northern section of this corridor may be able to use the Lothian Bus local services to Edinburgh which is contributing towards a significant bus mode share of 30%.

Summary: Transport Corridor 12

Currently the Midlothian West/ Borders transport corridor is served by a single park and ride facility at Straiton. This facility is served by regular bus services to the Edinburgh Central area. The park and ride site is served by a mix of express and regular bus services. The express services operate a limited stopping patterns differing between services, consequently the time savings, as shown in Table 5.10 differ depending upon which service is being used with the greatest journey time savings associated with Service X37 and the least with all stopping services.

It is proposed that a new park and ride site is introduced within the Midlothian West/ Borders corridor in the vicinity of the Gilmerton/ Lasswade areas. This area comprises of existing and proposed residential areas and is easily accessed by road from destinations within the wider transport corridor. The proposed facility would therefore serve both the local and wider area commuting population.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the arterial routes leading to the city centre. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the Straiton park and ride facility. Journey to work statistics indicate that 51% of Edinburgh commuters associated with this transport corridor work in Edinburgh, whilst a further combined 30% work in Edinburgh East and West.

The proportion of commuters in this transport corridor using public transport is 30%. To encourage a greater uplift in mode public transport mode share, consideration should be given to provide time-efficient bus services to employment centres in the East and South West areas of Edinburgh. The volume of trips to these destinations from this corridor is approximately 1,500 trips to both areas respectively, with similar volumes associated with commuters in the neighbouring Midlothian East/ Borders transport corridor. Developing a park and ride strategy to serve both of these corridors could result in reduction in traffic volumes on the A720 and at key junctions such as Sherriffhall.

Straiton currently provides no cycle parking provision at the park and ride facility. It is suggested that due to its proximity to nearby areas of population, that consideration should be given as to how connections for both pedestrians and cyclists to the site can be improved to encourage active travel opportunities. Improvements to footways and cycleways in conjunction with the provision of cycle parking at the existing and proposed park and ride facilities should form part of any improvement/development plans for park and ride facilities within this transport corridor.

Table 5.11 Transport Corridor 12 Summary Table

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population.	Straiton has no cycle parking. Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 14: West Lothian South

Table 5.12 Transport Corridor 14 Multi-Criteria Assessment Summary

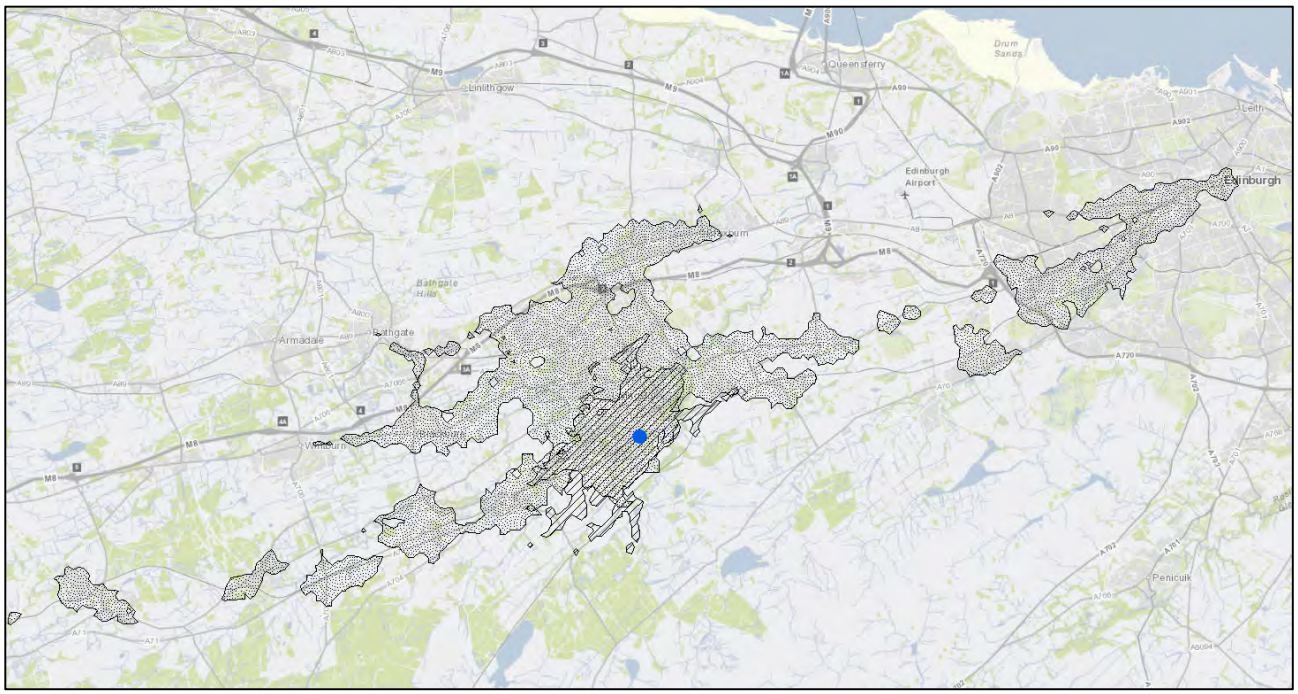
Park and Ride Facility	Existing		Proposed
	Addiewell	Kirknewton	Charlesfield Rd, West Livingston
	Breich	Livingston South	
	Curriehill	West Calder	
	Fauldhouse		

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Addiewell	12	0	6	●			4	●	●										
Breich	0	0	0	●			4	●	●										
Charlesfield Rd	★	★	★		★		★	★						★	★		★	★	★
Curriehill	39	2	12	●			4	●	●										
Fauldhouse	9	0	6	●			4	●	●										
Kirknewton	33	22	★		●		12	●	●										
Livingston South	125	5	7	●			6	●	●										
West Calder	25	2	8	●			6	●	●										

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
2,500	39%	4%	6%	39%	6%	6%

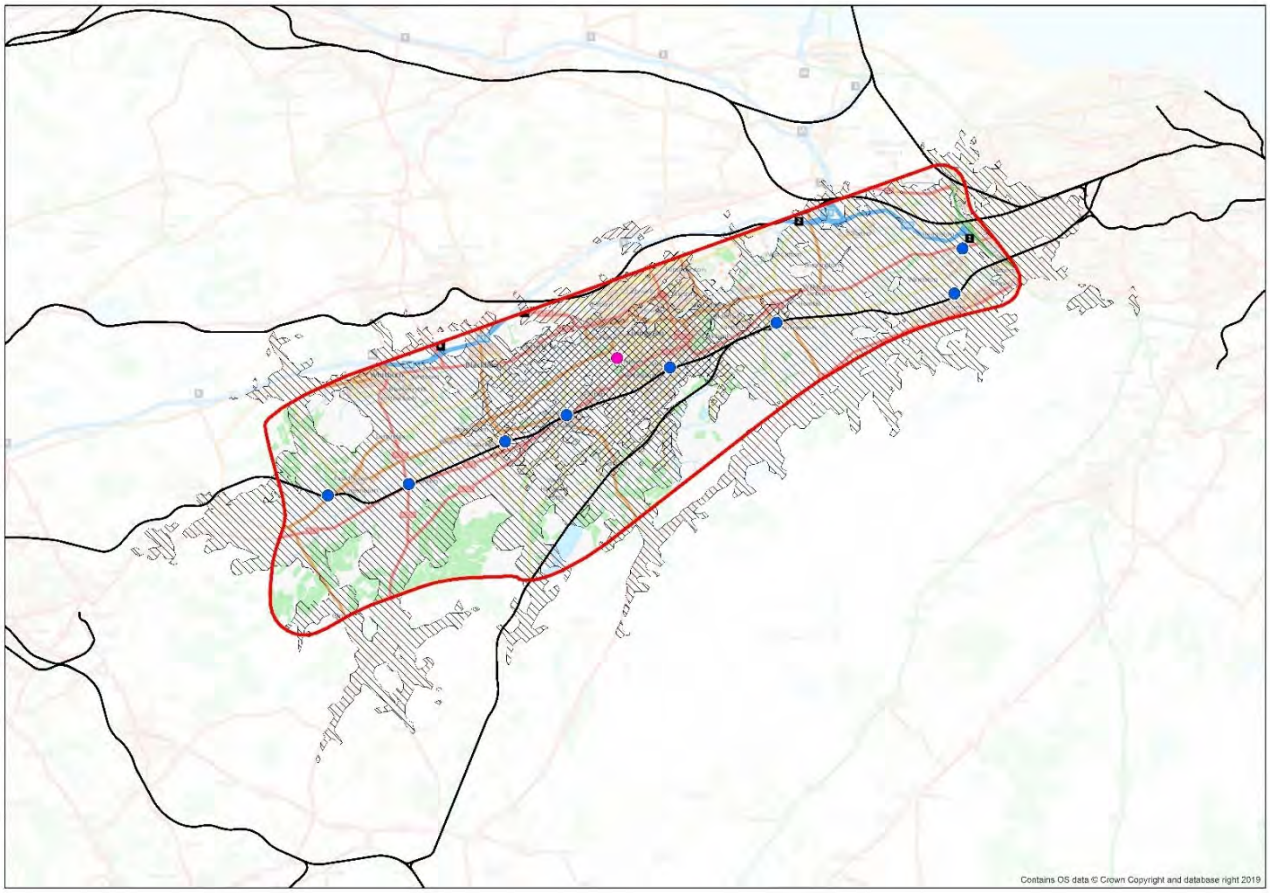
Figure 5.15 Conveyal 45-minute Accessibility Plot – Livingston South



Transport Corridor 14 accounts for approximately 2,500 work related trips into Edinburgh, with an equal distribution of trips to destinations in the Central and south-west areas of the City, accounting for 78% of these trips.

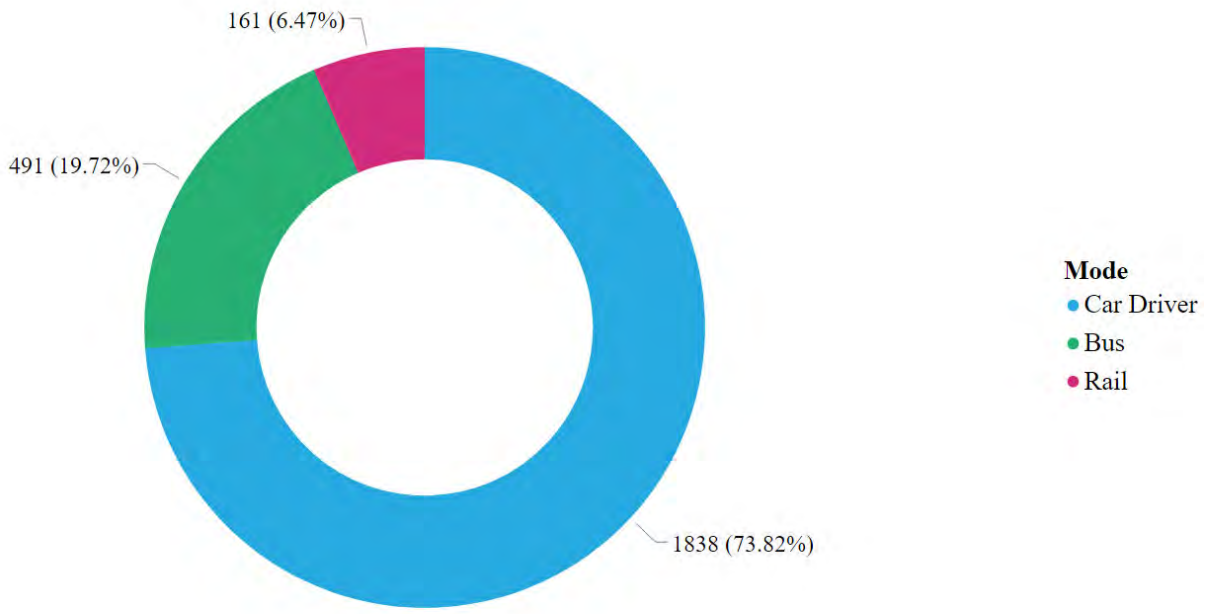
Livingston South is the major Park and Ride facility serving this area. Consideration of its associated public transport network highlights the limited opportunity for passengers to transfer between direct routes to the City Centre and cross-city routes. This is reflected in the low to very low number of jobs within the 45-minute journey time catchment of its Park and Ride stations.

Figure 5.16 West Lothian South 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



Charlesfield Road in West Livingston forms a proposal for a bus park and ride. This facility would serve the A71 strategic route into west Edinburgh. Connecting the facility by bus to Edinburgh provides flexibility of destinations within Edinburgh complementing the existing rail facilities that focus on providing access to the central Edinburgh area.

Figure 5.17 Travel to Work (To Central Edinburgh) Mode Shares for West Lothian South Transport Corridor. Source: Scotland's Census



The vast majority of commuters to Edinburgh travel by car, despite there being six train stations in the corridor only 6% travel by train to work.

Summary: Transport Corridor 14

The seven park and ride facilities located within the West Lothian South corridor are each served by the Shotts railway line with the exception of the facility at Kirknewton, which is served by bus. Regular direct services link each of the sites to Edinburgh and Glasgow along the Shotts Line, which is characterised by frequent stops.

Journey to work statistics indicate that 39% of commuters work in Edinburgh Central and also in Edinburgh South West. Commuters with destinations in the centre of Edinburgh are well-provided for with regards to public transport connectivity. However, the closest station to the Edinburgh South West employment focus, for commuters on the Shotts line, is Wester Hailes station. Bus connectivity is limited from Wester Hailes to Edinburgh Park with an additional bus journey of at least 20 minutes. Consequently, rail travel for commuting into Edinburgh is focussed on trips to the central area.

The Breich facility is associated with no car or cycle parking infrastructure and is located remotely from Breich Village. Consideration of how connections to this station can be improved particularly for active travel are required and how the barrier to movement posed by the nearby A71 can be addressed. Likewise, greater emphasis should be provided on how to encourage pedestrian and cycle trips to all facilities in this transport corridor should be considered, through the improvement of footways and cycleways in conjunction with increasing the provision of cycle parking at the facilities.

The Kirknewton facility is connected to Edinburgh by a frequent bus service and provides public transport mode choice to the local population. A further bus-based park and ride facility is proposed at Charlesfield Road, West Livingston. The bus connections provide flexibility to users of possible destinations and allows services to connect directly to the employment area of Edinburgh South West, as well as the central area of Edinburgh.

Table 5.13 Transport Corridor 14 Summary Table

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and ride facilities are well located to local population. Mix of public transport options for local and strategic commuters.	Breich has no car or cycle parking facilities. Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 15: West Lothian M8

Table 5.14 Transport Corridor 15 Multi-Criteria Assessment Summary

Park and Ride	Existing		Proposed
	Armadale	Hermiston	Heartlands Whitburn
	Bathgate	Livingston North	Kilpunt
	Blackridge	Uphall	Livingston (J3)

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Rail	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Armadale	187	11	30	●			6	●	●										
Bathgate	570	20	30	●			10	●	●										
Blackridge	49	5	20	●			5	●	●										
Heartlands Whitburn	★	★	★		★		★	★						★	★		★	★	★
Hermiston	450	1	18	●			4	●											
Kilpunt	★	★	★		★		★	★	★	★		★		★	★		★	★	★
Livingston (J3)	★	★	★		★		★	★	★	★		★		★	★		★	★	★
Livingston North	329	24	6	●			10	●	●										
Uphall	282	15	10	●			10	●	●										

Journey to Work Statistics

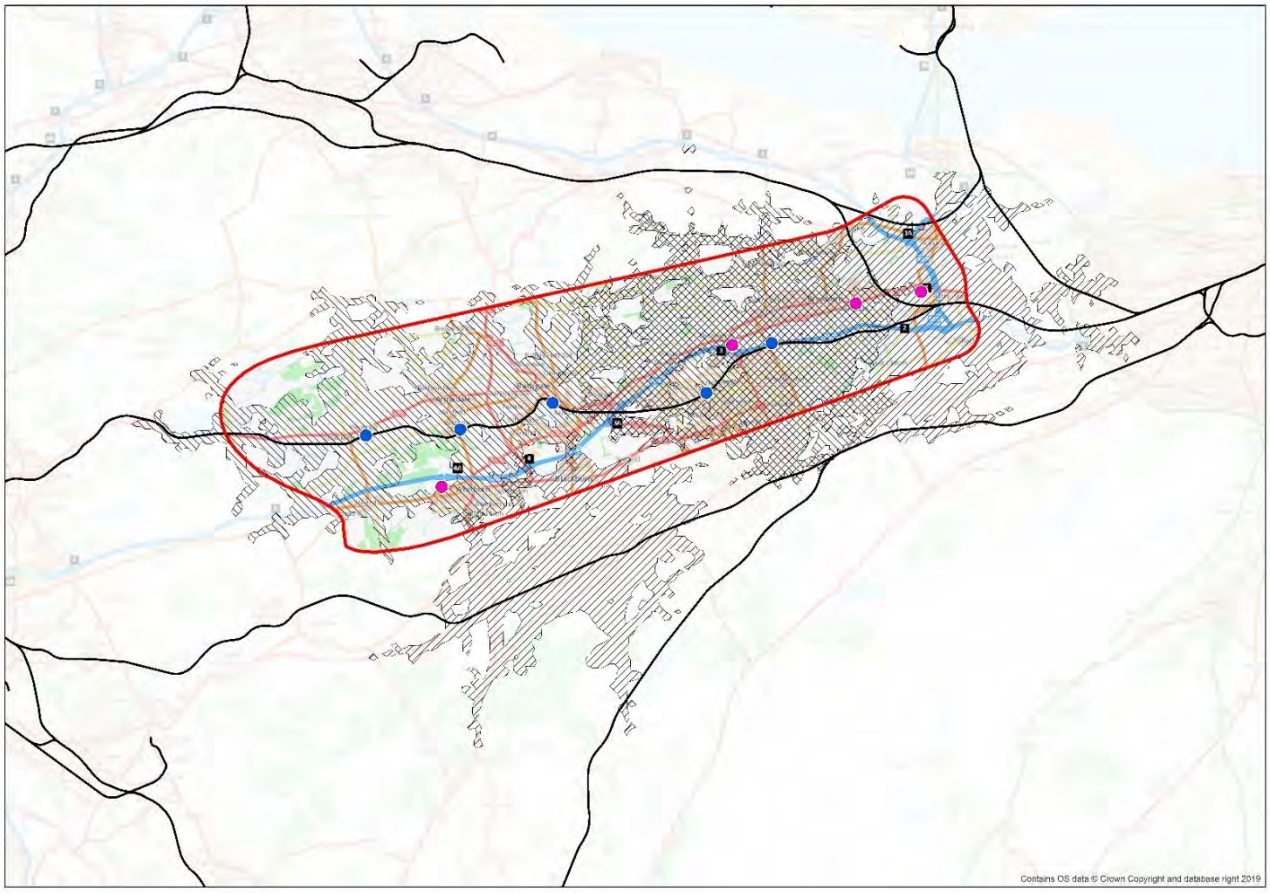
Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
11,500	44%	4%	5%	35%	6%	7%

The West Lothian M8 corridor benefits from a number of large Park and Ride facilities supporting the large number of journeys to work trips to Edinburgh. Each of the existing sites provide regular direct services to Edinburgh and Glasgow. These sites provide an above average ratio of spaces to population within a 15-minute peak hour drive time of the sites.

Facilities within this corridor have low proportion of cycle spaces when compared to car parking. However, with the exception of the Hermiston facility provision appears to be proportional to local population.

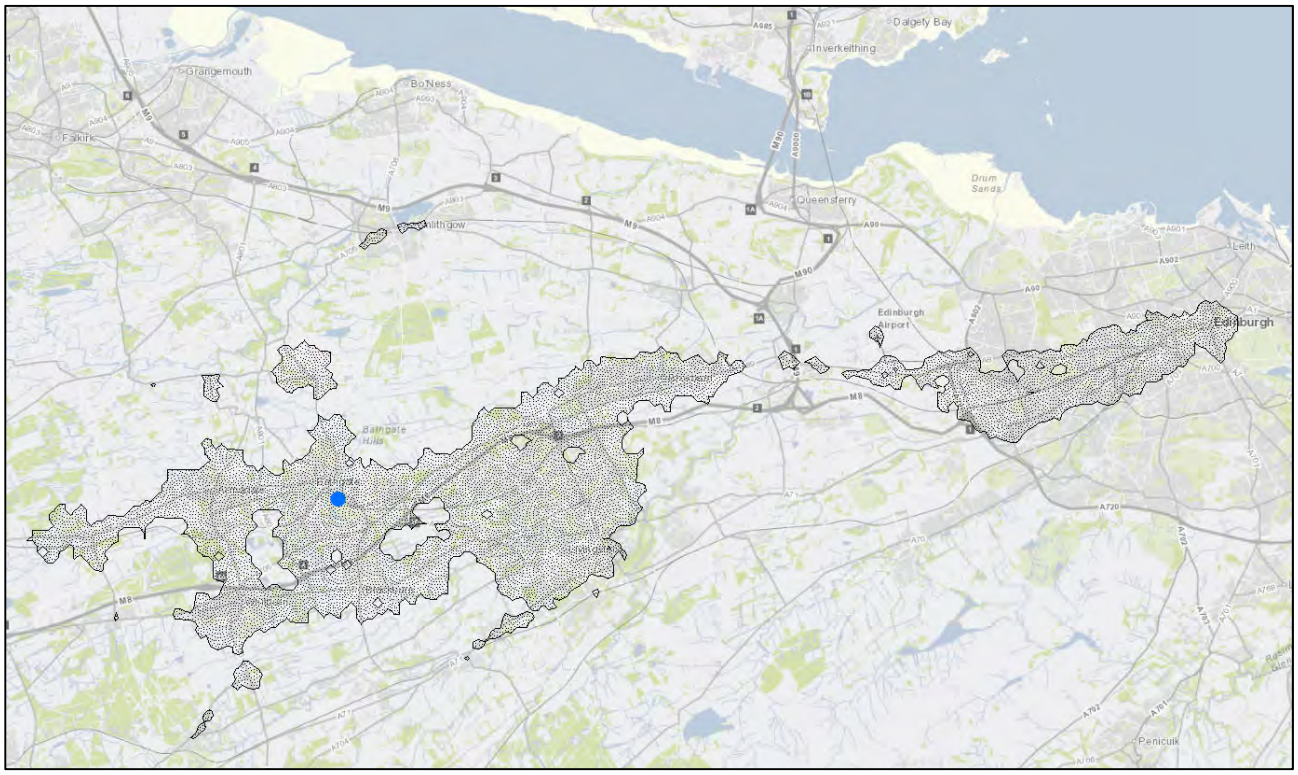
The proposed Park and Ride facilities are currently within the immediate vicinity of existing express bus connections to Edinburgh, Glasgow and Perth. As these will be connected by bus, they offer an opportunity to capture strategic road trips from the wider SEStran area at convenient, easy to access points within the immediate vicinity of the M8.

Figure 5.18 West Lothian M8 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



Transport Corridor 15 accommodates over 11,000 journeys to work trips and is ranked third in terms of the proportion of these within the SEStran area. The principal destinations are Edinburgh Central and Edinburgh South-West and commuters using this corridor benefit from its direct connectivity to employment in these two areas.

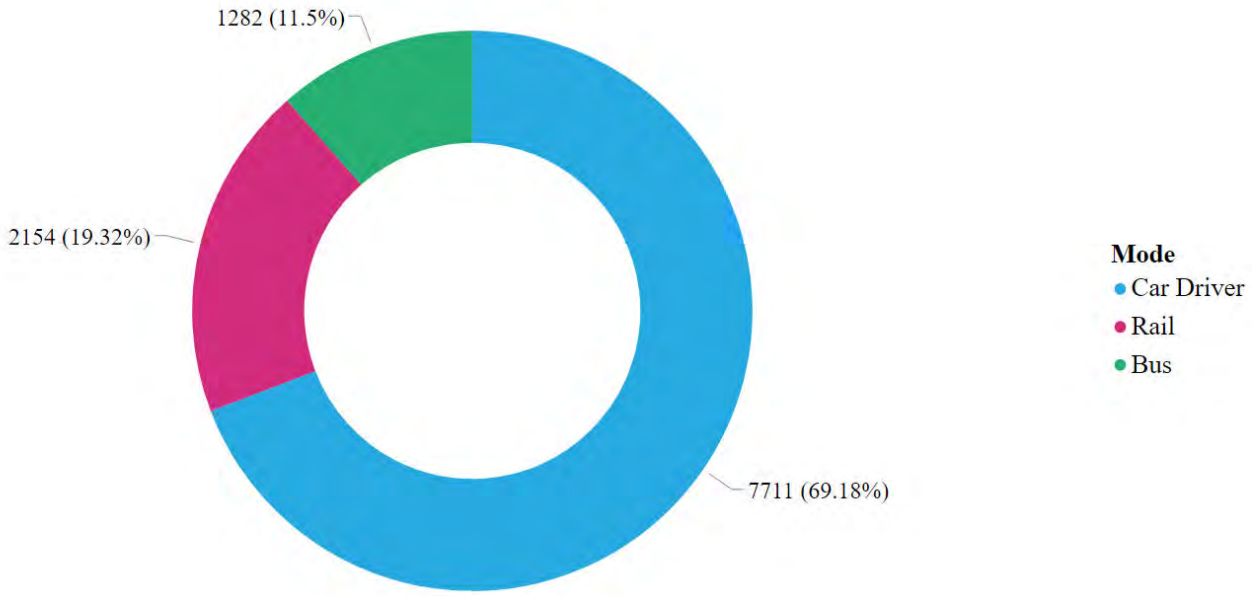
Figure 5.19 Conveyal 45-minute Accessibility Plot – Bathgate



The West Lothian M8 corridor is a popular corridor with significant demand for access to jobs in Edinburgh however, it also forms a key link of the strategic road network linking central regions of Scotland. Three Park and Ride facilities are proposed for this transport corridor and reflect the potential catchment offered by this wide range of commuters:

- The proposed bus Park and Ride facility at Kilpunt, located in the east of West Lothian, is likely to capture local trips from Broxburn, Uphall and Livingston north on the A89 strategic route to Edinburgh.
- Heartlands (Whitburn) and Livingston (Junction 3) facilities would be bus Park and Rides, located to serve a broad catchment of trips associated with the M8 and local areas. The strategic situation of these facilities would form attractive alternatives to commuters frustrated by congestion associated with this corridor on approach to Edinburgh.

Figure 5.20 Travel to Work (To Central Edinburgh) Mode Shares for West Lothian M8 Transport Corridor. Source: Scotland's Census



The vast majority of commuters to Edinburgh travel by car, despite the provision of bus and rail park and ride facilities comprises of seven park and ride site, served by the rail network.

Summary: Transport Corridor 15

The West Lothian M8 transport corridor comprises of six park and ride sites, which are served by the rail network. Regular direct services link each of the sites to Edinburgh and Glasgow. However, the high level of train services is not reflected in the rail mode share (12%) for commuters travelling into Edinburgh. This is a reflection of the low time benefits for commuters transferring from car, due to the nature of local train services in conjunction with the employment area served.

Three new park and ride sites are proposed within this transport corridor positioned to capture a combination of local and strategic road trips. However, for mode shift to bus, provision of public transport priority measures along the M8 corridor are required to connect to the Edinburgh greenway network, providing real-time journey savings on the remainder of the route into the centre of Edinburgh. Proximity and ease of access from the M8 to each of the proposed new park and ride facilities must be a priority of final site selection and planning.

Journey to work statistics indicate that 44% of the population living in West Lothian M8 transport corridor work in central Edinburgh. The second most popular destination is Edinburgh South West area, accounting for 35% of the journey to work statistics for those working in Edinburgh. Based on the data considered how commuters from this transport corridor are travelling to work in Edinburgh and whether public transport users are focussed on accessing the City Centre, whether there are parking capacity issues at the facilities or whether interchange penalties are adversely impacting on commuter trips. For example, commuters from this transport corridor with destinations in Edinburgh South West, can utilise Edinburgh Park Station, which is connected to adjacent employment zones by tram. Is there a significant proportion of commuters undertaking this trip or are interchange penalties adversely impacting on the journey time savings available to

commuters on this route. Further investigation would be beneficial to understand the real and perceived issues associated with commuter journeys associated with this corridor.

The larger Park and Ride sites associated with this corridor including Bathgate, Hermiston and Livingston North provide low cycle parking ratios when compared with the total car parking spaces provided. The sites are well located in relation to local residential areas consequently, greater emphasis should be provided on how to encourage pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.15 Transport Corridor 15 Summary Table

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Lack of bus priority on the M8 corridor. Improved understanding required of why commuters are not making greater use of Park and Ride Facilities within this corridor.

Transport Corridor 16: Edinburgh-Linlithgow-Falkirk

Table 5.16 Transport Corridor 16 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing		Proposed
	Camelon	Polmont	Bonnybridge
	Carmuirs	Larbert	Grangemouth
	Falkirk Grahamston	Linlithgow	M9 (J3)
	Falkirk High		Newbridge
			Winchburgh

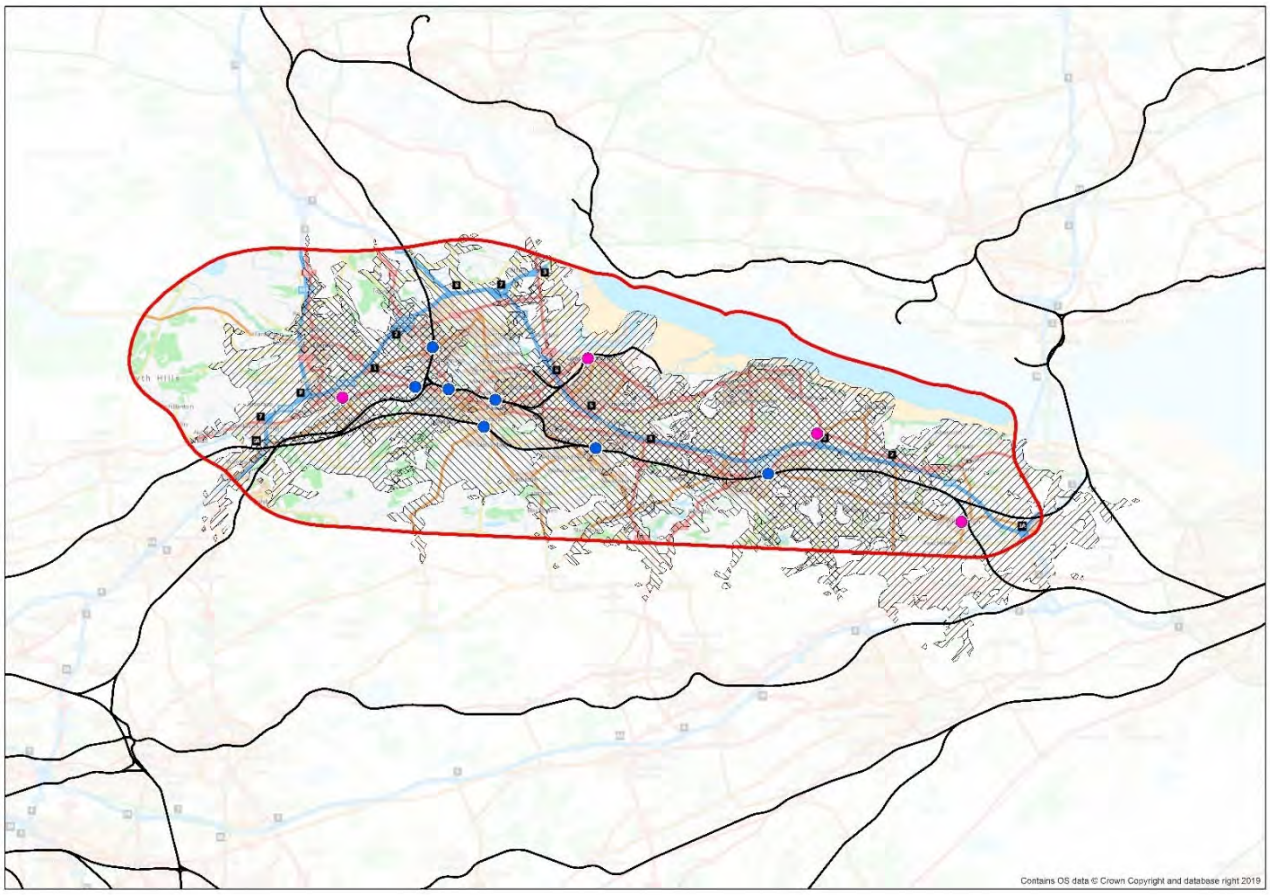
	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Bonnybridge	★	★	★	★			★	★	★		★			★	★		★	★	★
Camelon	30	3	8	●			10	●	●		●								
Carmuirs	189	★	6		●		8		●										
Falkirk Grahamston	342	13	40	●			10	●	●										
Falkirk High	285	7	20	●			10	●	●										
Grangemouth	★	★	★	★			*	●						★	★		★	★	★
Larbert	245	14	14	●			10	●	●		●								
Linlithgow	96	2	38	●			10	●	●		●								
M9 (J3)	★	★	★		★		★	★						★	★		★	★	★
Newbridge	★	★	★		★	★	★	★						★	★		★	★	★
Polmont	186	2	14	●			10	●	●										
Winchburgh	★	★	★	★			★	★			★			★	★		★	★	★

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
7,000	54%	4%	4%	28%	4%	6%

Existing Park and Ride facilities within the Edinburgh-Linlithgow-Falkirk transport corridor are well located in relation to existing population areas and are reliant on the rail network. Proposed sites would look to expand the network through providing strategic connectivity by bus, at key points on the road network.

Figure 5.21 Edinburgh-Linlithgow-Falkirk 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)

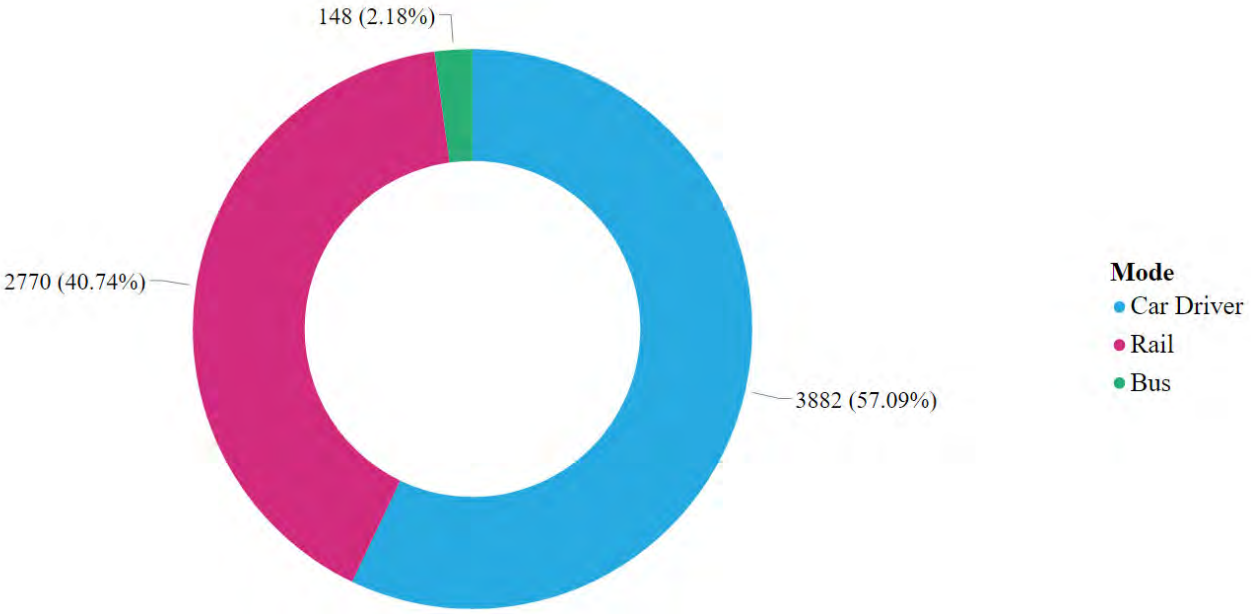


This Transport Corridor is well placed to provide benefits to car drivers transferring to public transport. The 45-minute public transport catchment for the corridor's largest site, Falkirk Grahamston, highlights the central location of the corridor and the connectivity options it can offer passengers to Edinburgh, Glasgow and Stirling.

Transport Corridor 16 benefits from its public transport connections to Central and South-West areas of Edinburgh, which account for 82% of the journey to work destinations originating within this corridor.

Figure 5.22 Conveyal 45-minute Accessibility Plot – Falkirk Grahamston

Figure 5.23 Travel to Work (To Central Edinburgh) Mode Shares for Edinburgh – Linlithgow Falkirk Transport Corridor. Source: Scotland's Census



The Edinburgh – Linlithgow – Falkirk corridor has the highest percentage mode share for rail out of all the corridors. This could be partly due to the high speed and frequency of the services between Glasgow and Edinburgh that go through this area.

Summary: Transport Corridor 16

The Edinburgh-Linlithgow-Falkirk transport corridor is bisected by the M9. There are seven park and ride facilities located in this corridor which are all served by the rail network. Regular direct services link each of the sites to Edinburgh and Glasgow, and three of the facilities provide connections to Stirling. The high level of train services serving these facilities is reflected in the largest rail mode share of each of SEStran corridors, for travel to work in central Edinburgh.

Demand for access to jobs in Edinburgh is low in relation to its resident population. However, this corridor is dominated by the M9, which forms a key strategic link for other neighbouring regions and transports a significant number of commuters through this corridor to the Edinburgh employment zone. Five new Park and Ride sites are proposed within this corridor. It is proposed that Bonnybridge, Grangemouth and Winchburgh will be served by the rail network, whilst the M9 (J3) site and Newbridge will be served by bus. A further aspiration for the Newbridge site, is that may form part of a future Edinburgh tram network expansion scheme.

The M9 (J3) site offers the opportunity for car users to interchange to public transport prior to entering the congested road network, associated with the periphery of Edinburgh. Provision of public transport priority measures along the M9 corridor which would connect to the Edinburgh greenway network, providing real-time journey savings on the remainder of the route into the centre of Edinburgh.

Journey to work statistics indicate that 54% of the population living in the Edinburgh-Linlithgow-Falkirk transport corridor work in central Edinburgh. The second most popular destination is Edinburgh South West area, accounting for 28% of the journey to work statistics for those working in Edinburgh. For commuter trips with destinations in this area are subject to a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the rail line. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the Queensferry corridor facilities. However, the local commuting population with destinations outside of the city centre incur a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work particularly the 28% who work in the South West area of Edinburgh.

Consideration of the provision of cycle spaces per population for the corridor indicates that on average the level of provision is medium to high. To ensure that all opportunities within the park and ride sites are maximised, consideration should be given to encouraging pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.17 Transport Corridor 16 Summary Table

Current Strengths	Current Issues & Gaps
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking. Car based Edinburgh commuters mode share less than 60%.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Bus priority measures along the strategic M9 corridor. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 17: Fife Central

Table 5.18 Transport Corridor 17 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing			Proposed
	Aberdour Burntisland Cardenden Cowdenbeath Cupar Dalgety Bay	Glenrothes with Thornton Halbeath Inverkeithing Kinghorn Kirkcaldy Ladybank	Leuchars Lochgelly Markinch North Queensferry Springfield	Dalgety Bay extension Inverkeithing extension Leuchars extension Levenmouth Tay Bridgehead

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Aberdour	94	2	5	●			6	●		●									
Burntisland	6	2	10	●			6	●		●									
Cardenden	13	2	0	●			4	●											
Cowdenbeath	46	6	10	●			5	●	●	●									
Cupar	116	7	16	●			5	●	●	●	●	●							
Dalgety Bay & extension	197	3	30	●			6	●		●									
Glenrothes with Thornton	50	3	5	●			4	●											
Halbeath	1,021	48	10		●		8	●	●	●		●							
Inverkeithing & extension	427	6	39	●	●		20	●	●	●		●							
Kinghorn	10	1	5	●			5	●											
Kirkcaldy	594	15	20	●			8	●		●									
Ladybank	60	4	14	●	●		5	●		●									
Leuchars & extension	150	4	10	●	●		20	●		●									
Levenmouth	★	★	★		★		★	★						★	★		★	★	★
Lochgelly	12	2	11	●			4	●											
Markinch	138	9	34	●			6	●		●		●							
North Queensferry	13	1	11	●			9	●		●									
Springfield	0	0	6	●			1	●		●									
Tay Bridgehead	★	★	★		●		★	●		●				★	★		★	★	★

Journey to Work Statistics						
Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
7,000	57%	4%	4%	23%	5%	8%

The Fife Transport Corridor covers a mix of settlements that are well served by the public transport infrastructure as indicated by the 15-minute peak hour drive time catchments to each of the existing sites. The scale of settlements and their distribution through Fife results in the range of jobs within a 45-minute public transport journey time of the sites

There are two large Park and Ride facilities located in Halbeath and Kirkcaldy that respectively serve strategic and local catchments. The Halbeath site captures trips from the A82 whilst Kirkcaldy serves its immediate local area.

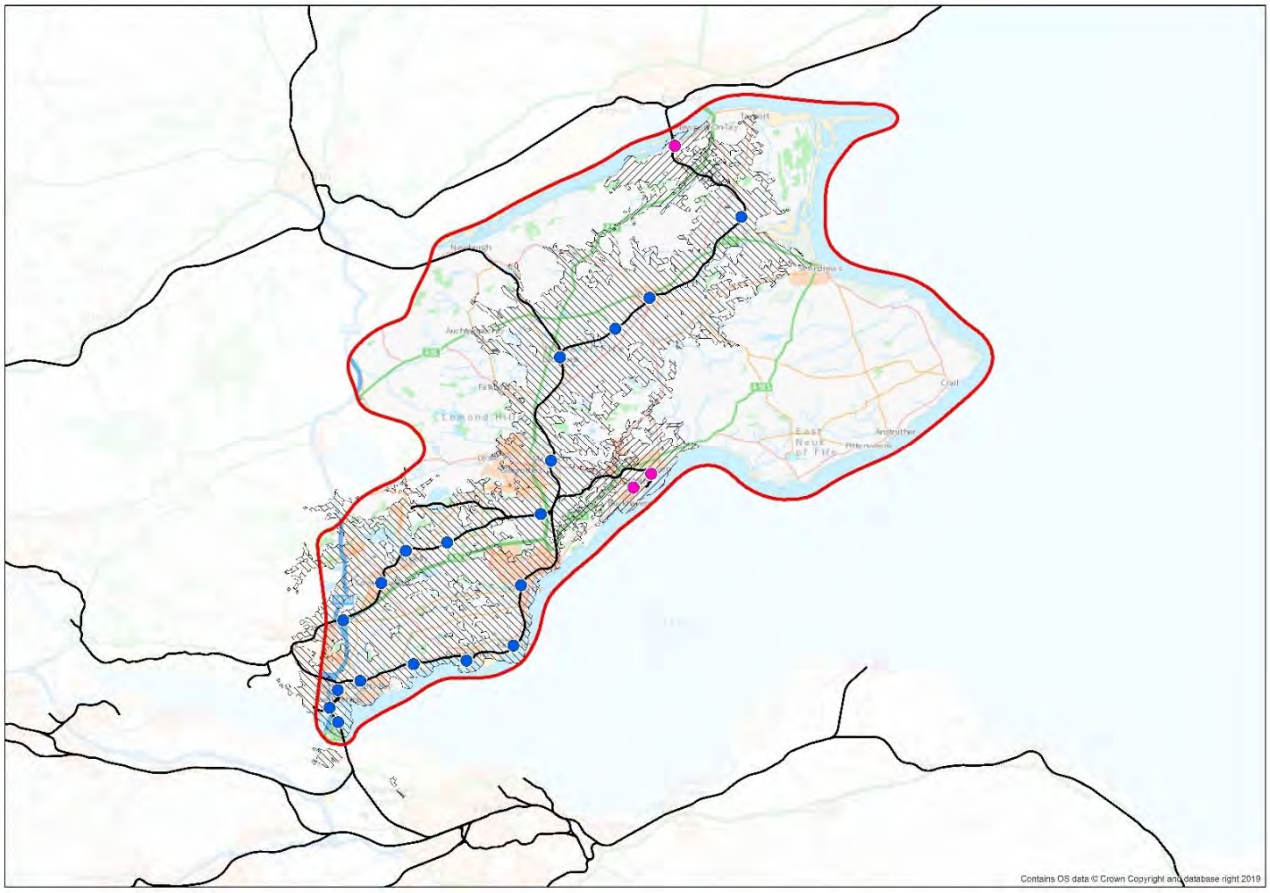
The road network from Fife to Edinburgh is heavily congested and this is reflected in the level of Park and Ride facilities provided to encourage mode transfer, with Park and Ride facilities located to serve local population as well as capture more strategic trips such as the Halbeath Park and Ride facility.

Consideration of the journey to work statistics, notes that trips associated with this corridor are predominantly focussed on accessing Central and South-West Edinburgh. Connectivity to central Edinburgh is good via the rail system however, there is limited cross-region connectivity to Edinburgh south-west.

Fife also benefits from a dedicated public transport corridor across the Forth, resulting in distance travelled savings resulting in time, monetary and environmental benefits.

Commuters resident within this corridor are best placed of all those in the SEStran area to benefit from a modal shift from car to public transport for travel to Edinburgh. The Fife Central transport corridor is particularly well-placed due to its public transport across the Forth.

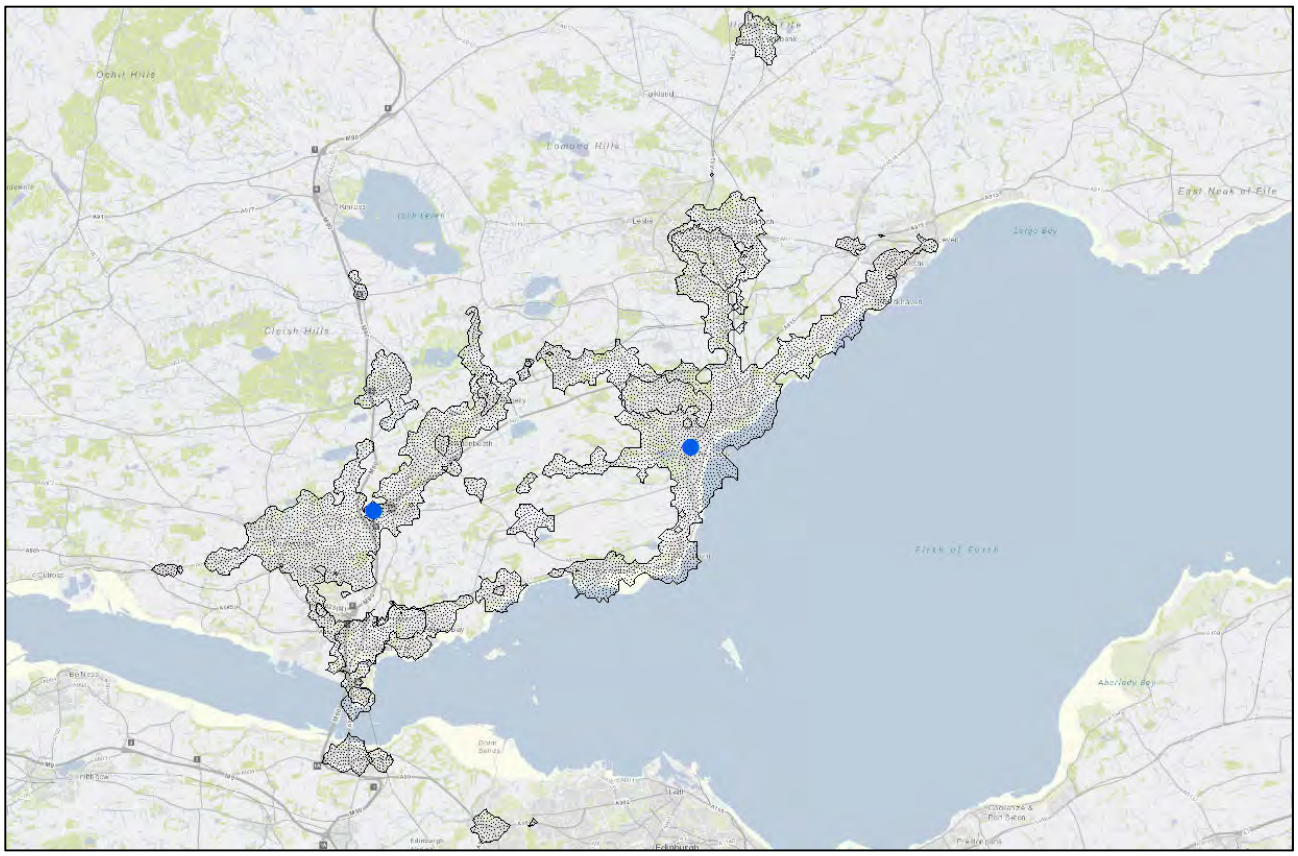
Figure 5.24 Fife Central 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



Fife Central benefits from the rail network opportunities that serve this transport corridor. Many of the Park and Ride facilities have evolved organically to serve the demand of the local population. The catchments for these sites extend into the surrounding rural areas which will be car dominant however their locations within existing settlements allow the promotion of access by foot and by bike. Thus, any reviews of facilities should consider promotion of accessibility by all modes of transport.

Complementing these local based sites is the Halbeath Park and Ride facility. This site is accessed directly from the A92 and due to its high level of accessibility captures strategic trips from a wide catchment not served by the local network of train stations.

Figure 5.25 Conveyal 45-minute Accessibility Plot – Halbeath and Kirkcaldy

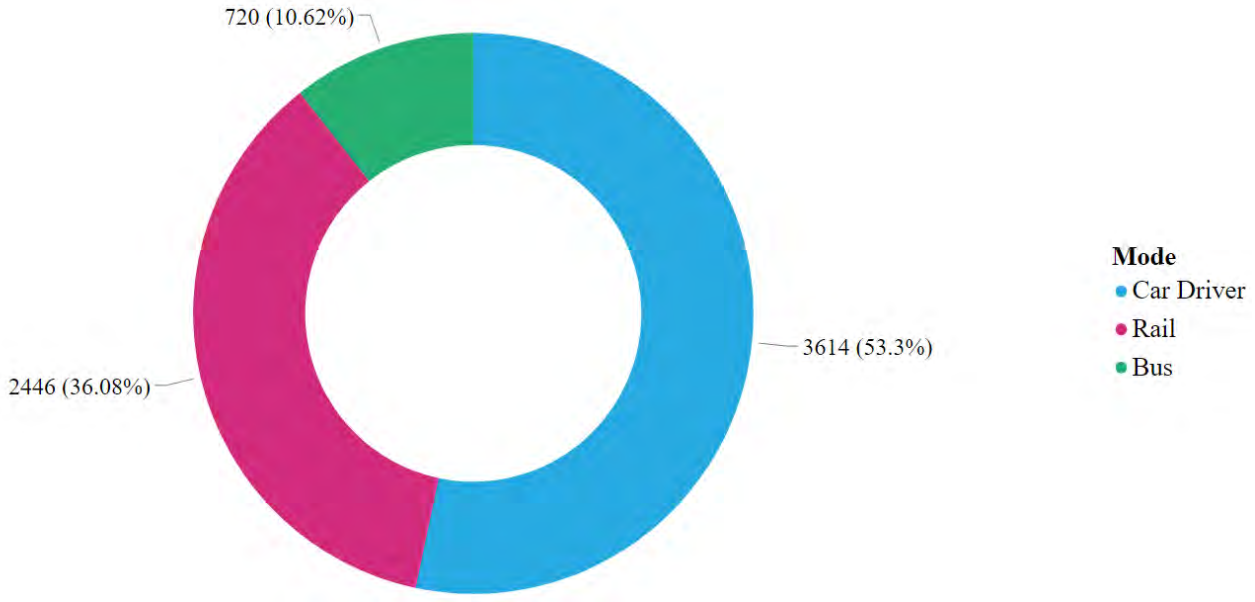


Opportunities to expand Park and Ride facilities at Dalgety Bay, Inverkeithing and Leuchars stations have been identified to meet demand.

New facilities have been identified at:

- Tay Bridgehead for a new bus Park and Ride located on the Fife side of the Tay Bridge. The development would capture traffic from the A92 heading northbound to Dundee, enhancing public transport opportunities to settlements such as St Andrews.
- Levenmouth station forms proposals to extend existing rail passengers services in Fife. This site is anticipated site is anticipated to pick up traffic from the A915 to Kirkcaldy and local roads

Figure 5.26 Travel to Work (To Central Edinburgh) Mode Shares for Fife Central Transport Corridor. Source: Scotland's Census



Fife has an extensive rail network providing services to Central Edinburgh and this is reflected in a high rail mode share for commuting trips. On top of this, there are Park and Ride available with a large amount of parking capacity. Considering the congestion experience at peak times on routes into Edinburgh it is no surprise that public transport alternatives are more popular here than anywhere else in the region outside Central Edinburgh.

Summary: Transport Corridor 17

The Fife Central transport corridor comprises of eighteen park and ride sites, with the exception of Halbeath, each of these is served by the rail network. All rail services provide regular direct connections into Edinburgh, although connections to Glasgow and Dundee are more limited. Inverkeithing and Leuchars benefit from the joint second highest peak hour service frequency of all the sites in the SEStran region.

The level of parking provision at the Fife Central park and ride sites is mixed. Provision at Burntisland is very low when compared to its local catchment population, in comparison to Inverkeithing which has a very high level of provision for both car and cycle parking. Many of the park and ride facilities have grown organically to accommodate increased demands from the local population. Their locations within existing settlements provides active travel opportunities for commuters and the proposed extensions to Dalgety Bay, Inverkeithing and Leuchars should explore opportunities to encourage these opportunities as part of the proposals.

Halbeath forms a strategic Park and Ride site which is easily accessible from the A82, offering a convenient interchange between car and bus from commuters based in north and west Fife, as well as Dundee. The bus routes to Edinburgh are dominated by the congestion issues associated with the Queensferry crossing. The dedicated public transport route via the Forth Road and bus priority measures along the A90 to Cramond Brig provide time savings to the Ferrytoll bus services. However, the lack of bus priority measures on the Queensferry Road corridor in and out of Edinburgh impact on the

reliability and attractiveness of the bus services and compare poorly to the rail based transport from Fife.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the rail line. Not all train services serving the Fife Central transport corridor stop at South Gyle consequently a number of commuters with destinations outside of the city centre incur a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work particularly the 23% who work in the South-West area of Edinburgh.

Consideration of the provision of cycle spaces per population for the corridor indicates that on average the level of provision is mixed with some facilities such as Cardenden, providing no cycle parking. To ensure that all opportunities within the park and ride sites are maximised, consideration should be given to encouraging pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.19 Transport Corridor 17 Summary

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. Mix of public transport options for local and strategic commuters. Car based Edinburgh commuters mode share less than 60%.	Cardenden has no cycle parking provision. Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Existing Park and Ride facilities are all focussed on using trains for onward travel. Limited cross-region routes, particularly within Edinburgh. To support bus park and ride, improved bus priority measures are required on the Queensferry Road corridor in and out of Edinburgh

Transport Corridor 18: Queensferry

Table 5.20 Transport Corridor 18 Multi-Criteria Assessment Summary

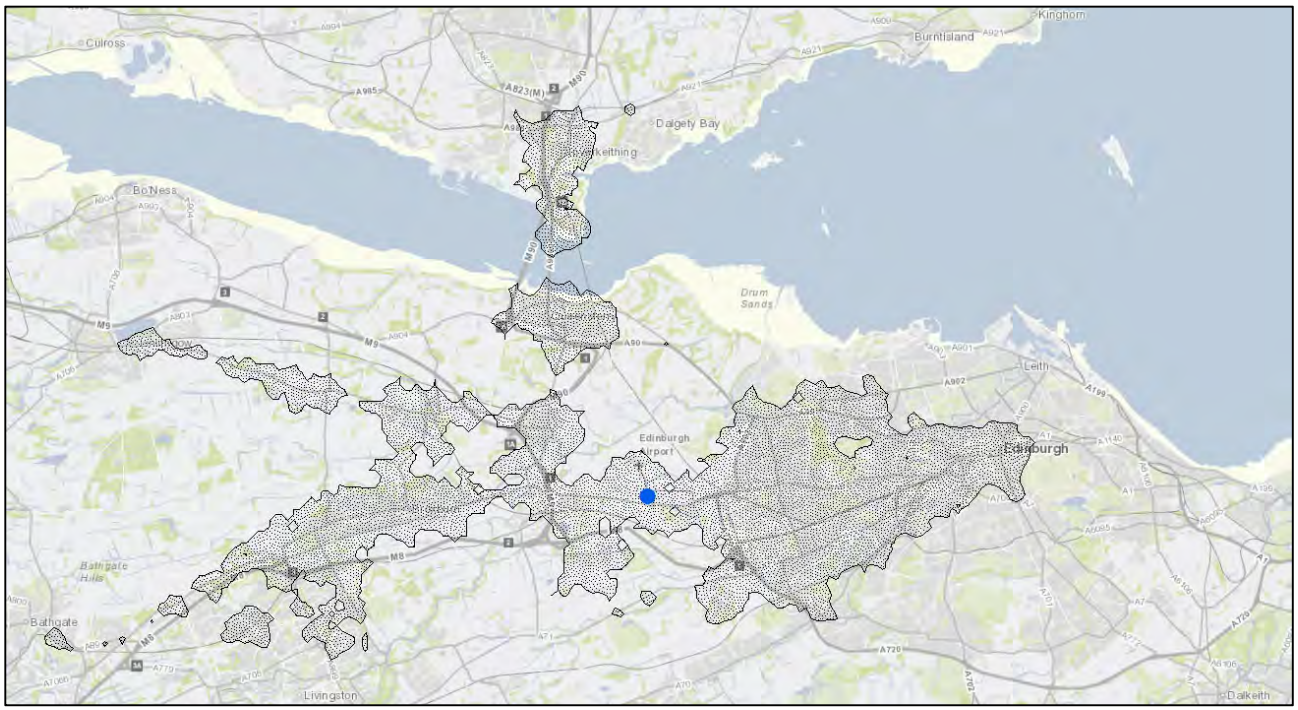
Park and Ride Facility	Existing	Proposed
	Dalmeny Edinburgh Gateway Ingliston	City Centre Queensferry Corridor South Queensferry (Echline Junction)

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
City Centre – Queensferry	★	★	★		★		★	★		★		★		★	★		★	★	★
Dalmeny	130	9	10	●			10	●		●									
Echline Junction	★	★	★		★		★	★						★	★		★	★	★
Edinburgh Gateway	0	0	100	●		●	20	●		●		●							
Ingliston	1085	46	0		●	●	12	●											

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
4,000	50%	5%	4%	25%	9%	7%

Figure 5.27 Conveyal 45-minute Accessibility Plot – Ingliston Park and Ride



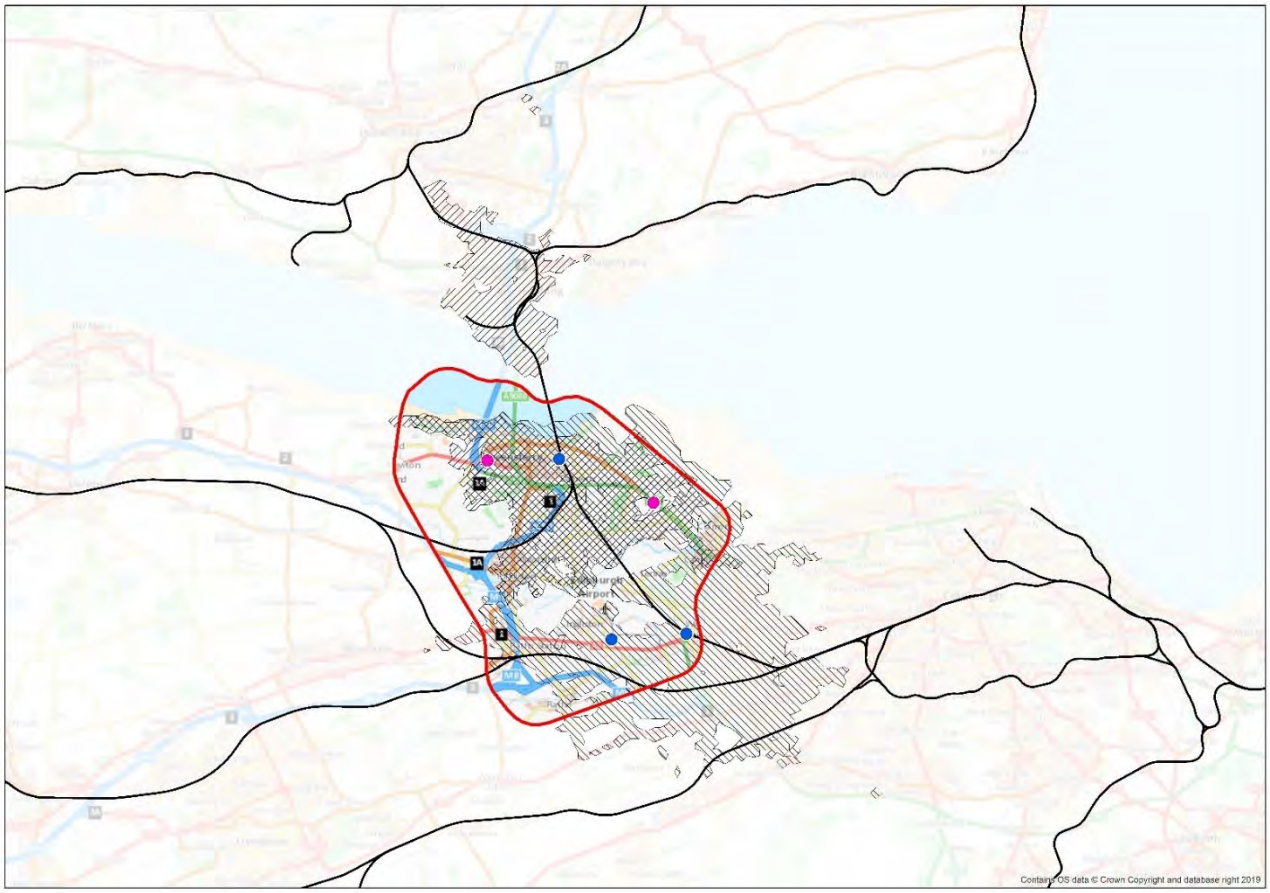
Transport Corridor 18 offers the potential to capture a number of strategic road trips before they cross into Edinburgh as it forms a buffer between adjacent transport corridors (16, 17, 19, 20 and 21).

Dalmeny and Edinburgh Gateway stations provides park and ride facilities for the local population to access rail based transport. In addition to these services, the local population is served by the Edinburgh bus network.

Ingliston Park and Ride offers an opportunity for car users to transfer to public transport for the final stages of their journeys into Edinburgh. Convenient access from the A8 provides efficient mode transfer to tram and bus.

The proposed park and ride facilities offer opportunities to capture strategic trips on the outskirts of Edinburgh from both the M9 and M90 corridors. To enhance benefits to public transport routes, consideration should be given to the promotion of additional public transport priority schemes with Edinburgh to improve reliability of journey times along key links as these schemes achieve the greatest environmental benefits through fuel cost savings. Fuel cost savings can be further improved through using greener fuel options such as electric vehicles.

Figure 5.28 Queensferry Corridor 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)

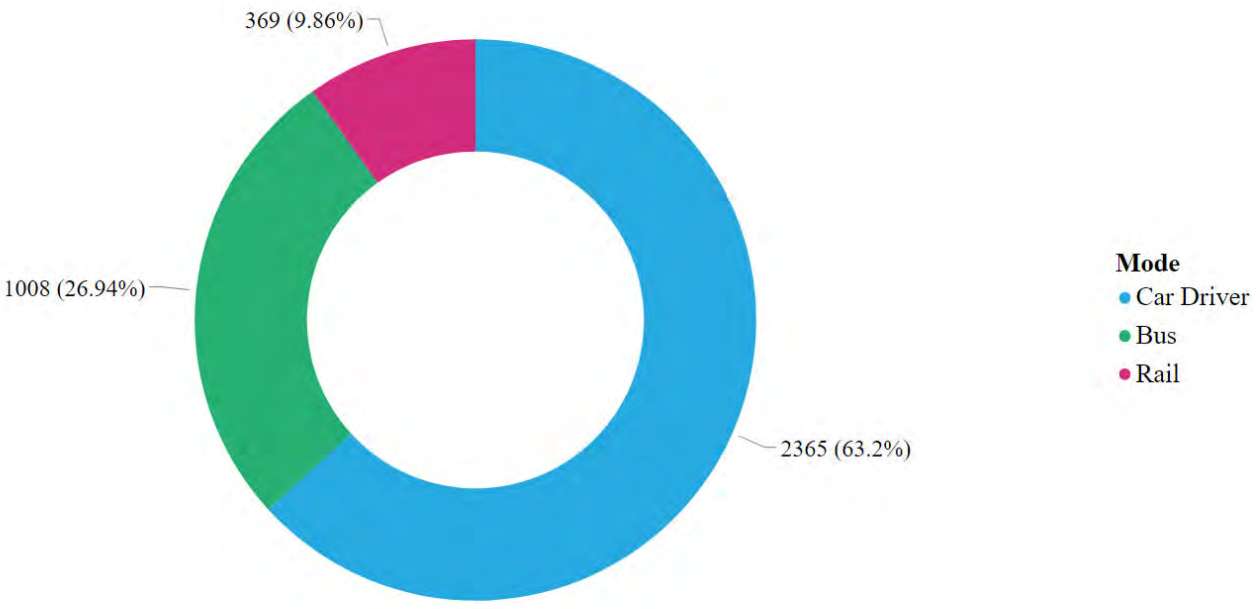


Three proposed facilities are identified for the Queensferry transport corridor:

- The site at Newbridge has been identified as part of aspirations to expand the Edinburgh tram network. The site is likely to comprise of both bus and tram movement and is anticipated to capture traffic from roads in West Lothian such as the M9 motorway and A89 eastbound.
- A new facility located along the City Centre-Queensferry corridor is identified within the recently published Edinburgh City Mobility Plan 2020. The site would be a bus park and ride and be located on the A90 strategic route between Queensferry and Edinburgh city centre. A specific location for this proposal is yet to be identified, however it is anticipated that most users would have to negotiate the Queensferry Crossing prior to accessing the facility to achieve mode transfer prior to the congested areas of west Edinburgh.
- Echline Junction Park and Ride facility would provide an opportunity for mode transfer adjacent to the Queensferry crossing. This proposal is identified within the previous SEStran Park and Ride strategy and may reflect or be in addition to the new facility proposed to serve the City Centre-Queensferry corridor identified above.

To achieve the full potential of these sites, a key objective to their development should be to minimise the interchange penalty between car and public transport as achieved at the Ingliston site.

Figure 5.29 Travel to Work (To Central Edinburgh) Mode Shares for Queensferry Transport Corridor. Source: Scotland's Census



As with the central Edinburgh corridor, results here may be slightly skewed due to the timing of the 2011 census pre-dating the opening of the tram. This means that the major park & ride at Ingliston and the rail / tram interchange at Edinburgh Gateway are not included in the journey to work statistics. Tram services from both of these sites are fast and frequent meaning a possible modal shift away from car.

Summary: Transport Corridor 18

The Queensferry transport corridor comprises of three park and ride sites and benefits from rail, bus and tram connections. Dalmeny and Edinburgh Gateway are served by rail whilst Ingliston is connected directly to the centre of Edinburgh by bus and tram and has the joint second highest peak hour service frequency of all the Park and Ride sites in the SEStran area.

In terms of parking, Ingliston has the largest car park, capturing strategic road based trips from the A8, but has no provision for cyclists, however car access to Ingliston require drivers to pass through either Newbridge or Gogar roundabout, both heavily congestion during peak periods. Dalmeny has parking for cyclists and cars, with evidence of overspill parking on surrounding streets. Edinburgh Gateway is associated with no car parking facilities.

Two new park and ride facilities are proposed in the vicinity of Queensferry. It is envisaged that these facilities will be located to form an attractive interchange point for drivers adjacent to the strategic road network and will be connected to Edinburgh by regular bus services.

This corridor is dominated by the congestion issues on the periphery of Edinburgh. The high level of congestion along the A8 corridor, provision of dedicated public transport priority measures and frequent transport connections into Edinburgh are key

considerations associated with commuters transferring from car to public transport. To improve the attractiveness of the existing and proposed park and ride sites, consideration should be given to the implementation of bus priority measures on the Queensferry Road and A8 corridor.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the respective railway lines. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the Queensferry corridor facilities. It is unclear, based on the data considered how commuters from this transport corridor are travelling to work in Edinburgh and whether public transport users are focussed on accessing the City Centre, whether there are parking capacity issues at the facilities or whether interchange penalties are adversely impacting on commuter trips. Further investigation into issues would be beneficial to understand how Edinburgh commuter public transport mode share can be improved for this transport corridor.

Consideration of the provision of cycle spaces per population for the corridor indicates that on average the level of provision is mixed with some facilities such as Ingliston, making no provision for cycle parking. To ensure that all opportunities within the park and ride sites are maximised, consideration should be given to encouraging pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.21 Transport Corridor 18 Summary

Current Strengths	**Current Issues & Gaps**
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. Mix of public transport options for local and strategic commuters.	Ingliston has no cycle parking provision. Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Lack of bus priority measures on the Queensferry Road corridor in and out of Edinburgh. Improved understanding required of why commuters are not making greater use of Park and Ride Facilities within this corridor.

Transport Corridor 19: Perth & North

Table 5.22 Transport Corridor 19 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing	Proposed
	Ferrytoll	

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Ferrytoll	1040	38	11		●		8	●		●		●							

Journey to Work Statistics

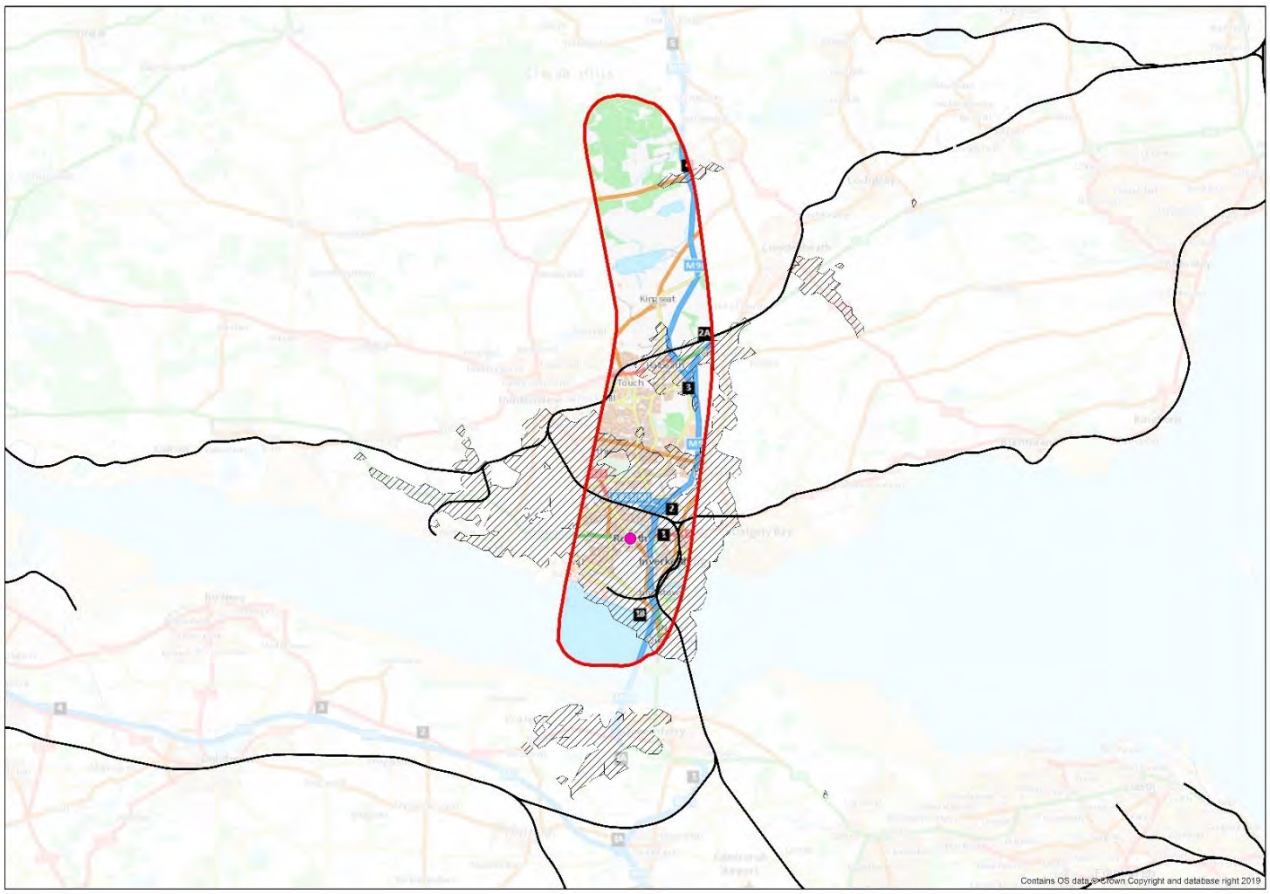
Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
1,000	57%	5%	7%	20%	3%	8%

Ferrytoll park and ride, located immediately adjacent to the M90 provides a highly accessible facility for this mode transfer interchange. The facility has a wide catchment, capturing trips from northern Fife, Kinross and Perth

Its location reduces the period of time car drivers are idling in congestion, whilst the dedicated bus route across the Forth reduces vehicular mileage, prior to accessing public transport priority measures along the congested A90 and M90 corridors.

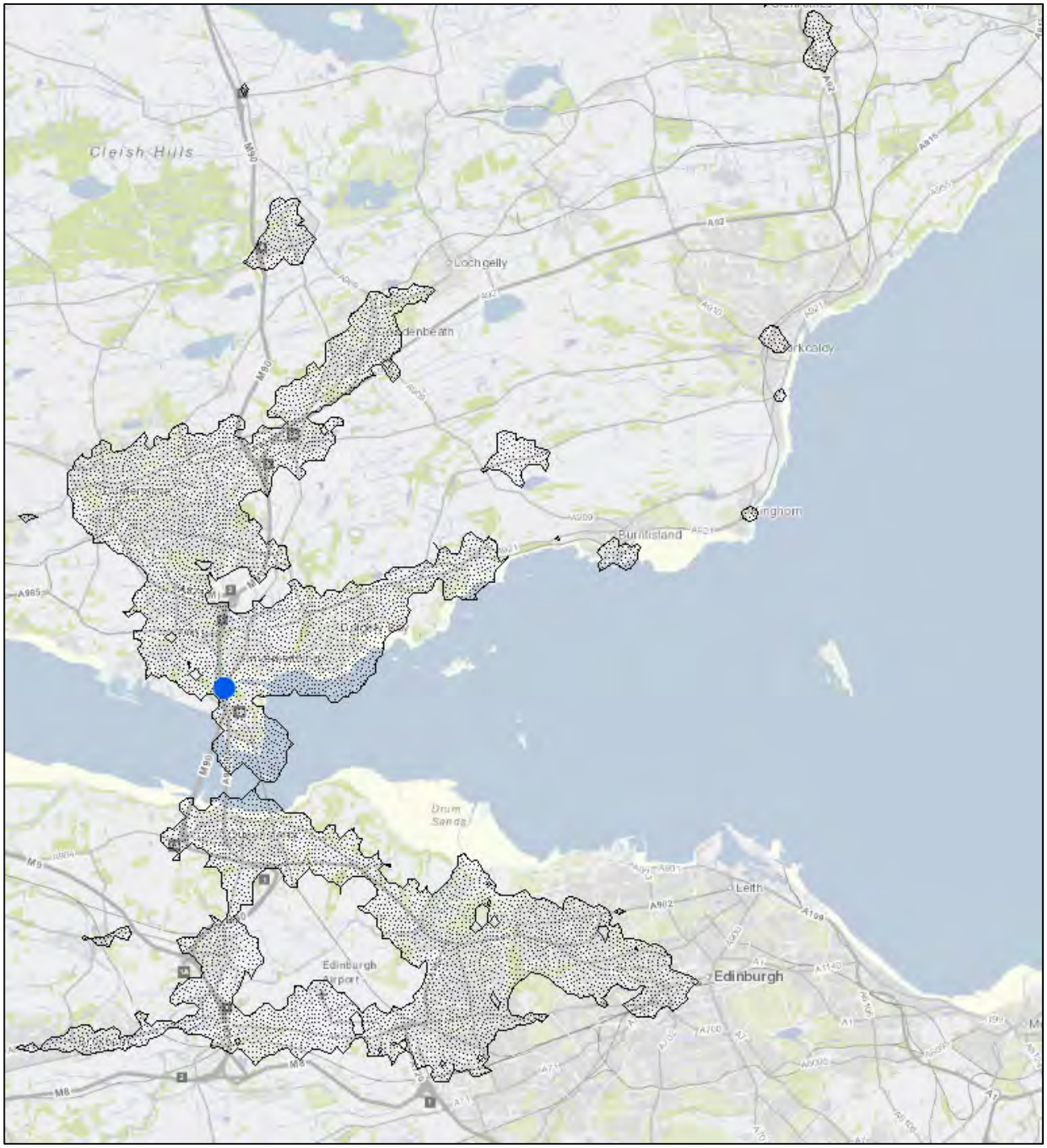
Ferrytoll has a low ratio of cycle to car parking spaces. However, when considered in relation to the local catchment population the level of provision appears to be proportional to areas of Very High provision elsewhere in the SEStran area.

Figure 5.30 Queensferry Corridor 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



The park and ride facility offers high time, monetary and environmental benefits to car drivers with destinations in central and west Edinburgh areas. Benefits to other areas of the city are limited due to the interchange penalties associated with cross-region trips.

Figure 5.31 Conveyal 45-minute Accessibility Plot – Ferrytoll Park and Ride



Summary: Transport Corridor 19

The Perth and North transport corridor comprises of a single Park and Ride facility at Ferrytoll. This facility has the largest car park in the SEStran region and captures trips from the M90 and has less emphasis on serving the local population. Ferrytoll is connected to Edinburgh, Dundee and Perth by regular direct bus services.

The southern section of this corridor is dominated by the congestion issues associated with the Queensferry crossing. The dedicated public transport route via the Forth Road and bus priority measures along the A90 to Cramond Brig provide time savings to the Ferrytoll bus services. However, the lack of bus priority measure on the Queensferry Road corridor in and out of Edinburgh impact on the reliability and attractiveness of the bus services and compare poorly to rail based transport from Fife.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the rail line. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using the Ferrytoll park and ride facility. However, those with destinations outside of the city centre incur a high interchange penalty as there are limited cross-city routes within Edinburgh, resulting in commuters having to travel into the centre of Edinburgh, before travelling out of the centre on an alternative road artery to access their place of work, particularly the 20% who work in the South-West area of Edinburgh.

The purpose of the Ferrytoll park and ride facility is to capture strategic road-based trips however, the facility also offers opportunities for local residents to access express services to Edinburgh. To ensure that all opportunities within the park and ride sites are maximised, consideration should be given to encouraging pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.23 Transport Corridor 19 Summary

Current Strengths	Current Issues & Gaps
Direct regular public transport to central Edinburgh. All existing facilities have cycle parking.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Lack of bus priority measures on the Queensferry Road corridor in and out of Edinburgh. Limited cross-region routes, particularly within Edinburgh.

Transport Corridor 20: Alloa-Dunfermline

Table 5.24 Transport Corridor 20 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing	Proposed
	Alloa Dunfermline QM Dunfermline Town Rosyth	Cambus Clackmannan Pitreavie

	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Alloa	64	3	20	●			2	●	●										
Cambus	★	★	★	★			★	★	★		★			★	★		★	★	★
Clackmannan	★	★	★	★			★	★	★					★	★		★	★	★
Dunfermline QM	93	5	10	●			6	●											
Dunfermline Town	175	11	38	●			5	●	●										
Pitreavie	500	★	★		★		★	★						★	★		★	★	★
Rosyth	143	9	30	●			5	●	●										

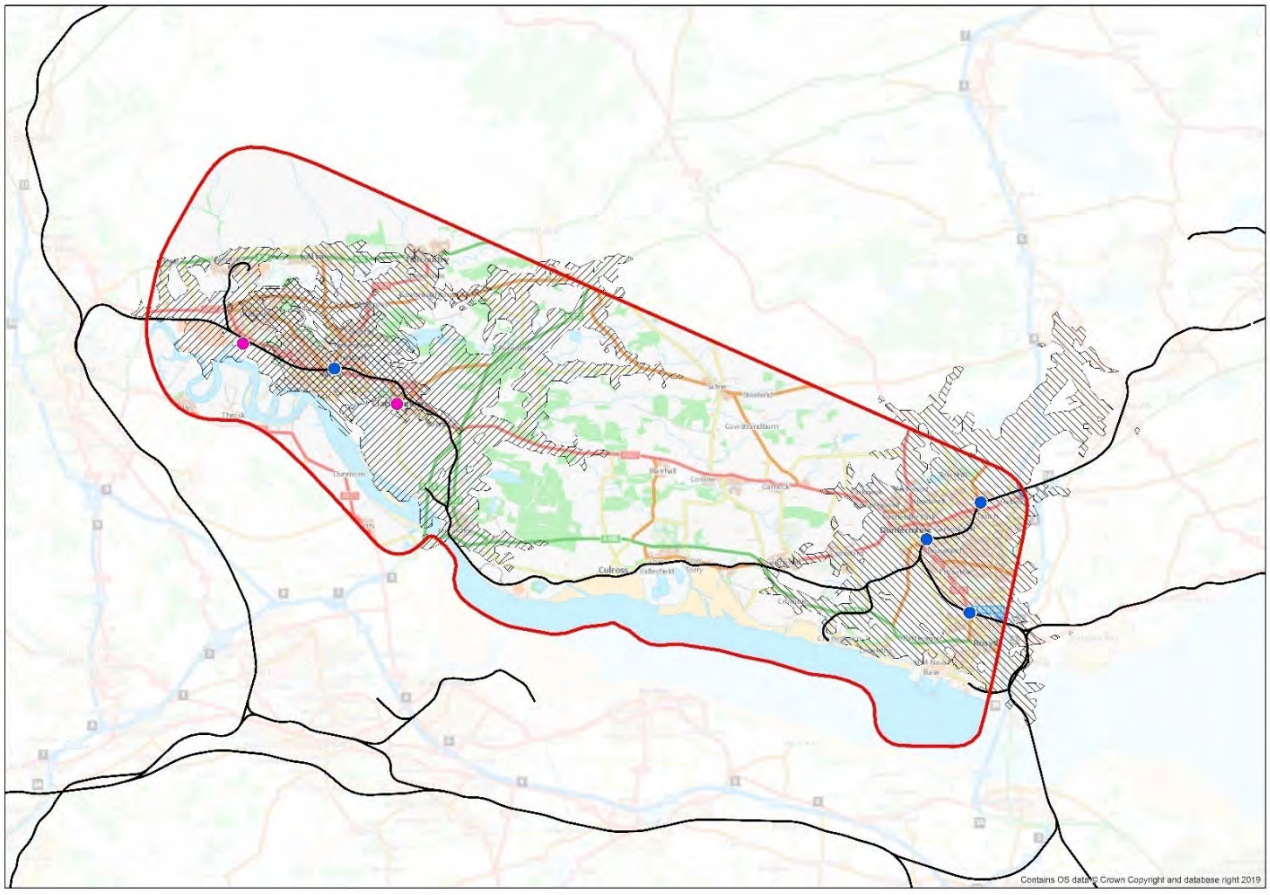
Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
5,000	57%	5%	7%	20%	3%	8%

The Fife West and Clackmannanshire park and ride facilities are each rail based, with limited strategic bus connections. The facilities are of a small to medium scale and are well-located in relation to the local population as indicated by the 15-minute drive time catchment.

Based on journey to work statistics, of those who currently work in Edinburgh, 57% work in central Edinburgh and 20% in Edinburgh south-west. Direct connections are available from Dunfermline and Roysth to Edinburgh and is reflected in the high journey time savings associated with car drivers switching to public transport for these sites. However, rail trips from Alloa are required to route via Stirling for onward travel to Edinburgh or Glasgow resulting in negligible benefits for commuters using rail when compared with car drivers.

Figure 5.32 Alloa-Dunfermline Corridor 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



The 45-minute accessibility plots for Alloa clearly indicates its connectivity to Stirling and that it has limited public transport accessibility to the east. Whilst Dunfermline Town Station facility is focused on access within Dunfermline and along the railway. The 45-minute accessibility plot takes into consideration walk from car to the station and a 5-minute wait prior to service departure, which is why the Conveyal plot does not show access into Edinburgh City Centre.

Figure 5.33 Conveyal 45-minute Accessibility Plot – Alloa and Dunfermline Town Stations

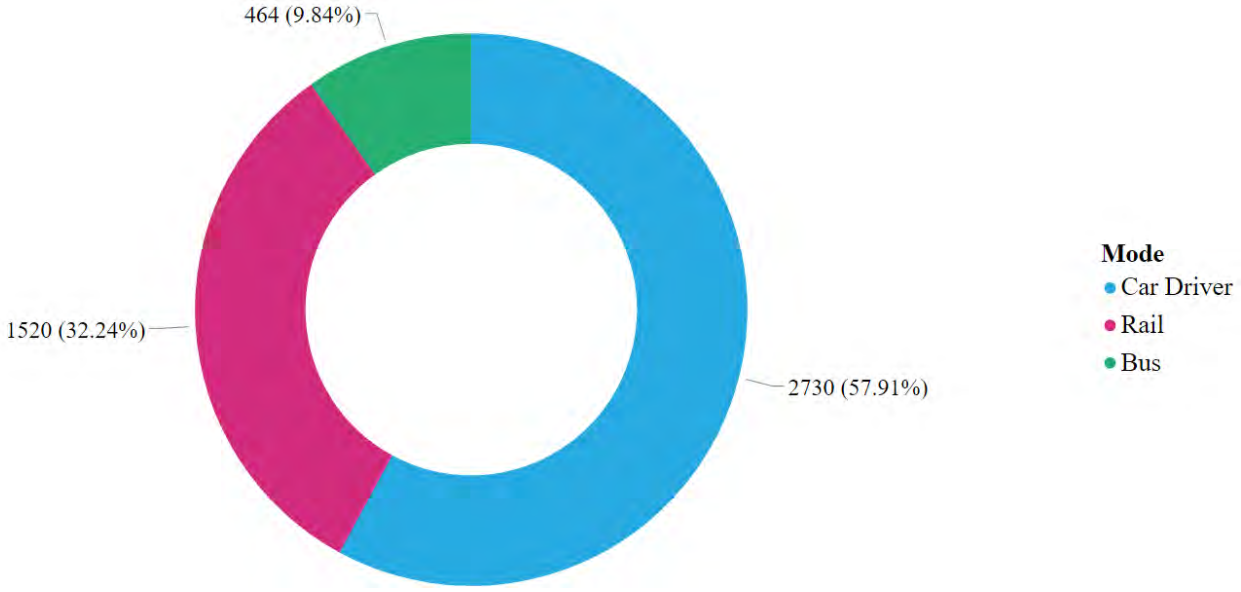
Within Clackmannanshire a site for a new railway station has been identified in Clackmannan and Cambus, land in Clackmannan has been identified and safeguarded for the development. Both sites would be served by the Edinburgh-Stirling-Glasgow line.

Users of the Clackmannan facility are likely to originate from Kincardine and Alloa, which are both approximately a 5-minute drive from the site. However, it is anticipated that to access the site many users will have to negotiate the Kincardine and Clackmannanshire bridges, which are often congested routes from Falkirk and West Lothian.

The catchment for Cambus is likely to include Alloa, Menstrie and settlements to the west of Stirling, which are all within a 10-minute drive from the site.

Within Fife, a proposed Park and Ride is identified for the Pitreavie/ Rosyth area, within the immediate vicinity of the Queensferry Crossing. The detailed proposals should aim to develop a site with similar functionality to the Halbeath facility, due to its close proximity to the A985. This would complement the demand within the local catchment which includes key settlements of Rosyth and Dunfermline, which are all within a 10-minute drive time of the proposed development.

Figure 5.34 Travel to Work (To Central Edinburgh) Mode Shares for Alloa Dunfermline Transport Corridor. Source: Scotland's Census



The corridor benefits from good rail provision in Dunfermline, Alloa and Rosyth, as they are served by four rail stations. This combines to give a high rail mode share of 32%.

Summary: Transport Corridor 20

The Alloa-Dunfermline transport corridor comprises of four rail based Park and Ride sites, with proposals for three new Park and Ride facilities in Cambus, Clackmannan and Pitreavie. The facilities are served by routes to Edinburgh and to a lesser extent Glasgow. Three further Park and Ride facilities are proposed, both Cambus and Clackmannnan would be served by rail and Pitreavie would link to the bus network to access Edinburgh.

This transport corridor is dominated by the congestion issues associated with the Queensferry crossing. Consequently sites closest to the crossing are shown to offer the greatest time benefit savings to those moving from car to public transport. This is reflected in the high public transport mode share associated with this transport corridor. Providing public transport mode choice through the proposed Pitreavie facility, could improve the financial savings available to the local population commuting to Edinburgh.

Access to destinations within Edinburgh is currently limited to the areas in the immediate vicinity of the rail line. Commuters with destinations close to the railway stations served by this transport corridor derive the greatest benefit from using the Alloa-Dunfermline park and ride facilities. Commuters with destinations in the centre of Edinburgh derive the greatest benefit from using this transport corridor's Park and Ride facilities. It is unclear, based on the data considered how commuters from this transport corridor are travelling to work in Edinburgh and whether public transport users are focussed on accessing the City Centre, whether there are parking capacity issues at the facilities or whether interchange penalties are adversely impacting on commuter trips. Further investigation into issues would be beneficial to understand how Edinburgh commuter public transport mode share can be improved for this transport corridor.

Consideration of the provision of cycle spaces per population for the corridor indicates that on average the level of provision is low. To ensure that all opportunities within the Park and Ride sites are maximised, consideration should be given to encouraging pedestrian

and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.25 Transport Corridor 20 Summary

Current Strengths	Current Issues & Gaps
Direct regular public transport to central Edinburgh. Park and Ride facilities are well located to local population. All existing facilities have cycle parking. Car based Edinburgh commuters mode share less than 60%.	Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Strategic commuter facilities located on rail lines Improved understanding required of why commuters are not making greater use of Park and Ride Facilities within this corridor.

Transport Corridor 21: Cross Forth (Kincardine)

Table 5.26 Transport Corridor 21 Multi-Criteria Assessment Summary

Park and Ride Facility	Existing	Proposed
	Kincardine (Walker Street)	

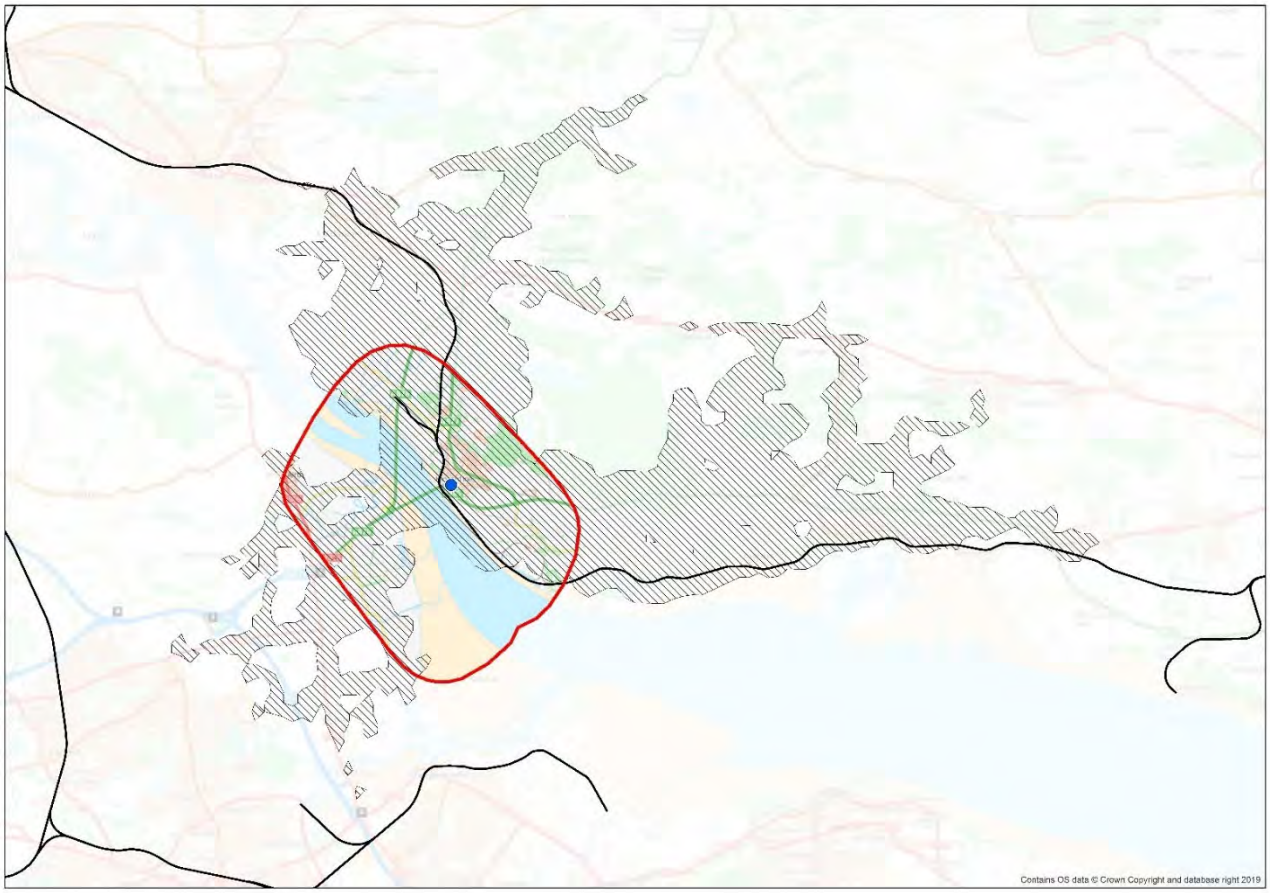
	Facilities			Public Transport				Destinations					Peak Hour Journeys						
	Car Park size	Disabled Bays	Cycle Parking	Train	Bus	Tram	Peak Hr Service Frequency	Edinburgh	Glasgow	Dundee	Stirling	Perth	Pop. catchment	Car Spaces per pop.	Cycle spaces per pop.	Employment catchment	Time	Monetary comparison	Environmental
Kincardine (Walker St)	67	0	0		●		4		●	●									

Journey to Work Statistics

Total trips to Edinburgh	Edinburgh Central	Edinburgh East	Edinburgh South	Edinburgh South West	Edinburgh West	Edinburgh North & Leith
100	52%	2%	4%	21%	7%	14%

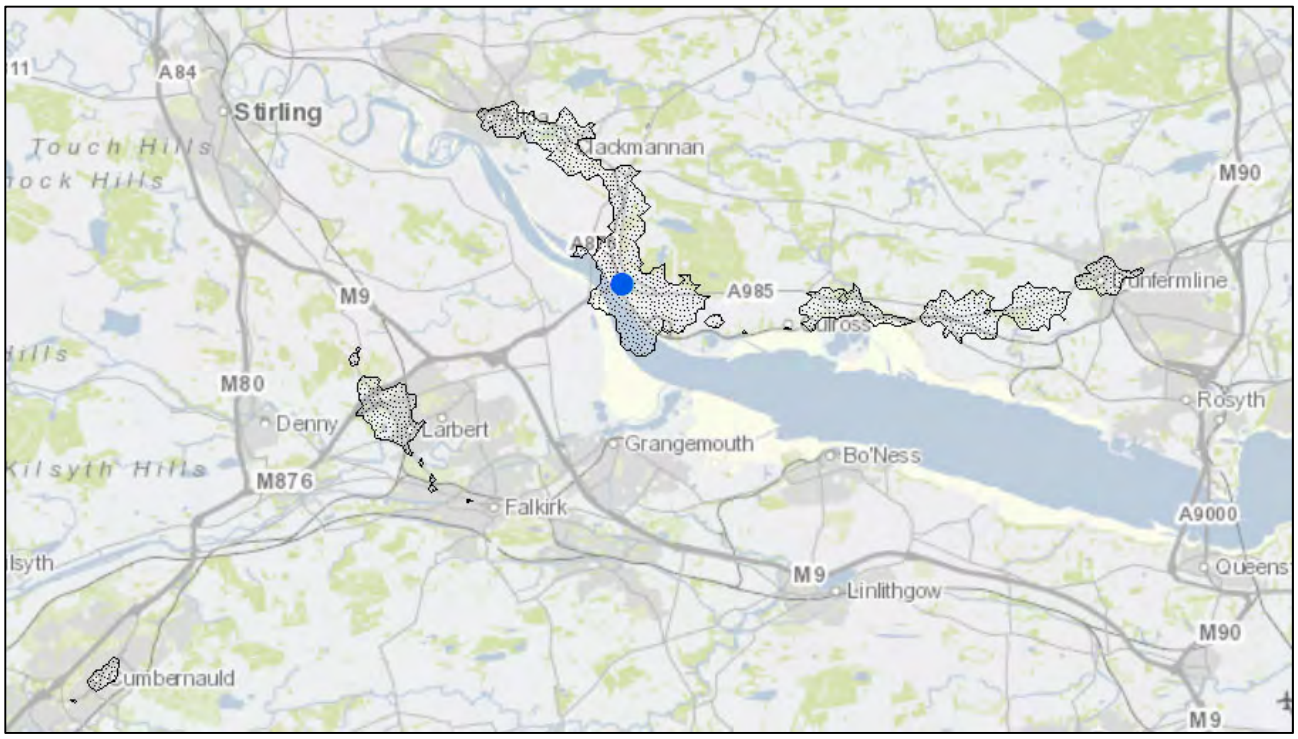
Walker Street Park and Ride facility is used to access bus services departing from nearby Kincardine High Street which is served by direct services to Dundee and Glasgow. Trips to Edinburgh, Stirling or Perth would require at least one change of bus service. This park and ride facility does not provide the local commuter population with public transport alternatives to the key employment areas. To inform proposals to improve service provision from this location would require consideration of the travel to work statistics for the local and wider catchment using Walker Street, to establish whether any changes to bus services would be beneficial to this site.

Figure 5.35 Kincardine 15-minute peak hour drive times (Existing and Proposed Park and Ride Facilities)



The lengthy journey times associated with the bus journey from the only park and ride in this corridor at Walker Street make it an unattractive option for commuters into Central Edinburgh resulting in a very high car mode share of 73%.

Figure 5.36 Conveyal 45-minute Accessibility Plot – Walker Street Park and Ride



Summary: Transport Corridor 21

The Cross Forth (Kincardine) transport corridor comprises of a car park located conveniently to local bus stops, that provide connections to local and regional destinations. Direct services are provided to Glasgow and Dundee but these destinations are associated with long journey times of greater than 45-minutes.

The Cross Forth transport corridor is dominated by the crossings of the Forth estuary. Away from the bridges, the road network surrounding is typically uncongested. Consequently, the benefits offered by express bus services from the Kincardine facility are limited in their attractiveness and offer low financial benefits when compared to cars.

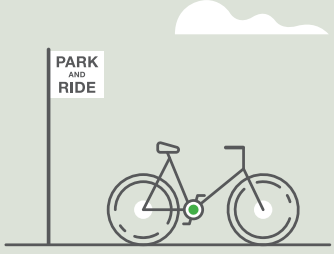
This Transport Corridor is served by a single facility, which comprises of a car park located conveniently to local bus stops, that provide connections to local and regional destinations. Direct services are provided to Glasgow and Dundee but these destinations are associated with long journey times of greater than 45-minutes.

The Kincardine facility has no cycle parking provision. Introduction of secure cycle parking at the site, could encourage and support an increase in cycle trips for onward travel by bus and also, due to its central location, to the town centre. To ensure that all opportunities within the park and ride sites are maximised, consideration should be given to encouraging pedestrian and cycle trips to the facilities, through the improvement of footways and cycleways in conjunction in conjunction with increasing the provision of cycle parking at the facilities.

Table 5.27 Transport Corridor 21 Summary Table

Current Strengths	Current Issues & Gaps
Local bus connections.	No cycle parking facilities provision. Improvement to existing along with all future proposals, should consider how active travel can be further encouraged through improvements to the facility and their connections to local residential areas. Long journey times to key destinations.

SEStran Regional P&R Summary Findings, Gaps and Interventions



6 SEStran Regional P&R Summary Findings, Gaps and Interventions

Introduction

This chapter presents an overview of existing and proposed SEStran Park and Ride facilities, based on the multi-criteria analysis presented in Section 5. Tables 6.1 and 6.2 provide a summary of the key findings for each of the transport corridors. These findings have subsequently been developed into possible interventions for further development as part of the RTS.

Overview of SEStran Park and Ride facilities

The Park and Ride facilities on offer in the SEStran region provide a range of public transport opportunities for travel to the resident population. The main hub of employment for the region is located in Edinburgh and this is reflected in the service provision at each of the facilities, with the exception of Walker Street, Kincardine (Transport Corridor 21). Many of the facilities provide connectivity to other key destinations such as Glasgow, Dundee, Perth and Stirling, which sit outside of the SEStran region.

In general terms, the main settlements in each of the transport corridors are within a 15-minute peak-hour drive of a Park and Ride facility. For the limited exceptions, such as Haddington and Peebles, strategic opportunities for commuters to transfer to public transport are provided on approach to Edinburgh.

The benefit of the location of many of the Park and Ride sites in relation to the local population provides the opportunity for journeys to the facilities to be undertaken by active travel modes such as walking and cycling. The majority of Park and Ride facilities provide cycle parking however, there are exceptions at the following sites:

- Transport Corridor 1 South Gyle and Wester Hailes Stations;
- Transport Corridor 12 Straiton bus park and ride;
- Transport Corridor 14 Breich Station;
- Transport Corridor 17 Cardenden Station;
- Transport Corridor 18 Ingliston bus park and ride; and
- Transport Corridor 21 Walker Street, Kincardine bus park and ride.

To optimise the opportunities for active travel, all Park and Ride facilities should accommodate cycle parking facilities and encourage foot and bike based trips through reviewing key connections within the Park and Ride sites and also how they connect to the local communities.

To ensure that all residents in the SEStran region have the opportunity to undertake a proportion of their commute to Edinburgh by public transport some Park and Ride facilities are located to capture car journeys from the strategic road network on the periphery of Edinburgh. These facilities have been developed to minimise the interchange penalty of transferring mode through:

- ease of access from the road network;
- regular high-quality public transport;
- comparable or shorter journey times;

- secure car parking facilities;
- affordable cost; and
- provision of environmentally sustainable public transport options.

Examples of strategic Park and Ride facilities are Sheriffhall, Ferrytoll and Halbeath. Proposed sites in a number of the transport corridors aim to introduce similar strategic facilities to encourage mode transfer through locating new facilities. Examples in West Lothian are the proposed Park and Ride facilities in the vicinity of the M8 and M9. However, to support bus Park and Ride sites adjacent to key road links, improved bus priority measures are required along congested sections of the corridors, such as motorways (for example M8) and other key strategic road links (for example A8, A89 and A90) to support efficient and reliable public transport journey times.

Journey to work statistics for the SEStran region support the current and future focus of the existing Park and Ride sites to support travel to the central area of Edinburgh. However, the statistics also indicated strong demand for travel to the East and South West areas of the cities.

Transport corridors able to directly accommodate public transport demand to Edinburgh South West are:

- Transport Corridor 14 West Lothian M8
- Transport Corridor 16 Edinburgh-Linlithgow-Falkirk
- Transport Corridor 17 Central Fife
- Transport Corridor 18 Queensferry
- Transport Corridor 20 Alloa-Dunfermline

Connectivity of the transport corridors to employment areas in East Edinburgh are less focussed geographically with key employment areas along the A7 (Royal Infirmary of Edinburgh and BioQuarter) and the A1 (Queen Margaret University, Edinburgh Fort, Seafield). Whereas employment zones in Edinburgh South West are dominated by Edinburgh Park, the Gyle and Gogarburn which are concentrated into a smaller geographical zone. Providing a mix of rail and bus connections allows flexibility and improved choice of destinations within transport corridors, particularly those dominated by rail facilities.

It is assumed that high public transport usage by commuters to Edinburgh is a strong indicator of successful Park and Ride facilities, the most successful transport corridors are:

- Transport Corridor 16 Edinburgh-Linlithgow-Falkirk
- Transport Corridor 17 Central Fife
- Transport Corridor 20 Alloa-Dunfermline

An improved understanding is required as to why commuters are making choices, for example whether the corridors listed above reflect a greater availability of access to public transport factors. However, it is assumed that these transport corridors are achieving the lowest commuter car-based trips into Edinburgh as a direct result that they provide a viable efficient alternative to the greatest number of employment destinations.

Table 6.1 Summarised strengths of Park and Ride facilities by transport corridor

	Transport Corridor												
	1-7: Edinburgh	9: East Lothian Coastal	10: East Lothian / Borders	11: Midlothian East / Borders	12: Midlothian West / Borders	14: West Lothian South	15: West Lothian M8	16: Edinburgh / Linlithgow / Falkirk	17: Fife Central	18: Queensferry	19: Perth and North	20: Alloa / Dunfermline	21: Cross Forth (Kincardine)
Direct public transport to central Edinburgh.	●	●	●	●	●	●	●	●	●	●	●	●	
Park and Ride facilities are well located to local population.	●	●	●	●	●	●	●	●	●	●		●	●
All existing facilities have cycle parking.		●	●	●			●	●			●	●	
Mix of public transport options for local and strategic commuters.	●					●			●	●			
Car based Edinburgh commuter mode share less than 60%.								●	●			●	

Table 6.2 Summarised issues and gaps of Park and Ride facilities by transport corridor

	Transport Corridor												
	1-7: Edinburgh	9: East Lothian Coastal	10: East Lothian / Borders	11: Midlothian East / Borders	12: Midlothian West / Borders	14: West Lothian South	15: West Lothian M8	16: Edinburgh / Linlithgow / Falkirk	17: Fife Central	18: Queensferry	19: Perth and North	20: Alloa / Dunfermline	21: Cross Forth (Kincardine)
No cycle parking at one or more facilities.	●				●	●			●	●			●
Within any proposal, consideration of how active travel can be further encouraged.	●	●	●	●	●	●	●	●	●	●	●	●	●
No car parking at one or more facilities.	●					●				●			
Limited cross-region routes, particularly within Edinburgh.	●	●	●	●	●	●	●	●	●	●	●	●	●
To support bus park and ride, improved bus priority measures are required on main road artery in and out of Edinburgh.						●	●		●	●	●		
Existing Park and Ride facilities are all focussed on using trains for onward travel.	●	●	●	●		●	●	●	●			●	
Improved understanding required of why commuters are not making greater use of Park and Ride facilities within this corridor.							●			●			

Interventions

The following sub-sections outline possible interventions for further consideration to help deliver a more sustainable transport network in the SEStran region. The emerging interventions are:

- Support active travel to Park and Ride facilities;
- Orbital Park and Ride investment
- Improve connectivity within Edinburgh
- Peripheral Park and Ride facilities;
- Park and Ride Digital twin
- Public transport as a service

Across all of these proposed interventions there is a need for ongoing co-ordination and wider planning for park and ride to support National, Regional and Local transport and environmental policies. Park and ride will not resolve existing transport issues without wider investment in public transport provision and prioritisation on key corridors, which will require a collaborative approach to future decisions.

Support Active Travel to Park & Ride Sites

The development and promotion of Active Travel forms a key strategy for SEStran and supports the vision of a regional transport system that provides a genuine choice of transport. Many of the Park and Ride facilities within the SEStran region provide cycle parking however the quality and scale of provision range from no cycle parking provision (South Gyle station) to cycle parking provision and no car parking (Brunstane Station).

Provision of cycle parking at facilities is desirable however supply alone is unlikely to initiate meaningful mode shift from car to public transport. These need to be supported by:

- Joined up routes that allow people to make functional journeys through active travel.
- Measures that address issues of safety and perception of safety on roads that hinder active travel.
- Prioritised space to accommodate secure, well-lit, visible cycle parking facilities.

Opportunity: Facilitate Active Travel

Reasons for proposing:

- Improve choice of transport for all.
- Encourage opportunities for people to be physically active as part of their journeys.
- Reduce congestion and improve air quality through encouraging non-car based journeys.

Orbital P&R Investment

As raised during the stakeholder workshop, and highlighted from the evidence, there is a distinct lack of public transport services and associated infrastructure provision to encourage park and ride for journeys which cross Edinburgh, or those commuters who travel around the A720 city by-pass.

A number of potential new P&R sites are noted within the draft Edinburgh City Mobility Plan, however the location and supporting public transport investment must be co-ordinated to maximise the benefits from such infrastructure. Commuters from the Scottish Borders and East Lothian are well served by Park and Rides for those who work in the city centre, however access to other employment area to the west of the city or Fife are less well connected.

In relation to investment in Orbital Park and Ride, the following high-level routes and sub-corridors should be considered in the short to medium term:

- New park and ride site on the A90 corridor, with direct access and onward bus priority on the A90 route serving both north and city centre bound routes.
- Delivery of the proposed Kilpunt park and ride site in Broxburn and provision of bus priority routes through Newbridge roundabout and along the A89 corridor.
- Ongoing support for new Winchburgh rail station linked to the Core Development Area, ensure adequate provision for accessibility and engage with Scotrail on timetabling to ensure adequate service frequency.

Longer term investment should consider the following element:

- New large park and ride site accessed off the M8 corridor, located between Junction 2 and 1 with opportunity to link in rail or bus/tram. This would assist with congestion and delays around Gogar Roundabout, Hermiston and the A71 corridor.

Opportunity: Strategic placement of Park and Ride Facilities

Reasons for proposing:

- Contribution to reducing traffic volumes on key links and junctions.
- Improved and consistent journey times for public transport users.
- Reduce congestion and improve air quality through encouraging non-car based journeys.

Improved connectivity within Edinburgh

Analysis of travel to work statistics for the SEStran region identified that central Edinburgh formed the main focus for work related trips within the region. Each of the transport corridors, with the exception of Alloa are consistent with this finding.

With the exception of Alloa, Carmuirs (Falkirk West) and Walker Street (Kincardine) park and ride sites, all other sites in the SEStran region operate direct services by rail and/or bus to Edinburgh City Centre. This provides a significant proportion of the SEStran population with public transport opportunities for their work commute to Central Edinburgh. However, for access to Edinburgh based jobs located outside of the central area public transport opportunities are more limited and fragmented, particularly when crossing the city.

Analysis of public transport routes for each of the SEStran transport corridors are focussed on the main artery connections into Central Edinburgh, with minimal opportunity for cross-city movements to be undertaken without having to first travel into Edinburgh City Centre. Outside the city centre, the principal areas of employment are the Eastern and South Western areas of the City. Due to the limited opportunity for efficient public transport journey times in comparison to car, the lack of opportunity to facilitate cross-city movements is likely to contribute to more car based travel for such journeys and impact on peak period congestion.

Opportunity: Facilitate Cross-City Public Transport Movements

Reasons for proposing:

- Improve public transport connectivity and penetration
- Reduce interchange penalties
- Improve bus journey times to key employment hubs in Edinburgh
- Potentially support reduced bus movement within the city centre network

Peripheral Park & Ride Sites

The majority of park and ride facilities have evolved in an organic fashion focussing on existing stations and parking opportunities close to existing public transport hubs. The success of strategically located park and ride sites such as Ferrytoll and Ingliston are widely documented and offer regular, high quality public transport connections into Edinburgh. This is evident form the corridor and site appraisal tables, where many of the park and ride sites are at capacity throughout the day.

Through consideration of the journey to work mode share data analysed, there are opportunities to encourage the transfer of commuters from cars to public transport for a portion of their trips.

The placement of park and ride facilities should be located adjacent to the strategic road network where possible and ideally prior to congested links and junctions that characterise the road network surrounding Edinburgh. Public transport prioritisation schemes and opportunities should be considered along the strategic and local links where possible to maximise the journey time savings to bus passengers.

The Park and Ride modelling, which assigned values to time, monetary and environmental benefits associated with mode transfer to public transport from private cars, identified that the greatest benefits occur when the majority of the trip is undertaken on a congested network. For example, a trip from Peebles to central Edinburgh utilises free flow links for approximately 80% of the distance travelled in comparison, in comparison to the final 20% of the journey. Consequently, maximising the benefits to Park and Ride users are focused on the strategic placement of facilities. This should be provided in conjunction with public transport priority measures to ensure improved journey times are achieved – otherwise Park and Ride will be ineffective and buses will join queuing traffic.

Opportunity: Strategic placement of Park and Ride Facilities

Reasons for proposing:

- Contribution to reducing traffic volumes on key links and junctions.
- Improved and consistent journey times for public transport users.
- Reduce congestion and improve air quality through encouraging non-car based journeys.

Park and Ride Digital Twin

In addition to the physical Park and Ride infrastructure, investment should also be prioritised in developing a real-time Park and Ride management plan. This would ensure a contemporary model of the Park and Ride network, and provide a more detailed appraisal tool to test interventions and response to travel patterns, ensuring future strategic investment decisions are optimised and targeted.

The monitoring of Park and Ride utilisation would also provide a means to identify trends while testing pilot studies or future interventions to provide an informed basis for strategic planning.

It is acknowledged that the 2009 Park and Ride strategy suggested the maintenance of a database for understanding the parking provision, utilisation and overspill at all sites within the SEStran region. This action was not progressed, however similar data is recorded and available through operator websites and local authority contact. Whereas the development of a Park and Ride digital twin will provide a more informative source and reference for future planning.

Improved understanding of the individual facilities will assist with the answering of questions associated with Transport Corridors 14 and 18 where it is unclear whether there is a capacity issue suppressing access to the Park and Ride sites or whether there is an issue associated with an aspect of the public transport journey e.g. over emphasis on changing mode at Edinburgh Park Station to tram, to access employment location.

Opportunity: Improved understanding

Reasons for proposing:

- Improve understanding of individual facilities demand fluctuations
- Provide evidence to support facility enhancements

Public Transport as a Service

A range of public transport operators currently operate within the SEStran region, comprising of commercial business and supported bus routes. Currently passengers are required to understand and inform themselves of the ticketing and pricing structure options of the service provider. However, taking the concept of Mobility as a Service (MaaS), public transport should be seen as a service and should embrace technological advances that will allow their customers to benefit from the network of services that best meet their requirements.

The adoption of the MaaS concept would allow the integration of multiple modes and transport providers into seamless journeys, with payments managed collectively for all stages of the trip. SEStran were previously involved in the operation of 'One Ticket' which aims to provide customer benefits through integrated ticket. However, the onus remains on the passenger to evaluate and purchase a dedicated ticket as opposed to the operators working together to deliver a user-friendly ticketing system.

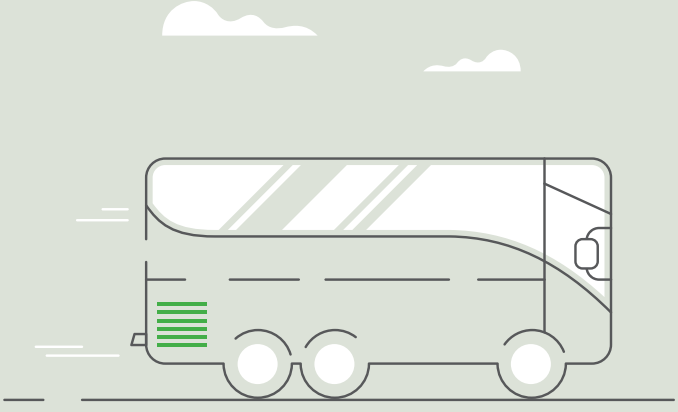
Opportunity: MaaS

Reasons for proposing:

- Improve benefits to passengers through facilitating choice.
- Automatically providing cost savings.
- Perception of seamless travel and impact of interchange penalty.

SESTRAN REGIONAL PARK AND RIDE STRATEGY

SEStran P&R Strategic Study Recommendations



7 SEStran Park and Ride Strategic Study Recommendations

This chapter sets out the key considerations for ongoing planning and delivery of Park and Rides. The primary focus is on the provision of sites which are accessible and attractive for cross-boundary travel, with any new investment focusing on sites which are shown to:

- be accessible from key strategic routes, which can maximise the shift from car to PT;
- maximise the potential reduction in congestion;
- integrate with high quality, frequent and efficient public transport corridors;
- be accessible by a range of modes, and not necessarily captive to car travel;
- offer 'value for money; in terms of benefits versus costs.

As part of the wider SEStran RTS, this Park and Ride study seeks to inform and shape the future role of Park and Ride in supporting the promotion of a sustainable transport hierarchy. On this basis, and in the context of Park and Ride, the RTS should be flexible and adaptable, responding to new interventions and evolving new transport and planning policies. Similar to the 2009 Park and Ride strategy, this study acknowledges the two key strands of travel which park and ride needs to reflect.

The first relates to travel on key commuter corridors which collect local catchments and feed major city centre and employment zone; and the second is more 'orbital' or inter-regional travel, including around Edinburgh and key settlements on the periphery of the city.

While rail based Park and Ride is more likely to be attractive for strategic commuter travel, the existing infrastructure is limited in terms of reserve car parking capacity and service frequency. The 'success' of the rail based sites does demonstrate the conditions which users expect from Park and Ride facilities – high frequency services with shorter overall journey times. Replicating this service should be paramount for any future park and ride site, where existing bus-based Park and Ride sites have shown mixed fortunes in terms of use and popularity.

Multi-modal Park and Ride Access

To inform the future investment decisions on site expansion and/or new site provision, the opportunity to improve site efficiency should be quantified and cognisance must be given to prioritising investment in supporting infrastructure. The strategic study has highlighted the current car parking demands, and in some cases overspill parking associated with a number existing Park and Ride sites. While this identifies the 'success' of the site, many of the sites are shown to be in close proximity to residential catchments and could be better served by active travel infrastructure and improved public transport connections.

As part of the SEStran RTS update, there is an opportunity to co-ordinate transport elements and findings from recent analysis, to integrate the park and ride data, active travel recommendations and Mobility Hub interventions. SEStran has also prepared a separate strategic study in relation to the provision and role of Mobility Hubs, taking cognisance of the Edinburgh City Mobility Plan and noting the potential for additional service integration through improved Park and Ride provision

Strategic Park and Ride Investment

Ongoing investment and where appropriate capacity improvements should be encouraged at local rail stations, particularly where there is evidence of sufficient residential catchments both in terms of walk, cycle and drive-in catchment. Any increased capacity should be evaluated relative to potential increased vehicle kilometres or impact on local community networks. Priority should be given to rail stations which have good strategic links and are easily accessible for all mode, including opportunities to interchange between bus and rail.

Priority should also be given to addressing localised parking issues at existing park and ride sites where there is evidence of overspill and excessive parking which impact on local residential networks.

While the term park and ride is indicative of car based travel, increasing car parking at existing sites should be assessed in the context of other opportunities to improve accessibility by active travel and bus. This may be addressed through investment at adjacent sites which could draw traffic and ease parking at more problematic sites which are not conducive to increased parking.

In relation to the existing Park and Ride sites, and taking account of current and potential growth in population (development led), there may be a need for sites to be accessed in the context of investment in active travel and public transport links versus additional parking capacity (e.g. local bus to train station). Where sites are limited in terms constrained land uses, facilitating more active travel trips where appropriate would satisfy the sustainable travel hierarchy while accommodating travel demands.

In accordance with the National Investment Hierarchy, public transport priority interventions should explore investment to support additional and new bus priority measures on the A8, A89, A90, A899, A702 and M8 corridors. These should ensure access to park and ride with immediate connection to bus priority lanes to offer meaningful savings in terms of journey times. The timetabling and service provision would also need to consider express and local service needs to balance journey time and catchment.

Policy Impact on Cross-border Transport Planning

The evidence has identified the concentration of travel demand to/from Edinburgh City Centre during the AM peak period, this is also shown to be tidal with a similar but less pronounced peak during the PM peak period. These trends and demands are likely to continue, with significant growth in housing developments around the periphery of Edinburgh and anticipated ongoing attraction of employment in the City. City Centre policies are aimed at controlling the impact of car based travel in the city, controlling environmental impact and improving the built environment for residents and visitors. As more stringent policies are adopted, the emphasis is on alternative modes of travel, and investment in public transport and active travel modes. As plans and interventions are developed for the city centres, cognisance must be given to journey origins and destinations from out with Edinburgh.

Across the SEStran region, transport authorities and operators should continue to engage and co-ordinate in relation to Park and Ride investment decisions, to maximise the potential benefits and efficiency savings for the wider transport network. For example, delivery of the proposed new Park and Ride facility at Kilpunt, in Broxburn, would benefit Newbridge roundabout and the A89 corridor into Edinburgh. This facility would require a

co-ordinated investment decision in bus priority measures in both West Lothian and Edinburgh, working collaboratively with operators and service providers.

The timetable for policy development and adoption presents a challenge for all authorities, with development plan and strategies published individually. In addition, national policy and strategic plans are evolving through the STPR2 review. Whilst this is an ongoing challenge for all involved, opportunities to better co-ordinate the preparation and development of these publications should be explored by SEStran as an ongoing objective.

The next stage for SEStran is to progress the development of the new Regional Transport Strategy, taking cognisance of this and other strategic study findings to ensure a co-ordinated and integrated cross-boundary vision for the future transport network.