Barrhead South Transportation Accessibility Appraisal

STAG Appraisal Report

November 2016

Prepared by: ..... [redacted]

Checked by: ..... [redacted]

Approved by: ..... [redacted]

Rev No	Comments	Checked by	Approved by	Date
1	Update following Demand forecasting plus minor edits	JC	JC	25/11/16

120 Bothwell Street, Glasgow, G2 7JT
Telephone: 0141 222 6400 Website: http://www.aecom.com

Job No: 60514187 Reference: draft re-edit Date Created: July 2016

Table of Contents

1 Introduction

1.1 Introduction

The purpose of this appraisal is to summarise the surface transport problems and possible solutions for the Barrhead South area of East Renfrewshire, including existing communities in Auchenback and West Arthurlie, newly created communities in Springfield and the expected development and growth of the Dams to Darnley Country Park.

The appraisal also seeks to reflect the wider impacts of transport solutions upon Barrhead as a whole, including areas identified for economic and social regeneration in the north of the town. The use of the Scottish Transport Appraisal Guidance (STAG) approach to this appraisal supports the determination of transport solutions for identified and/or perceived transport problems, using an evidence base.

As an objective-led rather than solution-led approach, STAG thus avoids pre-conceived solutions being brought forward without first considering other options which may also meet the identified problem or opportunities. The Transport Planning Objectives developed as part of this STAG Appraisal study therefore aim to capture the essence of the evidence-based problems to be addressed and any opportunities being developed.

1.2 STAG Appraisal

STAG is maintained by Transport Scotland to aid transport planners and decision-makers in the development of transport policies, plans, programmes and projects in Scotland. It is a requirement that all transport projects for which Scottish Government support or approval is required, are appraised in accordance with STAG[1].

STAG is one process containing the following stages:

- Pre-Appraisal: an analysis of present and future problems, constraints and opportunities; project-specific transport planning objectives are established with key stakeholders; and option generation sifting and development;
- Initial Appraisal *(STAG 1)*: initial appraisal and broad assessment of impacts to decide whether a proposal should proceed, subject to meeting the transport planning objectives and fitting with relevant policies;
- Detailed Appraisal *(STAG 2)*: detailed appraisal of the options taken forward from the initial appraisal with specific consideration to the Government's objectives (Environment, Safety, Economy, Integration, Accessibility and Social Inclusion), cost to government, monitoring and evaluation, risk and uncertainty.

Figure 1 presents the STAG process and illustrates how this report responds to the requirements of STAG.

[1] *Scottish Transport Appraisal Guidance* (The Scottish Government, Edinburgh, June 2008)

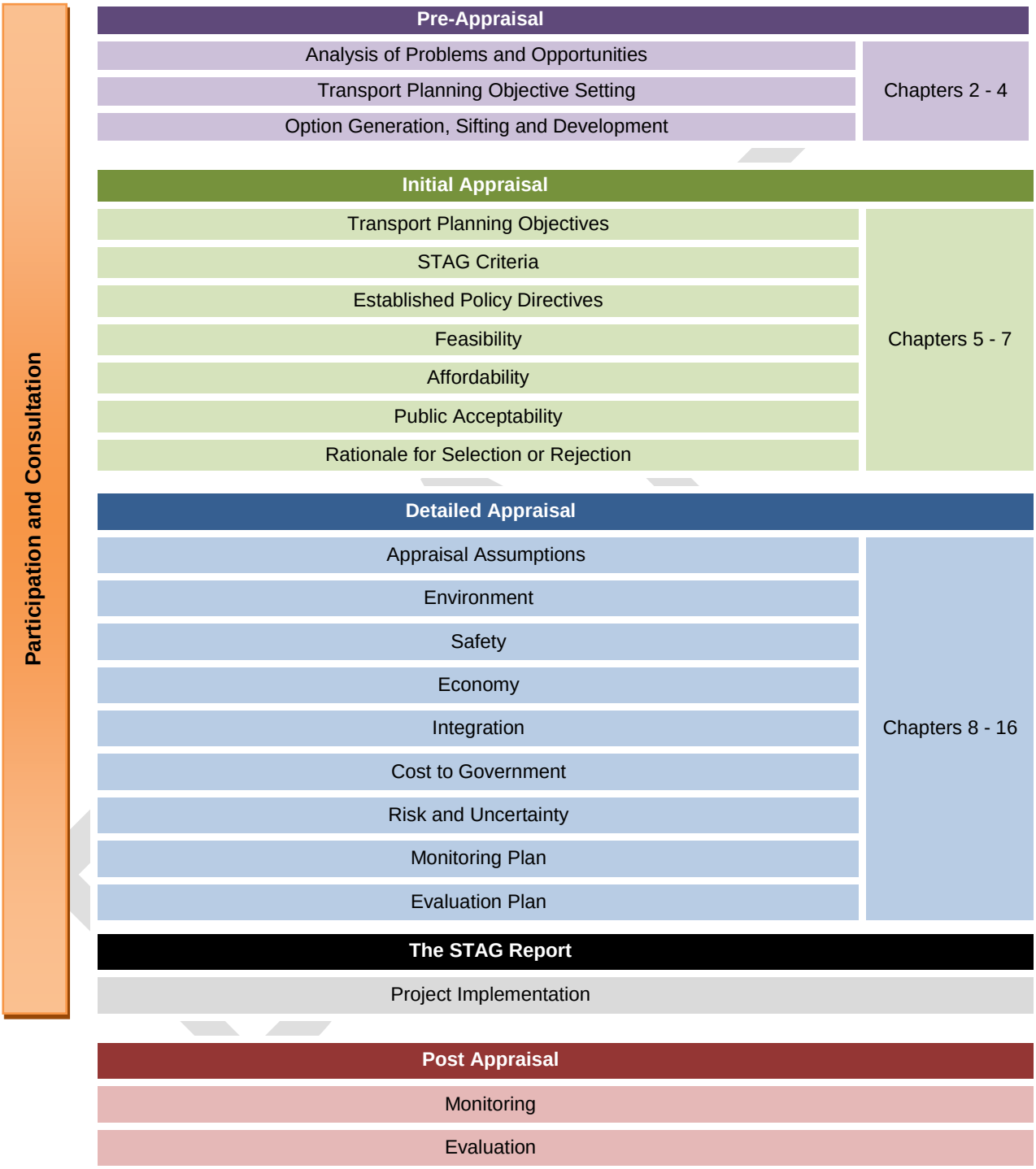

Figure 1 The STAG Process and Report Structure

1.3 Location and Study Area

The study area for this STAG Appraisal has been defined as Barrhead South comprising of Auchenback, Springfield, Arthurlie, the Dams to Darnley Country Park and the Barrhead South Strategic Development Opportunity which will see approximately 1,050 houses being built in the next decade. Barrhead South is a clearly-defined, predominantly residential, area to the south east of Barrhead Town Centre, East Renfrewshire. The location of Barrhead in relation to Glasgow City Centre and other East Renfrewshire localities is shown in **Figure 2**. The extent of Auchenback, Springfield and Arthurlie and the Dams to Darnley Country Park within Barrhead and the extent of the Barrhead South development is shown in **Figure 3**.

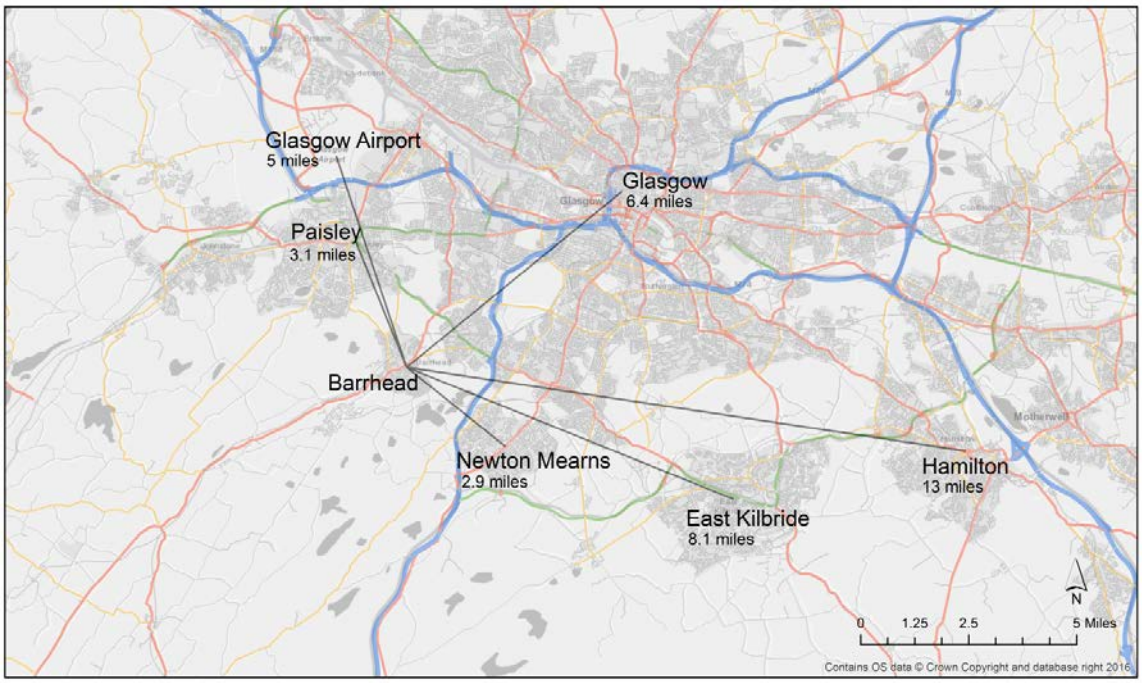

Figure 2 Map of Barrhead in relation to the surrounding area

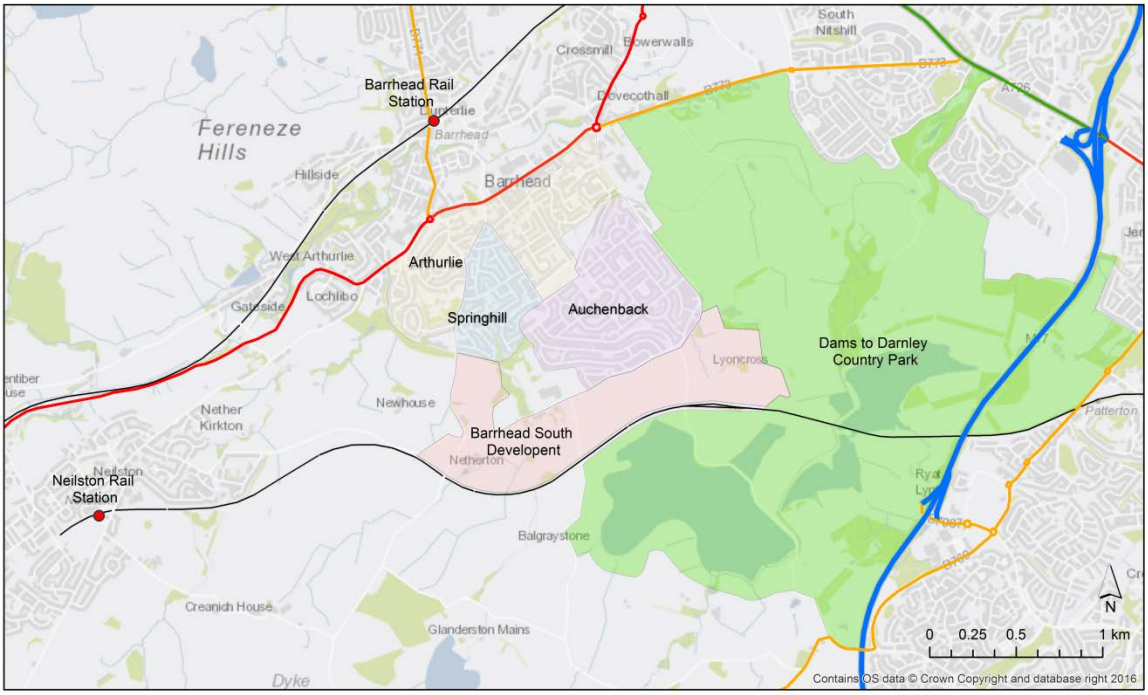

Figure 3 Map of Barrhead communities

1.4 Project History

A number of studies have been carried out in the study area over the past eight years with many of the developments coming to fruition, for example the Barrhead South Strategic Development Opportunity (more detail in Section 2.4) is now being progressed and the realignment of Aurs Road is scheduled for construction in 2018. The STAG has therefore had to evolve to take these into account. A brief history of the relevant studies is presented in **Table 1**.

Table 1 Project History

Year	Study	Author	Details
2006	Proposed New Station at Springfield between Neilston and Patterton: Technical Pre-Feasibility Review	Halcrow	Investigation into the technical aspects associated with the opening of a station. It does not address the operational requirements and capacity issues on the route, or the potential demand for the station.
2008	Auchenback and The Dams to Darnley Country Park STAG Appraisal	JMP Consultants on behalf of East Renfrewshire Council	Undertaken as part of the Auchenback and the Dams to Darnley Country Park STAG Appraisal. Sought to determine the necessary transport infrastructure required to realise economic growth and development opportunities in the Barrhead South area and recommended a package of infrastructure measures including a new railway station between Neilston and Patterton, with associated car park facilities, bus interchange measures and localised road improvement measures.

	Authority-wide STAG Appraisal into the strategic transport issues arising from the ERC Local Plan		Requirement by Transport Scotland
2010	Further STAG: Part 1 Appraisal of authority-wide Strategic Transport Issues	Atkins on behalf of East Renfrewshire Council	Recommended that six transport improvement packages should be prioritised in support of the development likely to progress within the lifespan of the new Local Plan. Due to poor economic conditions prevalent at that time, these packages did not include a railway station option for Barrhead South.
2011	M77 Masterplan Study	Jones Lang Lasalle on behalf of East Renfrewshire Council, Scottish Enterprise and Patterton	Proposed significant land use development to promote economic growth across the Barrhead and Newton Mearns areas and referred to a new rail station option in the Barrhead South area.
2013	Further appraisal of Barrhead South Local Plan Transport Options	Atkins on behalf of East Renfrewshire Council	Undertook a further appraisal of Barrhead South Local Plan Transport Options. That study followed the STAG Appraisal methodology and took account of new and proposed residential and commercial growth areas. Consultation took place with relevant stakeholders, including Transport Scotland's trunk road consultants (JMP) and a Stakeholder Engagement Workshop was held in May 2013.
2013	2008 STAG Appraisal refresh	Atkins on behalf of East Renfrewshire Council	Transport Scotland advised that they would require an updated STAG in support of the station project and agreed that the original STAG data could be brought up to date by way of a STAG refresh.
2014	'Auchenback Station' Rail Patronage Demand Analysis	Atkins on behalf of East Renfrewshire Council	To investigate rail service and timetabling issues that had frequently been raised during liaison meetings with SPT and Transport Scotland
2015	Operational Feasibility Study	Atkins on behalf of East Renfrewshire Council	Study of the technical feasibility of a new station to provide a sound basis for consideration of station infrastructure
2016	Revised STAG	East Renfrewshire Council	Incorporates and updates the appraisal work carried out previously, within the context of a wider Transportation Accessibility Appraisal for Barrhead South

1.5 Glasgow City Region City Deal Funding

The Glasgow City Region City Deal is an agreement between the UK Government, the Scottish Government and the following eight local authorities across Glasgow and the Clyde Valley:

- East Dunbartonshire Council;
- East Renfrewshire Council;
- Glasgow City Council;
- Inverclyde Council;
- North Lanarkshire Council;
- Renfrewshire Council;

- South Lanarkshire Council; and
- West Dunbartonshire Council.

The £1.13 billion funding is to support the eight local authorities in improving infrastructure, growing the life science sector, supporting business innovation and tackling unemployment. The City Deal aims to achieve:

- Improved infrastructure: £1.13 billion fund to support the delivery of an improved transport network across Glasgow and the Clyde Valley, key development and regeneration sites and improved public transport.
- Growth in life sciences: establishment of world class research and development and commercialisation facilities.
- Supporting business innovation: providing additional business incubator and grow-on space for entrepreneurs across the region enabling more small and medium enterprises to grow.
- Tackling unemployment: creation of thousands of new jobs and establishment of programmes to provide targeted support to 16-24 year olds and vulnerable residents, and testing new ways of boosting the incomes of people on low wages to make them more self-reliant.

The fund has opened up the opportunity for major infrastructure projects to be executed through a shared long-term vision supporting the local economy.

1.6 Report Structure

As presented in **Figure 1**, this report is structured in line with STAG as follows:

- Chapter 2 – Study Area Context
- Chapter 3 – Baseline Review of Socio-economic and Transport Characteristics
- Chapter 4 – Problems and Opportunities
- Chapter 5 – Objective Setting
- Chapter 6 – Option Generation, Sifting and Development
- Chapter 7 – STAG Part 1 Appraisal
- Chapter 8 – STAG Part 2 Appraisal
- Chapter 9 – Environment
- Chapter 10 – Safety
- Chapter 11 – Economy
- Chapter 12 – Integration
- Chapter 13 – Accessibility and Social Inclusion
- Chapter 14 – Cost to Government
- Chapter 15 – Risk and Uncertainty
- Chapter 16 – Monitoring and Evaluation
- Chapter 17 – Conclusions and Recommendations

The report is also supported by a number of Appendices:

- Appendix A – Consultation
- Appendix B – Established Policy Directives
- Appendix C – Appraisal Summary Tables (Part 1)
- Appendix D – Appraisal Summary Tables (Part 2)
- Appendix E – Demand Forecasting
- Appendix F – Equality Impact Assessment
- Appendix G – Option Summary Tables

2 Study Area Context

2.1 Introduction

This Chapter aims to set out the context of the study area through a review of the geography, Development Plan proposals and transport provision. The review of the current transport provision provides the background necessary to identify the problems and opportunities within the transport network that this STAG could address through option generation and subsequent appraisal.

2.2 East Renfrewshire

The East Renfrewshire Council 'Economic Development Strategy 2008-2013' reports that the authority covers an area of approximately 174 square kilometres and has a population of 90,000 residents and an immediate catchment population within a 15 minute drive-time of over 1 million people.

Figure 4 shows the extent of the Local Authority area. It shows that the north comprises the suburban residential areas of Newton Mearns, Clarkston and Thornliebank and the industrial town of Barrhead and that there is also an extensive rural hinterland to the south, within which the villages of Uplawmoor, Neilston and Eaglesham are located.

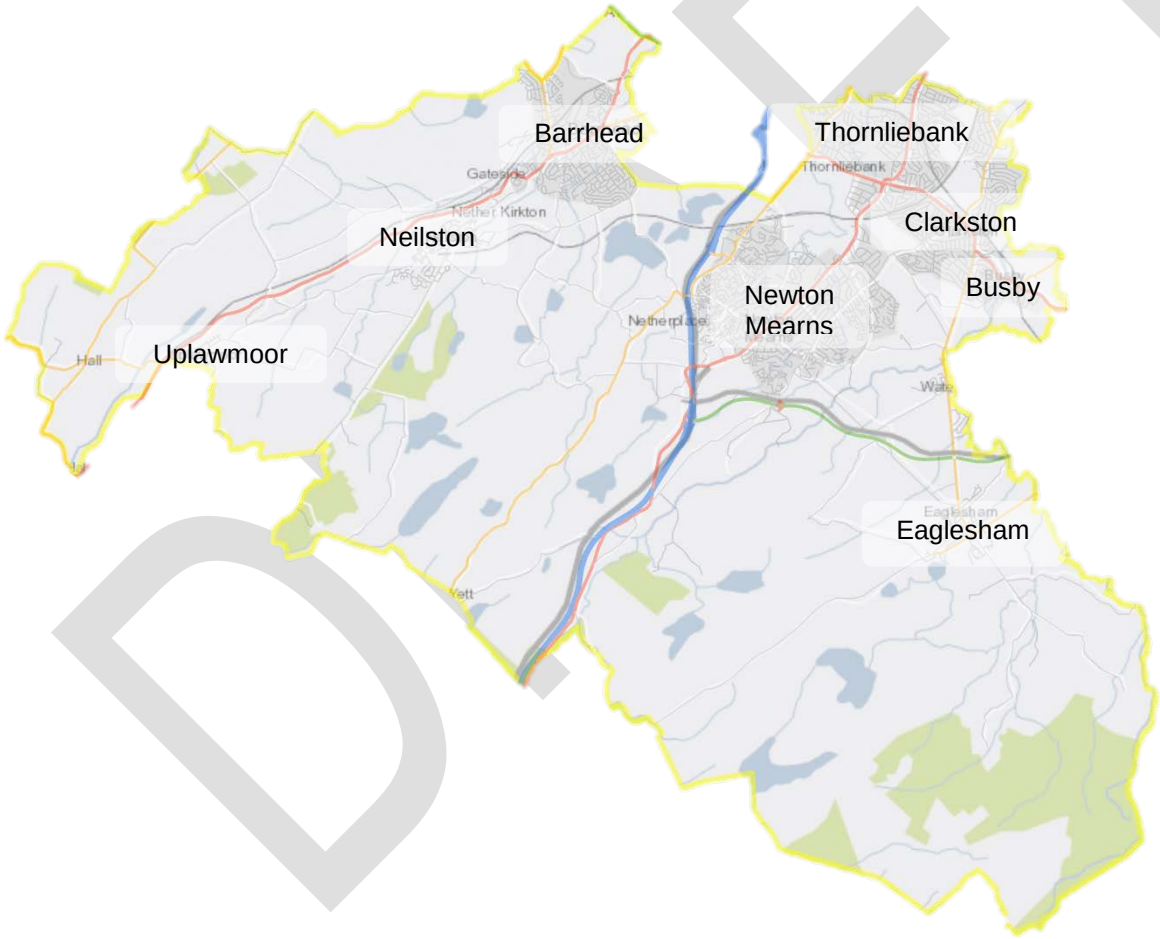

Figure 4 Geography of East Renfrewshire (Service Layer Credits: Contains OS data © Crown Copyright and database right 2016)

East Renfrewshire is one of Scotland's fastest growing local authority areas, with a strong housing market and many of the country's highest achieving primary and secondary schools. However, over the past two decades the area has seen the closure of several major employers such as Shanks, Nestle, Volvo and Arriva in Barrhead and Coats at Newton Mearns, with 2004 seeing the last manufacturing plant in the area to close.

Although growth in the service sector is starting to indicate signs of recovery, the net loss of over 1,500 jobs has dramatically affected the local authority area's economic performance. Whilst there is evidence that the East Renfrewshire economy is currently performing well in relation to national and regional indicators, there is now a limited window of opportunity to capitalise on major land use development opportunities and to reduce the social impacts of employment loss in Barrhead.

The East Renfrewshire Council Local Development Plan published in 2011 states that:

> ***"East Renfrewshire is regarded as one of the best places to live in Scotland; however, it is also an area of contrasts. While there are areas that are predominantly affluent and have high levels of employment and good health, there are also pockets of disadvantage and deprivation that are amongst the worst found in Scotland".***

The updated Local Development Plan published in 2015 further highlights that:

> **"*Significant changes are expected in future years, in particular an increasingly older population (over 65s). This has an impact on the type of housing and facilities that will require to be provided in future years."***

However, as the Local Development Plan 2015 discusses, the mix of residential, business and industry forming East Renfrewshire's built-up areas, ensures that the authority offers a good quality urban environment complemented by supporting land uses in the residential areas, such as schools, shops and community facilities.

Several key shopping and business destinations are situated close-by in surrounding local authority areas. These include Braehead Shopping Centre, Silverburn Shopping Centre and East Kilbride Shopping Centre. There are also plans for a business/commercial site to be developed at Greenlaw.

There is also a good network of important, local urban greenspaces comprising playing fields, woodlands, formal and informal parks along with amenity open spaces. It is this mixture of development that has contributed positively to the quality of life for residents and provides a robust model for the regeneration of areas such as Barrhead South (see below).

2.3 Barrhead

The town of Barrhead developed from four separate villages, during the 1700s. As a result of the formation of water mills along the River Levern corridor, the villages merged as they grew to form one of Scotland's first industrialised areas. The town continued to be characterised by manufacturing and industrial land uses throughout the 19th and 20th centuries. However, although still proud of its rich industrial and manufacturing past, these industries have since closed and the residents of Barrhead have suffered disproportionately in terms of job losses and plant closures, which has led to a drop in population and consequent social impacts on the community and local economy.

Barrhead is the largest town in the East Renfrewshire area with the southern and western extents bordering the rural hinterland. Due to its proximity, Barrhead has found new life as a popular commuter town for nearby Glasgow City Centre and to a lesser extent, Paisley. Its strong industrial and manufacturing heritage makes Barrhead similar in character to many medium-sized industrial towns in Glasgow and Renfrewshire and the town retains potential to be a major driver of economic growth in East Renfrewshire.

Despite the closure of local industries, leaving behind a town with fewer opportunities for employment and the associated socio-economic problems that this brings, the town has retained a strong and active community, hosting valuable facilities like its Sports Centre and providing excellent access to the many parks, rural paths and tracks that surround it.

In order to regenerate the area and provide an improved legacy for its future development, the 'Better Barrhead' initiative was developed and promoted by East Renfrewshire Council and local, regional and national partner organisations in 2008. This ten-year, £100m plan set out to ensure that Barrhead continued to meet the needs of its existing communities, businesses and potential investors, building upon existing local strengths to help make Barrhead an attractive and vibrant town in which to live, work and play.

To date, the project has delivered a new town centre supermarket, a health centre, upgraded Council headquarters and a community hub as well as significant town centre public realm improvements and a series of inter-linked environmental improvements at key sites in the town.

These investments have resulted in the creation of approximately 380 new jobs, with the associated footfall and economic activity arising from them, complemented by trips to the town centre generated by the local community, business partners, suppliers and others visiting and using the services they provide.

With a regenerated town centre, confidence levels amongst the town centre businesses have increased, with the town centre showing vacancy rates of only 4.9% in 2014 compared to 9.28% in 2001 (Source: East Renfrewshire Council Retail Monitoring Study). This demonstrates the resilience gradually building within the town centre throughout the 'Better Barrhead' regeneration strategy.

The confidence engendered amongst the private sector is also demonstrated by the way that local businesses are now seeking to manage local economic growth directly, through the formation of a Business Improvement District and also through the strong sense of community growing amongst residents.

The challenge of taking this transformation forward and continuing to build upon this progression is now being steered by the Council through its Local Development Plan 2015. This strategy balances the delivery of productive uses within the brownfield remnants of its industrial legacy along with a green belt release for residential development at Barrhead South to which it seeks to develop and improve access.

Through the funding made available to local authorities through the Glasgow and Clyde Valley City Deal Initiative, there is now a limited opportunity to realise further education and commercial business projects across Barrhead; opportunities for recreation within the Dams to Darnley Country Park; as well as supporting residential development and transport infrastructure, all within a common timeframe, thereby maximising their potential and sustainability.

2.4 Barrhead South

Barrhead South is the area that lies south-east of Barrhead Main Street (A736) on land that rises from the River Levern in the centre of Barrhead, southwards towards the Balgray Reservoir. The Barrhead South area has a resident population of just over 8,600 people[2] housed in a mix of Council-owned, local housing association and privately rented and owned properties. Housing quality is generally regarded as poor and the community sits within the lowest 15-20% of socially deprived community zones in Scotland. Local residents report a strong sense of community spirit and identity within the Barrhead South neighbourhoods of Auchenback, Springfield and Arthurlie and demonstrate a keen relationship with the surrounding area, as a place. **Figure 5** gives a sense of the place.

[2] Scotland's Census (National Records of Scotland, 2011)

Figure 5 Key areas within Barrhead South

Barrhead South is home to two primary schools, Auchenback and St Mark's Primary, and two secondary schools, St. Luke's High School which is located on Springfield Road and Barrhead High School located on Aurs Road. Much of the area is therefore relatively well served for education opportunities and above the 20% threshold for the education domain in Scotland according to the SIMD 2016 results[3].

Although some small retail units exist in Barrhead South, most residents rely on the wider range of community services available in Barrhead town centre and further afield. This results in a greater reliance on public or private transport to access services such as banks, retail, and health and community leisure facilities.

2.5 Barrhead South Development

The Barrhead South Development area is located to the south of Barrhead, bounded to the north by Springfield Road and to the south by the existing Neilston to Glasgow railway line. Often previously referred to as the Strategic Development Opportunity,

[3] Scottish Index of Multiple Deprivation (SIMD) (Scottish Government, Edinburgh, 2016).

the site extends to over 85ha in size and is located on the southern urban fringe of Barrhead South. It is expected that approximately 1050 homes are to be built in two phases; 470 homes by 2025 and 580 homes post-2025, as **Figure 6** shows.

The Council prepared a Development Framework for this site, setting out the Council's vision for the development and this informed the Master Plan for the area which is now contained in Supplementary Planning Guidance of the Local Development Plan 2015[4] and sets out clear guidelines for the residential development of Barrhead South. The 'Barrhead South Development' is now allocated in the East Renfrewshire Local Development Plan 2015[5] and is covered by Policy M2.2: Strategic Development Opportunity - Barrhead South.

Located along the M77 corridor, the Barrhead South Development Area is also a fundamental part of East Renfrewshire Council's M77 Strategic Development Opportunity, within which the Council supports planned economic growth in the M77 corridor. This development opportunity therefore forms one of the Council's key contributions towards the land use development identified by the Jones Lang LaSalle study[6] as having potential to make a substantial contribution towards Scotland's Gross Value Added (GVA).

[4] Local Development Plan Supplementary Planning Guidance: Barrhead South Master Plan (Geddes Consulting on behalf of East Renfrewshire Council, Edinburgh, June 2015)
[5] East Renfrewshire Local Development Plan (East Renfrewshire Council, June, 2015)
[6] M77 Corridor Masterplan and Development Framework (Jones Lang LaSalle, Glasgow, 2011)

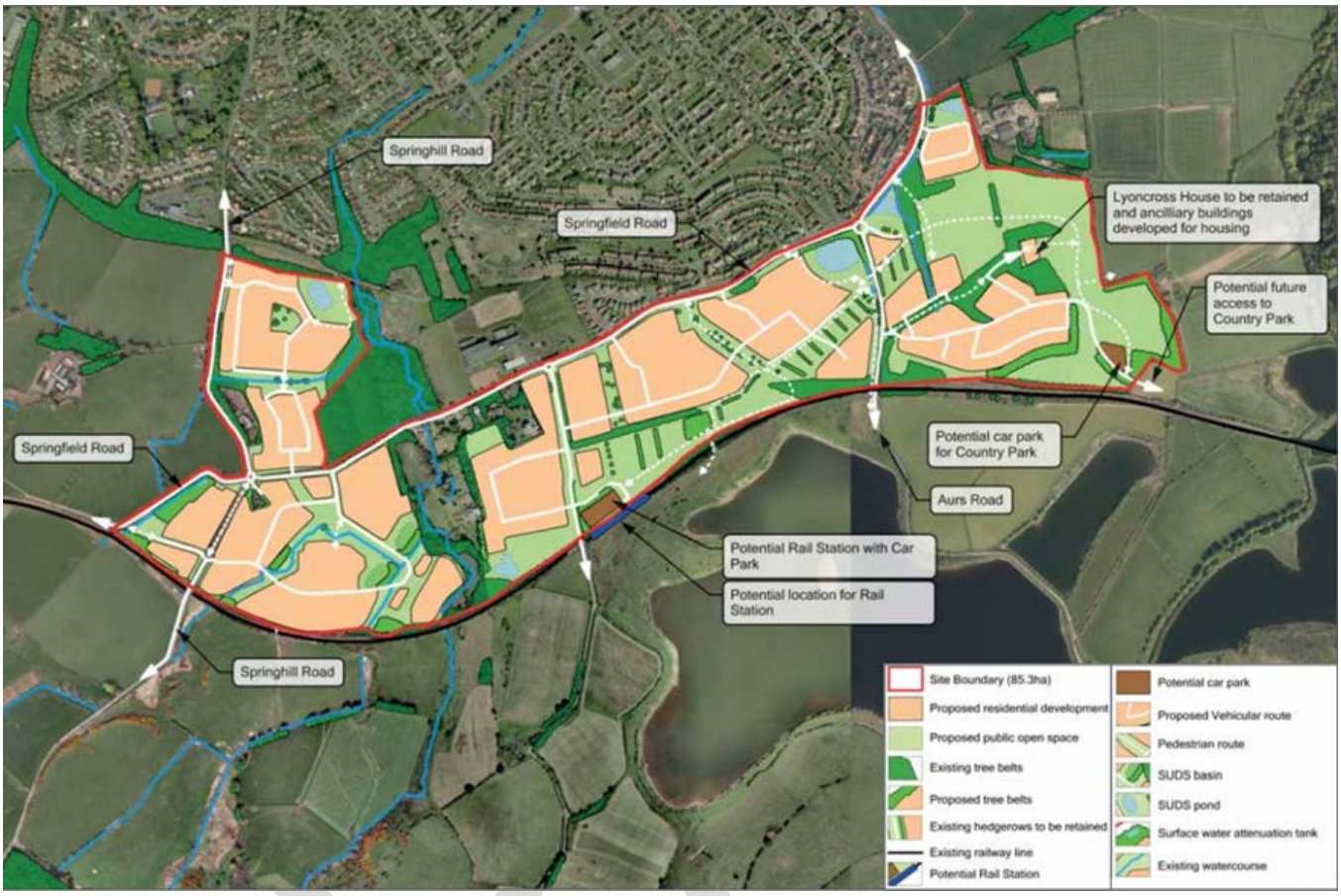

Figure 6 Barrhead South Development area plan (Supplementary Planning Guidance: Barrhead South Master Plan)

2.6 Dams to Darnley Country Park

The Dams to Darnley Country Park is a major countryside leisure and tourist destination project being led by both the East Renfrewshire and Glasgow City Councils. The project is supported by a range of other stakeholders and managed by a Joint Committee. The project seeks to improve accessibility and develop the Country Park and represents a unique opportunity to both maximise the recreational and environmental potential of an attractive and varied landscape and to improve its accessibility to local communities and visitors from further afield. The Country Park forms approximately 550 hectares of high quality greenbelt between the settlements of Barrhead, Newton Mearns and Darnley and borders the south-eastern edge of Barrhead South. Since the first meeting of the joint committee in 2006, there has been significant development of the Dams to Darnley Country Park with infrastructure improvements, numerous new paths, two new entrances and a new car park in the west of the Park.

The Gorbals Water Works Reservoir complex is the most striking feature lying within the Country Park which **Figure 7** shows. A series of interconnected reservoirs owned by Scottish Water are designated as Sites of Interest for Nature Conservation (SINC). The reservoirs are central to the Country Park and have a major significance to the study area given their location. The area also includes the Waulkmill Glen Site of Special Scientific Interest (SSSI), together with compartments of semi-natural, plantation and shelter belt woodlands.

Whilst there is currently no formal record of the number of visitors to the Country Park, a Recreation Study completed by the Moffat Centre for Travel and Tourism in 2008[7] highlighted that there are just under 1.5million people living within approximately 30 miles of the Country Park. Census 2011 data shows that approximately 126,000 people live within 3.5km of the Country Park and the Moffat report estimated that visitation levels currently range between 7,000-10,000 people annually.

Figure 7 Dams to Darnley Country Park

East Renfrewshire Council has produced a definitive set of visions for the Park within Supplementary Planning Guidance published in 2015, several of which have been implemented. These visions would improve the quality of, and access to, the Park thus attracting more visitors and providing a viable nature reserve. However, there remains to be surface access issues, especially for people travelling from further away. Further regeneration proposals for the Country Park that are emerging will turn it into a major regional tourist attraction for a range of interests, including walking, cycling, horse riding and non-motorised water based activities. If these proposals are realised, the Dams to Darnley Country Park Recreation Study forecasts that with associated investment in infrastructure and services, along with the development of destination awareness, visitor numbers could be expected to increase to exceed 250,000 visits per year.

2.7 Current Transport Provision

2.7.1 East Renfrewshire Road Network

The principal road network within East Renfrewshire is centred on the A77 / M77, A726 and A736 corridors. The M77 links Glasgow to Kilmarnock via East Renfrewshire; the A77 links Glasgow to Kilmarnock via Newton Mearns and Giffnock; A726 Glasgow Southern Orbital links the M77 to East Kilbride and the A736 links Glasgow to Irvine via Barrhead. According to the Local Transport Strategy[8] (page 21):

[7] Dams to Darnley Country Park Recreation Study (Moffat Centre , Glasgow, 2008)
[8] Local Transport Strategy 2008 – 2011 (East Renfrewshire Council, Thornliebank, 2007)

"All these roads cater for more localised traffic movements and access to local communities. It is important to ensure their dual role is taken into consideration when planning for the network".

Peak period congestion affects the M77 Junctions 5 to 1 in morning and evening peaks.

2.7.2 Barrhead Road Network

The existing road network around the study area is shown in **Figure 8**. The A736 passes through Barrhead to the north of Auchenback. At present, the main routes to the Trunk Road Network (TRN) and to Glasgow from Barrhead are firstly via the A736, B773 Darnley Road and the A726 leading onto the M77 at Junction 3 and secondly via Aurs Road linking indirectly through Newton Mearns to M77 Junction 4. M77 Junction 4 has only north-facing slips. Vehicles wishing to travel south on the motorway must travel via Junctions 3 or 5.

Peak period congestion on routes in and out of Barrhead has a significant impact on the town centre's viability. On-street parking was a key factor in this problem and through town centre regeneration the Council has provided a more structured approach to parking on Main Street. However, several key intersections within Barrhead continue to suffer from congestion and delay in morning and evening peak periods:

- Dovecothall roundabout – queuing on all approaches, especially Aurs Road/Darnley Road;
- Allan's Corner roundabout – queuing on all approaches AM/PM;
- Neilston Road / Lochlibo Road;
- Heavy right turn movements into Grahamston Road from Paisley Road;
- Queuing on Paisley Road / Cross Arthurlie Street; and
- Queuing on Carlibar Road PM.

Weekend traffic volumes are lower across Barrhead, yet the congestion in Main Street and traffic queues on all approaches to the Allan's Corner roundabout have a significant impact on the town centre's viability. Whilst no local congestion is reported within Barrhead South itself, residents are reliant on bus/car accessibility via the key locations noted above.

Several of the roads linking Barrhead to the south and west provide limited access due to height and weight restrictions and poor alignment. Restricted roads include but are not limited to:

- Aurs Road: vehicles weighing less than 3 T mgw only;
- Springfield Road: No Heavy Goods Vehicles;
- Springhill Road: vehicles weighing less than 7.5 T mgw only; and
- Balgraystone Road: vehicles under 4.0 m in height only.

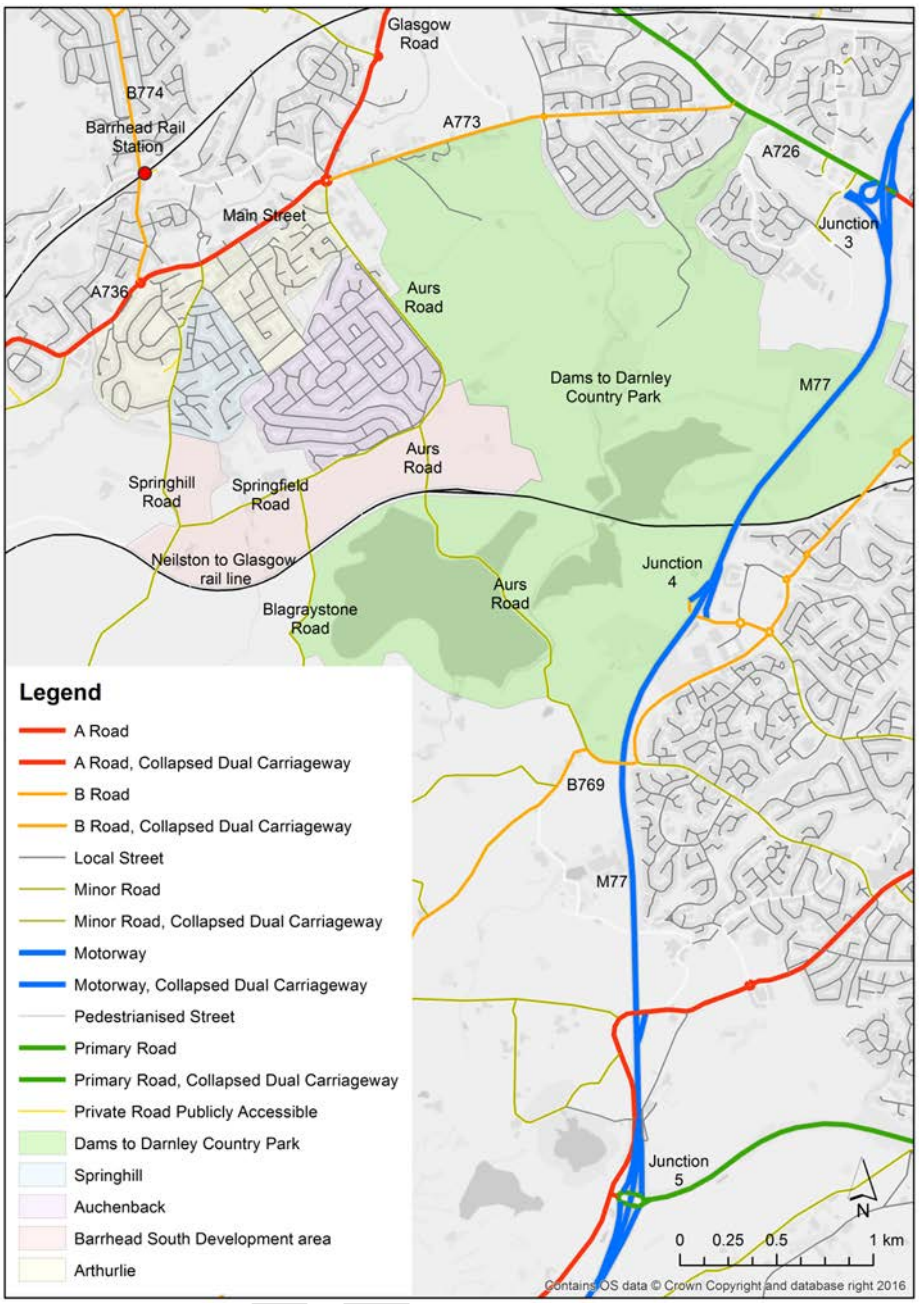

Figure 8 Barrhead Road Network

The local distributor route across the Gorbals Reservoir Complex provides single carriageway access to the M77 at Junctions 4 and 5 via the Aurs Road, although routes to both of these junctions are circuitous and vehicle classifications are limited by low-height rail and weak bridge structures. The Aurs Road links Barrhead South to the M77 at Junction 4 (northbound only) via the

A769 Dodside Road and Stewarton Road. An alternative route from Barrhead South to the M77 is via Aurs Road, the A769 Dodside Road, Malletsheugh Road and Ayr Road to join the A77 at Junction 5 for north/southbound movements.

The two main road links between Barrhead and Paisley are via the B771/B774 local distributor routes which link to southern Paisley via the A726/A761, passing through the south east and centre of Paisley. It is possible to access the M8 via Junctions 28/29, although routes into Paisley can be congested at peak times.

2.7.3 Barrhead South Road Network

The residential area of Auchenback is bounded to the east by Aurs Road, to the south by Springfield Road and to the west by Springhill Road. Aurs Drive, which runs north east to south west from Aurs Road to Arthurlie Road, marks the northern limit of Auchenback.

Within Auchenback, the streets are predominantly set out to form a network of local distributor roads and residential streets. This layout discourages significant amounts of through traffic, but road safety concerns have led to the introduction of traffic calming measures on some of the distributor routes. The majority of the internal residential roads are narrow which can cause problems as the high volume of on-street parking has reduced the carriageway space available for passing traffic. The road safety initiative, 'Twenty's Plenty' is operating within the Barrhead South area together with associated road calming speed humps on some streets. Continued investment is required in order to maintain satisfactory road conditions.

The LTS (page 21) states:

> ***'There are exceptions where a road performs an important role which they were not originally designed to do. The most notable example is Aurs Road which links Barrhead to Newton Mearns but is poorly aligned; weight and height restricted which leads to safety concerns. It is subsequently unsuitable for large volumes of traffic. It also acts as a link between Barrhead and the M77 but is unsuitable for this critical function'.***

Aurs Road is currently programmed for improved works to straighten out some links[9]. Some constraints however, remain such as the low bridge shown in **Figure 9**.

Figure 9 Low Bridge on Aurs Road

[9]:Local Development Plan Supplementary Planning Guidance: Dams to Darnley Country Park (East Renfrewshire Council, East Renfrewshire, June 2015)

2.7.4 Barrhead Public Transport Network

2.7.4.1 Bus Services

The main operator of bus services within Barrhead is McGill's, with Stagecoach also operating two services. Main Street (A736) and Paisley Road (B771) act as the principal public transport corridor for Barrhead with regular bus services to Paisley, Glasgow City Centre, Neilston, Pollok, Irvine, Ardrossan and East Kilbride. The McGill's bus depot is situated within Barrhead North and buses pick up passengers whilst en-route to their services outwith Barrhead. All bus services are operated commercially.

Table 2 and **Figure 10** detail the bus services currently operating in Barrhead. All services are operated by McGill's, with the exception of services X44 and X44B which are operated by Stagecoach.

Two services; the 51 and 3, specifically serve Barrhead South.

- Service 51: operates from Barrhead South, through Barrhead to Paisley town centre.
- Service 3: operates from Neilston, throughout Barrhead South to Glasgow City Centre.

Table 2 Barrhead Bus Services

Service Number	Route Description	Monday - Friday			Saturday			Sunday		
		Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus
X44	Ardrossan to Glasgow to Ardrossan	180	07:23	18:59	180	07:52	17:45	N/A	N/A	N/A
X44B	Irvine to Glasgow to Irvine	120	07:13	18:57	150	09:18	17:43	N/A	N/A	N/A
3	Neilston to Glasgow to Neilston	30	06:21	20:10	30	06:53	20:10	60	10:04	19:33
26	Barrhead to Glasgow to Barrhead	30 to 120	05:18	00:32	30 to 120	06:18	00:32	30 to 120	06:50	12:30
51	Barrhead to Paisley to Barrhead	10	05:59	23:29	10	06:29	23:29	30	07:22	23:21
52	Barrhead Circular	20	07:55	17:20	30	07:55	17:20	N/A	N/A	N/A
54	Neilston to Paisley to Neilston	20	06:39	20:14	20	06:39	20:14	60	09:53	17:13
64*	Barrhead to Gallowhill to Barrhead	15	05:32	06:51	20	06:36	07:48	120	07:26	19:05
66*	Barrhead to Paisley to Barrhead	15	06:14	06:29	N/A	06:28	06:28	30	09:42	10:12
395/6	East Kilbride to Uplawmoor to East Kilbride	60	08:19	18:07	60	08:33	18:02	N/A	N/A	N/A

*Services 64 and 66 pick up passengers in Barrhead only whilst en-route to their service routes which operate outwith Barrhead

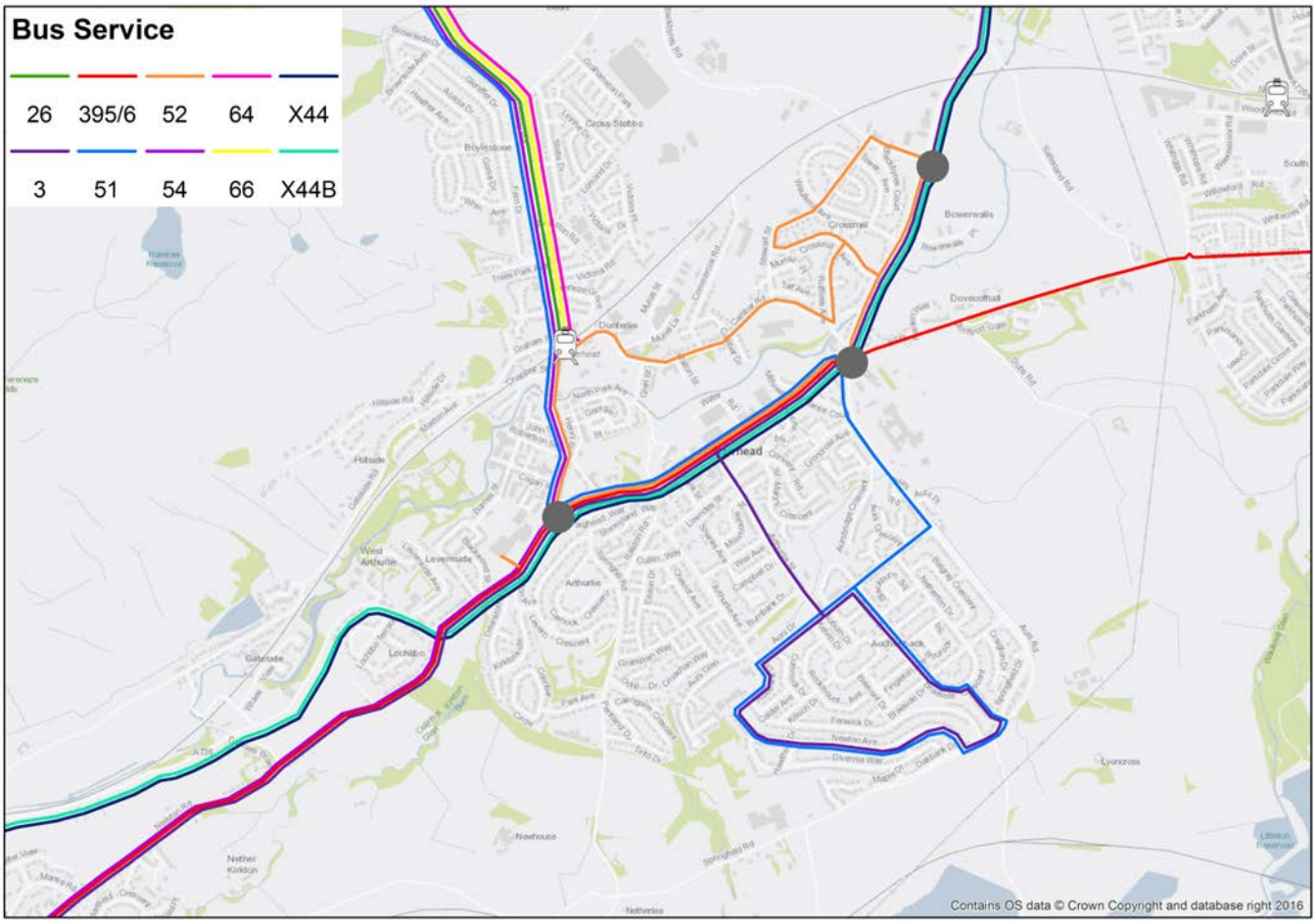

Figure 10 Barrhead Bus Routes

Barrhead town centre is generally well-served in terms of bus frequency, with 72% of bus stops being visited by at least 1 bus per hour between 7am and 7pm and 14% of bus stops served by at least 6 buses per hour. However, the bus services on offer are limited in their route choice, especially for east/west movements, for example from Barrhead to Newton Mearns, due to the poor alignment and height/weight restrictions present on Aurs Road and/or the alternative Balgraystone Road.

Barrhead South residents who rely on bus services therefore have reasonable access to Barrhead, Paisley and Glasgow during core operating hours, but limited access to other locations during the evenings and weekends. It is considered that links to Paisley adequately meet demand with half of the bus services serving Barrhead providing access to Paisley from 05:18 am through to 00:32 am on weekdays. Glasgow, by comparison, is less well-served by bus from Barrhead with a half-hourly service beginning at 6:17 am and terminating at 20:10 pm on weekdays.

Consultation (details in Appendix A: Consultation) revealed personal security concerns are reported to be a major constraint on evening use of public transport services. Furthermore, only one service provides Barrhead South residents with potential for rail interchange at Barrhead, which runs at 15/30minute headways on weekdays and weekends respectively.

During consultation (details in Appendix A: Consultation) it was reported that many Barrhead South residents use taxis for the return journey from Barrhead with shopping, as this short journey by taxi is not much more expensive than bus travel. Barrhead lies within McGill's GoZone 1 bus ticket option that offers the tickets detailed in **Table 3**. The ticket provides unlimited access to all services within Barrhead and services to Paisley and Glasgow City Centre. No comparable ticket is available for Stagecoach services.

Table 3 Details of advanced tickets available for purchase from McGill's for use on Barrhead bus services

	Day	Week	4 Week	10 Week
Adult	£4.00	£17.85	£58.80	-
Student	£2.75	£14.05	£49.35	£117.60
Child (U16)	£1.65	£6.60	£25.20	£58.80
Family (2 adults & up to 3 children)	£10	-	-	-

Site investigations have identified a relatively high number of bus stops in Barrhead South (27). This helps accessibility, however, with, on occasion, as little as 120m between bus stops this may affect the attractiveness of services due to the increased journey times associated with serving so many stops.

2.7.4.2 Rail Services

The nearest railway station to Barrhead South is Barrhead Rail Station, which is located on the Glasgow to Kilmarnock line and is situated to the north of Barrhead town centre, east of the B771 Paisley Road. It provides access to a weekday peak service of 4 trains per hour to/from Glasgow. The centre of the current Auchenback community, however, is 2,300m walking distance (approximately 30 mins) to Barrhead Rail Station.

Residents of Barrhead South wishing to use Barrhead Rail Station are faced with a substantial walk to Barrhead Main Street and then the need to access footpaths linking to the station or with having to make part of the journey by bus, taxi or private car, invoking an interchange penalty and additional cost. The topography of the area means that this journey incurs a downhill walk to the station and an uphill return.

Pedestrian access to Barrhead Rail Station from within Barrhead and Neilston was investigated and shows most of the Barrhead South area falls within a walk travel time (based on an average speed of 1.2m/sec) of between 20 and 30 minutes to Barrhead Station, which equates to a distance of 1.6km to 2.4km. Planning advice (PAN 75) recommends a maximum walk distance to a rail station of 800m and a maximum threshold for walking at 1600m, based on observed travel behaviour.

Neilston Rail Station is located south-west of Barrhead and south of Neilston village centre. This station provides access to rail services on the Glasgow to Neilston Line and serves existing commuter stations at Patterton Rail Station, east of the B769 Stewarton Road, and Whitecraigs Rail Station on the A77 Ayr Road before progressing to stations *en-route* to Glasgow City Centre. The centre of Barrhead South is 4,100m walking distance to Neilston Rail Station. This incurs a circuitous, approximately 57-minute walk or an 8-minute car drive or 15-minute bus journey. Much of the walking journey would involve the use of unlit rural single carriageway roads with no footways.

Patterton Rail Station is located in the north of Newton Mearns, directly east of Barrhead South on the opposite side of the M77 to Barrhead South residents. The station is on the same line as Neilston Rail Station, providing access to Glasgow City Centre. The centre of Barrhead South is 5,500 m walking distance to Patterton Rail Station which equates to an approximately 70-minute walk or 9-minute drive with the majority of the journey using Aurs Road.

Any decision whether to commute by rail is influenced by the perception of the total journey time and not just the duration of the rail journey element. Further factors influencing the choice of this mode of transport include the cost of rail travel, the service timetable and the availability of safe parking. The duration of the combined elements of the commuting journey, comprising the walk/bus ride to the station, finding a parking space (if driving) and waiting for the train - added to the train journey duration and the walk to a place of work - may be perceived as longer and less convenient by commuters, than a journey by car alone.

Table 4 shows the rail station entry and exit numbers for all rail stations within East Renfrewshire, and Figure 11 shows the average annual growth in passenger numbers over the past decade specifically for Barrhead, Patterton and Neilston rail stations.

Table 4 East Renfrewshire Rail Stations entry and exit numbers for 2013/14 and 2014/15 [10]

Railway Station Entries and Exits in East Renfrewshire		
Station	**13/14 Entries & Exits**	**14/15 Entries and Exits**
Barrhead	655,516	680,272
Busby	144,868	161,092
Clarkston	518,472	549,630
Giffnock	315,330	326,972
Neilston	416,712	418,768
Patterton	397,542	415,978
Thornliebank	217,158	230,406
Whitecraigs	278,746	296,752
Williamwood	220,244	228,512

[10] Office of Rail and Road, Estimates of Station Usage, Steve Davis Gleave (www.orr.gov.uk).

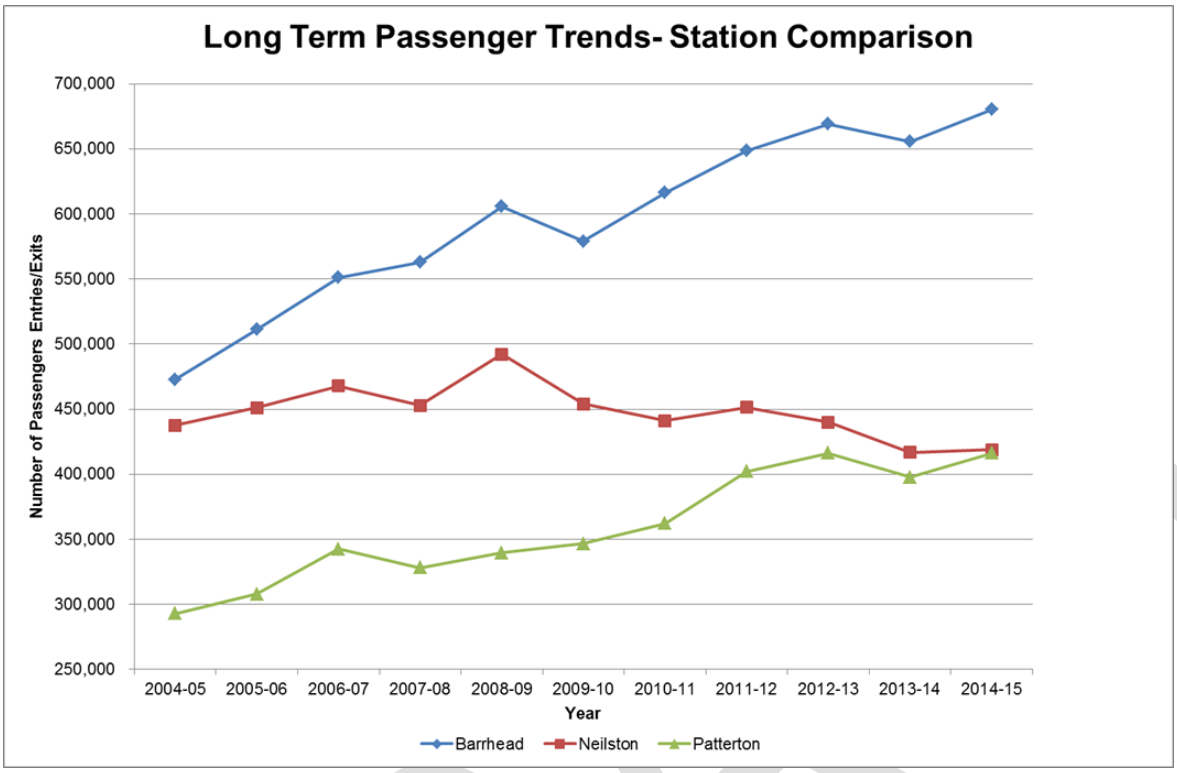

Figure 11 Long-term passenger trends for Barrhead, Neilston and Patterton Rail Stations[11]

Table 4 indicates that Barrhead rail station has the highest number of passenger entries/exits in East Renfrewshire, and Neilston the third highest. Figure 11 shows that average annual growth over the past decade for Barrhead rail station is 3.8% and nearby Patterton is 3.7%. Neilston rail station on the other hand had a reduction of 0.3% over the same period. This further adds to the evidence to suggest that Barrhead has adopted the role of a commuter town for Glasgow. The continued adoption of this role, coupled with an anticipated population increase from the Barrhead South development, will likely see such growth continue.

2.7.5 Barrhead South Pedestrian and Cycling Infrastructure

2.7.5.1 Pedestrian Infrastructure

Walking routes within Barrhead South are predominantly alongside the existing road network. Footways are provided on both sides of most streets, though limited maintenance of footways has led to some poor surfaces in places. In Upper Auchenback, a number of stepped lanes connect some areas and provide a considerable short cut compared to walking along the footways adjacent to the road. Local consultation (See Appendix A: Consultation) has revealed that residents have concerns about the poor maintenance of footways in the area and in particular the stepped lanes which present significant problems for residents with disability issues. These connecting lanes have inadequate lighting and do not have natural surveillance from the surrounding properties. This has led to personal security concerns from the residents and limits the willingness of many residents to use these routes, especially at night. An example of can be seen in the **Figure 12**.

[11] Office of Rail and Road, Estimates of Station Usage, Steve Davis Gleave (www.orr.gov.uk).

Figure 12 Stepped footpath off Divernia Way

There are a number of walking routes that link the residential areas within Barrhead South with Barrhead Main Street. The main pedestrian routes leading to the Barrhead South residential areas from Barrhead are along Aurs Road, Arthurlie Street, Arthurlie Avenue, Ralston Road and Springhill Road. The pedestrian footways linking Barrhead South to Main Street are approximately 1.5m in width with associated street lighting, and are considered to provide an adequate pedestrian link into Barrhead Town Centre for most people.

The topography of Barrhead South means that there is a significant gradient drop from upper to lower which can add time and considerable strain to a walking trip, especially for elderly residents and the less physically able. **Figure 13** shows the height differences within Upper Auchenback.

Figure 13 View South from Divernia Way showing the change in gradient

There are currently no national or regional walking network routes to provide for leisure/recreation walking activity in Barrhead South. There are, however, three Core Paths which facilitate, promote and manage the exercise of access rights under the Land Reform (Scotland) Act 2003:

- Aurs Road: Cowan Park to Dams to Darnley;

- Dams to Darnley: Springfield Road to Balgraystone Road; and
- Aurs Glen: Springfield Road to Springhill Road.

There are two established local walking network routes linking Barrhead South with the Dams and Darnley Country Park and leisure walking routes to the east and west:

- Barrhead to Fereneze Braes: A 5-mile walk from Barrhead to Fereneze Braes; and
- Dams to Darnley: A 7-mile circular walk within the Country Park.

2.7.5.2 Cycle Infrastructure

Cycle provision is generally poor in Barrhead and there are few formalised off-route cycle paths in the area. The path network within the Country Park, however, is “cycle friendly” and initiatives such as ‘Go Barrhead’ are encouraging residents to cycle. **Figure 14** forms part of the ‘Go Barrhead’ initiative and details recommended cycling routes. Two routes run through Barrhead South:

- <u>Cowan Park to St Luke’s High</u>
  - Route begins in Cowan Park, runs down Aurs Road, Aurs Drive up the hill of Roebank Drive onto Newton Avenue then through Aurs Glen to St Luke’s High School.
- <u>Main Street to the Dams Route</u>
  - Route begins in Main Street and runs up Springhill Road until Springhill and Auchenback Primary School before entering Aurs Glen which it runs through until reaching Balgraystone Road then into the Dams to Darnley Country Park.

Both of these routes require the cyclist to cycle on the road where no cycle lanes are present. All of the off-road sections of cycle path are within parks.

Despite the lack of cycle provision, residents using Google Maps to plan their journey to Glasgow City Centre would find that at some times in the day it is quicker to take the 47 minute cycle (from Fenwick Drive) into Glasgow City Centre than take a bus interchange option using Barrhead Rail Station taking 51 minutes.

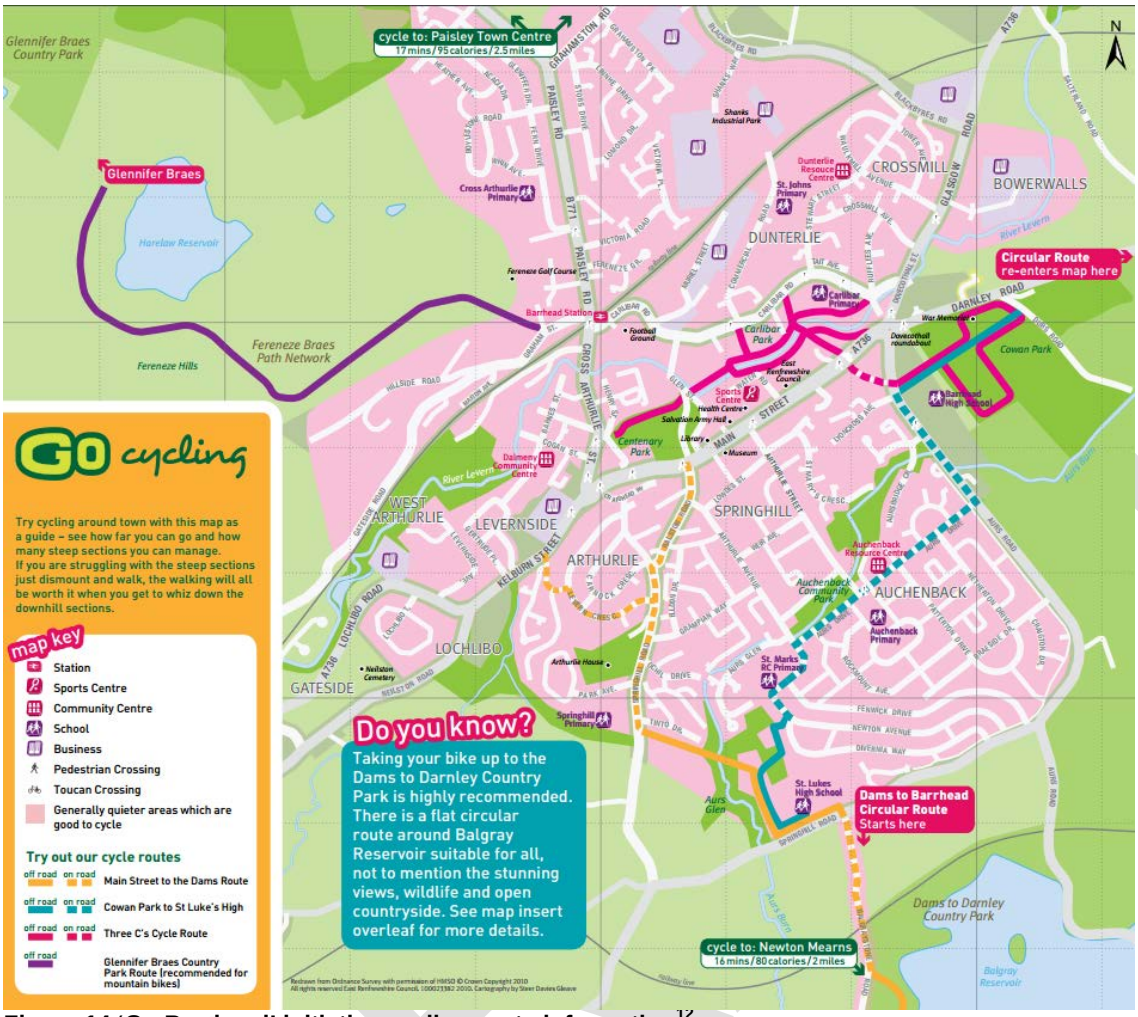

Figure 14 'Go Barrhead' initiative cycling route information[12]

2.8 Summary

This Chapter has provided context to the study area, including key geographic characteristics and current travel provision and transport infrastructure. The following Chapter will set out a review of the socio-economic and transport usage characteristics of the study area.

[12] Go Barrhead; Go Cycling (East Renfrewshire Council, 2010 (www.gobarrhead.co.uk))

3 Baseline Review of Socio-Economic and Transport Characteristics

3.1 Introduction

This Chapter presents an overview of the study area in terms of population demographics, economic activity and deprivation, along with transport patterns including travel to work. Consideration is also taken of issues relating to safety and security within the study area.

3.2 Demographics and Socio-Economic Characteristics

3.2.1 Population Structure

The 2011 National Census data was used to assess the existing population structure for the Barrhead South area. The breakdown of the population by age, shown in **Figure 15**, shows that the area has a larger proportion of those aged 75 and over than both the rest of Scotland and also Barrhead. It also indicates that compared to the Scottish average, Barrhead South has a low proportion of residents of working age, aged between 16 and 44 that has an impact on its economic performance. Furthermore, looking to the future, Barrhead South, like the wider authority area, has a higher proportion of 45 – 59 year olds than the Scottish average which indicates that provision for an ageing population should be a particular consideration for this area. The Local Development Plan 2015 recognises this problem which underlies the justification for many of the policies featured within.

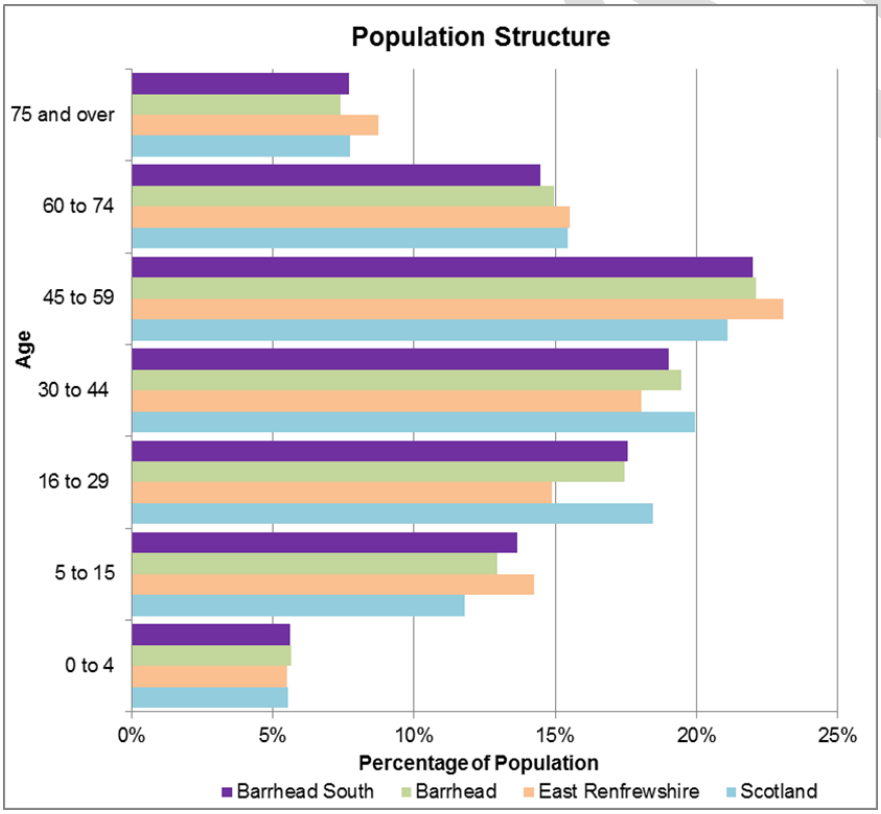

Figure 15 Breakdown of the population by age (2011 Census, Table KS102SC)

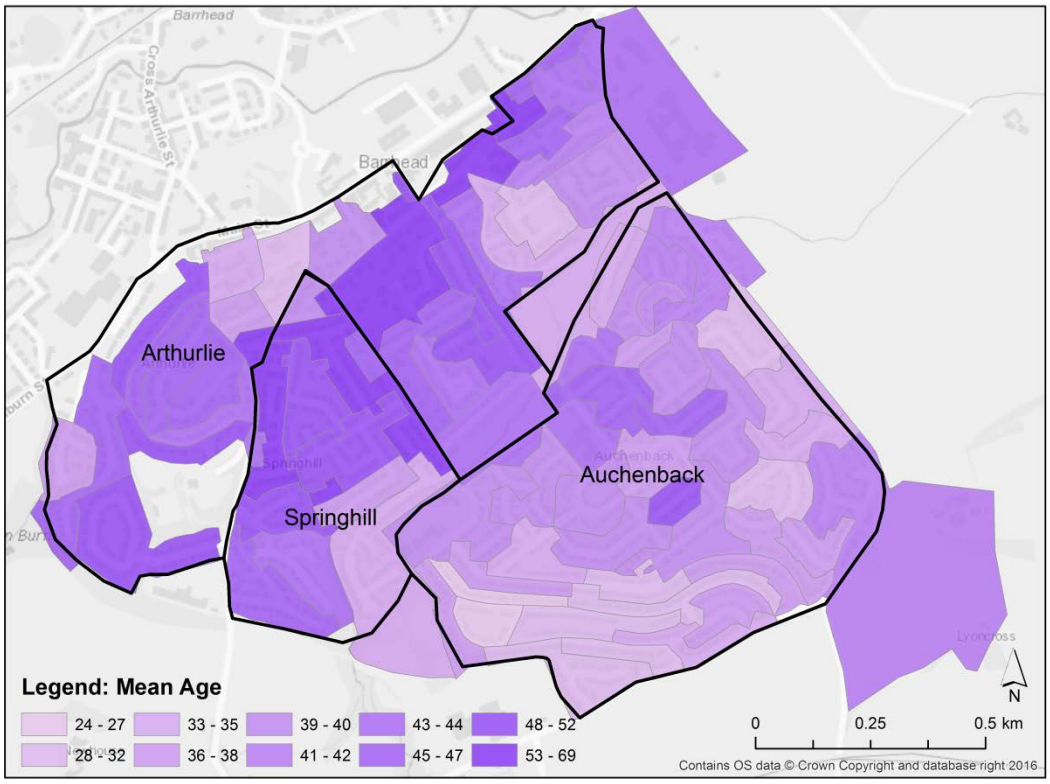

Figure 16 Breakdown of the mean age of residents within Barrhead South by output area (2011 Census, Table KS102SC)

Figure 16 shows the breakdown of the mean age of residents within Barrhead South and demonstrates a divide by age. There are obvious clusters, in Arthurlie for example, the mean age is 53 to 69 years whereas areas within Upper Auchenback have a mean age of 24 – 27 years.

3.2.2 Social Deprivation Rankings

The Scottish Index of Multiple Deprivation (SIMD) identifies concentrations of multiple deprivation across all of Scotland in a consistent way. It allows effective targeting of policies and funding where the aim is to wholly or partly tackle or take account of area concentrations of multiple deprivation. The SIMD also provides a relative ranking of the data zones in Scotland based on a weighted combination of data in the domains of Current Income, Housing, Health, Education, Skills and Training, Employment and Geographic Access and Crime. The most recent SIMD data for 2016 is presented at data zone level, enabling small pockets of deprivation to be identified.

Figure 17 shows the overall SIMD 2016 ranking for the data zones within Barrhead South. The data zones, which have a median population size of 760, are ranked from most deprived (1) to least deprived (6,976) on the overall SIMD and on each of the individual domains. The relative position of the data zones indicates how the combined socio-economic problems have impacted upon the single community area of Barrhead South.

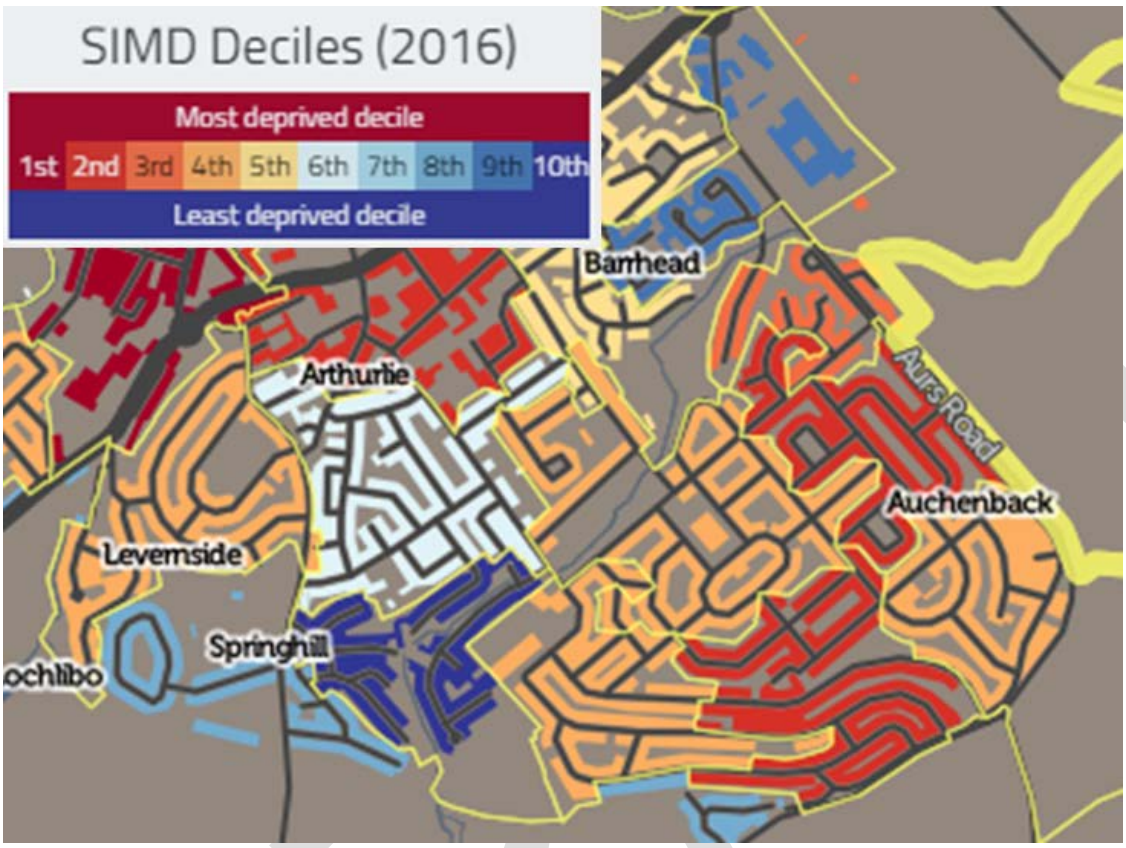

Figure 17 SIMD Index or Barrhead South (Scottish Index of Multiple Deprivation (SIMD), Scottish Government, 2016.)

The overall SIMD index is a weighted sum of the seven domain scores and three data zones within Barrhead South are in the 10-20% quintile (2nd Most Deprived Decile). One of the three zones has moved into this quintile in the 2016 SIMD rating period, two have remained and one has improved and moved from this quintile.

3.2.3 Economic

The East Renfrewshire Council 5-year Economic Development Strategy 'Growing Our Future'[13] links closely to the Scottish Government's stated economic commitment to:

> ***"Create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth".***

The transfer of Scottish Enterprise functions to local authorities has enhanced local economic development potential which, in tandem with Single Outcome Agreements, means that the Council is now in a much stronger position to lead on local economic development initiatives that will, ultimately, help achieve the Government's national outcomes.

[13] Scotland's Economic Strategy (Scottish Government, Edinburgh, March 2015)

The six key economic priorities for East Renfrewshire Council are to make the area;

- A place to run a business;
- A place to invest;
- A place to work;
- A place to learn;
- A place to live and be healthy; and
- A place to visit.

The closure of some of the area's major employers contributed to the loss of some 1,500 jobs across East Renfrewshire and the wider Clyde Valley. The social and economic impacts of these losses have been dramatic and Barrhead is showing only small signs of recovery, through growth in the local authority's service sector. **Figure 18** shows which sector Barrhead South residents are employed in. Compared with the Scottish average, a higher proportion of residents are employed within construction; wholesale and retail trade; administration; transport and storage; and human health and social work activities, and less in the manufacturing; accommodation and food service; information and communication; financial and insurance; and professional, scientific and technical sectors. Levels of activity in the agriculture, forestry and fishing; and mining and quarrying sectors are also lower than the Scottish average.

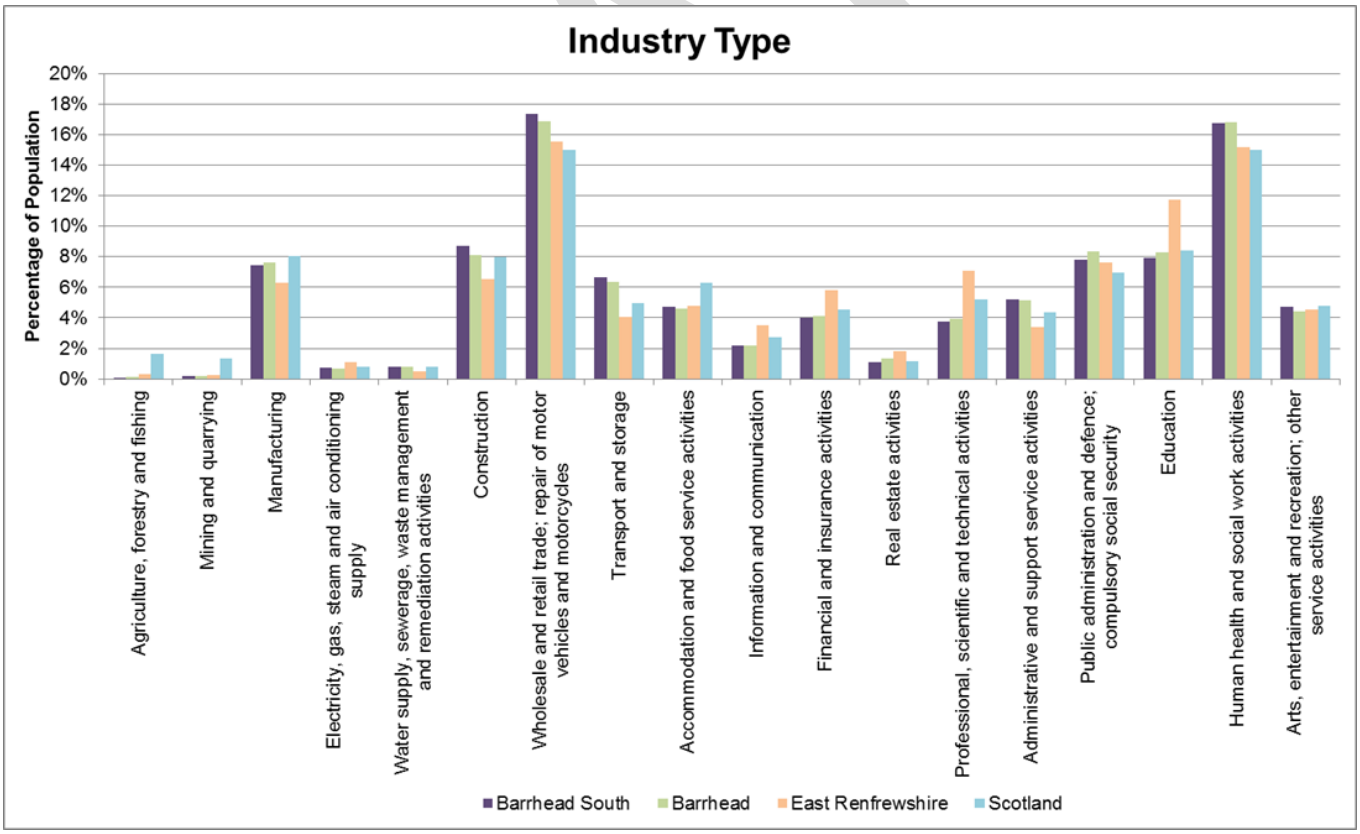

Figure 18 Graph of employment broken down by industry comparison (2011 Census, Table QS605SC)

In addition, due to poor infrastructure, a lack of effective business sites and the declining quality of existing commercial stock, the Barrhead area has failed to attract inward investment for some time. Barrhead's average house price of £134,314[14] is low compared with the local authority average of £241,364[15], which is the highest average in Scotland. High local residential land prices have compounded difficulties in bringing forward viable industrial and business sites in East Renfrewshire as a whole, which has limited potential for local job creation across the wider area, however Barrhead has the opportunity to attract industry and business through its lower value land.

Whilst the level of income deprivation for the whole of East Renfrewshire is below that in Scotland as a whole, with just under 8% of the population of East Renfrewshire recorded as income deprived compared with 13.4% across Scotland, the Barrhead South community is ranked in the lowest 5-10% of deprived areas for employment and in the lowest 15-20% of areas for income. The Council's Economic Development Strategy therefore seeks to address these inequalities by developing long-term land use development policies that ensure a future supply of sustainable, local employment opportunities.

At present 70% of the authority's working age population travels to work outside the area. East Renfrewshire Council aims to address these challenges by stimulating commercial development that will offer new local employment opportunities in key locations across the local authority area.

It is considered imperative that the Council creates a long-term spatial policy to ensure a sufficient supply of good quality employment land within its area. The ongoing regeneration of Barrhead town centre and associated business developments along the Glasgow Road corridor, alongside the creation of business, education and tourism developments elsewhere in the local authority area, all combine to provide a great opportunity to deliver major long-term economic benefits for Scotland.

To support this and relieve the pressure upon commercial sites, the Council has released a strategic development opportunity at Barrhead South, including residential land plots to accommodate 1,050 homes. It is intended that 470 homes are built by 2025 and 580 homes built post-2025. A development framework and masterplan identifies the objectives for the development and demonstrates how the development integrates with committed business and tourism developments in Barrhead North and the Dams to Darnley Country Park. To realise the economic and social benefits of this strategic development opportunity, significant improvements to transport accessibility are needed to provide greater coverage and choice, alongside improvements to public utility infrastructure.

3.3 Existing Transport Behaviours

3.3.1 Demographics - Car Ownership and Use

Figure 19 shows that the proportion of households with access to one car is similar at all levels, at around 42%. The proportion of households with access to two or more cars accounts for 32% of individuals in East Renfrewshire. This data is a reflection of the relative affluence of the authority area, particularly in comparison with the Scottish average, and may be an indication of the lower extent of public transport services available in residential areas.

[14] Rightmove, House Prices in Barrhead, 2016 (http://www.rightmove.co.uk/house-prices/detail.html?country=scotland&locationIdentifier=REGION%5E2951&searchLocation=Barrhead&year=1&referrer=listChangeCriteria)
[15] Statistical News Release (Registers of Scotland, 2016)

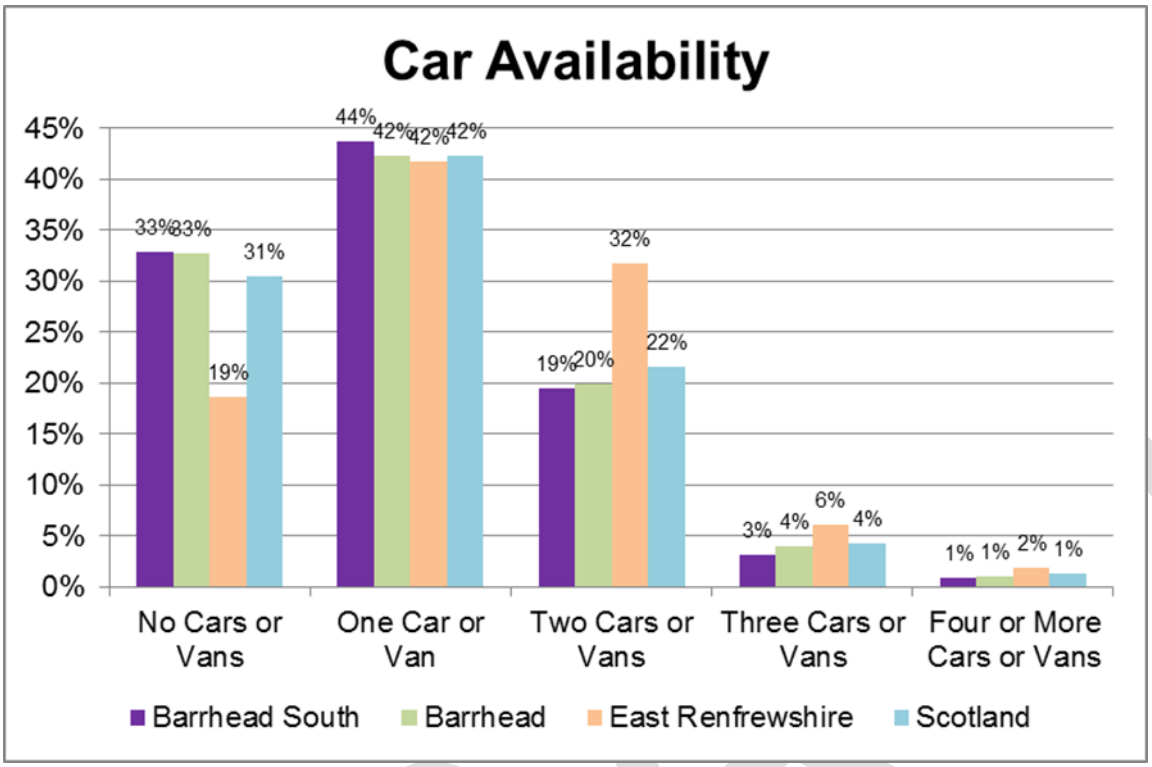

Figure 19 Graph showing car availability comparison (2011 Census. Table KS404SC)

However, the proportion of households in Barrhead without access to a car is higher (33%) than the local authority area (19%). The East Renfrewshire Council Local Transport Strategy asserts that:

> ***"….high levels of car ownership are not uniformly distributed across the authority area..."*** and
>
> ***"Car ownership is lower in the Barrhead and Neilston areas than it is in the rest of East Renfrewshire".***

Certainly, residential areas in the northern suburbs of the local authority area, which tend to be better served by public transport, also have lower levels of car ownership. The highest levels of ownership are evident in the most affluent areas, particularly Clarkston and the Greenfarm and Broom areas of Newton Mearns.

With relative affluence comes the ability to make more choices with respect to travel. Whilst areas of high car ownership may have poor access to public transport services, they will not be a priority for accessibility improvements, especially since the promotion of modal shift from private car to public transport can be challenging and time consuming.

With regard to Barrhead South, it is that segment of the population without ready access to a private car that is most likely to require good service levels of public transport, if they are to maintain or improve their access to essential services, employment and leisure opportunities. Both Barrhead and Barrhead South travel behaviours also exhibit relatively high proportions of taxi and/or minicab usage. This is a common feature of low-income areas and where there are low levels of car ownership.

3.3.2 Travel to Work Data

Travel to Work data from the 2011 Census has been used to analyse the distance travelled to work or study and therefore the inferred employment destinations and the method of travel to work or study. The travel to work characteristics of the census area statistical wards that make up Barrhead, East Renfrewshire and Scotland have also been analysed for comparison.

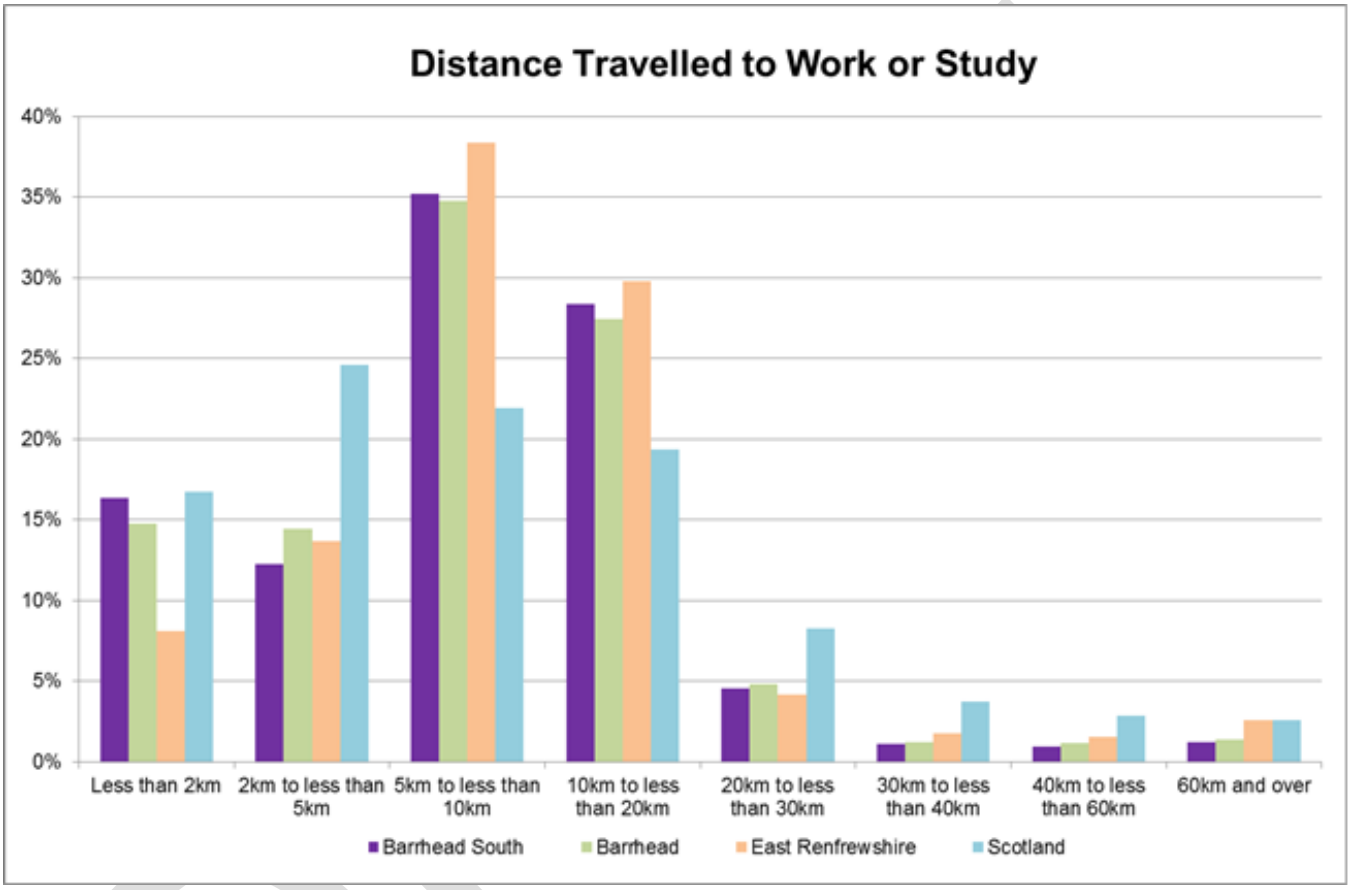

Figure 20 Graph showing distance travelled to work or study comparison (2011 Census, Table QS703SC)

Figure 20 shows the distance travelled to work or study and suggests that the main employment destinations for the residents of East Renfrewshire are located within the three authority areas of East Renfrewshire, Glasgow and Renfrewshire. This is in line with the 2001 Census Travel Flows data presented in **Figure 20**. Barrhead South residents, however, appear to be more likely to work locally (rather than in Glasgow) than other Barrhead residents, and reside considerably closer to their place of work than the rest of the local authority area. **Figure 21** demonstrates this. This is considered to be due, in part, to the relatively poor transport accessibility between Barrhead South and Glasgow City Centre and this may also contribute to the lower average income levels.

The residents of East Renfrewshire travel further to work or study than the national average with a high proportion of people travelling between 5km and 20km. This is representative of an area with a large number of people travelling to localities outside the Council area and shows that East Renfrewshire is dependent upon employment opportunities in Glasgow and beyond.

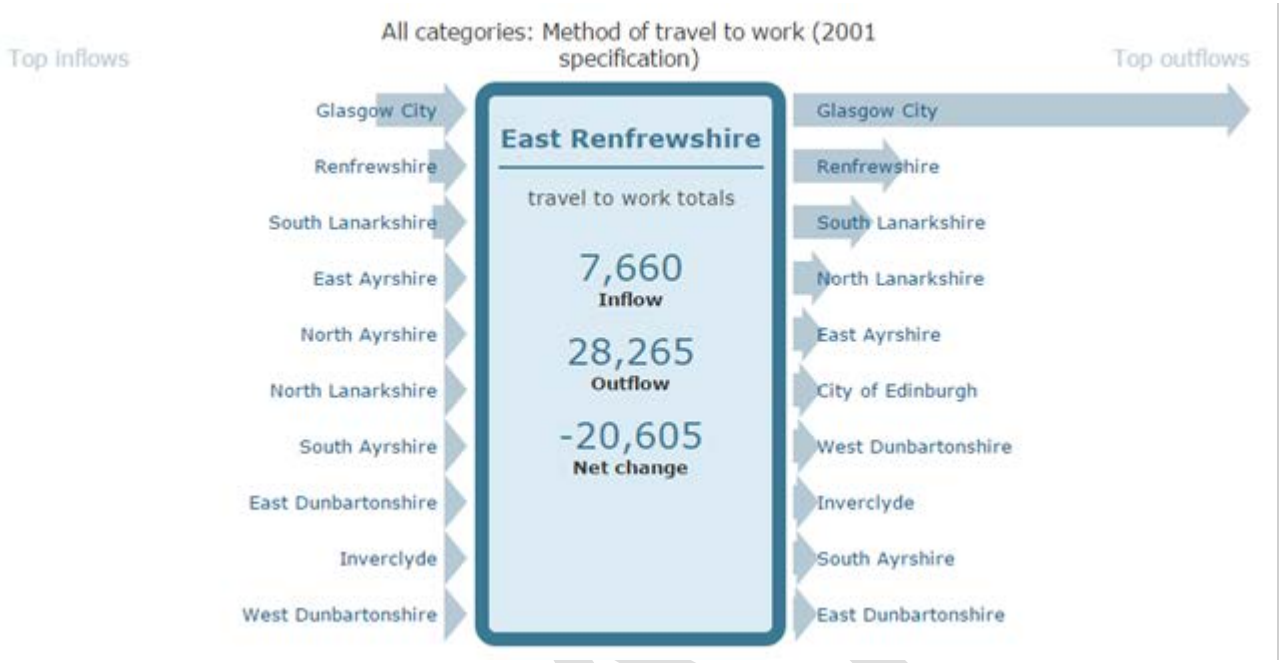

Figure 21 2001 Census Travel Flows for East Renfrewshire (www.nomisweb.co.uk)

According to the East Renfrewshire Council Local Transport Strategy:

> ***"Just 30% of residents work or study in East Renfrewshire with 45% travelling to Glasgow, 9% to Renfrewshire and 6% to South Lanarkshire. This highlights how dependent residents of East Renfrewshire are on employment opportunities in the surrounding area and the need for good transport links to them"***.

The LTS continues:

> ***"Trips to Glasgow City Centre display noticeably higher shares for public transport than those to other destinations. Indeed 64% of all journeys to work or study by rail are destined for Anderston or Merchant City. Destinations not located along an axis of public transport have much lower modal shares for bus and rail with commensurate increases in car usage. Some of the highest levels of bus usage are for trips to Paisley although car usage dominates for other destinations in Renfrewshire. Where a high quality public transport service exists, people are willing to use it otherwise the car is the preferred option".***

The LTS also states:

> ***"People are increasingly inclined to travel further to access services and employment opportunities as improvements to transport have made this possible without significantly increased journey times".***

According to the 2011 Census the average distance travelled to work or study by residents of Barrhead South was 10.1 km and 10.3 km for Barrhead residents. The average distance travelled by residents of East Renfrewshire as a whole was 11.7 km and the Scottish average also 11.7 km.

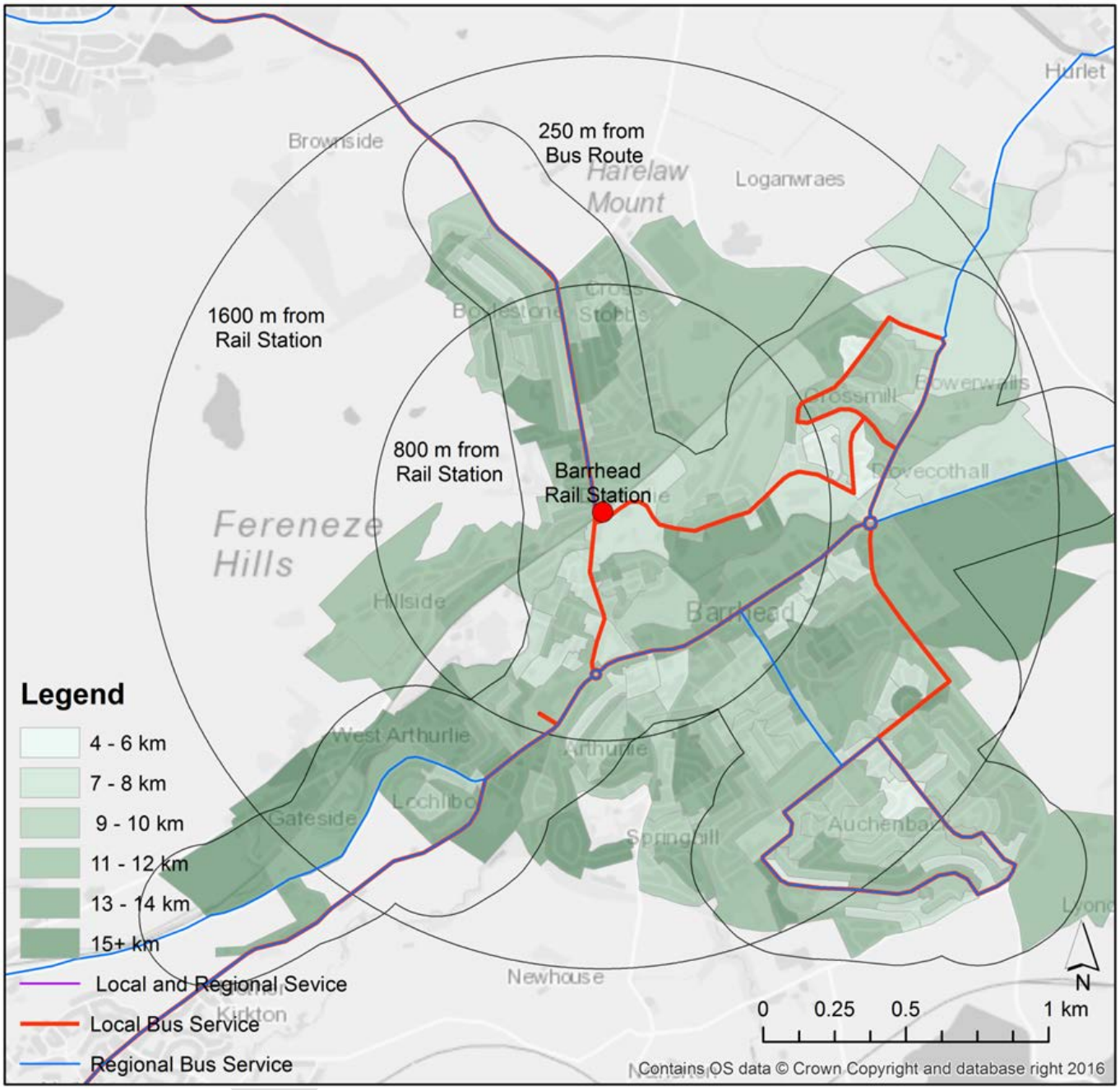

Figure 22 Map showing the mean distance Barrhead residents travel to work by output area overlain with public transport provision (2011 Census, Table QS703SC)

Barrhead South residents therefore travel at least 14% less distance to employment than residents in the wider local authority area which, coupled with the fact that 36% of Barrhead South residents are also employed within East Renfrewshire, may point towards the more limited public transport accessibility of this area to Glasgow City.

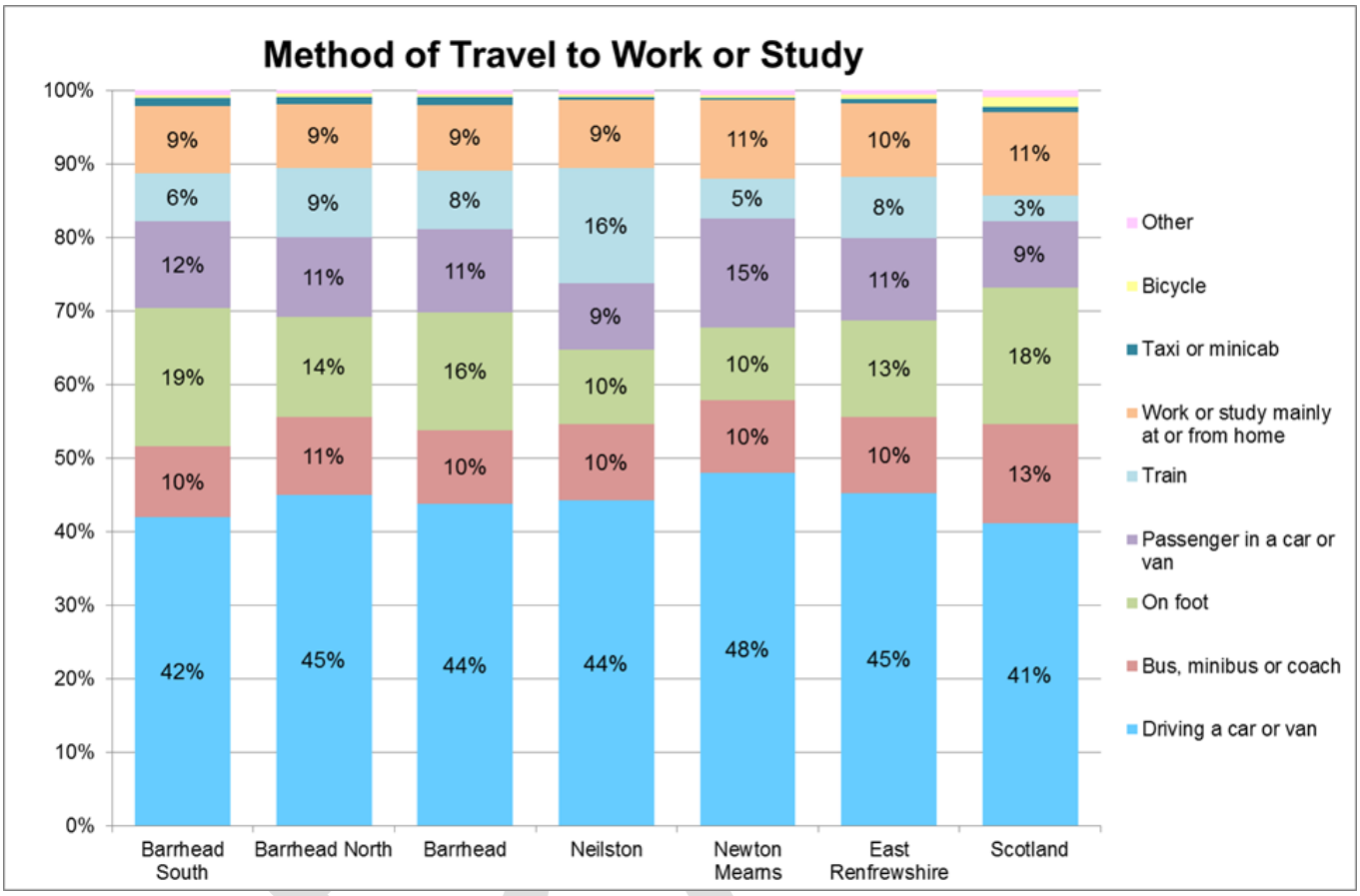

Figure 23 Graph of the method of travel to work comparison (2011 Census, Table QS702SC)

The method of travel to work or study is shown in the graph in **Figure 23** and the breakdown of bus and train use within Barrhead shown in **Figure 24**. It shows that generally, residents living outwith the 800 m boundary from the rail station use the train less than those who reside within a reasonable walking distance. Where train use is low, bus use is high. **Figure 23** shows the rail mode share for Barrhead (excluding Barrhead South) is 8%, which is higher than the national average of 3%. This is likely to be due to the location of Barrhead Rail Station which is relatively accessible for the majority of the residents within Barrhead.

The rail mode share is higher for those Barrhead wards located closest to Barrhead and Neilston Rail Stations and thus more accessible by walking. Certainly, Neilston has a very high rail modal share of 16% and this is considered to be influenced by its close proximity to Neilston Rail Station. The rail mode share for Barrhead South is lower (6%) when compared to the whole of Barrhead (9%), which is likely to be due to its location on the south-eastern periphery of Barrhead, some distance from Barrhead Rail Station.

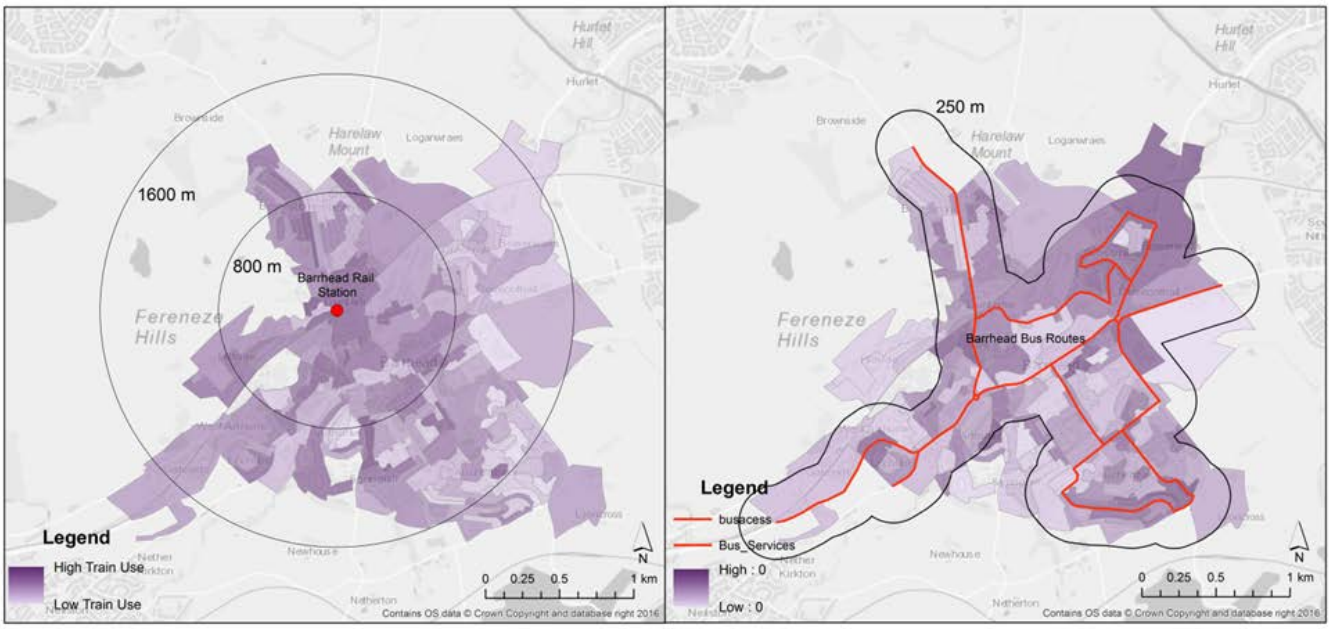

Figure 24 Maps showing the breakdown of rail and bus use to travel to work or study by output area in Barrhead (2011 Census, Table QS702SC)

The walk to work or study mode share for Barrhead South is higher than the national average, and it is noticeably higher than that for the rest of Barrhead and East Renfrewshire. This is possibly the consequence of a greater number of Barrhead South residents seeking local employment within Barrhead than residents in the rest of Barrhead, where walking to the station is a viable option for many people. **Figure 25** demonstrates a higher proportion of 'travel to work journeys' from Barrhead South being less than 2km in length. The areas where the 'travel to work' on foot journeys are highest coincide with the areas that have the highest levels of deprivation according to the SIMD.

As stated above, 36% of Barrhead South's full time employed residents work within East Renfrewshire with trips heavily concentrated on six wards within East Renfrewshire, five of which are within Barrhead itself. This could be due to a number of factors including convenience, the types of employment that residents of Barrhead South prefer to undertake or are qualified to do as well as the limited strategic transport choices available.

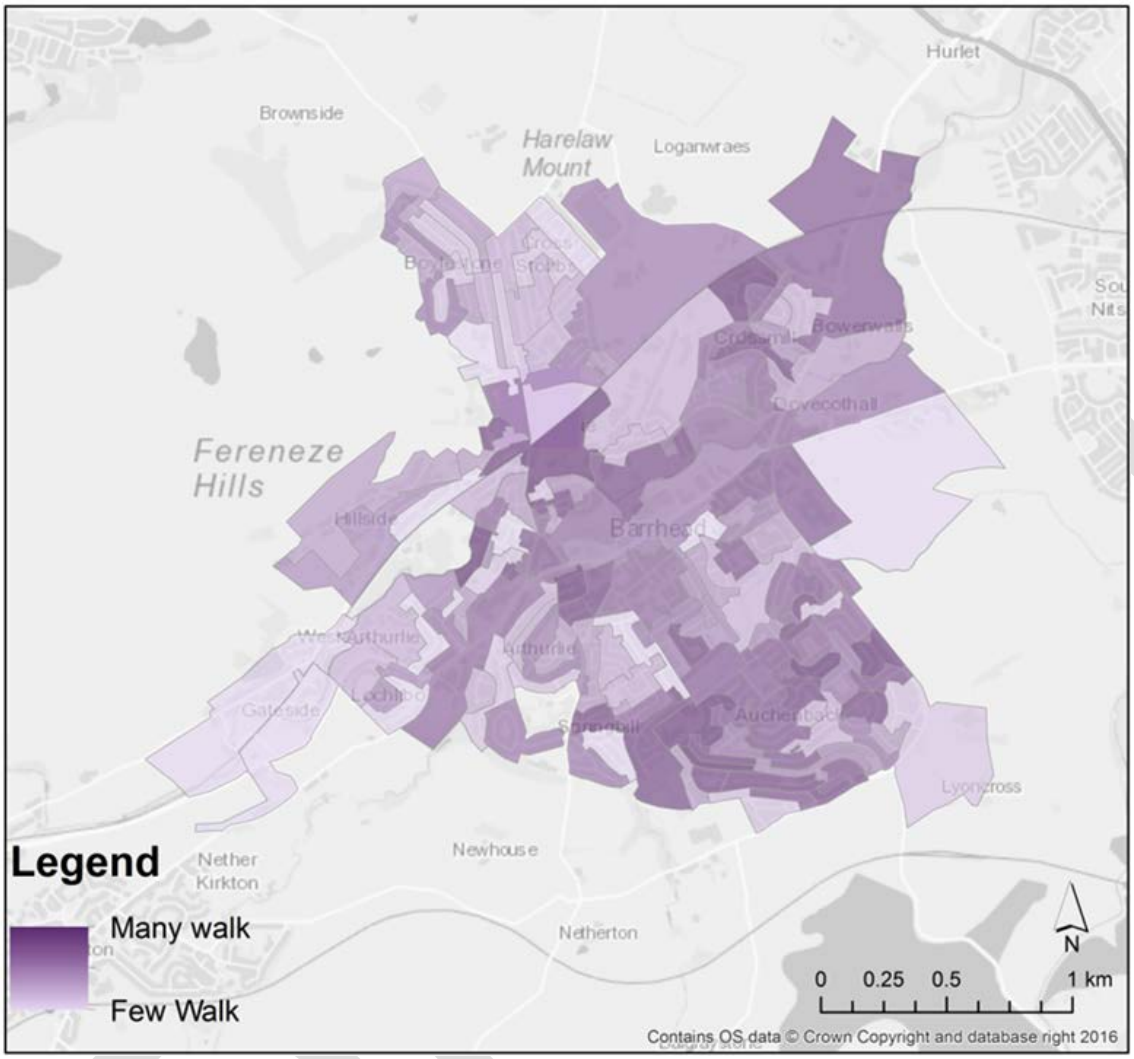

Figure 25 Map showing the breakdown of those who walk to work or study in Barrhead by output area (2011 Census, Table QS702SC)

3.4 Safety

Safety concerns were raised consistently throughout public consultations (details in Appendix A: Consultation), particularly in relation to the following aspects:

- Road traffic accidents;
- Pedestrian access to the Dams to Darnley Country Park; and
- Stepped lanes and inadequate lighting.

The Police Scotland Multi Member Ward Plan 2016[16] for Barrhead identified four key priorities;

- Drug Dealing and Drug Misuse;
- Violent Crime;
- Drunkenness and Antisocial Behaviour; and
- Dishonesty.

This signifies that there are personal safety fears for many residents, which also inhibit and influence their travel choices. Local people believe the cause of social problems to be, in part, due to a lack of access to employment, leisure and social facilities especially those available for young people.

3.4.1 Road Traffic Accidents

Figure 26 shows that in the past decade there has been a slight downward trend in the number of accidents but an average of six per year. In the past five years twenty-nine road traffic accidents have occurred in Barrhead South and on Aurs Road. All twenty-nine accidents have been categorised as 'Slight' which is defined as:

"One in which at least one person is slightly injured but no person is killed or seriously injured".

Nine of the accidents have involved pedestrians with three of those being children and one child cyclist.

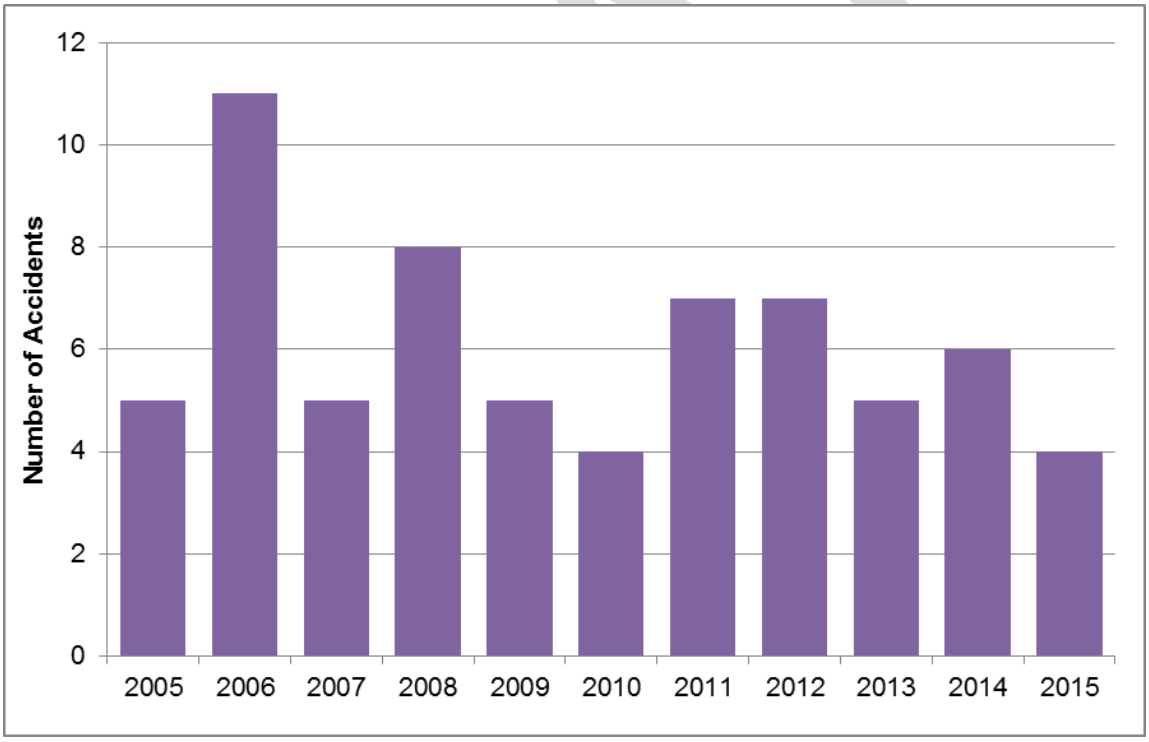

Figure 26 Graph showing the number of road traffic accidents in Barrhead since 2005 (www.crashmap.co.uk)**.**

[16] Barrhead Multi Member Ward Plan 2016 (Police Scotland, Giffnock, 2016 (http://www.scotland.police.uk/assets/pdf/142349/glasgow/345616/barrhead-mmwp-2016.pdf?view=Standard))

Figure 27, a photograph of Aurs Drive, shows that safety features have been removed and that the road markings are faded.

Figure 27 Aurs Drive

More recently, concerns have been raised regarding children's road safety awareness and inappropriate on-street parking after, two children were knocked down at the same site on Fenwick Road within a two week period in two separate incidents[17]. A further concern that has been raised is the speed at which the ten buses an hour travel along Braeside Road[18]. Those residents with concerns are aspiring for the bus route to be changed to avoid Braeside Road.

3.4.2 Dams to Darnley Country Park Access

During consultation (details in Appendix A: Consultation) safety and security concerns were raised regarding inadequate access to the Country Park. The Park has two official entrances from Barrhead South which are unlit as shown on the map in **Figure 28** provided on the Park's website. The alignment of the access paths however is such that visitors are likely to take shortcuts that involve crossing and/or walking along busy roads where no pedestrian paths are provided. The extent of this problem is such that Dams to Darnley Country Park website contains a warning to visitors that:

> ***"Aurs Road is a busy road between Newton Mearns and Barrhead so great care needs to be taken in crossing at this point".***

Furthermore those using the access paths have security concerns. **Figure 29** shows the access path from Springfield Road, via a bridge over the rail line, and has several aspects that have connotations associated with users feeling a lack of security such as graffiti, overgrown weeds and a Rotry razor spiked fence. The lack of lighting is also a factor that prevents local residents from using the Park after dark which is particularly restrictive in the winter months.

[17] Schoolboy knocked down near Barrhead playpark (Barrhead News, 2016 (www.barrheadnews.com/news/14543956.Schoolboy_knocked_down_near_Barrhead_playpark)
[18] Worried Barrhead community calls for change to 'dangerous' bus route (Barrhead News, 2016) (www.barrheadnews.com/news/14605565.Worried_Barrhead_community_calls_for_change_to__dangerous__bus_route)

Figure 28 Pedestrian access to the Dams to Darnley Country Park from Barrhead South. (www.damstodarnley.org)

Figure 29 Access path from Springfield Road looking towards Balgray Reservoir.

3.4.3 Stepped Lanes and Inadequate Lighting

Discussed during consultation (details in Appendix A: Consultation), residents felt unsafe using the stepped lanes that are abundant in Barrhead South due to the area's topography and street alignment. As discussed in Section 2.7.5.1, residents have concerns about the poor maintenance of footways in the area and concerns that the connecting lanes have inadequate lighting and do not have natural surveillance from the surrounding properties which was also evidenced during a visit to the site. This has led to personal security concerns from the residents and limits the willingness of many residents to use these routes, particularly at night.

3.5 Summary

This Chapter has provided a baseline review of the socio-economic characteristics of Barrhead South and provided an overview of the travel behaviour of residents. Consideration has also been taken of issues relating to safety and security within the study area. This understanding, combined with the investigation of the transport provision outlined in Chapter Two, provides a solid base from which the problems and opportunities can be drawn in the following Chapter.

4 Problems and Opportunities

4.1 Introduction

This Chapter sets out the problems and opportunities pertaining to the study area, following consideration of the background to the study area, as set out within the previous Chapters.

4.2 Problems

4.2.1 Social

- **An ageing population** will provide unique challenges regarding transport infrastructure and public transport provision. Furthermore, a reduction in the amount of residents who are economically active will negatively affect the town's economic standing.
- Barrhead South has **low levels of those of working age** (those aged between 16 and 59 years) but particularly those aged between 16 and 44 years, residing in the area. This is likely caused by a lack of employment opportunities within Barrhead and limited transport provision to employment opportunities outwith Barrhead meaning the area does not appeal to those of working age.
- Within Barrhead South there is **a largely uneven age distribution** whereby some areas, particularly the north west have a mean age of 53 – 69 years while other areas, particularly the south, have a mean age of 24 – 27 years. Generational clustering of this nature makes it is difficult to provide universal transport provision throughout the area that will fulfil everybody's needs.
- Barrhead South encompasses **pockets of high deprivation**. The causes of such high deprivation levels identified in the SIMD data have been attributed to issues regarding employment, income and housing and transport accessibility.
- There are a **lack of high skill and high value employment opportunities within Barrhead** with much of these opportunities being provided in Glasgow. It is therefore necessary that the appropriate transport provision is in place to enable the residents of Barrhead South to commute. Furthermore, improved transport provision within, to and from Barrhead would enable the town to become an attractive location for businesses to base themselves and thus provide employment opportunities that would reduce the need to commute to Glasgow.
- There is a **lack of commercial development sites in the area** limiting the scope for employment opportunities to arise in the local area.
- Due to a lack of high skill and high value employment opportunities the **majority of residents are required to travel outwith the local authority area to work or study**. The transport network therefore must be able to cater for this daily movement of people. Barrhead South has been identified as providing inadequate access, both by public transport and by the road network, to employment opportunities.

4.2.2 Transport Network

- Residents of Barrhead South have **low levels of car ownership and high taxi and/or minicab usage**. The 33% of residents without access to a car is a reflection of the high levels of deprivation in the area, which, as discussed, can be improved upon through improved transport provision. The high levels of taxi and/or minicab use is a reflection of the inadequate access to public transport: both the required frequency and destination of public transport but also the affordability.

- It has been established that **poor transport accessibility between Barrhead South and Glasgow City Centre** is negatively impacting the resident of Barrhead South. Poor accessibility restricts employment, social, domestic and leisure opportunities for Barrhead residents. Furthermore, poor transport accessibility to Barrhead South limits the number of visitors from further afield to the Country Park.
- **Peak period congestion on routes in and out of Barrhead** has a significant impact on the town centre's viability. On-street parking was a key factor in this problem and through town centre regeneration the Council has provided a more structured approach to parking on Main Street. Several key intersections within Barrhead, however, still suffer from congestion and delay in morning and evening peak periods, notably:
    - Dovecothall roundabout – queuing on all approaches, especially Aurs Road/Darnley Road;
    - Allan's Corner roundabout – queuing on all approaches AM/PM;
    - Neilston Road / Lochlibo Road;
    - Heavy right turn movements into Grahamston Road from Paisley Road;
    - Queuing on Paisley Road / Cross Arthurlie Street; and
    - Queuing on Carlibar Road PM.
- Despite work carried out to improve access since its creation in 2006, **poor access from Barrhead South to the Dams to Darnley Country Park** remains to be a problem limiting the Park's potential. Improving access to the Country Park would provide safe and secure leisure opportunities for Barrhead South residents.
- The **poor dedicated cycling provision** within Barrhead South to Barrhead, the Country Park and further afield further isolates Barrhead South residents from safely accessing employment, social, domestic and leisure opportunities using a sustainable and healthy transport mode.
- **Poor walk mode accessibility for the Barrhead South population to Barrhead Rail Station** is caused by several factors such as the street geometry, the topography of the area and therefore the requirement for stepped lanes, and the distance between Barrhead South and the Rail Station. The rail mode share for Barrhead South is lower when compared to the whole of Barrhead, which is likely also to be due to its location on the south-eastern periphery of Barrhead, some distance from Barrhead Rail Station.
- There is **insufficient provision for rail interchange by bus for Barrhead South residents** with it taking as long as 21 minutes from the centre of Auchenback (including the time taken to walk to the bus stop) to arrive at the Rail Station at peak times. Furthermore, it can, in some instances, be quicker to cycle to Glasgow City Centre or walk to Barrhead Rail Station than to choose to take the bus to the Rail Station.
- There is **unsuitable access for potential bus services operating east/west**. This is reflected in the bus services currently operating whereby only one service provides direct access to the East Renfrewshire towns situated to the east of Barrhead and beyond to East Kilbride. Due to poor alignment, many of the roads running to the south and east of Barrhead have height/weight restrictions and are therefore unsuitable for buses. The only alternative is via the A726, passing the M77 Junction 3.
- For similar reasons, there is **difficulty accessing the M77 Junctions 4 and 5 from Barrhead South**. All the roads, with the exception of Aurs Road, are single track country lanes. Aurs Road is a single carriageway but does not have the capacity for large volumes of traffic and has height and weight restrictions.

4.2.3 Barrhead South Development

- With an intended 1,050 houses being built there is an **anticipated increase in traffic on the local network resulting from the Barrhead South development area**.
- As the land is currently designated as greenbelt there is **insufficient existing public transport provision for the Barrhead South Development area**. With an anticipated 1,050 houses being built is it vital that public transport options are provided for the prospective residents to ensure transport integration.

4.3 Opportunities

4.3.1 Social

- An improved transport network will make Barrhead South a **more attractive place for families to reside,** where access to high skill and high value employment opportunities are not limited by poor transport provision. This will help to increase the proportion of residents of working age and may help with generational integration within the community.
- Improved access to employment, social, domestic and leisure opportunities will result in **lower levels of deprivation**.
- A better transport network with improved transport links to Glasgow City Centre and to the M77 will make **Barrhead a more attractive area for businesses to base themselves**. This would help to improve the local economy, attract working families to the area and reduce the need for residents to travel to Glasgow for employment.

4.3.2 Transport Network

- **Public transport provision that meets the needs of Barrhead South residents** will encourage residents into employment therefore improving the local economy.
- Recognising and acting upon the causes of congestion on the road network **will reduce congestion on routes in and out of Barrhead**. This will bring benefits to the local economy, and the environment.
- Improving accessibility both for Barrhead South residents and for those from further afield will result **in greater visitor numbers to the Dams to Darnley Country Park**. Greater visitor numbers will provide justification for continued investment in the Country Park therefore enabling sustainable access for local communities and for those from further afield.
- Combining initiatives such as 'Go Barrhead' with infrastructure measures that will improve the walking and cycling experience will see **an increase in the number of residents choosing sustainable transport modes.** As well as the health benefits for those choosing these transport modes, the reduction in numbers of cars on the road will bring benefits to the environment.
- There is an opportunity to provide **an attractive rail interchange option in Barrhead South for residents**. With relatively low levels of car ownership an attractive rail interchange option could provide residents with the access they require to employment, social, domestic and leisure opportunities.
- The **introduction of an east/west bus service** from Barrhead South would open up employment, social, domestic and leisure opportunities in the wider authority area to residents.
- Improvements to the road network would see **congestion relieved at M77 Junction 3 by improving access to Junctions 4 and 5**. This will bring benefits to the local economy, connectivity and the environment.

4.3.3 Barrhead South Development

- The most overriding opportunity comes from **using the Barrhead South Development as an opportunity to improve transport provision for Barrhead South residents**. The development gives the justification for transport network improvements to be made that otherwise would not be supported. Barrhead South has the potential to no longer be cut off from the rest of Barrhead and Glasgow. Improvements in accessibility to employment, social, domestic and leisure opportunities would improve the local economy and the quality of life of residents.

4.4 Summary

Table 5 provides a summary of the problems identified within Barrhead South and summarises the potential opportunities that could arise from improvements to the transport network. The evidence base provides the details of how these problems and opportunities have been identified.

Table 5 Summary of the problems and opportunities

	Problem	Evidence Base	Opportunity
Social	An ageing population	Analysis of the population structure and mitigation measures outlined in the Local Development Plan 2015	More attractive area for families to reside; Lower levels of deprivation
	Low levels of those of working age	Analysis of the population structure	More attractive area for families to reside; Lower levels of deprivation
	A largely uneven age distribution	Analysis of the population structure geography	More attractive area for families to reside; Lower levels of deprivation
	Pockets of high deprivation levels	Scottish Index of Multiple Deprivation	More attractive area for families to reside; Lower levels of deprivation; More attractive area for businesses to base themselves
	Lack of high skill and high value employment opportunities within Barrhead	Analysis of Census travel flows and industry type	More attractive area for businesses to base themselves
	Lack of commercial development sites	Local Development Plan and land review	More attractive area for businesses to base themselves
	Majority of Residents are required to travel outwith the local authority area to work or study	Analysis of Census travel flows and distance travelled to work or study	More attractive area for businesses to base themselves
Transport Network	Low levels of car ownership and high taxi and/or minicab usage	Analysis of Census car availability and consultation findings	Public transport provision that meets the needs of Barrhead South residents
	Poor transport accessibility between Barrhead South and Glasgow City Centre	Consultation and analysis of public transport provision	Transport provision that meets the needs of Barrhead South residents
	Peak period congestion on routes in and out of Barrhead	Local Transport Strategy and ATC data	Transport provision that meets the needs of Barrhead South residents

	Poor access from Barrhead South to the Dams to Darnley Country Park	Consultation, Supplementary Planning Guidance: Dams to Darnley Country Park, analysis of access and site investigation	Greater visitor numbers to the Dams to Darnley Country Park
	Poor cycling provision	Consultation, analysis of cycling provision and site investigation	An increase in the number of residents choosing sustainable transport modes
	Poor walk mode accessibility for the Barrhead South population to Barrhead Rail Station	Consultation, analysis of walk mode provision and Census method of travel to work data and site investigation	An increase in the number of residents choosing sustainable transport modes
	Insufficient provision for rail interchange by bus for Barrhead South residents	Analysis of public transport provision	An attractive rail interchange option for residents
	Unsuitable access for potential bus services operating east/west	Analysis of public transport provision	Introduction of an east/west bus service
	Difficulty accessing the M77 Junctions 4 and 5 from Barrhead South	Analysis of the road network	Congestion relieved at M77 Junction 3 by improving access to Junctions 4 and 5
Barrhead South Development	Anticipated increase in traffic on the local network resulting from the Barrhead South Development	Analysis of the Supplementary Planning Guidance: Barrhead South Master Plan	Using the Barrhead South Development as an opportunity to improve transport provision for Barrhead South residents; Good integration between the existing Barrhead South transport network and the Barrhead South Development Area's planned transport provision.
	Insufficient public transport provision for the Barrhead South Development area	Analysis of the Supplementary Planning Guidance: Barrhead South Master Plan	Using the Barrhead South Development as an opportunity to improve transport provision for Barrhead South residents; Good integration between the existing Barrhead South transport network and the Barrhead South Development Area's planned transport provision.

5 Objective Setting

5.1 Introduction

The need to be able to evaluate a transport strategy or project, post-implementation, is a fundamental element of appraisal and is emphasised within STAG. Building on the analysis of problems and opportunities, and taking into account relevant planning policy and consultation feedback, this Chapter therefore provides details of a set of Transport Planning Objectives (TPOs) and targets that have been developed for this study.

5.2 Established Policy Directives

Table 6 outlines and summarises the established policy directives that have a direct influence on the formulation of the TPOs and ultimately the preferred transport options that are suggested to best achieve those Objectives. **Appendix B: Established Policy Directives** contains a more thorough review of the established policies.

Table 6 Summary of Established Policy Directives

Policy	Date	Comment
National Policy		
Government Purpose and the National Performance Framework	2016	• To create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. • Underpins the delivery of the Scottish Government's agenda. • Informs regional and local policy.
Scotland's National Transport Strategy	2016	• Supports the delivery of the Scottish Government's Purpose. • Presents the following three strategic outcomes: Improve journey times and connections reduce emissions and improve quality, accessibility and affordability.
Scotland's Economic Strategy	2015	• Sets out how the Scottish Government intends on delivering their vision for Scotland. • Outlines four economic priorities: Investment, Innovation, Inclusive Growth and Internationalisation.
Climate Change Act	2009	• An Act of the Scottish Parliament to set a target for the year 2050, an interim target for the year 2020, and to provide for annual targets, for the reduction of greenhouse gas emissions.
A Low Carbon Economic Strategy for Scotland	2010	• Commits the Scottish Government to reducing emissions by at least 42% by 2020 and 80% by 2050. • Sets the aim of having 10% of Scotland's transport use from renewable sources by 2020.
Infrastructure Investment Plan	2015	• Sets out a number of priorities for investment in infrastructure across transport, water, digital, waste and other sectors. • Recognises that investment in infrastructure is a key driver of both short- and long-term economic growth performance and makes a vital contribution to delivering the ambitions set out in the Government Economic Strategy. • Notes that enhancing transport infrastructure and services more generally can open up new markets, increase access to employment and help to drive up competitiveness and deliver growth. • Recognises that investment in transport infrastructure plays an essential role in creating the right conditions for successful and sustainable growth in a low carbon economy.
National Planning Framework 3	2014	• The spatial expression of the Government Economic Strategy; sets out national priorities for development and infrastructure investment.

		• Supports the concept of a city deal to drive employment and economic development.
Scottish Planning Policy	2014	• Acknowledges that the economy relies on efficient transport connections and also highlights the need to address the development requirements of businesses and enable key opportunities for investment to be realised. • Aims to promote the vibrancy and viability of town centres.
Regional Policy		
Glasgow and Clyde Valley Strategic Development Plan	2012	• A statutory document, alongside Local Development Plans, that takes a strategic, region-wide view of spatial needs across the Glasgow and Clyde Valley region
A Catalyst for Change: The Regional Transport Strategy for the West of Scotland	2008-2021	• The Regional Transport Strategy's vision is for "A world-class transport system that acts as a catalyst for an improved quality of life for all". • Four key transport outcomes are identified; improved connectivity, access for all, reduced emissions and attractive, seamless, reliable travel.
Local Policy		
East Renfrewshire Council Local Transport Strategy	2008 - 2011	• Sets out the policies, projects and proposals for transportation within East Renfrewshire and beyond. The LTS sits in a hierarchy of transport plans beneath the National and Regional Transport Strategies. • Transport & Land-use is one of five core objectives which will promote greater integration between transport and land-use will reduce the need to travel and encourage local economic activity.
East Renfrewshire Council Local Development Plan	2015	• Sets out policies and proposals for the use, development and protection of land within East Renfrewshire. • Provides the Council with a land-use development strategy to guide the future sustainable growth of East Renfrewshire up to 2025 and beyond and provides an appropriate basis for determining planning applications.
East Renfrewshire Council Supplementary Planning Guidance: Dams to Darnley Country Park	2015	• Supplementary planning guidance to the Local Development Plan which focuses specifically on the Dams to Darnley Country Park. Real emphasis has been placed on improving access to the Park both for local residents and for those from further afield. • The guidance details enhancements based upon four themes: access, facilities, natural and built heritage and the promotion and management of the Park.
East Renfrewshire Council Supplementary Planning Guidance: Barrhead South Master Plan	2015	• Sets out the development principles for Barrhead South (Policy M2.2) including the provision of a new Rail Station and links between Barrhead and the Dams to Darnley Country Park. • Sets out the master planning principles which should be followed at the more detailed design stage which will follow at the stage of securing planning permission.
Single Outcome Agreement	2013-2016	• Improvements to the transport network have been identified as intermediate outcomes aimed at addressing the five outcomes set by East Renfrewshire Council.
Economic Development Strategy	2008-2013	• A 5-year vision for economic development and regeneration within East Renfrewshire.

5.3 Consultation

A number of consultations have been carried out since 2006. This has included public consultation, stakeholder consultation, area forums, letters to businesses and an online survey. **Figure 30** summarises the consultations that have taken place during this period. Appendix A provides further details of the consultations that have taken place, including the purpose, who attended, the venue and date.

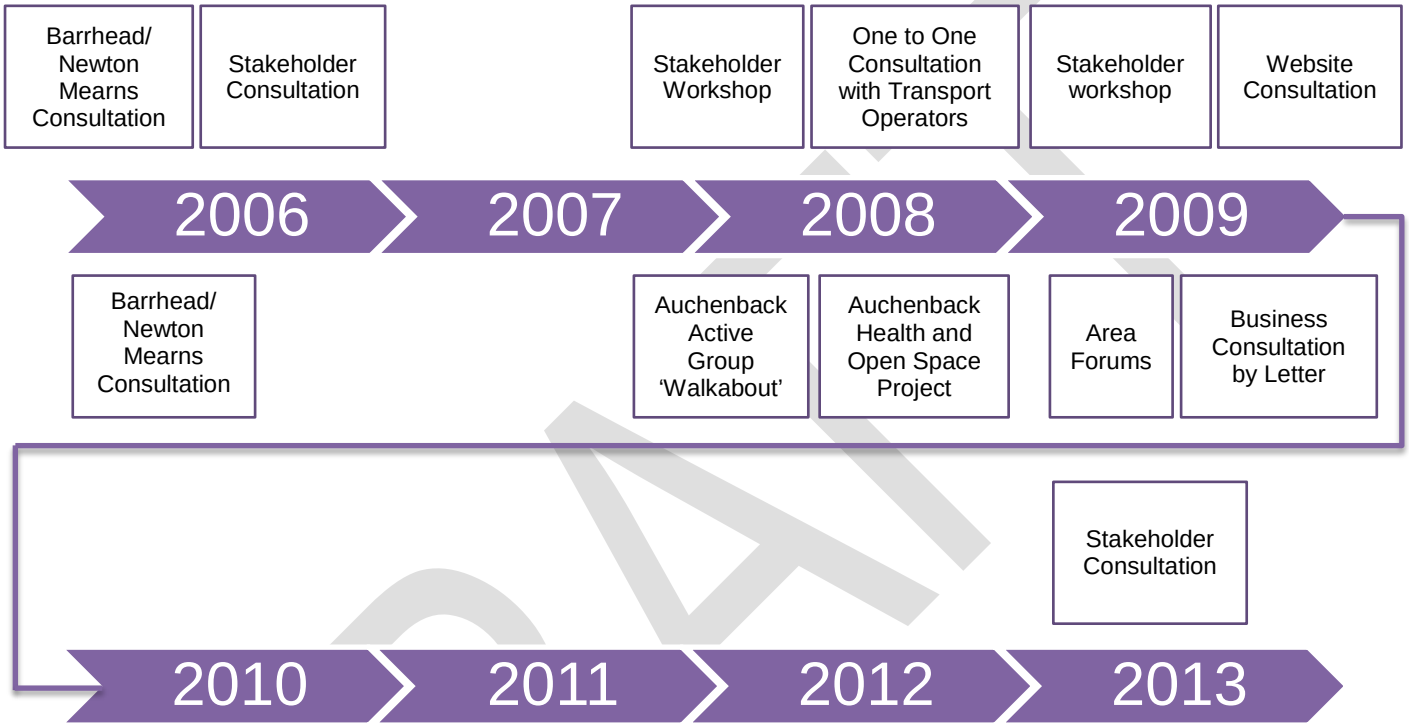

Figure 30 Time lined summary of consultations

The feedback gathered during the consultation process has been considered in the development of the TPOs for the study.

5.4 Transport Planning Objectives

As befits an objective-led appraisal process, TPOs do not automatically point to a single transport solution. The following TPOs have been developed to address the problems and opportunities identified within the study area. The TPOs also align with national, regional and local policy objectives whilst also taking due cognisance of the outcomes of the stakeholder consultations, where appropriate.

To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor;

To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield;

To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns;

To enable fully sustainable access to Springfield and the Dams to Darnley Country Park for local communities;

To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield; and

To mitigate any adverse transport impacts created by the Barrhead South Development.

Table 7 presents an assessment of how the TPOs address the problems identified, ensuring that a robust set of objectives have been developed.

Table 7 Transport Planning Objectives appraised against the problems

Transport Planning Objectives / Problems	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield	To mitigate any adverse transport impacts created by the Barrhead South Development
An Ageing Population	✓	✓	✓			
Low Levels of those of Working Age	✓	✓	✓			
A Largely Uneven Age Distribution	✓					
Pockets of High Deprivation Levels	✓	✓				
Lack of High Skill and High Value Employment Opportunities within Barrhead	✓			✓	✓	
Lack of Commercial Development Sites	✓	✓				
Low Levels of Car Ownership and High Taxi and/or Minicab Usage	✓	✓	✓			
Poor transport accessibility between Barrhead South and Glasgow City Centre	✓	✓	✓			

Transport Planning Objectives / Problems	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield	To mitigate any adverse transport impacts created by the Barrhead South Development
Majority of Residents Travel Outwith the Authority to Work or Study	✓		✓			
Peak Period Congestion on Routes In and Out of Barrhead	✓	✓			✓	✓
Poor Access from Barrhead South to the Dams to Darnley Country Park				✓	✓	
Poor Cycling Provision	✓	✓	✓	✓	✓	✓
Poor Walk Mode Accessibility for the Barrhead South Population to Barrhead Rail Station	✓	✓	✓			
Insufficient Provision for Rail Interchange by Bus for Barrhead South Residents	✓	✓	✓			
Unsuitable Access for Potential Bus Services Operating East/West	✓	✓				
Difficulty Accessing the M77; Junctions 4 and 5 from Barrhead South	✓	✓				✓

Transport Planning Objectives / Problems	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield	To mitigate any adverse transport impacts created by the Barrhead South Development
Anticipated Increase in Traffic on the Local Network resulting from the Barrhead South Development	✓	✓		✓		✓
Insufficient Public Transport Provision for the Barrhead South Development Area	✓	✓		✓		

5.5 Development of SMART Objectives

As part of the process necessary to move these TPOs into a position where options for achieving them can be developed, it is also necessary to ensure the objectives are 'SMART' in preparation for the Appraisal. This has been done in **Table 8**. The purpose of setting 'SMART' TPOs is to ensure that measures developed are realistic and sufficiently focused to permit practical consideration.

To this end the TPOs have been appraised to ascertain how they meet relevant 'SMART' criteria, in this case being;

Specific: that the TPOs should be clear about what they set out to achieve, identifying the reference point against which any change will be compared and what the units of change will be, for example increased modal share of sustainable modes. The TPOs should also be specific about the geographic area to which they will apply and include a plan that defines the area of application;

Measurable: the impacts of the TPOs relative to the reference point set above need to be recorded as a readily available data source against which any targets can be measured. A coherent monitoring strategy must also be in place in order to measure progress with confidence in the results;

Attainable: through wide statutory, technical and public consultation, it is essential that an informed general consensus is reached on the desirability of meeting the TPOs and on their achievability and affordability;

Relevant: the transition of TPOs into transportation improvement options requires them to be relevant to the analysis of travel and accessibility problems. Local, regional and national transport objectives will also assist in the development of relevant options; and

Time-related: the achievement of TPOs should be related to a specific timescale.

Table 8 Transport Planning Objectives appraised against SMART criteria

SMART / Transport Planning Objectives	**Specific**	**Measurable**	**Attainable**	**Relevant**	**Time-related**
To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	Evidence of inequality is present in the SIMD statistics published by the Scottish Government in 2016. Improved transport accessibility to jobs will improve the ranking that Barrhead South currently holds.	The proportion of households able to access transport nodes to travel to places of work is measurable as well as the improved SIMD ranking that this area presently holds.	Providing increased choice for travel is attainable through City Deal funding offered to East Renfrewshire Council and developer related funding. In addition East Renfrewshire Council is a key stakeholder/land owner.	Current limited access to public transport and reduced choice of mode are cited as causes of low economic performance and social deprivation by local residents. Better accessibility meets local and national economy objectives.	The delivery of transport options alongside residential development in Barrhead South, development of the Country Park and new leisure facilities requires transport solutions to be delivered on a similar timescale to that of the Local Development Plan (2025).
To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	Improved transport accessibility in Barrhead South will provide new connections to education, social and leisure opportunities across East Renfrewshire as well as Glasgow City Centre and further afield.	The proportion of households able to access amenities, particularly social, domestic and leisure opportunities can be directly measured in the monitoring plan.	Providing increased travel choice for residents is attainable through City Deal funding, developer contributions and the Access for All strategy.	Current limited access to public transport and reduced choice of mode are cited as causes of social deprivation by local residents. Better accessibility meets local and national accessibility objectives.	The delivery of local transport options requires transport solutions to be delivered on a similar timescale to that of the Local Development Plan (2025).
To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	Improved transport provision and integration will assist in addressing personal security concerns.	The proportion of residents accessing public transport nodes to travel to places of work, education and/or leisure is measurable. Resident opinion of public and personal safety can be surveyed.	Promoting safety in the transport system through improved provision and integration is attainable through City Deal funding offered to East Renfrewshire Council and developer related funding.	Enhancing transport provision and local accessibility improves personal and road safety, and aligns with local, regional and national transportation objectives.	The achievement of safety in local transport solutions to be delivered on a similar timescale to that of the Local Development Plan (2025).

SMART / Transport Planning Objectives	Specific	Measurable	Attainable	Relevant	Time-related
To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	The provision of transport modes that offer effective and attractive alternatives to private car use secures sustainable accessibility.	The proportion of residents and visitors using non-private transport will be measured through the change in national Census data 2011/21 (sustainable transport use), and through Country Park visitor surveys.	The focus on public transport provision within local development projects makes fully sustainable accessibility more attainable.	Access by sustainable modes is relevant to the travel and accessibility problems cited by residents and fits with local, regional and national transportation objectives.	The delivery of sustainable transport requires solutions to be delivered on a similar timescale to that of the Local Development Plan (2025).
To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	Improved public transport options to the Country Park will be measured as increased modal share of sustainable modes.	A coherent monitoring strategy will be established to measure success in encouraging access from outside the local authority area and impacts of transport measures relative to any targets. This could include change in national Census data 2011/21 (sustainable transport use), and Country Park visitor surveys.	The delivery of public transport within Springfield and the Country Park will make fully sustainable accessibility more attainable.	Transport provision that increases the opportunity for using sustainable modes is relevant to the travel and accessibility problems cited by residents and fits with local, regional and national transportation objectives.	The delivery of local transport options for the Country Park requires transport solutions to be delivered on a similar timescale to that of the Local Development Plan (2025).
To mitigate any adverse transport impacts created by the Barrhead South Development.	Improved public transport accessibility will enable the establishment of a sustainable travel culture ahead of residential development and the enhancement of the Country Park.	A robust public transport network with strong walk/cycle elements will support the travel demand management objectives of the Barrhead South Development. This could be measured by change in national Census data 2011/21 (sustainable transport use), and resident travel surveys.	A strong public expectation is that the residential development of Springfield will yield both community enhancement and increased accessibility within the same timescale.	Mitigation of private motor traffic is required to avert accessibility problems on routes serving Barrhead South and the Country Park as well as local, regional and national transport objectives.	The mitigation of adverse impacts is needed to begin before the Barrhead South development is occupied (2025) in order to deter unsustainable transport habits.

6 Option Generation, Sifting and Development

6.1 Introduction

The options that could be adopted in order to address the identified problems and opportunities are identified and summarised in this Chapter. Work undertaken in previous studies has been used to inform the option generation process ensuring that the options generated address the issues identified in the STAG Pre-Appraisal (Chapters Two to Five). An indication as to whether each option will be progressed to a more detailed level of appraisal is also included.

6.2 Do Minimum and Reference Case

6.2.1 Do Minimum

The options generated must be appraised against the 'do minimum' option that includes transport improvement commitments that have policy and funding approval and from which it would be difficult to withdraw. The Do Minimum therefore includes:

- Barrhead South Development.
- Realignment of Aurs Road to improve access between Barrhead and Newton Mearns.

Further details can be found within Chapter Eight.

6.3 Option Generation

Options to be considered as part of this review have mostly been generated with assistance from stakeholder consultees, but have been added to or developed in more detail through the following processes:

- Those which have been considered by East Renfrewshire Council or other stakeholders previously but not taken forward in detail;
- Those which have been considered through statutory processes; and
- Those identified in an internal study team discussion.

The options identified for appraisal are described in this Section: they fall under three categories:

- Management Measures;
- Infrastructure Measures; and
- Information Provision.

6.3.1 Management Measures

Public Transport Service Levels:

- Increase frequency of daytime bus services in Barrhead South: This option would involve increasing the number of services to/from Barrhead South to Glasgow City Centre from the current 30 minute headways to 10 minutes, with operator participation.

- Increase frequency of evening bus services in Barrhead South: This option would require the increase in the number of services between Barrhead South and Barrhead town centre after 7:20 pm to reduce headways from the current 30 minutes to 20 minutes.
- Extension of existing bus operating hours in Barrhead South: This option would involve extending the operating hours of bus services between Barrhead South to Glasgow City Centre beyond 7:40 pm with an hourly or better service that could cater for more flexible working patterns and evening leisure activities.
- Introduction of new bus route services to serve Barrhead South: This would involve the creation of new bus services between the Barrhead South Development and existing services and destinations serving Barrhead South such as Barrhead Town Centre and Rail Station and Glasgow City Centre. There is potential for services to access key destinations for employment, including the Greenlaw Business/Commercial Development and the existing Braehead, Silverburn and East Kilbride Shopping Centres during daytime and/or evening periods;
- Introduce new bus route services to serve the Dams to Darnley Country Park from Barrhead: This option would involve introducing new direct bus routes from Barrhead, using Barrhead South as a through route to the Country Park via Aurs Road continuing on to Newton Mearns.

Measures to Restrain Car Use:

- On-street car parking restrictions: This measure would control the location of on-street parking within Barrhead South, in order to keep roads clear for the swept path of public transport vehicles, especially at junctions and pedestrian crossing points. This measure would also allow for the future introduction of a controlled parking zone.

6.3.2 Infrastructure Measures

Public Transport Provision:

- New rail station: In conjunction with the Springfield Road housing development, a new rail station is technically feasible on the Glasgow to Neilston line adjacent to the new residential development at Barrhead South. This measure would enable residents of Barrhead South to directly access Glasgow City Centre by rail for employment, leisure and retail opportunities without incurring interchange penalty costs/delays. The rail station would also act as a transport hub for visitors from further afield to the Country Park.
- New rail station car park: In conjunction with the new rail station, this option would involve the construction of a car park to allow rail-based Park & Ride.
- A new bus terminus facility: In conjunction with the Barrhead South housing development, a bus turning area and terminus could be constructed to allow existing Barrhead South bus services to access the new housing area and also serve the potential new rail station and Country Park.
- Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South: These measures involve the replacement of existing flag stops with bus shelters that are well lit and include measures to improve passenger security such as installation of CCTV or are in locations with a good degree of natural surveillance.
- Provide dedicated car parking for Country Park visitors: This option would provide additional car parking within the Country Park, accessed from Aurs Road, for visitors to the Park, reducing the burden of on-street parking upon local streets.

Road:

- Realignment and widening of Springfield Road from the Barrhead South development to Neilston: The realignment would see Springfield Road, currently a single track country lane straightened where necessary and widened to accommodate two lanes of traffic. This would accommodate an increase in traffic anticipated to come from the Barrhead South Development.
- Link to the M77 and the Glasgow Southern Orbital from Barrhead: This would see a single carriage road developed that would link Barrhead to the M77. This option would reduce congestion on the transport network by diverting vehicles travelling from Barrhead to Glasgow giving the option to join the M77 at a more southerly junction. The link would also improve east to west movement of traffic within East Renfrewshire with improved access to the Glasgow Southern Orbital, A726.

Pedestrians and cyclists:

- Upgrade of connecting footpaths in Barrhead South: This option would identify locations within the study area where the connecting pedestrian footpaths between housing areas can be upgraded to improve accessibility to existing public transport nodes, as well as improving personal security for those on foot. This includes measures such as installation of high quality street lighting; removal of blind spots by realignment and construction of DDA compliant ramps.
- Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park: This measure would provide a direct route, free from danger of mixing with traffic on the Aurs Road, for people moving by sustainable modes between Barrhead South and the Country Park
- Provide cycle links within Barrhead South to Main Street: This measure would see the provision of cycle lanes within Barrhead South providing a safe provision for those cycling to school and into Barrhead.

6.3.3 Information Provision

Public Transport Information:

- Improve public transport information and marketing: This option would involve the provision of timetable information for bus services at all stops in Barrhead South which is always up-to-date and legible. The timetables can be for the bus services that route through the study area, but also for connecting bus and rail services in locations such as Paisley, Silverburn and Glasgow City Centre. Additionally, this option would provide information about how to access the Country Park by public transport and sustainable modes.
- Real-Time updates at bus stops: This option would see bus stops fitted with real-time technology to alert individuals of the length of time they will be required to wait before their bus arrives.

6.4 Option Sifting

In this Section, the described above options are initially sifted using the TPOs. This initial assessment of options is intended to identify those that can be sifted out prior to Part 1 Appraisal and those options that have been recommended for Part 1 Appraisal. The Option Sifting in **Table 9** follows this section. The key to the tables is as follows:

✓✓✓	Major positive impact
✓✓	Moderate positive impact
✓	Minor positive impact

O	Neutral impact
✘	Minor negative impact
✘ ✘	Moderate negative impact
✘ ✘ ✘	Major positive impact

Table 9 Option Sifting – Performance of Options Against TPOs

Transport Planning Objectives / Options	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield	To mitigate any adverse transport impacts created by the Barrhead South Development	Initial Sift Outcome
Increase frequency of daytime bus services in Barrhead South	✓	✓	O	O	O	✓	Reject
Increase frequency of evening bus services in Barrhead South	✓	✓	O	O	O	✓	Reject
Extension of existing bus operating hours in Barrhead South	✓✓	✓✓	O	O	O	✓	Reject
Introduction of new bus route services to serve Barrhead South	✓	✓	✓	O	✓	✓	Reject
Introduce new bus route services to serve the Dams to Darnley Country Park from Barrhead	O	O	✓	✓	O	✓	Reject
On-street car parking restrictions	O	O	✓	O	O	O	Reject
New rail station at Barrhead South	✓✓✓	✓✓	✓	O	✓✓✓	✓✓✓	Retain for further consideration
New rail station car park at Barrhead South	O	O	O	O	O	✓	Retain for further consideration
A new bus terminus facility at Barrhead South	✓✓	✓✓	✓	O	O	✓	Retain for further consideration
Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South	✓	✓	✓✓	O	O	✓✓	Retain for further consideration
Provide dedicated car parking for Country Park visitors	O	✓✓	O	O	✘	O	Retain for further consideration
Realignment and widening of Springfield Road from the Barrhead South development to Neilston	O	✓	✓	✓✓	✓	✓✓	Retain for further consideration
Link to the M77 and the Glasgow Southern Orbital from Barrhead	✓✓	✓✓✓	✓	O	✓✓	✓✓	Retain for further consideration
Upgrade of connecting footpaths in Barrhead South	O	✓	✓✓✓	✓✓	O	✓	Retain for further consideration

Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park	O	✓✓	✓	✓✓✓	✓	✓	Retain for further consideration
Provide cycle links within Barrhead South to Main Street	O	✓✓✓	✓	✓	✓	✓✓	Retain for further consideration
Improve public transport information and marketing	✓	✓	✓	✓	O	✓	Retain for further consideration
Real-Time updates at bus stops	✓	✓	✓	O	O	✓	Retain for further consideration

6.5 Rationale for Option Rejection

Following the initial sift exercise a number of options will not be progressed further within this study, the rationale for this is outlined below.

Increase frequency of daytime bus services in Barrhead South: Services from Barrhead South to Glasgow City Centre already operate at a high frequency and no significant benefit would arise from more buses on this route. Whilst not providing an exceptional level of service to Glasgow City Centre (30 minute headway), daytime bus services typically operate at a reasonable frequency appropriate for the communities that they serve. It is anticipated that any significant enhancement would require substantial on-going revenue support whilst generating only limited benefits. Such revenue support is not available to increase daytime frequency for any similar bus services in the Glasgow conurbation and we do not consider it could be made available here. We therefore consider this option to be undeliverable. This option is therefore rejected from further consideration.

Increase frequency of evening bus services in Barrhead South: This option would involve increasing the volume of services between Barrhead South and Barrhead town centre to a 20 minute headway from the current 30 minutes after 7:20 pm. However, the current 30 minute headway is considered to be suitable for the anticipated use of the service and it is highly unlikely that there would be sufficient evening demand to / from Barrhead town centre to justify an increase in bus frequency on a commercial basis. Therefore, any significant enhancement would require substantial on-going revenue support whilst generating only limited benefits. Such revenue support is not usually available for similar bus services in the Glasgow conurbation and we do not consider it could be made available here. We therefore consider this option to be undeliverable. This option is therefore rejected from further consideration.

Extension of existing bus operating hours in Barrhead South: The current bus services to / from Glasgow City Centre from the study area operate until 7:40 pm. There may be some demand for a service that operates until later in the evening but it is unlikely that the demand will be sufficient for a dedicated commercial service. Any direct evening service to Glasgow would therefore require public sector subsidy. Evidence from previous assessments, exacerbated by current budgetary pressures for bus service support, suggests that there is no potential for this option to be a priority over other services making calls for the same funding (as there is an evening bus service to Barrhead South, just not directly from Glasgow). It is therefore considered that this option would be undeliverable. This option is therefore rejected from further consideration.

Introduction of new bus route services to serve Barrhead South: This option would involve new bus routes from Barrhead South to emerging destinations of high demand. If the passenger demand for a destination was high then the commercially driven bus services would be operating the route. As committed developments come online the commercial operators may adjust routes to cater for this demand, though we consider such changes unlikely in the foreseeable future. If there is a social need to operate a bus route then SPT could operate a supported bus service where the tender for operation is based on a scoring system. However, evidence from elsewhere suggests that SPT would not fund a service given the level of existing public transport in the study area and other calls for the same funding. We therefore consider this option to be undeliverable. This option is therefore rejected from further consideration.

Introduce new bus route services to serve the Dams to Darnley Country Park from Barrhead: Many locations do not have direct public transport access to the proposed Country Park and there are a variety of potential options that could create new routes to enable this direct access. However, no option has been identified that is likely to be operable on a commercial basis and it is felt

to be extremely unlikely that any such service would be a priority for public funds for a supported service We therefore consider this option to be undeliverable. This option is therefore rejected from further consideration.

On-street car parking restrictions: There are certain locations within the study area where the level of on-street parking can hinder both vehicle and cyclist movement (notably on Aurs Drive in Auchenback). This option would introduce measures to prevent vehicles parking at these locations or restrict which side of the road residents can park on narrow streets. Whilst some limited benefits would arise from this measure, these are not considered sufficiently great to outweigh the public acceptability risks from local residents. This option is therefore rejected from further consideration.

6.6 Options Retained for Further Consideration

From the initial sift exercise; the following options were retained for further consideration with the Part 1 Appraisal.

- New Barrhead South rail station.
- New Barrhead South rail station car park.
- A new bus terminus facility.
- Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South.
- Provide dedicated car parking for Country Park visitors.
- Realignment and widening of Springfield Road from the Barrhead South development to Neilston.
- Link to the M77 and the Glasgow Southern Orbital from Barrhead.
- Upgrade of connecting footpaths in Barrhead South.
- Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park.
- Provide cycle links within Barrhead South to Main Street.
- Improve public transport information and marketing.
- Real-Time updates at bus stops.

These options are grouped and developed in the subsequent Sections of this report.

6.7 Option Grouping

As noted previously, the most effective transport solutions are usually groups of measures, rather than individual interventions. Within this Section, we outline how the twelve individual options retained following the initial sift have been grouped for the purposes of the STAG appraisal (see **Table 10**).

Initially, it should be noted that none of the retained options conflict to an extent that the introduction of one would render any of the others unfeasible. However, some of the options are dependent upon each other.

Specifically a car park adjacent to the rail station would only be beneficial and viable if a new rail station was actually constructed. A rail station could be constructed with or without a car park; although a car park will enhance the potential gains from the station. A bus turning area likewise could be feasible as a standalone facility but combined with a rail station to allow modal interchange would again enhance the benefits.

7 STAG Part 1 Appraisal

The options detailed in **Table 10** have been put together through the logical grouping of measures.

Table 10 Option Groupings

Option Groupings	Measures	Rationale
Do Minimum	• Barrhead South Development. • Realignment of Aurs Road to improve access between Barrhead and Newton Mearns.	These measures have policy and funding approval and from which it would be difficult to withdraw.
Soft Measures	• Improve public transport information and marketing. • Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South. • Real-Time updates at bus stops.	These measures have been grouped based on their likelihood to influence a positive change in behaviour regarding transport choices rather than involving any major transport infrastructure changes.
Improved Pedestrian/Cycle Provision	• Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park. • Provide cycle links within Barrhead South and Main Street. • Upgrade of connecting footpaths in Barrhead South.	These measures all relate to infrastructure improvements regarding pedestrian and cycling provision.
Road Network Upgrade	• Provide dedicated car parking for Country Park visitors, accessed from Aurs Road. • Realignment and widening of Springfield Road from the Barrhead South development to Neilston. • Link to the M77 and the Glasgow Southern Orbital from Barrhead.	These measures all regard infrastructure measures that will improve the road network.
Bus Terminus Facility	• A new bus terminus facility in the Barrhead South Area.	This measure would work well with the Rail Station option below but could also operate in isolation and hence has been appraised alone.
Rail Station with Park & Ride	• Barrhead South rail station. • Barrhead South rail station car park.	These two measures have been packaged together with the Park & Ride viewed as a potential enhancement of any rail station.

6.8 Summary

This Chapter has set out the process of option generation, sifting and development. Eighteen options were identified in the initial option generation. An initial appraisal against the TPOs allowed for the sifting of these options resulting in six of the eighteen options being rejected. The remaining twelve options have been put together into logical groupings for further appraisal in the following Chapters of this STAG.

7.1 Introduction

This Chapter sets out an initial appraisal of the option groupings generated at the pre-appraisal stage. An indicative assessment of the scope and scale of the benefits and impacts associated with each option grouping has been considered against the TPOs, STAG Criteria, the fit with established policy directives and the feasibility, affordability and likely public acceptability.

For the purposes of the appraisal, the seven point scale is defined as follows:

✓✓✓	Major positive impact
✓✓	Moderate positive impact
✓	Minor positive impact
O	Neutral impact
✘	Minor negative impact
✘✘	Moderate negative impact
✘✘✘	Major positive impact

STAG Part 1 Appraisal Summary Tables (ASTs) are contained within Appendix C.

7.2 Appraisal Against Transport Planning Objectives

7.2.1 Do Minimum

The Do Minimum scenario is appraised against the TPOs in **Table 11**.

Table 11 Do Minimum appraisal against TPOs

Do Minimum Objective Appraisal	
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.
• The Do Minimum scenario does not include measures to address the increase in travel demand on the existing transport network generated by the Barrhead South Development (beyond the development of pedestrian links to the existing core path network), and the associated impact on accessibility. • The realignment of Aurs Road will improve east to west movement of vehicles, thus improving the ease of access to Newton Mearns and access to the M77 linking to Glasgow.	0
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.
• The Do Minimum includes the development of core paths that will link the existing Barrhead South area to the Country Park, as part of the Barrhead South residential development, but does not enhance accessibility to social, domestic or leisure facilities further afield. • The realignment of Aurs Road will improve east to west movement of vehicles, thus improving the ease of access to Newton Mearns and access to the M77 linking to Glasgow.	0
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.
• The Do Minimum scenario has limited scope to address this objective, however the realignment of Aurs Road would bring opportunities to:	✓

o Improve east to west movement of vehicles, which would have a positive impact on safety through smoothing link speeds and reducing congestion. o Remove blind corners which would improve safety for on-road cyclists and improve the pedestrian environment.		
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• The Do Minimum includes the development of core paths that will link the existing Barrhead South area to the Country Park, as part of the Barrhead South residential development. • The realignment of Aurs Road would provide the opportunity for a bus service to serve the Country Park thus making the Park more accessible for those without a car, albeit the actual provision of a new bus service does not form part of the Do Minimum scenario.		✓
Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• The Do Minimum scenario does not include measures to maximise the opportunity to travel to the Country Park from further afield other than improved safety on Aurs Road for those travelling via private car. • The realignment of Aurs Road would provide the opportunity for a bus service to serve the Country Park thus making the Park more accessible for those without a car, albeit the actual provision of a new bus service does not form part of the Do Minimum scenario.		O
Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• The Barrhead South development addresses and mitigates for any transport impacts within the development area and its links to the surrounding network. • The realignment of Aurs Road will help to mitigate the impacts of the increase in traffic volumes brought by the development.		✓

7.2.2 Soft Measures Grouping

The Soft Measures grouping comprises of improving public transport information and marketing; measures to improve security and journey quality for bus passengers at bus stops; and real-time updates at bus stops, and is appraised against the TPOs in **Table 12**.

Table 12 Soft Measures appraisal against TPOs

Soft Measures Objective Appraisal		
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	
• This grouping would see an improvement in the journey experience of those using bus services in Barrhead South. • A bus service currently provides direct links from Barrhead South to Glasgow City Centre. The measures included within this grouping would encourage use of this service, through enhanced information provision and bus stop waiting environment. • This grouping does not provide any new transport links.		✓
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	
• This grouping would see an improvement in the journey experience of those using bus services in Barrhead South. • A bus service currently provides links from Barrhead South to Barrhead town centre where it is possible to access bus services that serve East Renfrewshire and further afield. The measures included within this grouping would help to encourage use of these services, through enhanced information provision and bus stop waiting environment.		✓

• This grouping does not provide any new transport links.		
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	
• The upgrade of existing bus stop locations would provide a more attractive waiting area with improved lighting, where appropriate, which would assist in addressing personal security concerns. • Additional CCTV at bus stop locations would assist in addressing personal security concerns through an increase in surveillance.		✓✓
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• Improvements at bus stops, including Real-Time updates and measures to improve security and journey quality for bus passengers, may make public transport a more attractive option, in general terms. However, this grouping does not provide any new transport links.		O
Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• Improving the journey experience of bus passengers would help to encourage those from further afield to access the Country Park by bus. However, this grouping does not provide any new transport links.		O
Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• The measures in this grouping would do little to achieve this objective.		O

7.2.3 Improved Pedestrian/Cycle Provision

The Improved Pedestrian/Cycle Provision grouping involves providing direct pedestrian/cycle links between Barrhead, Barrhead South and the Country Park, providing cycle links within Barrhead South and Main Street, and the upgrade of stepped footpaths. This grouping is appraised against the TPOs in **Table 13**.

Table 13 Improved Pedestrian/Cycle Provision appraisal against TPOs

Improved Pedestrian/Cycle Provision Objective Appraisal		
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	
• The measures in this grouping would improve the cycling interchange opportunities for Barrhead South residents using Barrhead Rail Station to travel to Glasgow City Centre.		✓
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	
• Whilst it is anticipated this grouping would achieve this objective by supporting accessibility within Barrhead; as pedestrian/cycle links cannot be used by all residents to cover greater distances, this grouping would be limited in its ability to achieve this objective.		O
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	
• The measures in this grouping would address some of the safety and security concerns of those who cycle by providing suitable cycle ways. • The upgrading of connecting paths would improve the pedestrian environment.		✓
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• Creating secure and safe pedestrian/cycle routes connecting Barrhead to the Country Park through Barrhead South will provide sustainable access and therefore have a positive impact in terms of this achieving objective. However, this grouping does not enable fully sustainable access as it does not alter the existing public transport provision.		✓✓

Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• The measures in this grouping would do little to achieve this objective.		O
Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• These measures would provide sustainable transport opportunities for those prospectively residing in the development area which would encourage a move away from car travel.		✓✓

7.2.4 Road Network Upgrade

The Road Network Upgrade grouping involves providing parking for the Country Park, the realignment and widening of Springfield Road and the development of a M77 link road. This grouping is appraised against the TPOs in **Table 14**.

Table 14 Road Network Upgrade appraisal against TPOs

Road Network Upgrade Objective Appraisal		
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	
• A link from Barrhead South to the M77 would give Barrhead South residents an additional route option if they chose to travel to Glasgow City Centre by car, avoiding congestion around Junction 3. • Access to employment opportunities east of Barrhead to areas such as East Kilbride would also be improved. This would, however, be limited to those with access to a car.		✓✓
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	
• A link to the M77 and therefore the A726 would significantly improve east/west access in East Renfrewshire opening up social, domestic and leisure opportunities. This would however be limited to those with access to a car.		✓✓
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	
• The M77 link would remove traffic from Aurs Road and Main Street which would therefore improve the safety of these roads for all users. • Additional parking facilities for the Country Park would be expected to increase visitor numbers. Greater numbers of people within the Park should therefore improve individuals' perception of their personal security when using the Park and its parking facilities. However, improving car access would likely result in a greater number of vehicles on the road network, with associated safety implications.		✓
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• The realignment of Springfield Road will go some way to improving the ease of access to the Country Park for the residents of Neilston by both sustainable modes and by private car, through reducing congestion and journey times. Otherwise there are few opportunities for this grouping to achieve this objective. • Additional parking facilities for the Country Park will increase visitor numbers and indirectly provide the justification necessary for continued investment that will therefore enable sustainable access for local communities, albeit the overall impact of this is expected to be negligible.		O
Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• A link to the M77 and therefore the A726 would significantly improve east/west access in East Renfrewshire and links to Glasgow and would therefore attract visitors to the Park from further afield. • Better road access would make the route more attractive for commercial bus services to serve the Park, assisting with sustainability. • However, additional parking facilities would improve access to the Country Park for those travelling by car, which is not a sustainable mode of travel.		✓

Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• A link to the M77 and therefore the A726 would significantly improve east/west access in East Renfrewshire and links to Glasgow which would help to divert traffic that would otherwise be an addition to the congested road network to the north of Barrhead. • The realignment and widening of Springfield Road would allow an improved and safer journey to Neilston from Barrhead South, opening up access to Neilston Rail Station.		✓✓

7.2.5 Bus Terminus Facility

The Bus Terminus Facility would involve the construction of a bus terminus within the Barrhead South development area. This grouping is appraised against the TPOs in **Table 15**.

Table 15 Bus Terminus Facility appraisal against TPOs

Bus Terminus Facility Objective Appraisal		
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	
• A bus terminus would give the opportunity for an expansion of the area for which the current bus services operate thus widening accessibility and improving integration between services. However, it would not involve the introduction of any new services.		✓
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	
• A bus terminus would give the opportunity for an expansion of the area for which the current bus services operate thus widening accessibility and improving integration between services. However, it would not involve the introduction of any new services.		✓
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	
• A high quality bus terminus facility would provide a safe environment for people to make use of public transport.		✓
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• A bus terminus adjacent to the Country Park would open up access for locals who deem the walk to the park too demanding.		✓
Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• A bus terminus adjacent to the Country Park would open up access for visitors from further afield.		✓
Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• A bus terminus would give the opportunity for a bus service to operate within the development area thus providing public transport provision and therefore mitigating against any adverse impacts on the road network through an increase in vehicles on the road associated with the residential development.		✓

7.2.6 Rail Station with Park and Ride

The Rail Station with Park and Ride grouping comprises of the construction of a new rail station with Park and Ride facilities within the Barrhead South development area. This grouping is appraised against the TPOs in **Table 16**.

Table 16 Rail Station with Park a& Ride appraisal against TPOs

Rail Station with Park & Ride Objective Appraisal		
Objective	To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	
• A rail station within Barrhead South with access to the rail service operating on the Neilston to Glasgow line with a frequent rail service (half hourly increasing to 15 minute headway at peak times) to/from the area would address all aspects of this objective. • Interchange opportunities further improve the accessibility to the proposed rail station and thus the opportunities that arise from its use. • The rail station would also improve links to the east of Barrhead with services calling at Patterton.		✓✓✓
Objective	To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	
• A rail station within Barrhead South with access to the rail service operating on the Neilston to Glasgow line will provide some enhancement to access east / west in East Renfrewshire. • Interchange opportunities further improve the accessibility to the proposed rail station and thus the opportunities that arise from its use.		✓
Objective	To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	
• The rail station would provide an alternative form of transport for those in Barrhead South with personal security concerns relating to the existing transport provision. • The rail station and park and ride facilities would be designed to incorporate measures which mitigate the safety and security concerns of users. • Direct access to Glasgow City Centre without the need to change, particularly in the evening and at night, would also go some way to addressing personal safety concerns.		✓✓
Objective	To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	
• The rail station would provide an additional mode of access to the Park therefore improving sustainable access. Increased visitors from further afield as a result of improved accessibility will allow for greater justification for the maintenance and improvement of sustainable access which will benefit the local community.		✓✓
Objective	To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	
• A rail station adjacent to the Country Park will open up accessibility for those living in proximity to the Neilston to Glasgow rail line. A rail station will reduce the necessity of a car to access the Country Park, particularly for those from further afield.		✓✓✓
Objective	To mitigate any adverse transport impacts created by the Barrhead South Development.	
• The development is anticipated to reinforce Barrhead's function as a commuter town for Glasgow. The new rail station and park and ride facilities would mitigate the effects of increased traffic on the road network to Glasgow and the roads approaching Neilston and Barrhead rail stations. • For many the rail station would be within walking distance which would promote sustainable travel options, reducing the potential traffic volumes on the road network.		✓✓✓

7.2.7 Objective Appraisal Summary

Table 17 provides a summary showing how each of the six groupings performed when appraised against the TPOs using the seven point scale.

Table 17 Summary appraisal against TPOs

Objective Appraisal Summary						
TPO / Package	Do Minimum	Soft Measures	Improved Pedestrian/ Cycle Provision	Road Network Upgrade	Bus Terminus Facility	Rail Station with Park & Ride
To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.	O	✓	✓	✓✓	✓	✓✓✓
To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield.	O	✓	O	✓✓	✓	✓
To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns.	✓	✓✓	✓	✓	✓	✓✓
To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities.	✓	O	✓✓	O	✓	✓✓
To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield.	O	✓	O	✓	✓	✓✓✓
To mitigate any adverse transport impacts created by the Barrhead South Development.	✓	O	✓✓	✓✓	✓	✓✓✓

7.3 Appraisal Against Feasibility, Affordability and Public Acceptability

Feasibility has been assessed in terms of the technical, engineering and operational requirements of the proposals and whether it is deemed possible for them to be implemented.

Affordability has been considered for each grouping with regards to the overall costs and possible avenues of funding which may be available.

Public Acceptability is related to how agreeable each of the proposed grouping measures would be to the local community, taking into account disruption during construction, areas of land use, end benefits and safety. Public consultation on the specific groupings has not been undertaken, however the assessment against 'public acceptability' is takes account of input from local consultation, stakeholder consultation and surveys (see Appendix A: Consultation).

The STAG Policy Assessment Framework (PAF) is used to assess the performance of options (groupings) against criteria relating to affordability, deliverability and risks including public acceptability risks. The chart outputs from the PAF assessment may assist in illustrating the feasibility, affordability and public acceptability of options, and are provided at the end of this Chapter.

7.3.1 Do Minimum

The Do Minimum scenario is appraised against feasibility, affordability and public acceptability in **Table 18**.

Table 18 Do minimum appraised against feasibility, affordability and public acceptability

Do Minimum Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• This option is deemed to be technically feasible and includes no untried technologies or practices. • Whilst the Do Minimum includes measures to support the increased travel demand associated with the Barrhead South Development site, increased future road congestion alongside insufficient measures to encourage modal shift away from the private car across the wider study area are key factors which would adversely affect the ability to successfully operate the Do Minimum scenario.
Affordability	• The Do Minimum comprises measures which are committed and have funding secured. • There is a developer contribution of £10,000 per unit built in the new development, which has the potential to mitigate the impact of increased travel demand generated by the new development. • This Do Minimum is considered affordable in the context of it requiring no capital investment and incurring no ongoing operating or maintenance costs over and above what is already committed.
Public Acceptability	• Measures to support the increased travel demand associated with the Barrhead South Development site are likely to gain public support. However, the Do Minimum scenario does not go beyond this to provide measures across the wider study area to encourage the use of sustainable transport modes; improve access to employment and other key services and facilities; and address the safety and security concerns of local residents, thereby limiting the reach of this scenario.

7.3.2 Soft Measures

The soft measures grouping is appraised against feasibility, affordability and public acceptability in **Table 19**.

Table 19 Soft measures appraised against feasibility, affordability and public acceptability

Soft Measures Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• The measures included within this grouping are deemed to be technically feasible and include no untried technologies or practices. • These are all measures that have been implemented successfully in other locations, and there are no factors which are expected to affect the operation of these measures over their projected life.
Affordability	• This grouping is considered to be affordable through developer contributions associated with the new Barrhead South residential site. There is potential for funding from the City Deal funding stream.
Public Acceptability	• This grouping aims to make bus a more attractive mode of travel, through improving the bus stop waiting environment and increasing the availability of service information, and is therefore likely to gain public support. However, there is no expansion of the bus network in terms of service provision or geographic reach.

7.3.3 Improved Pedestrian/Cycle Provision

The Improved Pedestrian/Cycle Provision measures are appraised against feasibility, affordability and public acceptability in **Table 20**.

Table 20 Improved pedestrian/cycle provision appraised against feasibility, affordability and public acceptability

Improved Pedestrian/Cycle Provision Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• This grouping is deemed to be technically feasible and includes no untried technologies or practices. • Aurs Road within Barrhead South is comprised of a single carriageway and collector road, separated by a grassed strip. This is anticipated to provide ample opportunity for cycle lane provision without impeding on the current road arrangement. • For many of the residential streets in Barrhead South, on-street parking is a necessity. This therefore makes on-road cycle lanes more difficult to implement. • The topography of Barrhead South may dissuade many in the area from choosing cycling as an alternative travel mode. • For many in the current Barrhead South area, travel to the south towards the Country Park would involve a considerable height gain, which may dissuade residents from utilising cycle/pedestrian routes.
Affordability	• This grouping is considered to be affordable through developer contributions associated with the new Barrhead South residential site. There is potential for funding from the City Deal funding stream.
Public Acceptability	• Measures to improve the pedestrian and cycle environment, and address the safety and security concerns of local residents using these modes, are likely to be publicly acceptable. However, this may be negated through the potential loss of on-street parking for cycle lanes, and these measures alone may have a limited impact on improving access to employment and other land-uses. These measures alone are likely to be insufficient to support the increased travel demand associated with the Barrhead South residential development site, which would reduce the level of public support for this grouping.

7.3.4 Road Network Upgrade

The Road Network Upgrade measures are appraised against feasibility, affordability and public acceptability in **Table 21**.

Table 21 Road network upgrade appraised against feasibility, affordability and public acceptability

Road Network Upgrade Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• The road network upgrade is deemed to be technically feasible and includes no untried technologies or practices. There are no factors which are expected to adversely affect the operation of these measures over their projected life. There will be disruption to the road network during construction.
Affordability	• The capital cost the road network upgrade is expected to be relatively high. It could potentially be funded through developer contributions, the City Deal funding stream and potentially the Scottish Government.
Public Acceptability	• Measures to improved accessibility to the trunk road network and reduce congestion and smooth the flow of traffic on key routes is likely to be publicly acceptable, however, in isolation, this option does not address issues and concerns relating to sustainable transport provision.

7.3.5 Bus Terminus Facility

The Bus Terminus Facility is appraised against feasibility, affordability and public acceptability in **Table 22**.

Table 22 Bus terminus facility appraised against feasibility, affordability and public acceptability

Bus Terminus Facility Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• This bus terminus facility is deemed to be technically feasible and includes no untried technologies or practices. • East Renfrewshire Council own and have safeguarded land to the east of Balgraystone Road, where the rail line intercepts the road, for a Rail Station and interchange opportunity (which could include a bus terminus facility). Therefore, no private land acquisition issues are envisaged. • Patronage levels would require to be sustained in order to make the bus terminus commercially viable and enable successful operation over its projected life.
Affordability	• The costs of this facility could be relatively high with a good quality bus terminus requiring hard standing areas, bus stances / canopies, lighting, CCTV, real time information and help points. • The bus terminus facility is considered to be affordable through developer contributions associated with the new Barrhead South residential site. There is also potential for funding from the City Deal funding stream.
Public Acceptability	• Measures to improve sustainable transport provision, and the ability to interchange between services, is likely to be publicly acceptable. The bus facility would be designed in line with best practice and would include measures to address the safety and security concerns of local residents when using public transport. The location of the bus terminus facility within the Barrhead South residential development would go some way to supporting the increased travel demand associated with the development site.

7.3.6 Rail Station with Park and Ride

The Rail Station with Park and Ride facility is appraised against feasibility, affordability and public acceptability in **Table 23**.

Table 23 Rail station and Park and Ride appraised against feasibility, affordability and public acceptability

Rail Station with Park and Ride Appraisal Against Feasibility, Affordability and Public Acceptability	
Feasibility	• The rail station and park and ride facility are deemed to be technically feasible, with no untried technologies or practices involved. • Whilst two technical studies into the feasibility of constructing a new station have been undertaken, further investigative studies would require to be carried out to establish the impact a new station on this line would have on timetabling issues and overcrowding. • The Barrhead South residential development masterplan indicates that a potential site for a new rail station exists within land owned by Network Rail and that an adjacent car park area could be located on land owned by East Renfrewshire Council. Furthermore, the Local Development Plan safeguards land for this purpose. Therefore, no private land acquisition issues are envisaged. • Consultation with Network Rail has confirmed that is the provision of a new rail station is at a stage of development that would allow it to proceed to a point of engineering scope freeze and in sufficient detail to allow finalisation of a business case and scheduling of implementation resources. (GRIP 4). • Patronage levels would be required to be sustained in order to make the new station commercially viable and enable the successful operation over its projected life.
Affordability	• The availability of funding potentially awarded to the Council as part of the Glasgow & Clyde Valley City Deal Infrastructure Fund, to improve transport and regenerate/develop sites supporting economic growth, means that the costs for this grouping could be incorporated within the Council's City Deal funding award. • This reduces the risk to East Renfrewshire Council arising from any delay in development of the

	Barrhead South residential development site and/or its phased development. The funding will allow for the creation of an asset for adoption by Network Rail and the costs associated with this grouping's ongoing operating and/or maintenance costs and its likely operating revenues will be realised by Network Rail. • Funding will be available through developer contributions associated with the new Barrhead South residential site, and there may be scope to secure funding through the Scottish Stations Fund.
Public Acceptability	• Measures to improve sustainable transport provision, and the ability to transfer trips from car to rail for longer journeys, are likely to be publicly acceptable. The new rail station and park and ride facility would be designed in line with best practice and would include measures to address the safety and security concerns of local residents when using public transport. The location of the rail station and park and ride facility within the Barrhead South residential development would support the increased travel demand associated with the development site, and open up access to a range of land-uses for this area.

7.4 STAG Criteria Appraisal

7.4.1 Do Minimum

The Do Minimum is appraised against the STAG Criteria in **Table 24** using the seven point scale.

Table 24 Do minimum appraised against STAG criteria

Do Minimum Appraisal Against STAG Criteria		
Environment	• There is potential for a significant increase in vehicles on the road following the completion of the Barrhead South residential development. • Straightening of Aurs Road will make using the road more appealing thus potentially increasing the number of vehicles using the road, with associate negative impacts on the local environment. • The hedgerows and trees along Aurs Road provide an attractive habitat for wildlife: where possible these are likely to be retained.	✘
Safety	• The realignment of Aurs Road to straighten the route and remove the existing height and weight restrictions, thus reducing queuing traffic and improving the east to west movement of vehicles, is expected to have a positive impact on road users and pedestrians. However, this impact may be negated if there is an increase in volumes of vehicular traffic in the local area.	✓
Economy	• The straightening of Aurs Road may have a small impact on reducing journey times. • A population increase in Barrhead may make the area more attractive to investors.	✓
Integration	• The realignment of Aurs Road to improve access between Barrhead and Newton Mearns may achieve improvements to integration. • The residential development has been designed to encompass pedestrian links between the development, the existing Barrhead South area and the Dams to Darnley Country Park. • The measures included within the Do Minimum align with local policies and bring forward the Strategic Development Opportunity identified in the Local Development Plan.	O
Accessibility and Social Inclusion	• The straightening of Aurs Road will improve accessibility to the Country Park. • The implementation of core walking paths will improve accessibility between the residential development and the Country Park.	✓

7.4.2 Soft Measures

The Soft Measures grouping is appraised against the STAG Criteria in **Table 25** using the seven point scale.

Table 25 Soft measures appraised against STAG criteria

Soft Measures Appraisal Against STAG Criteria		
Environment	• It would be expected that these measures would encourage public transport use, therefore reducing the number of vehicles on the road, with an associated positive environmental impact.	✓
Safety	• The improvement of personal security for bus passengers and the installation of real-time updates and CCTV on bus stops will increase individuals' perceptions of their safety. • Any measure which improves the journey experience for public transport passengers may result in greater public transport patronage and as such fewer private vehicles on the road. This in turn would have a positive effect on safety.	✓
Economy	• Greater accessibility to public transport will open up employment and leisure opportunities for Barrhead South residents, and improve journey times to a small degree.	✓
Integration	• Transport Integration – potential for improved public transport information, marketing of services, improved bus stop waiting environment and the implementation of real-time passenger information, will improve integration between modes and services and reduce reliance on private car use. There is potential for a slight indirect benefit on ticketing through improved marketing of discount tickets that are available. • Transport and Land Use Integration – No conflict with existing land uses. Measures would encourage the residents of the new development and surrounding areas of Barrhead South to use the local bus services to access a variety of land-uses in Barrhead, Paisley and other locations such as Silverburn and parts of Glasgow. • Policy Integration – Aligns well with Local Transport Strategy and other transport strategies by supporting use of public transport.	✓
Accessibility and Social Inclusion	• Improving the appeal of public transport will increase accessibility to employment, social and leisure opportunities, particularly for those without access to a car. • Improving the security and journey quality for bus passengers may allow for more vulnerable members of society to feel able to use public transport.	✓

7.4.3 Improved Pedestrian/Cycle Provision

The Improved Pedestrian/Cycle Provision grouping is appraised against the STAG Criteria in **Table 26** using the seven point scale.

Table 26 Improved pedestrian/cycle provision package appraised against STAG criteria

Improved Pedestrian/Cycle Provision Appraisal Against STAG Criteria		
Environment	It would be expected that these measures would encourage residents to transfer to sustainable transport, therefore reducing the number of vehicles on the road and with an associated positive impact on the local environment.	✓
Safety	• Providing designated cycle paths and improving the pedestrian walking environment will bring safety benefits for cyclists and pedestrians. • Encouraging residents to choose more sustainable transport options over car use may lead to a reduction in the number of vehicles on the road and thus a reduction in road accidents.	✓
Economy	• Although these measures may result in an increase in leisure trips made to the	O

	Country Park by sustainable modes of transport, generally, it is not considered to have an impact on the wider economy, nor is there expected to be a notable impact on neither reducing journey times nor generating travel time savings. Unlikely to have a notable impact on local businesses.	
Integration	• Transport Integration – improved environment for pedestrians and cyclists will go some way to improving integration between modes and services and reduce reliance on private car use. • Transport and Land Use Integration – this grouping will provide increased access to the Country Park from Barrhead South. No anticipated conflict with existing land uses. • Policy Integration – Aligns well with Local Transport Strategy and other transport strategies by providing and encouraging the use of sustainable modes of transport.	✓
Accessibility and Social Inclusion	• Improvements to the walking and cycling environment may lead to an improvement in local accessibility and social inclusion, particularly for those without access to a car.	✓

7.4.4 Road Network Upgrade

The Road Network Upgrade is appraised against the STAG Criteria in **Table 27** using the seven point scale.

Table 27 Road network upgrade appraised against STAG criteria

Road Network Upgrade Appraisal Against STAG Criteria		
Environment	• Several environmental impacts may be incurred through the implementation of the measures in this grouping caused by increasing the ease of travel for vehicles and thus potentially increasing the number of vehicles on the road. However if it is assumed that the housing development will inevitably bring an increase in the number of vehicles on the road, the realignment of Springfield Road and the M77 link will improve traffic flows, reduce congestion, smooth link speeds and thus mitigate some of the environmental impacts. • Improving the parking provision for the Dams to Darnley Country Park may discourage users from using sustainable travel options, opting for travel by car, with associated environmental impacts. • Development of new infrastructure will have an environmental cost in terms of the creation of impermeable surfaces.	✘
Safety	• The realignment of Springfield Road will improve safety for road users by removing blind corners and preventing the confrontation of traffic flowing in opposite directions. Straightening, however, may encourage users to exceed the speed limit. • Increased parking provision may reduce inappropriate parking on Aurs Road. • Increased levels of traffic could have associated negative safety impact.	✓
Economy	• All of the measures in this grouping have the potential to have a positive economic impact for Barrhead by improving accessibility and reducing travel times, and therefore improving employment and leisure opportunities. • The M77 link has the potential to encourage business to the area, thus providing employment. • A more direct link to the strategic road network should reduce journey times and vehicle operating costs for those travelling from Barrhead South. • The M77 link will open up east/west access to vehicles that otherwise would not be able to operate due to low bridges.	✓✓
Integration	• Transport Integration – the new road link would offer greater opportunity for bus routes to provide improved services east/west through reducing congestion and	✓

	increasing the flow of traffic and would provide a more direct route from Barrhead South to the strategic network. The M77 link road would alleviate traffic volumes on Aurs Road and Main Street, which could enhance these routes for users of sustainable modes. • Transport and Land Use Integration – This grouping offers a more direct link to the strategic road network helping avoid routing through already congested areas. However care would be needed to ensure it did not result in erosion of the greenbelt area. • Policy Integration – the provision of a new road link and a new car park would fit with policies to develop and grow the visitor market at the Dams to Darnley Country Park. However, it only has limited scope to increase travel by sustainable modes.	
Accessibility and Social Inclusion	• The M77 link would improve east/west accessibility. This would increase accessibility to employment and leisure opportunities for those residing in the Levern Valley area. • Increased parking provision for the Country Park will open it up to visitors from further afield who are required to travel by car. • However, there is limited scope to increase travel by sustainable modes, and hence ability to improve accessibility and social inclusion for those without access to a private car.	✓

7.4.5 Bus Terminus Facility

The Bus Terminus Facility is appraised against the STAG Criteria in **Table 28** using the seven point scale.

Table 28 Bus terminus facility appraised against STAG criteria

Bus Terminus Facility Appraisal Against STAG Criteria		
Environment	• It would be expected that the bus terminus facility would encourage public transport use, therefore potentially encourage modal shift away from private car, with associated positive impacts on the local environment. • Development of new infrastructure will have an environmental cost in terms of the creation of impermeable surfaces.	✓
Safety	• The bus terminus facility would be designed in line with best practice and would incorporate measures which would assist in addressing the personal safety concerns of local residents when using the facility. Encouraging residents to choose more sustainable transport options over car use will lead to a reduction in the number of vehicles on the road and thus a reduction in road accidents although the impact on safety is considered to be minimal.	✓
Economy	• A bus terminus will promote the provision of a bus service operating within the new housing development (extension of existing service route) which may help improve links to Barrhead town centre and in turn encourage greater spending in the area. • A bus terminus could encourage more people to use the Dams to Darnley Country Park again boosting spending in the area. • There is unlikely to be a notable impact on journey times and hence travel time savings.	✓
Integration	• Transport Integration – A bus terminus will facilitate integration between sustainable transport modes (walking and cycling) and bus services. • Transport and Land Use Integration – The bus terminus is to be situated within the new housing development therefore allowing for an easy integration with the land-use. There is no anticipated conflict with existing land-uses. • Policy Integration – provision of public transport at the Dams to Darnley Country Park fits with aspirations to encourage sustainable access to the Park. Overall, the promotion of sustainable transport is in line with policy directives.	✓

Accessibility and Social Inclusion	• A bus terminus within the new housing development will encourage the provision of a bus service that will provide an essential service for those who reside in the area without access to a car.	✓

7.4.6 Rail Station with Park and Ride

The Rail Station with Park and Ride facility is appraised against the STAG Criteria in **Table 29** using the seven point scale.

Table 29 Rail station with Park & Ride appraised against STAG criteria

Rail Station with Park & Ride Appraisal Against STAG Criteria		
Environment	• It would be expected that these measures would encourage public transport use, therefore reducing the number of vehicles on the road, with an associated positive impact on the environment. • Development of new infrastructure will have an environmental cost in terms of the creation of impermeable surfaces.	✓✓
Safety	• Encouraging residents to choose more sustainable transport options over car use could lead to a reduction in the number of vehicles on the road for longer journeys, and thus a reduction in road accidents. Rail is considered to be a safer mode of transport than the private car. However, there may be a small increase in the number of vehicles on local roads associated with the park and ride facility. The new rail station and park and ride facility would be designed in line with best practice and would incorporate measures which would assist in addressing the personal safety concerns of local residents when using the facility.	✓
Economy	• A rail station will improve the ease of access to the Country Park for those living further afield. The improved access would increase visitor numbers and thus contribute to improving Barrhead's economy. • The station would be situated on the rail line serving Glasgow City Centre providing significantly reduced journey times to a major source of high quality employment opportunities whilst also improving access to employment opportunities in the Barrhead area.	✓✓
Integration	• Transport Integration – The provision of a rail station should assist with integration of feeder modes (i.e. walking and cycling) to the rail network avoiding the distance and topographical issues associated with accessing Barrhead Station from Barrhead South. • Transport and Land Use Integration – The rail station would be situated within the new housing development, thus integrating well with land-use. No anticipated conflict with existing land-uses. Furthermore no alteration to the rail line would be required to allow for the construction of the rail station. • Policy Integration – the rail station would assist with providing public transport access to the Dams and Darnley Country Park and would tie up with the Local Transport Strategy and other policy directives encouraging sustainable forms of transport. The provision of a new rail station aligns with Local Development Plan aspirations.	✓✓
Accessibility and Social Inclusion	• Access to the railway from Barrhead South will significantly reduce the journey time to Glasgow for local residents. • Improved access to Glasgow City Centre also provides greater access to onward connections serving a wider area, particularly for those without access to a car. • The station will be situated in close proximity and within a 15 minute walk from the areas within Barrhead South with the highest levels of deprivation.	✓✓

7.4.7 STAG Criteria Appraisal Summary

Table 30 provides a summary showing how each of the six groupings performed when appraised against the STAG Criteria using the seven point scale.

Table 30 Summary of groupings appraised against STAG criteria

STAG Criteria Appraisal Summary						
Grouping / STAG Criteria	Do Minimum	Soft Measures	Improved Pedestrian/ Cycle Provision	Road Network Upgrade	Bus Terminus Facility	Rail Station with Park & Ride
Environment	✘	✓	✓	✘	✓	✓✓
Safety	✓	✓	✓	✓	✓	✓
Economy	✓	✓	O	✓✓	✓	✓✓
Integration	O	✓	✓	✓	✓	✓✓
Accessibility and Social Inclusion	✓	✓	✓	✓	✓	✓✓

7.5 Conclusion of the STAG Part 1 Appraisal

Following this initial analysis of the option groupings it can be seen that different groupings meet different criteria to varying extents and that a package of measures in most likely required to provide a good all round fit. It is recommended that the following combined packages are therefore taken through to the Part 2 Appraisal within STAG:

- Do minimum;
- Do minimum PLUS investment in softer measures and Pedestrian / Cycling links;
- Do minimum PLUS investment in softer measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77
- Do minimum PLUS investment in softer measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus

Figure 31 details the process in which options are grouped and then packaged and at what stage in the STAG this occurs.

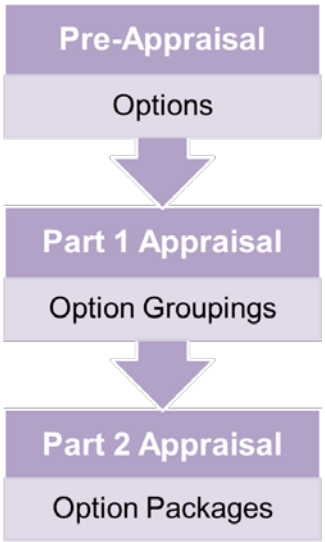

Figure 31 Option Grouping and Packaging Process

The packages are further developed in the following Chapter and in turn appraised through the STAG Part 2 process.

8 Appraisal Assumptions

8.1 Introduction

This Chapter will set out the appraisal assumptions for each of the packages taken forward for consideration at STAG Part 2. Table 31 provides a recap of the measures within each package.

Table 31 Measures within each package

Package	Measures
1: Do Minimum	• The Barrhead South Development; and • The realignment of Aurs Road.
2: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links	• The Barrhead South Development; • The realignment of Aurs Road; • **Improved public transport information and marketing**; • **Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South**; • **Real-Time updates at bus stops**; • **Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park**; • **Provide cycle links within Barrhead South and Main Street**; and • **Upgrade of connecting footpaths in Barrhead South**.
3: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77	• The Barrhead South Development; • The realignment of Aurs Road; • Improved public transport information and marketing; • Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South; • Real-Time updates at bus stops; • Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park; • Provide cycle links within Barrhead South and Main Street; • Upgrade of connecting footpaths in Barrhead South; • **Parking for the Country Park**; • **Realignment and widening of Springfield Road**; and • **Development of a M77 link road**.
4: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus	• The Barrhead South Development; • The realignment of Aurs Road; • Improved public transport information and marketing; • Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South; • Real-Time updates at bus stops; • Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park; • Provide cycle links within Barrhead South and Main Street; • Upgrade of connecting footpaths in Barrhead South; • **Rail Station;** or • **Rail Station with Park & Ride**; or • **Rail Station with Bus Terminus**; or • **Rail Station with Bus Terminus and Park & Ride**

8.1.1 Do Minimum

The Do Minimum package contains the following:

- The Barrhead South Development; and
- The realignment of Aurs Road to improve access between Barrhead and Newton Mearns.

The following sections will set out what these measures will involve.

8.1.1.1 Barrhead South Development

The development area is split into four areas, owned by three housing developers and East Renfrewshire Council, each owning their respective plots. The site extends to over 85ha in size and the development is anticipated to provide 1,050 homes in total, developed in two phases. 470 homes are planned to be built by 2025 and 580 homes post-2025.

In addition to the developer contribution of £10,000 per unit built, it is expected that the developers will comply with the access and road mitigation strategy outlined and that the access points are in accordance with the requirements of the Design Manual for Roads and Bridges, Designing Streets and the Council's design standards. The Local Development Plan Supplementary Planning Guidance[19] outlines the indicative road network for the area which is shown in **Figure 32.**

Figure 32 Indicative Movement Hierarchy Plan (Local Development Plan Supplementary Planning Guidance: Barrhead South Master Plan)

[19] Local Development Plan Supplementary Planning Guidance: Barrhead South Master Plan (Geddes Consulting on behalf of East Renfrewshire Council, Edinburgh, June 2015)

8.1.1.2 Realignment of Aurs Road

The realignment of Aurs Road will involve the straightening of two sections as detailed in **Figure 33.**

The Dams to Darnley Country Park Supplementary Planning Guidance also indicates that the weak bridge in the eastern corner of Balgray Reservoir will be replaced, removing the weight restriction and the realigned road sections lined with hedgerow.

Figure 33 Aurs Road Realignment (Local Development Plan Supplementary Planning Guidance: Dams to Darnley Country Park)

8.1.2 Package 2: Do Minimum PLUS investment in Softer Measures and Pedestrian / Cycling links

This package would incorporate the measures included within Package 1, together with the following measures:

- Improved public transport information and marketing;
- Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South;
- Real-Time passenger information updates at bus stops;
- Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park;
- Provide cycle links within Barrhead South and Main Street; and
- Upgrade of connecting footpaths in Barrhead South.

8.1.2.1 Improved Public Transport Information and Marketing

The measure to improve public transport information and marketing is assumed to incorporate:

- Up to date bus timetabling information available at every existing bus stop in the Barrhead South area (27 stops);
- Up to date bus timetabling information easily accessible online; and
- Guidance to residents to advise how to access online travel information.

8.1.2.2 Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South

The measures to improve security and journey quality for bus passengers at bus stops in Barrhead South are assumed to incorporate:

- Sheltered bus stands with seating facilities and integrated lighting at all 27 existing stops. This will include the installation of new bus shelters at 10 existing bus stops and the replacement of 11 seat-less shelters;
- High access raised kerbs with tactile paving installed at all 27 existing stops;
- Road markings indicating the bus stops at all 27 existing stops; and
- Installation of CCTV at key locations.

8.1.2.3 Real-Time updates at bus stops

It is assumed that Real-time passenger information technology will be installed within all 27 bus stops that are currently in operation in Barrhead South.

8.1.2.4 Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park

It is assumed that the provision of direct pedestrian/cycle linkage between Barrhead, Barrhead South and the Country Park will follow the intentions set out within the Dams to Darnley Country Park Supplementary Guidance as shown in **Figure 34**. 4km of footpath are to be developed providing three additional access points from Barrhead South.

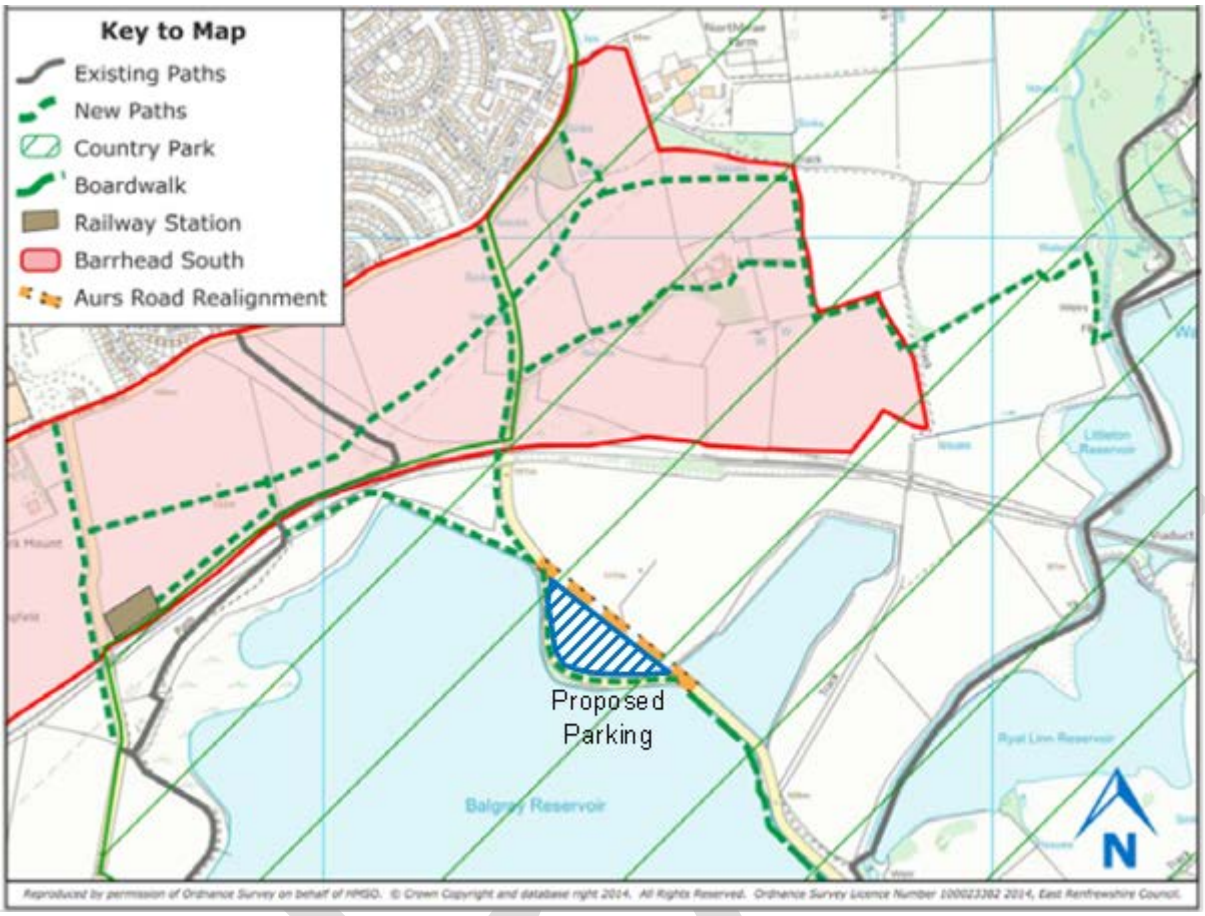

Figure 34 Barrhead South to Dams to Darnley Country Park proposed path network alignment (Local Development Plan Supplementary Planning Guidance: Dams to Darnley Country Park)

8.1.2.5 Provide cycle links within Barrhead South and Main Street

As a minimum, it is assumed that the three primary roads connecting Barrhead to Main Street would be upgraded to provide cycling provision providing either as on-road cycle lanes or shared user pavements. These are:

- Springhill Road to Springhill and Auchenback Primary School;
- Arthurlie Street and Aurs Drive; and
- Aurs Road until the Dams to Darnley Country Park.

This would cover a distance of 2.8 km.

8.1.2.6 Upgrade of connecting footpaths in Barrhead South

The connecting footpaths in Barrhead South cover a total distance of 3.6 km. It is assumed that not all 3.6 km of footpath would require to be upgraded, with the stepped footpaths being given priority. The stepped footpaths cover a total distance of 288 m.

8.1.2.7 Summary

Table 32, below, provides a summary of the measures and appraisal assumptions for Package 2, over and above those set out within the Do Minimum.

Table 32 Package 2 Summary of measures and appraisal assumptions

Measure	Location	Cost Per Unit	Total Cost	Assumptions
PT information & marketing	• Mailshot to residents • 27 existing bus stops • Online			
CCTV	5 existing bus stops	£3,750 per bus stop	£18,750	
RTPI	27 existing bus stops	£6,000 per bus stop	162,000	
New bus shelter	10 existing bus stops	£3,000 per bus stop	30,000	
Bus stop seating	11 existing bus stops	£1,000 per bus stop	11,000	
High access raised kerbs	27 existing bus stops	£2,000 per bus stop	54,000	
Consistent road markings and improved bus stop signage	27 existing bus stops	£500 per bus stop	13,500	
Pedestrian / cycle link	Between Barrhead, Barrhead South and the Country Park	Highly dependent on design		4km total length,
Cycle links	• Springhill Road to Springhill and Auchenback Primary School • Arthurlie Street and Aurs Drive • Aurs Road until the Dams to Darnley Country Park	Highly dependent on design		2.8km total length
Tactile paving	27 existing bus stops	£200 per bus stop	£5,400	
Lighting	27 existing bus stops	£500 per bus stop	£13,500	
Upgrade of connecting footpaths	Stepped areas	Highly dependent on design		288m total length

The above figures are taken from previous work and SPONS 2017. They are all subject to change and are not based on specific designs or specifications. They should not be revisited as plans progress.

8.1.3 Package 3: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

This Package will include the measures within Package 2, together with the following measures:

- Parking for the Country Park;
- Realignment and widening of Springfield Road; and
- Development of a M77 link road.

8.1.3.1 Parking for the Country Park

The realignment of Aurs Road provides the space required for a car park to be built on the eastern side of Balgray Reservoir.

Figure 34 highlights the area available for the car park to be built on. The western extents are assumed to be the current alignment of Aurs Road and the eastern extents to be the realigned Aurs Road. The car park will have an area of approximately 8650m^2. This would be enough space for up to 350 car parking spaces. It is assumed that 100 spaces would be provided at this location[20] The car park is assumed to include lighting, CCTV and signage, designed to current best practice. Based on Spons 2017, this could cost around £250 - £300k.

8.1.3.2 Realignment and widening of Springfield Road

The realignment and widening of Springfield Road is assumed to extend from the roundabout at Kirktonfield Drive in Neilston to St Luke's High School in Barrhead, and cover a distance of 1.9 km. This will widen the road from a one-lane country road to a single carriageway with two lanes, following the standards set out in the Design Manual for Roads and Bridges[21].

The road section crosses two bridges with width constraints. At present the bridge in Neilston is one-way, controlled by traffic signals. It is assumed that a similar configuration will also be implemented at the bridge adjacent to St Luke's High School.

8.1.3.3 Development of a M77 link road

It is assumed that the development of an M77 link road will follow recommendations set out in the M77 Corridor Masterplan and Development Framework[22]. This recommends a road linking Barrhead South to Junction 5 of the M77. The two-lane single carriageway road will be approximately 5-6 km in length and will require both the upgrading of existing roads but also new road development. A cost estimate provided in 2013[23] suggested it would be of the order of £10million

8.1.3.4 Summary

Table 33, below, provides a summary of the measures and appraisal assumptions for Package 3, over and above those set out within Package 2.

[20] Based on a statement on East Renfrewshire Council's website that 200 spaces are to be provided around the country park (http://www.eastrenfrewshire.gov.uk/article/7463/East-Renfrewshire-City-Deal-projects)
[21] The Design Manual for Roads and Bridges (The Highways Agency, Scottish Government, Welsh Assembly Government and the Department for Regional Development Northern Ireland, May 2008)
[22] M77 Corridor Masterplan and Development Framework (Jones Lang LaSalle, Glasgow, 2011)
[23] Supporting Technical Report, Proposed Balgray Link Road, East Renfrewshire,18th January 2013

Table 33 Package 3: Summary of measures and appraisal assumptions (measures additional to Package 2)

Measure	Location	Cost Per Unit	Total Cost	Assumptions
Country Park car parking provision	Eastern side of Balgray Reservoir	£120 per m^2	£300,000	• 8,650 m^2 area. Good quality facility, no difficulties with planning stages. • Assumes that 2,500m^2 would be allocated for car parking • Includes lighting, CCTV and signage, designed to current best practice. • Figure taken from SPONS 2017
Realignment and widening of Springfield Road	• Realignment and widening from roundabout at Kirktonfield Drive to St Luke's High School • Signal-controlled junction at bridge adjacent to St Luke's High School	Dependent on design		• 1.9km length, width. Includes 'finishes' – kerbing drainage etc. • Area of new surfaces Xm^2 Includes 'finishes' – kerbing drainage etc.
2-lane single carriage link road to M77	• Barrhead South to Junction 5 of the M77 • Upgrade of existing junctions		£10,000,000	• Based on figures provided in Balgray Link Road, Supporting Technical Report, January 2013

8.1.4 Package 4: Do minimum PLUS investment in softer measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus

Package 4 will incorporate the measures included within Package 2, together with the following measures:

- Rail Station; or
- Rail Station with Park and Ride; or
- Rail Station with Bus Terminus; or
- Rail Station with Bus Terminus and Park and Ride

8.1.4.1 Rail Station

The Barrhead South Master Plan Supplementary Planning Guidance sets out land that is designated for the development of a rail station and a preliminary design as shown in **Figure 35**.

It is assumed that the new rail station will be a twin platform station, with a westbound platform and an eastbound platform. A sheltered waiting area will be provided on each of the two platforms, and CCTV, lighting and information provision will be designed to current best practice. Provision will be made for taxis, cycle parking and passenger pick up / drop-off. This option alone does not include parking provision or the capacity to accommodate bus interchange. It is further assumed that the station would be unstaffed. An underpass on Balgraystone Road will be used as the pedestrian access points. Balgraystone Road will also be used as an access point to the eastbound platform for road vehicles.

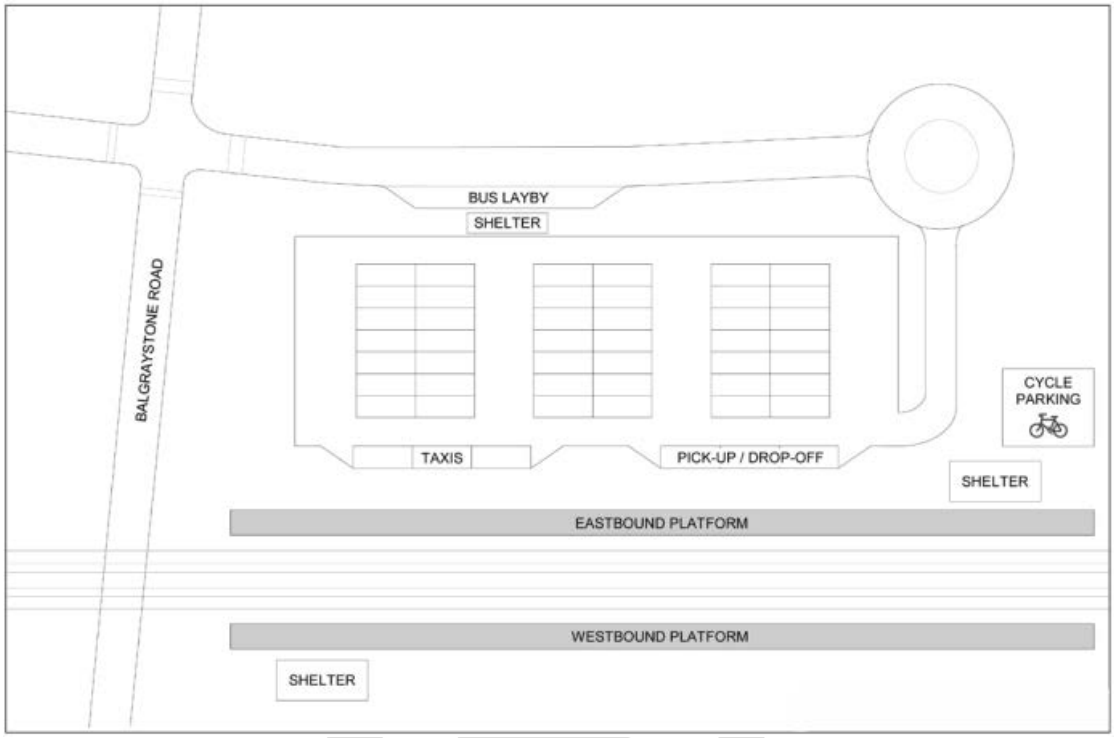

Figure 35 Preliminary Design of the Barrhead South Rail Station (Local Development Plan Supplementary Planning Guidance: Barrhead South Master Plan (Geddes Consulting on behalf of East Renfrewshire Council, Edinburgh, June 2015))

8.1.4.2 Rail Station with Park and Ride

The Park and Ride facility would be located adjacent to the new rail station described above, and is noted within the Barrhead South Master Plan Supplementary Planning Guidance as having the potential to provide 80 spaces, although considered more likely to contain 40 spaces together with drop-off facilities. CCTV, lighting and information .Provision will be designed to current best practice.

8.1.4.3 Rail Station with Bus Terminus

The rail station will take the form of that described in Section 8.1.4.1. The bus terminus will include a turning circle and covered bus stop to allow passengers to be picked up and dropped off. It is assumed that there will be lay-by provision for one bus, and that the facility would be un-staffed. **Figure 35** gives an indication of how the bus terminus will relate to the rail station however future designs will vary depending on whether the car park option is progressed.

CCTV, lighting, high access raised kerbs and information provision at the bus terminus will be designed to current best practice.

It is assumed at this stage that there will be no new buses serving the terminus, however, the local bus services which serve Barrhead Main Street, Paisley, and Glasgow from Barrhead South would route via the development and to the terminus.

8.1.4.4 Rail Station with Bus Terminus and Park and Ride

This measure combines the measures described in Sections 8.1.4.1, 8.1.4.2and 8.1.4.3, above.

8.1.4.5 Summary

Table 34, below, provides a summary of the measures and appraisal assumptions for Package 4, over and above those set out within the Package 2.

Table 34 Package 4: Summary of measures and appraisal assumptions (measures additional to Package 2):

Measure	Location	Cost Per Unit	Total Cost	Assumptions
New rail station	Barrhead South	Current cost estimates for the Rail Station and associated works are £10.95million[24].		Good quality facility, no difficulties with planning stages. Twin platform, two sheltered waiting areas, unstaffed station. Provision for taxis, cycle parking and passenger pick up / drop-off, Parking for 40 vehicles. CCTV, lighting and information provision designed to current best practice.
Park & Ride facility	Barrhead South rail station			Good quality facility, good location, no difficulties with planning stages. Forty space car park plus drop-off area. CCTV, lighting and information provision designed to current best practice.
Bus terminus	Barrhead South rail station			Turning circle and covered bus stop. Lay-by provision for one bus. CCTV, lighting, high access raised kerbs and information provision designed to current best practice. Unstaffed facility. Expansion of current service route to terminus, but no new bus services serving terminus.

[24] Information received from East Renfrewshire Council 01/11/16

8.2 Summary

This Chapter has set out the appraisal assumptions for each of the Packages being considered in the STAG Part 2 appraisal. The following Chapters consider the performance of each Package against the STAG Part 2 appraisal criteria.

STAG Part 2 Appraisal Summary Tables (ASTs) are contained within Appendix D: Appraisal Summary Tables (Part 2).

9 Environment

9.1 Introduction

A Scottish Transport Appraisal Guidance (STAG) Assessment was used to identify objectives for the proposals and to investigate the previous options as part of a Part 1 STAG assessment. This section of the report sets out the environmental Strategic Level Part 2 STAG assessment for the four packages taken forward as detailed within Chapter 8, and summarised below:

- Do Minimum;
- Do Minimum PLUS investment in Softer Measures and Pedestrian / Cycling links;
- Do Minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77
- Do Minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a Bus Terminus.

Previous environmental investigation has been carried out by East Renfrewshire Council for which much is relevant and transferable to inform this Part 2 STAG. Further work is underway as part of the City Deal process, no new environment work has been undertaken to inform this chapter. The information presented here is largely an edited version of the STAG work presented in the 2008 Auchenbach STAG and hence some updates will be required. It is anticipated that the environmental work being done as part of the City Deal process will provide these updates.

Due to their extensive nature the following sections assessing the packages will merely summarise the primary environmental impacts with reference made to the more extensive appraisal from the documents listed above where appropriate.

9.2 Noise and Vibration

9.2.1 Introduction

This section aims to set out the potential impacts on noise and vibration levels for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

According to the STAG Guidance (STAG TD 7.4.1.1):

> ***"Transport is a major source of noise. Noise exposure can have an adverse impact on human health and perceived quality of life."***

The STAG Guidance continues by noting that (STAG TD 7.4.1.3):

> ***'Relatively large changes in traffic flows are required to bring about perceivable changes in noise levels (assuming all other traffic variables are constant). For freely flowing traffic, a difference of about 3dB(A) is required before there is a change, perceivable to the human ear, in the noise level for the steady state situation. A 25% increase or 20% decrease in traffic flow, if speed and other factors remain unaltered, only results in a 1dB change'.***

9.2.2 Assessment

9.2.2.1 Package 1: Do Minimum

The options within the Do Minimum package will see some increase in traffic on Aurs Road due to its realignment but the impact is considered to be minimal. During construction, the noise and vibration is anticipated to have a greater impact however the impact will be short lived and not long term.

The addition of 1050 houses however is expected to cause a considerable increase in traffic levels and thus traffic noise and vibration through an increase in the number of cars on the road in the area. This coupled with many of the local roads in the surrounding area not having been designed to cater for such a capacity will likely cause an increase in traffic noise through congestion.

The Barrhead South Development is anticipated to be constructed in close proximity to the rail line and proposed station. However, at this stage, a detailed Part 2 assessment is not required as this population does not exist at present and therefore the percentage annoyance cannot be calculated as the estimated population densities are unknown.

An aim of the Dams to Darnley Country Park initiative is to:

'Conserve and enhance the biodiversity, geodiversity, landscape and built heritage of the Country Park'

An increase in traffic on Aurs Road, intersecting the country park will conflict with achieving this aim through increased noise and vibration. Furthermore, improved access to the Country Park will cause an increase in visitor numbers that will also disrupt habitat.

9.2.2.2 Package 2: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links

The additional measures within the do minimum PLUS investment in softer measures and pedestrian / cycling links package are not road based or rail based options. Excluding noise from construction, these measures will not have an impact on noise and vibration. The introduction of soft measures however could encourage modal shift with a positive impact on noise and vibration.

9.2.2.3 Package 3: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

The Country Park car parking option could potentially increase in traffic on Aurs Road. However, based on a turning count survey by 'Count on Us' in 2005 (provided by East Renfrewshire Council), there were 1991 vehicles (two-way AM and PM peak) on Aurs Road to the south of the Springfield Road / Aurs Road junction. As highlighted previously, a 25% change in traffic flows would result in a 1dB change. Based on this, the peak flow would have to increase by around 500 vehicles. The Country Park visitors utilising the car park(s) would arrive outwith these peak times and likely to be spread throughout the day and over the weekend but it is highly unlikely that the required traffic threshold for perceivable change would be reached.

The widening and realigning of Springfield Road may see an increase in distance travelled to rail interchange through Barrhead South residents opting to travel to Neilston Rail Station rather than use Barrhead Rail Station. The increase in traffic will negatively impact noise and vibration levels in both residential and rural areas.

The provision of a new road link from Barrhead South to the M77 is likely to divert some traffic away from Aurs Road thereby reducing noise and vibration but introduce new traffic to the new route. It is also possible that this new route would encourage individuals to opt for car travel over public transport due to increased ease of car travel. This would therefore see an increase in traffic levels and therefore an increase in noise and vibration.

9.2.2.4 Package 4: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a Bus Terminus.

The measures Package 4 are not anticipated to result in a change in traffic flows that would result in a perceivable change in noise. For the Barrhead South Rail Station, the existing rail line is approximately 300m from any existing population (along Springfield Road). Therefore were a station to be constructed there would be no discernible noise impact on these residents, especially considering the topography of the land which rises up from the built-up area to a defined ridgeline and then falls down towards the railway line and Balgray Reservoir.

The assessment was undertaken to identify potential changes to the noise environment that may arise as a result of the proposed Barrhead South Rail Station on the Glasgow to Neilston railway line. The changes that are likely to occur in the noise environment of the proposed Barrhead South Development area, between 'without Barrhead South Rail Station' and 'with Barrhead South Rail Station' scenarios have been considered.

The following is now outdated with Pan 56 being revoked and replaced with PAN1/2011 and therefore requires updating. The assessment does however give an indication of the noise and vibration impact and until such times as it is updated will remain.

Expected noise levels have been modelled using CADNA-A noise mapping software (Rev3.7) and assessed with regard to the PAN 56 Noise Exposure Categories (NEC's).

PAN 56 suggests the use of NEC's to help planning authorities determine applications for residential development on sites subjected to noise from road, rail, air, and "mixed" transportation noise. In this assessment, they have been referred to in order to provide an indication as to whether changes in noise levels arising from the indicative location of the Barrhead South Station will affect the site's suitability for future residential development. 6.50 PAN 56 designates the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods, and the limits for noise levels corresponding to each NEC. The NEC levels for rail traffic are shown in **Table 35** below.

Table 35 PAN 56 NECs for Rail Traffic

Noise Levels Corresponding To NEC's For New Dwellings (LAeq,TdB)	NECs				
	Time	A	B	C	D
Rail Traffic	07:00 – 23:00	<55	55 - 66	66 - 74	>74
	23:00 – 07:00	<45	45 - 59	59 – 66	>66

The NEC advice is as follows:

- NEC A: *Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.*
- NEC B: *Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise. For proposed development subject to the high end of the category a Noise Impact Assessment will assist authorities in identifying appropriate noise mitigation measures.*
- NEC C: *Planning permission should not normally be granted. Based upon the evidence contained within a Noise Impact Assessment, however, it may be possible to grant permission subject to measures that ensure an adequate level of protection against noise.*
- NEC D: *Planning permission should generally be refused.*

CADNA-A noise mapping software (Rev3.7) was used to model the following scenarios.

- Daytime without Barrhead South Station;
- Daytime with Barrhead South Station;
- Daytime difference map;
- Night time without Barrhead South Station;
- Night time with Barrhead South Station; and
- Night time difference map.

The daytime maps show that with no station the noise levels fall within NEC A and B, with the majority of the Barrhead South Development area within NEC A. With the addition of a station, the width of the NEC B band reduces meaning that more of the Barrhead South Development area is within NEC A. The daytime difference map shows that around the station there would be a potential reduction of 3dB and across the majority of the Barrhead South Development area there would be a 2dB reduction. Therefore with the operation of a new station there could potentially be a decrease in noise levels during the daytime.

Similar to above, the night time maps show that with no station the noise levels fall within NEC A, B, and a small band of NEC C in close proximity to the rail line. With the addition of the station, the width of the NEC B and C bands are reduced. As with the daytime models, the majority of the Barrhead South Development area is within NEC A. The night time difference map shows that around the station there would be a potential reduction of 2dB around the station and 1db across the Barrhead South Development area.

9.2.3 Summary

The main source of increased noise and vibration levels arise from an increase in traffic levels. Two of the four packages (Packages 2 and 4) aim to encourage and achieve a modal shift to more sustainable transport methods from private car use and thus reducing noise and vibration levels. The Do Minimum package and Package 3 are both likely to increase traffic levels on local roads however with that reduce congestion on roads currently operating at capacity this will therefore cause a redistribution of noise and vibration levels across the area.

9.3 Global Air Quality

No assessment of global air quality has been undertaken at this stage.

9.4 Local Air Quality

9.4.1 Introduction

This section aims to set out the potential impacts on local air quality for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

9.4.1.1 DMRB Screening

A consideration of the potential changes in air quality arising from the packages has been undertaken in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11.3.1, taking into account changes contained within associated Interim Advice Notes (IANs).

The DMRB provides a scoping threshold to determine whether there are likely to be any significant impacts associated with a package. The scoping threshold is based on the traffic scenarios resulting from each package, and affected roads are those that meet any of the following criteria:

- Road alignment will change by 5m or more; or
- Daily traffic flows will change by 1,000 Average Annual Daily Traffic (AADT) or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speed will change by 10 km/hr or more; or
- Peak hour speed will change by 20 km/hr or more.

If none of the roads in the network meet any of the above threshold criteria, or there are no properties or relevant designated sites (AQMAs) near the affected roads, then the impact of the scheme can be considered to be neutral in terms of local air quality and no further work is needed. In this instance this is not the case.

9.4.2 Study Area & Baseline

9.4.2.1 Air Quality Progress Report

BMT Cordah Limited was commissioned in 2008 to undertake ERC's Local Air Quality Management (LAQM) Annual Progress Report (APR). This report concluded that there are a small number of locations where NO^2 and PM^{10} annual mean objective may be exceeded within the Council Area.

NO^2 diffusion tube data from a monitoring site at Kelburn Street (Barrhead) indicated that the annual mean objective of 40 µg/m^3 was exceeded. According to Defra's LAQM guidance, TG.(03) it is recommended that the Council undertake a Detailed Assessment of NO^2 concentration to determine with more certainty that the objective is being exceeded at this location. Kelburn Street, Barrhead is located to the west of Barrhead Main Street and as such is outwith the study area of Auchenback and the Country Park. In a recent publication[25], it is noted that levels at Kelburn Street have now dropped.

In addition to the above, there have been no changes in industrial processes, no commercial, domestic, retail, or other developments in the last year that would have a negative impact of local air quality.

It is therefore concluded that the prevailing air quality within the study area is generally good.

9.4.2.2 <u>Package 1: Do Minimum</u>

The Aurs Road realignment has the potential to cause an increase in the number of vehicles using the road. The pollution caused by this increase will negatively affect the local air quality through increased emissions.

The Barrhead South development is anticipated to bring 1,050 new homes to the area. If it is assumed that car ownership for those occupying these houses will be in line with that of Barrhead South and the 2011 Census data detailing Car Availability, there will be an anticipated addition of 998 cars to the local roads. An additional 998 cars will have a negative impact on the local air quality and more so if the necessary transport provision is not provided to mitigate the impacts of the increase.

[25] 2015 Updating and Screening Assessment for East Renfrewshire Council,In fulfillment of Part IV of the,Environment Act 1995,Local Air Quality Management, April 2015

9.4.2.3 Package 2: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links

The measures within this package aim to encourage a modal shift towards sustainable travel. If successful there will be a reduction in the number of cars on the local road network and therefore improved air quality.

9.4.2.4 Package 3: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

The addition of parking provision within the Country Park will encourage park users to travel to the park by private car rather than through sustainable modes. Furthermore the car parking provision will make the park more appealing to those travelling from further afield increasing the average distance travelled to reach the park. The results of such will cause an increase in car emissions and thus poorer local air quality.

The Springfield Road widening and realignment will improve access between Neilston and Barrhead South and therefore will likely increase the number of vehicles using the road compared to present. It would also be likely that the increased ease of access to Neilston from Barrhead South would encourage Barrhead South residents to travel the greater distance by private car to interchange at Neilston Rail Station over using Barrhead Rail Station. This would result in an increase car emissions and therefore poorer local air quality.

The M77 link road will have the greatest impact on local air quality as it will provide considerably more direct east/west access than as is currently available. Furthermore, it will provide east/west access without height or weight restrictions and will therefore result in a greater number of HGVs using the local roads. The addition of vehicles to the area and an increase in the number of vehicles on the local road network will increase emissions and therefore reduce the local air quality. It is however anticipated that the new link road will provide additional access to the M77 and will redistribute the traffic to reduce congestion and produce an increase in free-flow on all the strategic roads in the area and thus reduce emission and pollution from congestion.

9.4.2.5 Package 4: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a Bus Terminus.

The measures within this package are not anticipated to result in an increase in traffic flows on the local network and therefore will not impact local air quality negatively. Rather it would be anticipated that improved access to rail travel and a reduced journey distance to access rail would see a modal shift from private car use to electrified rail travel. Increased access to rail travel could see Barrhead South residents' method of travel to work by train increase from 6% to be in line of that seen in Neilston (16%) which would significantly reduce car emissions and improve local air quality.

The inclusion of a bus terminus alongside the rail station would provide a sustainable interchange option for those residing outwith walking distance of the station. Encouraging bus to rail interchange over private car to rail interchange would further improve local air quality.

9.4.3 Summary

The main source of changes in the local air quality will arise from an increase in private car use. To prevent poorer air quality as a result of the Do Minimum and the subsequent likely increase in traffic levels on local roads it is imperative that modal shift to more sustainable travel is encouraged as mitigation. Two of the four packages (Packages 2 and 4) aim to encourage and achieve this modal shift to more sustainable transport methods and would thus improve local air quality. The Do Minimum package and Package 3 are both likely to increase traffic levels on local roads however with that will reduce congestion on roads and reduce emissions caused by congestion.

9.5 Water Quality

9.5.1 Introduction

The STAG Guidance (STAG TD 7.4.4.1) states that:

> ***"Water quality is of critical importance to people, biodiversity, agriculture and recreation. The development and operation of new transport infrastructure has the potential to have a significant effect on water quality, for example through entrainment of sediments during construction or runoff containing pollutants once the option is in operation."***

This section aims to set out the potential impacts on water quality for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

9.5.2 Methods & Limitations

The STAG Guidance (STAG TD 7.4.4.3) notes that, at strategic level, 'A qualitative assessment needs to be made of the sensitivity of the water environment within the study area. This should take into account factors such as the quality of the resource, the scale at which it is important to policy makers, the rarity of the resource and whether it might be substitutable over time. Assessing the quality of the resource may include factors such as fisheries and conservation value as well as water quality. Information about the nature of the option may then be used to make a qualitative assessment of the nature and likely magnitude of associated effects and the significance of the impact on the resource'.

9.5.3 Study Area and Baseline

In Scotland, SEPA is the environmental regulator responsible for protecting 'controlled waters' in Scotland. It has statutory powers and duties for protection and monitoring of the quality of controlled waters. Controlled waters are defined in law and are essentially all waters, either above or below ground, which are neither in the drinking water supply pipe or the sewerage network.

SEPA has obligations under the Water Framework Directive (WFD), the Water Environment and Water Services (Scotland) Act 2003 (WEWS) and the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR). SEPA is therefore required to ensure that the water environment is protected and that any discharges, disposal to land, abstractions, impoundments or impacts associated with engineering works (such as the packages) are properly regulated by SEPA.

Surface water bodies are classified using a system of five quality classes – high, good, moderate, poor and bad, with groundwater classified as good or poor. In general, the classification of water bodies describes by how much their condition or status differs from near natural conditions. Water bodies in a near natural condition are at high status, while those whose quality has been severely damaged are at bad status.

This system was devised following EU and UK guidance and is underpinned by a range of biological quality elements, supported by measurements of chemistry, hydrology (changes to water levels and water flows) morphology (changes to the beds, banks and shores of water bodies) and assessment of invasive non-native species.

9.5.3.1 Surface Water

For the purpose of this appraisal, only watercourses and water bodies identified within the study area or close to the study area boundary have been considered. A review of Ordnance Survey maps and aerial photographs indicates that two watercourses are present within the study area and details of these are summarised in **Table 36** below.

Table 36 SEPA Water Body Classification System

Watercourse	Water Quality Current Status
Brock Burn	Good with Medium confidence in 2008 with overall ecological status of Good and overall chemical status of Pass.
Aurs Burn	Unclassified
Kirkton Burn	Unclassified
Levern Water	Moderate ecological potential with Medium confidence in 2008 with overall ecological status of Moderate and overall chemical status of Pass.

Source: http://gis.sepa.org.uk/rbmp/

The Brock Burn lies within the Dams to Darley Country Park and is a small, north flowing watercourse. The Brock Burn was dammed in the mid-nineteenth Century by the Gorbals Gravitation Water Company to create the Barrhead dams that still dominate the Country Park landscape today. North of the Barrhead dams the Brock Burn bisects Waulkmill Glen and Darnley Mill. The Aurs Burn flows eastwards from Barrhead through the north west of the Dams to Darnley Country Park, before joining the Brock Burn. The Kirkton Burn flows north east from Neilston, bypassing the west of Arthurlie before joining Levern Water.

In addition to the above watercourses, there are three main reservoirs in the study area; Balgray reservoir, Ryat Linn and Waulkmill Glen.

During consultation (details in Appendix A: Consultation), Scottish Water has indicated that all three reservoirs are connected in terms of feeding into one another. Balgray reservoir feeds into both Ryat Linn and Waulkmill Glen reservoirs, i.e. the discharge from the Balgray reservoir forms the other two reservoirs. Ryat Linn feeds directly into Waulkmill Glen through its overflow spillage. Ryat Linn is drained by opening valves which feed into Waulkmill Glen. In effect this is one reservoir. A review of SEPA's RBMP Interactive Map highlighted that Balgray Reservoir's current overall status was 'Moderate ecological potential with Medium confidence in 2008 with overall ecological status of Moderate and overall chemical status of Pass'.

Balgray Reservoirs' overall classification (2008) was 'moderate ecological potential', and it's 'Predicted Status' in 2015 and 2021 'moderate' and 2027 is expected to be good.

9.5.3.2 Ground Water

All four packages fall within the Paisley and Rutherglen bedrock and localised sand and gravel aquifers groundwater zone. This groundwater has been classified by SEPA with an overall status of Poor with High confidence in 2008. The quality of the groundwater has been classified as Poor with High confidence and the quantity of groundwater has been classified as Good with High confidence in 2008. There is no trend for pollutants for this water body.

The term groundwater refers to all water which is below the surface of the ground in the saturated zone and which is in direct contact with the ground or subsoil. The saturated zone is where all the cracks in the rock and all the spaces between the grains of rock or within the soil are filled with water. The upper limit of the saturated zone may be thought of as the water table. The zone above the water table, where pore spaces contain both air and water, is known as the unsaturated zone.

Figure 36 indicates that groundwater vulnerability, when assessed in 2008 was very low.

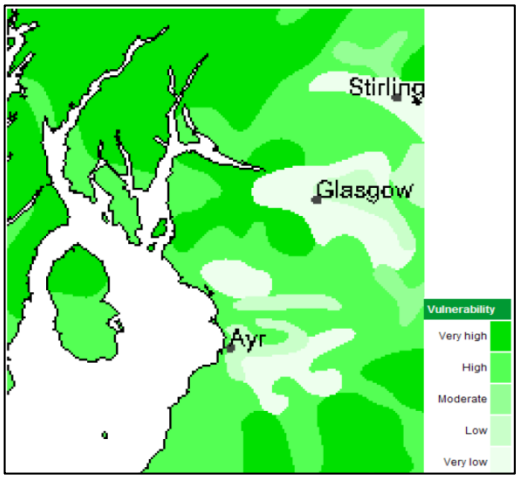

Figure 36 Groundwater Vulnerability *(www.bgs.ac.uk)*

9.5.3.3 Protected Areas

The White Cart Water catchment and associated surface waters comprise a Freshwater Fish protected area. In 2008, the mandatory condition is categorised as Pass, however, the FWF Overall Status Guideline is a Fail.

The Levern Water is classified as a Sensitive Area River for Urban Waste Water Treatment.

All four packages fall within the Paisley and Rutherglen bedrock and localised sand and gravel Aquifers Drinking Water Protection Zone.

9.5.3.4 Local Flood Risk

In addition to its obligations for water quality, SEPA is responsible for producing 'flood maps' to provide a Scotland-wide picture of the areas estimated to be at risk of flooding from rivers and/or the sea (www.sepa.org.uk/flooding/flood_map/view_the_map.aspx).

The SEPA Indicative Flooding Map has been developed to show areas that may be affected by flooding from rivers within the study area. Five main reasons for flood risk arising are:

- Increased flow rates and volumes to watercourses with restricted capacities;
- Building of structures which restrict flow and on historical flood plains;
- Progressive development in catchments with insufficient drainage pipes to cope with peak flows;
- Insufficient maintenance of culverts, grills, screens and road gullies leading to capacity restrictions at peak flows; and
- Watercourses and gullies becoming obstructed by fly-tipping and overgrown vegetation impeding channel flows during peak flows.

The Flooding Map estimates areas with a 0.5% (1:200) or greater probability of being flooded in any given year. It is anticipated that the addition of drainage into the water bodies and its tributaries without mitigation measures, such as flood storage and attenuation, could result in flood impact during heavy rainfall events. Mitigation measures at proposed outfalls would be required to minimise this potential flood impact. However, there have only been minor flooding incidents within East Renfrewshire. Most incidents have been localised flooding, and have generally been associated with debris building up in watercourses, particularly at culvert screens.

A large stretch of Aurs Burn is located within the boundaries of the Country Park. However, as of 2008, Glasgow City Council and the Glasgow City Council Flood Prevention and Land Drainage (Scotland) Act 1997: 2005 Statutory Report indicates there have been no known incidences of flooding.

9.5.4 Consultation

For the purposes of the appraisal of water quality, drainage and flood defence, consultation with SEPA and Scottish Water have been carried out.

Scottish Water outlined a set of thirteen precautions that must be adhered to in order to prevent contamination and damage to the water assets. At the time of the preparation of the 2008 STAG there had been no response from SEPA.

9.5.5 Assessment

9.5.5.1 Package 1: Do Minimum

The Do Minimum will see significant development in terms of housing, roads and the upgrade and realignment of existing roads. Assessments will be carried out as appropriate.

9.5.5.2 Package 2: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links

Package 2 comprises few infrastructure based options and will likewise have a no impact on local water quality.

9.5.5.3 Package 3: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

With appropriate consideration of construction-related impacts at detailed design stage, it is expected that Package 3 and the options contained within will not have an impact on any of the water bodies identified within the study area. It is expected that run-off effects associated with the road, and Country Park car park, will be properly mitigated using SUDS techniques. In terms of flooding hazard, the SEPA Flood Map was used in the 2008 to show that the options will not be at risk of a 1:200 flood event.

9.5.5.4 Package 4: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus.

Similarly, with appropriate consideration of construction-related impacts at detailed design stage, it is expected that Package 4 and the options contained within will not have an impact on any of the water bodies identified within the study area. It is expected that run-off effects associated with the rail station, car park, and bus turning area will be properly mitigated using SUDS techniques. In terms of flooding hazard, the SEPA Flood Map was used in the 2008 to show that the options will not be at risk of a 1:200 flood event.

9.6 Geology

9.6.1 Introduction

The STAG Guidance (STAG TD 7.4.5.1) states that:

> ***"The underlying geology has played a fundamental role in determining the landscape character of Scotland. Transport options could have a direct impact on strata by imposing different loads, which could cause ground to collapse, by altering the hydrogeology or by burying or damaging important deposits or outcrops. Some geological or geomorphological features are of scientific interest and educational value. They may be designated as statutory Sites of Scientific Interest (SSSI) or non-statutory Regionally Important Geological Sites (RIGS)."***

9.6.2 Methods & Limitations

STAG notes that at the strategic level, 'assessment will be restricted to identifying those sites of particular geological importance (designated sites) or significant mineral reserves and making a qualitative assessment of the degree to which the option may affect such sites '(STAG TD 7.4.5.3).

9.6.3 Study Area & Baseline

9.6.3.1 Designated *Sites*

According to the Scottish Natural Heritage (SNH) Gateway, there is one SSSI within the study area. The site is Waulkmill Glen (NS 522583) and is located to the north-west of Waulkmill Glen Reservoir. The site is 5.3ha in size and was designated as a SSSI in 1986. Waulkmill Glen is a key site for the study of carboniferous geology.

9.6.4 Assessment

Given the distance from the SSSI, the size, and location of the potential options within all packages there will be no impact on the designated site.

9.7 Biodiversity and Habitats

Not included in previous reports.

9.8 Landscape

9.8.1 Introduction

According to the STAG Guidance (STAG TD 7.4.7.1):

> ***"The visual appearance of linear transport infrastructure (both the infrastructure and the traffic it carries) can have a major impact on the existing landscape. Major trunk roads and railways must have gentle, not sharp, curves or gradients. Consequently they often need long, high and visually dominant bridges, cuttings, and embankments etc. where rivers, mountains, valleys or other infrastructure have to be crossed."***

This section aims to set out the potential impacts on the landscape for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

9.8.2 Methods and Limitations

STAG TD 7.4.7.3 prescribes a strategic level qualitative assessment, in which ‘a broad assessment of landscape character and quality should be attempted and any specific designations identified. There are several methodologies available which take into account factors such as topography, land cover (vegetation) and historical/cultural associations to establish the character of a landscape. However, reference should first be made to landscape character assessments published by SNH prior to undertaking a more detailed assessment. In the absence of detailed project options it may only be possible to say whether the option may have a positive, neutral or negative impact on the landscape. At the strategic level, defining areas of different character and quality can be an important means of influencing the selection of modes and route corridors.

9.8.3 Study Area and Baseline

The majority of the landscape within East Renfrewshire is designated as green belt in recognition of the importance and inherent sensitivity of this landscape as a setting for the urban area. In addition to this, the landscape offers valuable recreational opportunities and contrast in relation to the adjacent urban landscape, including Glasgow.

The landscape has been classified into 18 character types based on distinct combinations of characteristics. The character types typically draw out the more subtle differences in topography and physical features across the landscape of East Renfrewshire and have been subdivided into 52 unique character areas, each with a specific geographical location.

9.8.3.1 Plateau Farmlands

Plateau Farmlands are characterised by their transitional location between the sheltered landscapes of Rolling Farmlands and Broad Valley Lowland, and exposed uplands and moorlands. This comprises a landform which is generally flat gently sloping or a slightly undulating topography.

This landscape is a complex mixture of man's influence on interlinked geological and ecological systems. This has resulted in diverse habitats of wetland, grassland, woodland, hedgerow, burns and reservoirs.

Key Characteristics:

- Landform is predominantly flat, gently sloping or slightly undulating.
- An exposed landscape, in contrast to surrounding landscape.
- Meandering burns drain through broad and shallow valleys and have little visual impact on the landscape.
- Agricultural land use is dominated by pastoral farming consisting mostly of sheep farming with some cattle farming.
- Fields tend to be rectilinear and evenly spaced. Fields are increasingly defined by post and wire fences; however older beech and hawthorn hedges still exist in various states of repair.
- Tree cover is generally limited to a few windblown trees along field boundaries.
- Settlements tend to be sparse and confined to a scatter of farmsteads, such as Lyoncross, which are prominent in the landscape because of the height of the land and the lack of screening.
- The landscape houses numerous detractors including roads, rail lines, pylons and telegraph poles, all of which have a visual impact in the exposed landscape.

Transport and communication routes also tend to favour this uniform and accessible landscape and it houses major roads, rail lines, pylons and telegraph poles, all of which have considerable impact in the exposed landscape.

9.8.3.2 Consultation

The extent of the landscape change is often described by the 'magnitude of change' and in this instance it is likely that the magnitude of change will be neutral and have little or no impact.

Consultation responses from SNH and Dams to Darnley Country Park have mirrored this view.

9.8.4 Assessment

9.8.4.1 Package 1: Do Minimum

This has not been assessed

9.8.4.2 Package 2: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links

Package 2 would see the realignment of Aurs Road which is considered to have a negligible impact on the landscape as the realignment is localised to the existing route. The provision of improved pedestrian and cycle links would have some bearing on the landscape but being largely within the urban area of Barrhead this is considered to be minimal. The development of housing at the Barrhead South Development Area will have the biggest impact on the landscape.

9.8.4.3 Package 3: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

Although car parking exists within the Country Park, a new car park could have the potential for a landscape impact. However this impact can be negated by appropriate location planning and strategic landscaping and tree planting. Similarly a new road link could have potential for landscape impact but with appropriate design and planning this would be kept as low as possible.

9.8.4.4 Package 4: Do minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a Bus Terminus.

The options within package 4 will be developed within the Barrhead South Development. The planning guidance for the development recommends that it seeks to maximise the natural screening and integration provided by the topography of the area and retain existing landscape features where possible. Therefore is it appropriate to assume that the rail station, car park, and bus turning area will be designed to a similar standard as such have a negligible impact on the landscape considering 1050 houses would have been built adjacent these options.

9.9 Visual Amenity

Not included in previous reports

9.10 Agriculture and Soils

9.10.1 Introduction

According to the STAG Guidance (STAG TD 7.4.9.1):

> ***"The loss or severance of agricultural land by new infrastructure may affect the viability of farm holdings. This can be particularly important in marginal agricultural areas. Soils close to any new construction can be affected by pollution from runoff and aerial deposition. Construction can cause the loss of valuable agricultural soil, which even if kept stored is likely to degrade in quality. If soil is taken from a site of nature conservation interest there is the possibility of losing valuable seed banks. Land that is contaminated with toxic and hazardous materials can pose a threat to human health and safety if disturbed."***

This section aims to set out the potential impacts on agriculture and soils for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

9.10.2 Methods and Limitations

The STAG Guidance highlights that at the strategic level it would be sufficient to identify the relevant grades of agricultural land in the study area and to make a qualitative assessment of the likely scale of land take.

9.10.3 Study Area and Baseline

Analysis of Macaulay Land Use Research Institute Agricultural Land Classification Map has indicated that the soil within the study area in close proximity to the package locations is defined as Class 4. This land is capable of producing a narrow range of crops. Class 4 whilst valuable is not given the same stringent protection as Class 1, 2 or 3. The land is primarily grassland with some limited potential for other crops and as a result is of limited agricultural quality.

Whilst the potential for crops is limited, it is important that valuable land resources are managed carefully to ensure land capability is optimised. Potential mitigation measures that could be introduced to minimise the impact of the proposed packages include removing the topsoil from the immediate location and placing in an area where it can still be used for agriculture and sustainably designing the drainage for the proposed packages to ensure that polluted run-off does not reach adjacent agricultural land.

9.10.4 Assessment

9.10.4.1 Package 1: Do Minimum

As part of the proposed Barrhead South development, East Renfrewshire Council have undertaken intrusive site investigations and concluded that there was slight contamination within the infilled railway line and redundant filtration beds to the east of the site. The assessment recommended these areas to be treated via removal of contaminant source from the soil or the introduction of hardstanding across the affected areas. The options will be developed upon the same soil and as such will not have an adverse impact on the quality of the soil.

9.10.4.2 Package 2: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links

The physical infrastructure options within Package 2 are upgrades of existing infrastructure and as such will not result in adverse impacts on agriculture or soils.

9.10.4.3 Package 3: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77

The option to develop a car park within Package 3 will be developed on Class 4 land and as such quality land take is therefore minimised.

The option to develop a new road link with the M77 will require further investigation

9.10.4.4 Package 4: Do Minimum, PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus.

The options within Package 4 will be developed on Class 4 land and as such quality land take is therefore minimised.

9.11 Cultural Heritage

9.11.1 Introduction

The STAG Guidance (STAG TD 7.4.10.1) states that:

> ***"Transport schemes have the potential to impact on the built environment of our cities, towns and villages which may contain historic buildings and conservation areas. Although modern buildings are susceptible to change, historic buildings and conservation areas are more vulnerable due to their historic value and more sensitive to deterioration in their surroundings."***

This chapter aims to set out the potential impacts on the landscape for each of the four packages taken forward for the Strategic Level STAG 2 assessment.

9.11.2 Methods and Limitations

At the strategic level, it would be sufficient to identify the relevant heritage designations in the study area and to make a qualitative assessment of the likely impact of the options on the importance and integrity of the resource. These should be recorded in terms of their international, national, regional and local/other importance, so that a more balanced view can be taken of likely impacts. Where the level of detailed information permits, the option should be assessed in terms of the 7-point scale (major negative to major positive)

9.11.3 Study Area and Baseline

9.11.3.1 Designated Properties and Listed Buildings

Table 37 details scheduled ancient monuments within the study area.

One of the most important designated properties within the study area is a Category C(S) listed building (Reference 18683) located at Lyoncross. This property is a 2-storey farm house dating from c. 1780 with extensive modifications added c. 1900.

A further listed building within the vicinity is Balgray House, Newton Mearns (Reference 18533). Due to the location of this building in relation to the proposed options there will be no direct or indirect effects upon this building.

The Local Plan 2015 stipulates the Council will safeguard Scheduled Ancient Monuments and their settings from development that will have an adverse effect. In addition, other archaeologically important resource shall be preserved in situ wherever feasible.

Table 37 Scheduled Ancient Monuments

Reference	Location	Description
Arthurlie Cross	Barrhead	Celtic Cross
Duncarnock Craig	South of Barrhead	Hillfort

9.11.4 Consultation

Consultation with SNH has mirrored this view as they have no concerns relating to proposed packages and are in fact in favour of any measures to encourage sustainable transport.

9.11.5 Assessment

Given the location and scale of the options within Packages 1, 2, 3 and 4 there will be no significant impacts on SAMs or LBs are predicted, however further archaeological investigations will be required for all packages.

9.12 Physical Fitness

Not included in previous reports

9.13 Summary

Table 38 is an initial appraisal of the likely impacts of the packages against the Environment criterion.

Table 38 Package appraisal against environmental criterion

	Noise and Vibration	Local Air Quality	Water Quality, drainage and flood defence	Geology	Landscape	Agriculture and soils	Cultural Heritage
Do Minimum	0	-1	-1	0	-1	0	0
Package 2	0	1	-1	0	-1	0	0
Package 3	0	-1	-1	0	-1	0	0
Package 4	0	1	-1	0	-1	0	0

10 Safety

10.1 Introduction

This Chapter will discuss the impacts of the proposals on the two safety sub-objectives: Accidents and Security.

10.1.1 Accidents

In line with STAG, a qualitative assessment of the impact of each package on accident levels and users likely to be affected has been undertaken.

Typically, accidents are reduced when the incidence of queuing traffic is reduced. Similarly, safety is increased when the mode share for public transport is increased.

In the Do Minimum case, danger to pedestrians, cyclists and other transport users is mitigated through general improvements for walking and cycling, for example through measures proposed as part of the Barrhead South residential development plans and implementation of committed Council strategies. The Do Minimum case also increases safety through realigning Aurs Road to straighten the route, thus improving the east to west movement of vehicles. The realignment of Aurs Road would remove blind corners thereby improving safety for on-road cyclists.

Compared to the Do Minimum, it is considered that each of the Packages, through the promotion of sustainable transport modes, will increase levels of safety to varying degrees as follows:

Package 2: Package 2 involves the promotion of soft measures (for example, public transport information provision and marketing, improved bus waiting environment (including, where appropriate, the provision of CCTV), and the provision of real-time passenger information at bus stops), together with improved pedestrian and cycle links within Barrhead, Barrhead South and the Country Park; cycle links within Barrhead South and Main Street; and the upgrade of stepped footpaths throughout the study area. These measures would enhance the journey experience for users of sustainable modes, thus encouraging use of these modes. This is anticipated to have a minor positive impact on safety, by encouraging modal shift away from private car and enhancing the safety pedestrian and cycle links and the bus stop waiting environment.

Package 3: Package 3 involves the measures described within Package 2, together with enhancements to the road network, including parking for the Country Park, the realignment and widening of Springfield Road and the development of a M77 link road. Overall, it is anticipated that this Package would have a **moderate positive impact** on safety, through promoting and enhancing the environment for sustainable transport users, and removing traffic from Aurs Road and Main Street through the development of a more appropriate M77 link road, which would have safety benefits for all road users.

Package 4: In addition to the benefits offered by Package 2; Package 4, through the development of a new rail station at Barrhead South, may transfer some trips by car to a safer mode, rail, thus having a **moderate positive benefit**.

Should Package 4 include Park and Ride provision, this Package is further expected to remove cars from the road network by encouraging modal shift from car to rail for longer trips. The provision of a Park and Ride facility may generate more local traffic in populated areas, however the proposed size of the car park (circa. 80 spaces) and location of the rail station is likely to only result in a marginal increase in traffic on the local roads that can easily accommodate these extra trips as they are lightly trafficked at present. It is therefore assumed that the accident implications of the parking element of Package 4 are negligible and thus it is expected that there will be an overall **moderate positive impact** on Personal Injury Accidents.

Should Package 4 include provision for a bus terminus, there is further potential to reduce the number of road casualties by removing cars from the road network, however this effect will depend on the degree of modal shift generated from private modes and it is expected that there would be an overall **moderate positive impact** on Personal Injury Accidents.

In terms of change to the balance of severity of accidents associated with each Package, it is expected that Packages which result in a smoother flow of traffic (through modal shift from private car, and / or removing car trips from the local network) would see a reduction in link speeds which should in turn result in a reduction in the severity of accidents. It is anticipated that Packages 3 and 4 would have a **moderate positive impact** in this regard, albeit increased parking provision at the proposed Barrhead South rail station may generate more local traffic in populated areas. However, as discussed above, the increase in traffic on local roads is expected to be marginal, and it is anticipated that the local roads would easily accommodate these extra trips as they are lightly trafficked at present. It is therefore assumed that the accident implications of the parking element of Package 4 are negligible.

Package 4 is expected to have a **minor positive impact** through the promotion of sustainable transport modes.

10.1.2 Accident Costs

Analysis has not been undertaken at this stage in line with relevant STAG Guidance (Section 8 Safety) to quantify the impacts of each intervention in terms of changes in accident levels and severity against the Do Minimum scenario. It is not considered necessary for Packages 1 or 2. Further information will be available when the Strathclyde Regional Transport Model is available and when designs for a potential Balgray link have been progressed.

10.1.3 Security

It is considered that Security is of particular relevance in relation to the development of public transport measures, including the promotion of walking and cycling, promotion of public transport, and the development of Park and Ride facilities and new bus and rail stations/facilities. These facilities require the incorporation of good design to mitigate feelings of insecurity.

Collaboration with private business and/or community groups can help to provide a ‘human presence’ within or around public transport facilities. Un-staffed stops should be constructed to take account of passenger safety and security. Elements incorporated into the design can include lighting, CCTV and open areas, where waiting passengers are visible from neighbouring roads or streets.

New station and Park and Ride facilities should be designed in accordance with current good practice and standards to ensure that all aspects of passenger safety are allowed for wherever possible. Similarly, on-board public transport it is possible to design a safe and secure environment.

Feedback from stakeholder consultations indicated that security is a key factor in encouraging the use of public transport; and the requirement for a safe and secure environment both on-board public transport services, and within waiting and parking areas, particularly for those who may be travelling during quieter periods for example late in the evening, was noted.

In summary, it is considered that the personal security concerns of many individuals when using public transport, walking and cycling can be largely dealt with in the provision of mitigating facilities designed into the scheme development, such that all Packages would achieve a positive impact in this regard. Further details are set out within **Table 39**. It should be noted that not all mitigating facilities will be relevant to all Packages.

Table 39 Assessment of Security Sub-Criterion

Security Indicator	Relative importance (High / Medium / Low)	Vulnerable groups of Society affected	Without strategy (Poor / Moderate / High)	With strategy (Poor / Moderate / High)
Site perimeters, entrances and exits	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Clearly marked site perimeters / exits. Use of open fencing rather than solid walls.
Formal surveillance	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Effective CCTV system in place. Design to encourage staff surveillance and group passengers.
Informal surveillance	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Positive use of materials (fencing etc.) and design to encourage open visibility from site surrounds. Encouragement or proximity of retailers or other activity.
Landscaping	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Positive use of landscaping features (design, plants etc.) to contribute to visibility and deter intruders.
Lighting and visibility	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Good design to avoid recesses and facilitate camera / monitor view. Lighting to daylight standard in passenger areas when facility open. Attention to lighting on signing, information and help points.
Emergency call	High	Children, elderly, women travelling alone.	Poor	Moderate / High: Good provision of emergency phones, help points, public telephones and information on emergency help procedure.

Package 4 will have the greatest impact on security as the proposed rail station and associated facilities will be designed to be well-lit, maximise natural surveillance from the proposed Barrhead South residential development, be constructed so as to have no blind spots and generally provide an environment that is safe and secure. Since the rail station and potential associated facilities (Park and Ride facility and / or bus terminal) are not currently existing, Package 4 will not enhance the existing levels of security, but once constructed would provide a safe environment for public transport users who access the station either by foot, public transport or car. Note that the benefits of the rail station will be reduced if personal security concerns within the existing areas of Barrhead South prevent people from walking there.

Package 2 will have a positive impact on security within Barrhead South. As highlighted in the previous sections, many residents have personal safety and security fears whilst using footpaths and bus stops and the upgrading of these to incorporate measures such as improved lighting, CCTV, enhanced waiting areas and improved information provision, where appropriate, will increase the perceived level of security amongst users.

Package 3 is unlikely to have a material impact on security beyond that gained from the measures also included in Package 2.

10.2 Summary

Table 40 provides a summary of the performance of each Package against the STAG Safety criterion.

Table 40 Performance against STAG Criteria: Safety

STAG Part 2 Packages	Summary Rational for Scoring
Do Minimum	Danger to pedestrians, cyclists and other transport users mitigated through general improvements for walking and cycling, for example through implementation of committed Council strategies. Safety increased through realigning Aurs Road to straighten the route and remove the existing height and weight restrictions, thus reducing queuing traffic and improving the east to west movement of vehicles. Realignment of Aurs Road would remove blind corners and improve safety for on-road cyclists.
Package 2	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them. Road casualties could be reduced by removing cars from road network, dependent on the degree of modal shift from private car. Mitigating facilities would be designed into scheme development – for example enhanced public transport waiting areas, improved lighting, CCTV to address the personal security concerns of many individuals.
Package 3	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them. Road casualties could be reduced through promoting and enhancing the environment for sustainable transport users, and removing traffic from Aurs Road and Main Street through the development of a M77 link road, which would have safety benefits for all road users. As per Package 2, mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.
Package 4: New Rail Station	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them, together with a greater range of transport options through the provision of a new rail station at Barrhead South. Road casualties could be reduced by removing cars from road network, dependent on the degree of modal shift from private car. As per Package 2, mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals. Rail is considered a safer mode than car.

Package 4: New rail station & P&R	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them, together with a greater range of transport options through the provision of a new rail station at Barrhead South. Road casualties could be reduced by removing cars from road network, dependent on the degree of modal shift from private car, however this could be negated to some degree at the local level through the provision of Park and Ride facilities at the new rail station and associated increased levels of traffic on the local road network, with safety implications, albeit this impact is expected to be minimal. As per Package 2, mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals. Rail is considered a safer mode than car.
Package 4: new rail station & bus terminus	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them, together with a greater range of transport options through the provision of a new rail station and bus terminus at Barrhead South. Road casualties could be reduced by removing cars from road network, dependent on the degree of modal shift from private car. As per Package 2, mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals. Rail is considered a safer mode than car.
Package 4: new rail station & P&R & bus terminus	The measures in this Package would supply individuals with a greater level of understanding of the transport options available to them, together with a greater range of transport options through the provision of a new rail station and bus terminus at Barrhead South and a new bus terminus. Road casualties could be reduced by removing cars from road network, dependent on the degree of modal shift from private car, however this could be negated to some degree at the local level through the provision of Park and Ride facilities at the new rail station and associated increased levels of traffic on the local road network, with safety implications. As per Package 2, mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals. Rail is considered a safer mode than car.

11 Economy

11.1 Introduction

Within STAG, there are three Economy sub-criteria. These are:

- Transport Economic Efficiency (TEE)- the benefits ordinarily captured by standard cost- benefit analysis- the transport impacts of an option (including the use of bespoke values if appropriate and subject to approval by Transport Scotland);
- Wider Economic Benefits (WEBs)- relates to the notion of wider economic benefits derived from the impact of transport upon agglomeration, and the underlying relationship of impacts of agglomeration upon productivity; and
- Economic Activity and Location Impacts (EALIs)- allows the impacts of an option to be expressed in terms of their net effects on the local and/or national economy

A full economic assessment has not been undertaken of the packages. Package 1 contains key elements that are bound up with the City Deal process and being considered through the business case process. It is noted that the Strathclyde Regional Transport Model (SRTM) is being developed and it is intended that this model will form the basis for modelling all Glasgow City Deal transport interventions. Hence, when the model is available (early 2017) analysis can be made across the various schemes (whether proposed as part of City Deal or not)

Package 2 is made up of small scale improvements which together improve walking, cycling and bus access around the area but the details are not fully known and hence the benefits difficult to calculate at this stage. Package 3 contains a key component to deliver a link road between the M77 J5 and Barrhead known as the Balgray Link. Work is underway to explore the details of this option and until this is complete it is not appropriate to assess the economic aspects.

In the interim however, it has been requested that cursory economic assessment is made of the rail station option in Package 4. In the absence of SRTM a catchment model approach has been adopted building on work undertaken previously in 2014.

11.2 Economic Assessment

A demand forecast has been developed for the provision of a new station at Barrhead South including consideration of abstraction from other stations; crowding analysis has also been undertaken. Options to improve access to the existing Barrhead station through the provision of quicker bus services have also been explored in terms of the relative economic performance when compared against a new station. In these options, a scenario whereby bus access time from Barrhead South to Barrhead Station was improved by 3.5 minutes and by 5 minutes was explored. Demand Forecasting and Crowing is presented in Appendix E.

The summary results are presented in Table 41.

Table 41 – Demand Forecasting Summary

Demand Forecast for Opening Year (2019)			
Development Scenario	**Barrhead with Bus 3.5 min IVT Saving**	**Barrhead with Bus 5 min IVT Saving**	**Barrhead South (inc. abstraction)**
Without	59,646	87,880	115,611
With	61,129	90,066	128,491
Development Scenario	**% of New Station Demand**	**% of New Station Demand**	**% of New Station Demand**
Without	51.6%	76.0%	100%
With	47.6%	77.9%	100%
Demand Forecast for Mid-Year (2036)			
Development Scenario	**Barrhead with Bus 3.5 min IVT Saving**	**Barrhead with Bus 5 min IVT Saving**	**Barrhead South (inc. abstraction)**
Without	93,726	138,373	257,608
With	107,133	158,167	357,900
Development Scenario	**% of New Station Demand**	**% of New Station Demand**	**% of New Station Demand**
Without	36.4%	53.7%	100%
With	29.9%	44.2%	100%
Demand Forecast for Lifetime (2017 - 2076)			
Development Scenario	**Barrhead with Bus 3.5 min IVT Saving**	**Barrhead with Bus 5 min IVT Saving**	**Barrhead South (inc. abstraction)**
Without	5,084,776	7,505,076	14,207,620
With	5,770,880	8,517,864	19,460,000
Development Scenario	**% of New Station Demand**	**% of New Station Demand**	**% of New Station Demand**
Without	35.8%	52.8%	100%
With	29.7%	43.8%	100%

The demand forecasting and crowding analysis show that, with regards to crowding the introduction of a new station at Barrhead South is likely to have the following impacts:

Barrhead line

In the do minimum scenario (i.e. with no station at Barrhead South), four out of eleven trains in the peak violate the <10 minute standing obligation by 2023. After the introduction of the new station at Barrhead South these trains are still affected by crowding but at slightly reduced levels. Three of the four trains affected by crowding in the Do Minimum scenario would also be over total capacity (seated + standing). In the new station scenario this number has reduced to two.

In summary, no significant change to rolling stock requirements compared to the Do Minimum on the Barrhead line is expected for the new station option.

Neilston Line
In the Do Minimum scenario, three out of eight trains violate the <10 minute standing obligation, by 2023. In the new station scenario, the number has increased to six, with significant increases to the number of passengers standing for longer than ten minutes on some trains. The number of trains that would also exceed total capacity (seated + standing) is forecast to increase from one to two. It is noted that there may be a flattening of the demand profile on the Neilston line in this scenario which would spread the demand and potentially reduce the crowding on key services.

Some increase in rolling stock requirements compared to the Do Minimum is likely to result based on these forecasts.

When considering the impact of improved bus services to Barrhead Station, the crowding impacts are considered to be

Barrhead Line
In the 3.5 minute IVT saving option crowding affects the same four trains as in the Do Minimum, with a slight increase in the number of passengers standing for more than ten minutes. Increasing the bus journey time saving to 5 minute has no substantial impact on train crowding. Similarly no increase in the number of trains exceeding total capacity is expected as a result of the option.

The impact of the introduction of improved bus access to Barrhead Station is likely to be minor.

11.3 Economic Assessment of a new station at Barrhead South

The economic assessment makes use of the demand forecasts presented above, and applies November 2016 WebTAG values to calculate the time benefit of the users of Barrhead South station, using the rule of half. Following this updated guidance, wait and walk time are weighted by a factor of 2 for all purposes (instead of the previous 2.5 for wait, and 1 for all In Work values). The proportionate approach of applying a single value of time for In Work is adopted. All values of time were expressed in market prices. The purpose split is all week average person trips, taken from November 2016:

- In work 7.8%
- Commute 43.4%
- Other 48.7%

The 'Do Minimum' costs for the abstracted travellers are the journey time from the previously used stations. For newly generated users of Barrhead South, the journey time using Barrhead is applied, with a longer access time to get to Barrhead Station of 35 minutes (based on walk time from the central point of the development area).

The travellers using Neilston each have a 1.2 minute disbenefit, due to longer end to end journey times due to the additional stop.

The process as outlined in WebTAG unit A5.4 is applied to calculate Marginal External Costs (ie decongestion benefits), using the 'Scotland', 'Inner and Outer Conurbation' parameter values.

The following elements are missing from the economic benefit as currently calculated:
- user charges and revenue.

11.3.1 Costs
Capital cost values (in £2016) and profile as supplied by East Renfrewshire Council are used:
- £10.95m total

- 2016 - 4%
- 2017 - 27%
- 2018 - 55%
- 2019 - 14%

No QRA and an optimism bias of 66% are applied, in line with WebTAG A5.3, table 3. Construction Price inflation of 3% pa is assumed, against an assumed general price inflation of 2.5%. The GDP Deflator was used to change the price base, and the indirect tax adjustment applied in order to change to market prices.

11.3.2 Cost-Benefit Analysis
The results, including the development, in £2010 values and prices, are:

- Present Value of Benefits - £24.2m
- Present Value of Costs - £15.8m
- Net Present Value - £8.4m
- Benefit to Cost Ratio - 1.53

11.4 Economic Assessment of improved bus access to Barrhead

Given the problems with accessing Barrhead from the south of the town and that the new development area will be even further away from the existing station, the option to improve linkages to Barrhead Station was explored. This is based on improved bus services to the station and based on routing options two scenarios were explored. One sees a journey time reduction in bus access of 3.5minutes and the other of 5 minutes. Further information is provided in Appendix E and it is noted that the routes are assumed to operate on a commercial basis.

11.4.1 Benefits
The assessment for the benefits due to the bus improvement option are calculated in a similar manner, using the appropriate change in demand at Barrhead station as calculated in the demand forecasting spreadsheet. Each passenger is assumed to experience either 3.5 or 5 minutes improvement in journey time. This is unweighted, as the time is spent in-vehicle, rather than walk access.

11.4.2 Costs
No costs are available for the assessment.

11.4.3 Cost-Benefit Analysis
The results, including the development, in £2010 values and prices, are:
Present Value of Benefits £6.5m for 5 minute access improvement, £4m for 3.5 minute improvement

11.5 WEBS and EALIS

At this stage neither WEBS or EALIs have been assessed for the projects. It is however worth noting that as part of the City Deal Assessment of GVA contributions, the East Renfrewshire projects are expected to contribute £846million. These include the realignment of Aurs Road (a key part of the Do Minimum), the Balgray Link that forms a key part of Package 3 and a new rail station that forms a key part of Package 4.

11.6 Summary

A full TEE can be completed for both Package 3 and Package 4 when the SRTM is available and when more is known about the design of the Balgray link. Until then however, it is considered that the new train station performs favourably by offering the

residents of Barrhead South, including those in the new development area a realistic public transport option linking to the Glasgow and the wider area. The analysis at this stage has been necessarily crude in the absence of SRTM and it assumes that those who would choose to use Barrhead South Station would, without it, still choose rail and hence have to travel to Barrhead. In reality there is a high change they would choose a different mode or not travel. This could lead to increased congestion around the area and particularly accessing the M77 and would do nothing to help the social deprivation that exists in the area due to relatively low levels of car ownership and lack of employment opportunities.

12 Integration

12.1 Introduction

This Chapter will consider the impact of each Package of measures on the STAG criteria for Integration. Environment integration is considered in Chapter Nine and integration with social inclusion is dealt with in Chapter Thirteen. Issues relating to transport, land-use and policy integration will be reviewed in this Chapter.

12.2 Transport Integration

STAG recognises that an integrated transport system must operate as a true network across all modes in order that passengers can move easily from one service to another in a comfortable environment. Integrated transport can, thus, reduce the need to travel, tackle congestion and pollution and support a strong economy, a sustainable environment and a healthy and inclusive society. Consideration of integrated transport typically takes account of the integration of different elements of the public transport network (ticketing, interchanges, timetables, inter-modal opportunities), but extends to include opportunities such as Park and Ride, and even Park and Share facilities.

It is considered that all of the Packages will have a positive impact on transport integration through encouraging modal shift. Package 4 would have the greatest impact through, as a minimum, the provision of a new rail station, together with soft measures, and measures to promote sustainable transport.

STAG notes that important elements which should be considered when planning integrated transport facilities include through-ticketing / joint ticketing arrangements; enhanced connections and co-ordination of services; clear, accessible and wider availability of information; improved waiting facilities; appropriate location; and accessibility for the elderly and mobility impaired. General discussions with SPT have indicated that whilst integrated (including smartcard) ticketing may not be appropriate or practical to implement at a local, Council area level, initiatives to implement this on a regional or national basis are supported where schemes can assist in meeting project objectives. Indeed, it is understood that SPT are progressing ambitions for a region-wide smart-ticketing / integrated ticketing initiative as well as real-time bus passenger information at bus stops across Strathclyde which should be supported at the Council level given the potential for such schemes to deliver a step change in public transport usage at the local level.

The following statements can be made in terms of overall transport integration:

- Package 1 (Do Minimum) may achieve improvements to integration through the realignment of Aurs Road to improve access between Barrhead and Newton Mearns, and the proposed transport measures associated with the Barrhead South residential development. However, the overall impact on transport integration is expected to be neutral.
- Packages 2, 3 and 4 will have a positive impact on transport integration through the measures that they promote:
    - Soft measures and pedestrian / cycle links (Packages 2, 3 and 4): potential for improved public transport information, marketing of services, improved bus stop waiting environment and the implementation of real-time passenger information, together with improved access for pedestrians and cyclists, will improve integration between modes and services and reduce reliance on private car use. There is potential for a slight indirect benefit on ticketing through improved marketing of discount tickets that are available.
    - Enhancements to the road network (Package 3): enhancements to the road network, including the realignment and widening of Springfield Road and the development of a link road between Barrhead South and the M77 would have a positive impact on the integration of bus services using these routes through reducing congestion and improving the flow of traffic. The M77 link road would alleviate traffic volumes on Aurs Road and Main Street, which could enhance these routes for users of sustainable modes.

- New rail station (Package 4): the development of a new rail station at Barrhead South will encourage people to transfer from cars to rail services, particularly if dedicated Park and Ride facilities are provided. This impact may be negated by an increase in more local car trips to the Park and Ride facility and this would require to be considered appropriately at the design stage. However, it is anticipated that the proposed size of the parking facility (circa. 40 spaces), together with the nature of the local road network which is currently lightly trafficked, will result in any impacts from increased levels of car trips being negligible. The new rail station would be designed with consideration given to quality of infrastructure, layout and information provision. Due cognisance would require to be given to the impact of a new station on the wider rail network, and the feasibility of doing so would require a separate technical study updating the work done to date. The new rail station would aim to provide a key interchange location, thereby enhancing integration between walking, cycling and rail modes – and bus if the bus terminus element of this Package is also progressed.
- The development of a bus terminus as part of Package 4 would improve integration of bus services, and enhance opportunities for bus – rail interchange. As above, it is expected that design of the bus terminus would incorporate clear and accessible information provision; quality waiting facilities (including, for example, quantity and quality of seating, and weather protection through the provision of shelter); and measures such as high access raised kerbs to assist accessibility for the elderly and mobility impaired. Opportunities will arise to 'dove-tail' bus timetables with the existing rail timetable, which will result in minimal wait time for interchange passengers, particularly if services can be marketed together.

12.3 Land-Use Transport Integration

Developments in UK and Scottish Government policy have provided a clear framework for the integration of land-use and transport planning with a general requirement to promote sustainability and reduce the need to travel to relevant existing or future developments.

The land-use transport integration sub-objective should consider whether:

- Any land required for the proposal is preserved for uses which are incompatible with transport (for example, protected or conservation areas);
- The proposal fits with the general policies of all authorities at all levels concerning transport and land-use; and
- The proposal conflicts with any other existing or planned development.

Thus, there is a requirement for the identification of the land-use policies or proposals conflicting with statutory planning documents at local, regional and national levels. This has been carried out to some extent during the STAG Part 1 process and no conflicts have been identified.

At a national level, the **Scottish Planning Policy (SPP) 2014** acts as Scotland's overarching policy framework. It provides policy guidance and support to the Scottish Government's transport vision through the integration of land-use, economic development, environmental issues and transport planning, and replaces the previous 2010 SPP and a number of former policy documents including the former SPP17 – Planning for Transport. The SPP sits alongside other Scottish Government planning documents, including the National Planning Framework (NPF3, 2014), which sets out the Scottish Government's spatial development priorities for the next 20 to 30 years. The SPP sets out policy that will help to deliver the objectives of NPF3.

NPF3 and SPP 2014 share a single vision for the planning system in Scotland:

> ***"We live in a Scotland with a growing, low-carbon economy with progressively narrowing disparities in well-being and opportunity. It is growth that can be achieved whilst reducing emissions and which respects the***

quality of environment, place and life which makes our country so special. It is growth which increases solidarity – reducing inequalities between our regions. We live in sustainable, well-designed places and homes which meet our needs. We enjoy excellent transport and digital connections, internally and with the rest of the world."

The SPP outlines that the planning system is a key mechanism for integration and should support patterns of development which:

- Optimise the use of existing infrastructure;
- Reduce the need to travel;
- Provide safe and convenient opportunities for walking and cycling for both active travel and recreation, and facilitate travel by public transport;
- Enable the integration of transport modes; and
- Facilitate freight movement by rail or water.

More locally, the East Renfrewshire Council Local Development Plan was adopted in June 2015 and sets out policies and proposals for the use, development and protection of land within East Renfrewshire. The Local Development Plan provides the Council with a land-use development strategy to guide the future sustainable growth of East Renfrewshire up to 2025 and beyond and provides an appropriate basis for determining planning applications.

The Strategic Aim of the Plan is:

"To foster a rich and diverse environment and promote and manage land-use change for the benefit of the local community and economy in a manner which is sustainable".

This Aim is supported by five key strategic objectives:

- Promote the principles of sustainable economic growth;
- Provide for local needs and equality of access to housing, jobs, facilities and services, particularly to assist in social inclusion;
- Protect and enhance heritage and environmental resources and seek to provide opportunities for improving physical well-being;
- Facilitate reducing the overall need to travel and the reliance on car use; and
- To promote sustainable development and reduce carbon emissions.

Overcoming issues of accessibility to jobs, community and social facilities by a range of transport modes are key elements of the Local Development Plan, which recognises a need to provide and maintain public transport to serve a growing and ageing population. The Plan therefore focuses on provision of improved public transport and pedestrian and cycling networks to secure positive impacts on people's health and well-being, as well as social cohesion, through increased activity and social interaction.

The emphasis upon use of sustainable transport modes also helps to reduce the use of private car travel and contributes towards lower carbon emissions. Accessibility issues have been taken into account in identifying preferred areas and sites for

new development, based on a complementary two-strand approach comprising regeneration and consolidation of urban areas and for controlled growth to be master planned and directed to key strategic locations including the Barrhead South area.

Of specific relevance to Package 4, Policy M2.2 of the Local Development Plan details the provision for the safeguarding of land for a Barrhead South Rail Station, Park and Ride and Bus Terminus; and of specific relevance to Package 3, the Plan promotes the investigation into improved connectivity between Barrhead and Newton Mearns and details the need for Aurs Road to be upgraded.

Discussions with East Renfrewshire Council's local planning team have indicated that none of the Packages conflict with wider land-use proposals, and, indeed, they support plans for the Barrhead South Masterplan Area and the Dams to Darnley Country Park.

12.3.1 Barrhead South Masterplan Area

Due to the peripheral location of the development in relation to Barrhead Main Street and the existing transportation infrastructure around the site, it is envisaged that the development would be a large generator of private car trips to destinations outwith East Renfrewshire including Glasgow City Centre. As previously discussed, East Renfrewshire Council will collect a contribution from the developer of the Barrhead South development site towards the cost of public transport facilities. This provides an ideal opportunity to maximise cross benefits.

It is anticipated that Package 4 would have the largest impact in terms of reducing the number of vehicle trips originating from the development and increase the proportion of trips via sustainable modes to a variety of land-uses in the wider area including shopping, education, employment, leisure and transport. The proposed new rail station would provide a sustainable transport option to Glasgow City Centre and the localities around the stations *en-route*.

The enhancement of the new rail station with a bus terminus would provide a bus stop within the new development. It is aspired that the local bus services which serve Barrhead Main Street, Paisley, and Glasgow from Barrhead South would route via the development and provide a viable, sustainable alternative to access various land-uses within these localities instead of the private car.

The provision of a Park and Ride facility at the new rail station would result in more trips being made to the Barrhead South area, as the circa. 80 space car park would act as a Park and Ride site for commuters to Glasgow City Centre from Barrhead (who are unable to park at Barrhead Station) and perhaps the residential areas to the south-west of Newton Mearns. It is worth noting that these trips would already be on the road network and would be 'diverted' trips.

Packages 2, 3 and 4 would enable the residents of the new development to have a direct pedestrian access through Barrhead South to the centre of Barrhead to access local services, thereby reducing the need for private car use on these short trips.

Packages 2, 3 and 4 would also encourage the residents of the new development and surrounding areas of Barrhead South to use the local bus services to access a variety of land-uses in Barrhead, Paisley, East Kilbride and other locations such as Silverburn and parts of Glasgow.

12.3.2 Dams to Darnley Country Park

As previously discussed, East Renfrewshire Council continues to support the Dams to Darnley Country Park Joint Committee in its role in turning the Country Park into a major recreational and environmental resource for the local community and the wider public for a range of interests including walking, cycling, horse riding, and possibly water-based activities.

Package 4 could serve as a transport gateway into the Country Park from locations outwith East Renfrewshire and thus would generate additional trips to the Park via sustainable modes.

Packages 2, 3 and 4 involve the construction of footpaths to connect into the Country Park from the proposed Barrhead South rail station. Once constructed, these paths would facilitate pedestrian and cycle journeys into the Park from the local area, supporting land-use aspirations.

12.3.3 Summary

Overall, it is considered that each of the Packages would bring benefits to facilitating the achievement of land-use aspirations, to varying degrees, through promoting sustainability and reducing the need to travel. Furthermore, it is considered that none of the land required for the proposals is reserved for uses which are incompatible for transport.

Specifically relating to Package 4, the Local Development Plan details the provision for the safeguarding of land for a Barrhead South Rail Station, Park and Ride and Bus Terminus; and of specific relevance to Package 3, the Plan promotes the investigation into improved connectivity between Barrhead and Newton Mearns and details the need for Aurs Road to be upgraded.

12.4 Policy Integration

The Policy Integration criterion examines whether the proposed scheme contributes to, and is consistent with, other Government policies and legislation beyond transport. Consideration of transport planning policy has been undertaken within the STAG Part 1 and Pre-Appraisal stages of this study and no conflicts have been identified. In addition, a PAF was used as part of the Initial Appraisal, to assess and demonstrate the contribution of each Package to meeting current Scottish Government transport policy objectives. This has been refreshed in light of the STAG Part 2 appraisal, and is presented at the end of this Chapter.

A brief overview of key planning policies is provided below, in terms of consideration of wider Government policies.

At a regional level, the **SPT RTS** supports a wealthier, fairer, healthier, safer, stronger, smarter, greener Scotland. It is considered that each of the Packages will support the RTS goals through contributing to the following RTS objectives:

- **Safety and Security:** To improve safety and personal security on the transport system;
- **Modal Shift:** To increase the proportion of trips undertaken by walking, cycling and public transport;
- **Excellent Transport System:** To enhance the attractiveness, reliability and integration of the transport network;
- **Effectiveness and Efficiency:** To ensure the provision of effective and efficient transport infrastructure and services to improve connectivity for people and freight;
- **Access for All:** To promote and facilitate access that recognises the transport requirements of all;
- **Environment and Health**: To improve health and protect the environment by minimising emissions and consumption of resources and energy by the transport system;
- **Economy, Transport and Land-Use Planning:** To support land-use planning strategies, regeneration and development by integrating transport provision.

The **SPP 2014** sets out four planning outcomes and these outcomes are consistent across the NPF3 and SPP:

- **A successful, sustainable place:** supporting sustainable economic growth and regeneration, and the creation of well-designed, sustainable places;
- **A low carbon place:** reducing our carbon emissions and adapting to climate change;
- **A natural, resilient place:** helping to protect and enhance our natural and cultural assets, and facilitating their sustainable use; and
- **A more connected place:** supporting better transport and digital connectivity.

The spatial strategy set out in NPF3 is complemented by an ongoing programme of investment in transport infrastructure. It outlines that the economy relies on efficient transport connections, within Scotland and to international markets, and planning can play an important role through improving connectivity and promoting more sustainable patterns of transport and travel as part of the transition to a low carbon economy.

The overall purpose of the **Scottish Government Economic Strategy (2011)** is to:

> ***"Focus the Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth".***

The measures proposed in all Packages will help to encourage economic development through improving journey time reliability and enhancing the level of accessibility and inclusiveness to key services.

The **Glasgow and Clyde Valley Strategic Development Plan (SDP) (2012)** is a 25-year land use plan for Glasgow and the Clyde Valley city-region that supports the Scottish Government's central purpose of increasing sustainable economic growth. It provides:

> ***"…a policy framework to help shape good quality places and enhance the quality of life in the city region. The Plan focuses on growing the economy of the city region in a low carbon and sustainable manner and setting out a planning framework which positively encourages investment within Glasgow and the Clyde Valley."***

In the Competiveness section of the SDP it is stated that if low carbon economy in the city-region is to be achieved; climate change targets are to be met; the city-region's carbon footprint to be minimised; and the vision is to be delivered by 2035, transport within the city-region must undergo a significant step-change in terms of:

- An increase in the levels of active travel;
- The level and quality of public transport provision, increasing patronage and integration; and
- The scale of shift from private to public modes.

The **Climate Change Act 2008** sets national targets for reductions in greenhouse gas emissions. The Act outlines that the net UK carbon account for the year 2050 should be at least 80% lower than the 1990 baseline and that CO_2 emissions should be reduced by at least 26% of their 1990 baseline levels. It is considered that each of the Packages, through the promotion of public transport, walking and cycling, will reduce the adverse environmental impacts of private car traffic, particularly harmful local emissions.

Prior to the **Equality Act 2010**, there were three separate public sector equality duties covering race, disability and gender. The Equality Act 2010 replaced these with a new single equality duty covering race, sex, disability, sexual orientation, religion and belief, age, gender reassignment and pregnancy and maternity. The new duty in the Equality Act 2010 came into force on 5 April 2011 and replaces all previous equality legislation including the Disability Discrimination Act 1995.

In the context of this study, such adjustments will be covered through the provision of soft measures, for example high access kerbs, shelters, tactile paving and information provision, and improved pedestrian links. The new rail station (Package 4) would be designed with consideration given to quality of infrastructure, layout and information provision and, where appropriate, the use of measures such as, but not limited to, tactile paving, dropped / raised kerbs and audible crossing warnings. Should Park and Ride and / or a bus terminus be implemented as part of Package 4, these facilities would also incorporate measures such as the appropriate use of signage, dropped kerbs etc. and allocation of accessible bays for the mobility impaired, as appropriate.

The following general statements can be made in terms of overall policy integration:

- Do Minimum: **negligible impact** on policy integration through the implementation of sustainable transport measures proposed as part of the Barrhead South residential development.
- Package 2: promotes sustainability and reduces the need to travel through the provision of pedestrian and cycle links, soft measures, public transport information and marketing, improved bus waiting environment, and the implementation of real-time passenger information at bus stops. All of these measures could encourage modal shift and assist in achieving a healthy, prosperous and inclusive society, resulting in an overall **minor positive impact.**
- Package 3: in addition to the benefits described for Package 2, above, the realignment and widening of Springfield Road and the development of a link road between Barrhead South and the M77 would have a positive impact on the local environment through reducing congestion and improving the flow of traffic. The M77 link road would alleviate traffic volumes on Aurs Road and Main Street, which could enhance these routes for users of sustainable modes, thus encouraging modal shift and going some way to achieving a healthy, prosperous and inclusive society. However, the ability of this Package to contribute to policy integration, above and beyond that of Package 2, is limited and the overall impact is expected to be **minor positive.**
- Package 4: this Package is expected to have the greatest impact in terms of promoting sustainability and reducing the need to travel through the provision of the sustainable travel measures described within Package 2, together with the provision of a new rail station at Barrhead South and the potential for a bus terminus and / or Park and Ride facility. All of these measures could encourage modal shift and assist in achieving a healthy, prosperous and inclusive society, resulting in an overall **major positive impact** if all elements of this Packages are implemented.

In addition, the Packages will contribute to the following wider Government policies:

- Disability: The design of the new Barrhead South rail station, and potential Park and Ride facilities and bus terminus (Package 4) will be fully compliant with the Equality Act 2010 and will provide easy access to wheel chairs and push chairs, thus facilitating access for the mobility impaired, including the elderly and those with young children. The enhancement of bus stop waiting environments (Packages 2, 3 and 4) would also assist in providing easier access to bus services for the mobility impaired through the provision of tactile paving and high access bus boarders.
- Health: The expected modal shift from car to public transport for journeys by local residents and others travelling to employment, education and recreational facilities will provide greater opportunities for increased walking and cycling trips to reach public transport stops. In addition, the use of public transport (as opposed to cars) will reduce the adverse environmental impacts of traffic, particularly harmful local emissions, with an overall positive effect on health. This may be negated to a small degree in relation to Package 3 if the realignment and widening of Springfield Road and the development of a link road between Barrhead South and the M77 results in additional volumes of traffic. This may also be negated to a small degree in relation to Package 4 if parking at the new Barrhead South rail station results in additional traffic on local roads, albeit, as previously discussed, this impact is expected to be negligible.

- Rural affairs: The Packages do not reach rural areas and therefore can do very little to contribute to improve rural affairs or retaining rural communities;
- Social exclusion: Each of the Packages fit in with policies to promote social inclusion, by enabling the people who live in socially deprived areas (particularly those with no access to a car) access to the public transport network. It is anticipated that Package 4 would perform best in this regard, by improving access to the public transport network for those residing within Barrhead South, particularly if all aspects of this Package were implemented.

It can therefore be said that each of the Packages has the potential to be supportive of national policies beyond transport.

A PAF table has been completed and is shown below.

.

NTS High Level Strategic Outcomes			DM	P2	P3	P4	P4+PR	P4+B	P4+PR+B
	Lower Level Policy Objective	Question to be scored							
Promote Economic Growth									
1	Promote 'competitive' inter-urban journey times.	To what extent does the intervention reduce inter-urban journey times?	Neutral	Neutral	Moderate Positive	Strongly Positive	Strongly Positive	Strongly Positive	Strongly Positive
2	Reduce inter-urban journey time on public transport.	To what extent does the intervention reduce inter-urban journey time on public transport.	Slight Positive	Neutral	Moderate Positive	Strongly Positive	Strongly Positive	Strongly Positive	Strongly Positive
3	Reduce the proportion of driver journeys delayed due to traffic.	To what extent does the intervention reduce the proportion of driver journeys delayed due to traffic?	Slight Negative	Slight Positive	Moderate Positive	Neutral	Neutral	Neutral	Neutral
4	Maximise the labour catchment area in city regions	To what extent does the intervention help maximise the labour catchment area in city regions where economic evidence demonstrates that this is required?	Slight Negative	Slight Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
5	Support the development and implementation of relevant proposed national developments identified in the National Planning Framework	To what extent does the intervention support the development and implementation of relevant proposed national developments identified in the National Planning Framework?	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Improve Integration									
6	Promote seamless travel	To what extent does the intervention improve the integration of journeys made by public transport or via Park and Ride by reducing interchanges and interchange times?	Neutral	Slight Positive	Neutral	Slight Positive	Strongly Positive	Strongly Positive	Strongly Positive
7	Policy integration	To what extent does the intervention support or constrain the potential achievement of policy objectives within other sectors or delivery agencies?	Neutral	Slight Positive	Slight Positive	Slight Positive	Moderate Positive	Moderate Positive	Moderate Positive
8	Access to amenities and services	To what extent does the intervention improve accessibility?	Neutral	Slight Positive	Strongly Positive	Strongly Positive	Strongly Positive	Strongly Positive	Strongly Positive
Protect the environment and improve Health									
9	Reduce CO2 emissions per person	To what extent does the intervention reduce CO2 emissions per person?	Neutral	Slight Positive	Moderate Negative	Slight Positive	Slight Positive	Slight Positive	Slight Positive
10	Meet the targets set out in the Climate Change (Scotland) Act 2010	To what extent does the intervention help meet the targets set out in the Climate Change (Scotland) Act 2010	Neutral	Slight Positive	Moderate Negative	Slight Positive	Slight Positive	Slight Positive	Slight Positive
11	Improve air quality	To what extent does the intervention affect air quality? Is the intervention located in an Air Quality Management Area?	Neutral	Slight Positive	Moderate Negative	Slight Positive	Slight Positive	Slight Positive	Slight Positive
12	Improve health	To what extent does the intervention enable the population of Scotland to live longer healthier lives?	Neutral	Moderate Positive	Neutral	Neutral	Neutral	Neutral	Neutral
13	Well designed, sustainable places	To what extent does the intervention improve landscape, streetscape and the local environment?	Neutral	Slight Positive	Slight Positive	Slight Negative	Slight Negative	Slight Negative	Slight Negative
14	Reduce the overall ecological footprint	To what extent does this intervention reduce overall ecological footprint?	Neutral	Slight Positive	Neutral	Slight Negative	Slight Negative	Slight Negative	Slight Negative
Improve safety of journeys									
15	Promote continuing reduction in accident rates and severity rates across the strategic transport network recognising the need to continue the work of the Strategic Road Safety Plan through the STPR period.	To what extent does the intervention promote continuing reduction in accident rates and severity rates across the strategic transport network?	Neutral	Slight Positive	Neutral	Moderate Positive	Slight Positive	Slight Positive	Moderate Positive
16	To reduce the accident and severity rate to the national average	Does the intervention have the potential to reduce accident rates?	Neutral	Slight Positive	Neutral	Moderate Positive	Slight Positive	Slight Positive	Slight Positive
Promote social inclusion									
17	Improve the competitiveness of public transport relative to the car	To what extent does the intervention improve the competitiveness of public transport relative to the car?	Neutral	Moderate Positive	Slight Negative	Slight Positive	Slight Positive	Moderate Positive	Moderate Positive
18		To what extent does the intervention improve the choice of modes or routes facing public transport users?	Neutral	Neutral	Neutral	Moderate Positive	Moderate Positive	Moderate Positive	Strongly Positive
19		To what extent does the intervention reduce the relative costs of public transport?	Neutral	Neutral	Neutral	Slight Positive	Slight Positive	Slight Positive	Slight Positive
20	Reduce Inequality	To what extent does the intervention tackle the significant inequalities in Scottish society?	Neutral	Slight Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive
21	Improve overall perceptions of public transport	To what extent does the intervention Improve overall perceptions of public transport	Neutral	Strongly Positive	Neutral	Moderate Positive	Moderate Positive	Moderate Positive	Moderate Positive

12.5 Summary

Table 42, on the following page, provides a summary of the performance of each Package against the STAG Integration criterion.

Table 42 Performance Against STAG Criteria: Integration

STAG Part 2 Packages	Integration Criteria				Summary Rational for Scoring
	Transport Interchanges		Land use Integration	Policy Integration	
	Services and Ticketing	Infrastructure and information			
Do Minimum	0	0	0	0	Overall neutral impact on integration through implementation of committed schemes.
Package 2	+1	+2	+1	+1	Pedestrian / cycle links, soft measures, and measures to promote and enhance public transport usage are expected to improve integration between modes and reduce car use. Will enhance pedestrian and cycle access between the Barrhead South Development and a range of land-uses, and also to the Country Park. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.
Package 3	+1	+2	+1	+1	As per Package 2, plus: Enhancements to the road network, including the realignment and widening of Springfield Road and the development of a link road between Barrhead South and the M77, would have a positive impact on the integration of bus services using these routes through reducing congestion and improving the flow of traffic. The M77 link road would alleviate traffic volumes on Aurs Road and Main Street, which could enhance these routes for users of sustainable modes. However, this may be negated to a small degree if upgrades to the road network result in additional volumes of traffic. The LDP promotes improved connectivity between Barrhead and Newton Mearns, and the Aurs Road upgrade.
Package 4: New Rail Station	+2	+2	+2	+2	As per Package 2, plus: New rail station: Encourages transfer of trips from car to rail. Supports wider regeneration plans for Barrhead South. Improves access to Barrhead South Development, the Dams to Darnley Country Park and land-uses in the wider area via the rail network. Promotion of sustainable transport is in line with Government policies relating to transport and beyond. Land for new rail station is safeguarded in LDP. Park and Ride: Encourages transfer of trips from car to rail for longer journeys. Impact negated to some degree if increased parking results in increased traffic on local roads, albeit impact expected to be negligible. Bus Terminus: Further enhances integration between walking, cycling, rail and bus modes, and improves access to Barrhead South Development, the Dams to Darnley Country Park and land-uses in the wider area via the bus network. Opportunities to 'dove-tail' bus timetables with rail timetable.
Package 4: New rail station & P&R	+2	+2	+2	+2	
Package 4: new rail station & bus terminus	+3	+3	+3	+3	
Package 4: new rail station & P&R & bus terminus	+3	+3	+3	+3	

13 Accessibility and Social Inclusion

13.1 Introduction

Accessibility defines the ability of people and businesses to access goods, services, people and opportunities. STAG highlights four aspects of accessibility that require to be considered in relation to transport schemes, grouped under the headings of Community Accessibility and Comparative Accessibility. These are:

- Community Accessibility
  - Public transport network coverage; and
  - Access to local services.

- Comparative Accessibility
  - Distribution of impacts by people group; and
  - Distribution of impacts by location.

In addition, STAG requires consideration of how policies (including activities, functions, strategies, programmes, and services or processes) may impact, positively or negatively, on different sectors of the population in different ways and this is considered within the framework of an Equality Impact Assessment.

This Chapter will consider each of these aspects in turn.

13.1.1 Community Accessibility

Community accessibility relates to the existing public transport network coverage and access to local services and both of these elements are reviewed below.

13.1.1.1 Public Transport Network Coverage

This is measured by the changes in the number of people with public transport access to key services and destinations.

Bus is an important mode of access in the study area. There is a strong network of bus services, combining local services with services to destinations outwith the study area, including Paisley, Glasgow City Centre, Neilston, Pollok, Irvine, Ardrossan and East Kilbride. Chapter Two provides details of bus service provision within the study area, and a summary of services is provided within **Table 43**.

Table 43 Barrhead Bus Services

Service Number	Route Description	Monday - Friday			Saturday			Sunday		
		Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus
X44	Ardrossan to Glasgow to Ardrossan	180	07:23	18:59	180	07:52	17:45	N/A	N/A	N/A
X44B	Irvine to Glasgow to Irvine	120	07:13	18:57	150	09:18	17:43	N/A	N/A	N/A

Service Number	Route Description	Monday - Friday			Saturday			Sunday		
		Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus	Freq. (Mins)	First Bus	Last Bus
3	Neilston to Glasgow to Neilston	30	06:21	20:10	30	06:53	20:10	60	10:04	19:33
26	Barrhead to Glasgow to Barrhead	30 to 120	05:18	00:32	30 to 120	06:18	00:32	30 to 120	06:50	12:30
51	Barrhead to Paisley to Barrhead	10	05:59	23:29	10	06:29	23:29	30	07:22	23:21
52	Barrhead Circular	20	07:55	17:20	30	07:55	17:20	N/A	N/A	N/A
54	Neilston to Paisley to Neilston	20	06:39	20:14	20	06:39	20:14	60	09:53	17:13
64*	Barrhead to Gallowhill to Barrhead	15	05:32	06:51	20	06:36	07:48	120	07:26	19:05
66*	Barrhead to Paisley to Barrhead	15	06:14	06:29	N/A	06:28	06:28	30	09:42	10:12
395/6	East Kilbride to Uplawmoor to East Kilbride	60	08:19	18:07	60	08:33	18:02	N/A	N/A	N/A

*Services 64 and 66 pick up passengers in Barrhead only whilst en-route to their service routes which operate outwith Barrhead

These services are likely to provide an attractive option for those without access to a car and play a key part in maintaining good accessibility within the study area. Barrhead town centre is generally well-served in terms of bus frequency, however the bus services on offer are limited in their route choice, especially for east/west movements, for example from Barrhead to Newton Mearns, due to the poor alignment and height/weight restrictions present on Aurs Road and/or the alternative Balgraystone Road.

Barrhead South residents who rely on bus services have reasonable access to Barrhead, Paisley and Glasgow during core operating hours, but limited access to other locations during the evenings and weekends. It is considered that links to Paisley adequately meet demand with half of the bus services serving Barrhead providing access to Paisley from 05:18 am through to 00:32 am on weekdays. Glasgow, by comparison, is less well-served by bus from Barrhead with a half-hourly service beginning at 6:17 am and terminating at 20:10 pm on weekdays.

Evidence gathered during the Pre-Appraisal and STAG Part 1 consultation process indicated that personal security concerns are a major constraint on residents' evening use of public transport services. Furthermore, only one service provides Barrhead South residents with potential for rail interchange at Barrhead, which operates at 15/30minute headways on weekdays and weekends respectively.

Site investigations identified a relatively high number of bus stops in Barrhead South (27). This aids accessibility, however, with sometimes as little as 120m between bus stops, this may affect the attractiveness of services due to the increased journey times associated with servicing so many stops.

The nearest rail station to Barrhead South is Barrhead Rail Station, which is located on the Glasgow to Kilmarnock line and is situated to the north of Barrhead town centre, east of the B771 Paisley Road. It provides access to a weekday peak service of four trains per hour to/from Glasgow. The centre of the current Auchenback community, however, is 2,300m walking distance (approximately 30 mins) to Barrhead Rail Station.

Residents of Barrhead South wishing to use Barrhead Rail Station are faced with a substantial walk to Barrhead Main Street and then the need to access footpaths linking to the station or with having to make part of the journey by bus, taxi or private car, invoking an interchange penalty and additional cost. The topography of the area means that this journey incurs a downhill walk to the station and an uphill return.

Pedestrian access to Barrhead Rail Station from within Barrhead and Neilston was investigated and shows most of the Barrhead South area falls within a walk travel time (based on an average speed of 1.2m/sec) of between 20 and 30 minutes to Barrhead Station, which equates to a distance of 1.6km to 2.4km. Planning advice (PAN 75) recommends a maximum walk distance to a rail station of 800m and a maximum threshold for walking at 1,600m, based on observed travel behaviour.

Neilston Rail Station is located south-west of Barrhead and south of Neilston village centre. This station provides access to rail services on the Glasgow to Neilston Line and serves existing commuter stations at Patterton Rail Station, east of the B769 Stewarton Road, and Whitecraigs Rail Station on the A77 Ayr Road before progressing to stations en-route to Glasgow City Centre. The centre of Barrhead South is 4,100m walking distance to Neilston Rail Station. This incurs a circuitous, approximately 57-minute walk or an 8-minute car drive or 15-minute bus journey. Much of the walking journey would involve the use of unlit rural single carriageway roads with no footways.

Patterton Rail Station is located in the north of Newton Mearns, directly east of Barrhead South on the opposite side of the M77 to Barrhead South residents. The station is on the same line as Neilston Rail Station, providing access to Glasgow City Centre. The centre of Barrhead South is 5,500 m walking distance to Patterton Rail Station which equates to an approximately 70-minute walk or 9-minute drive with the majority of the journey using Aurs Road.

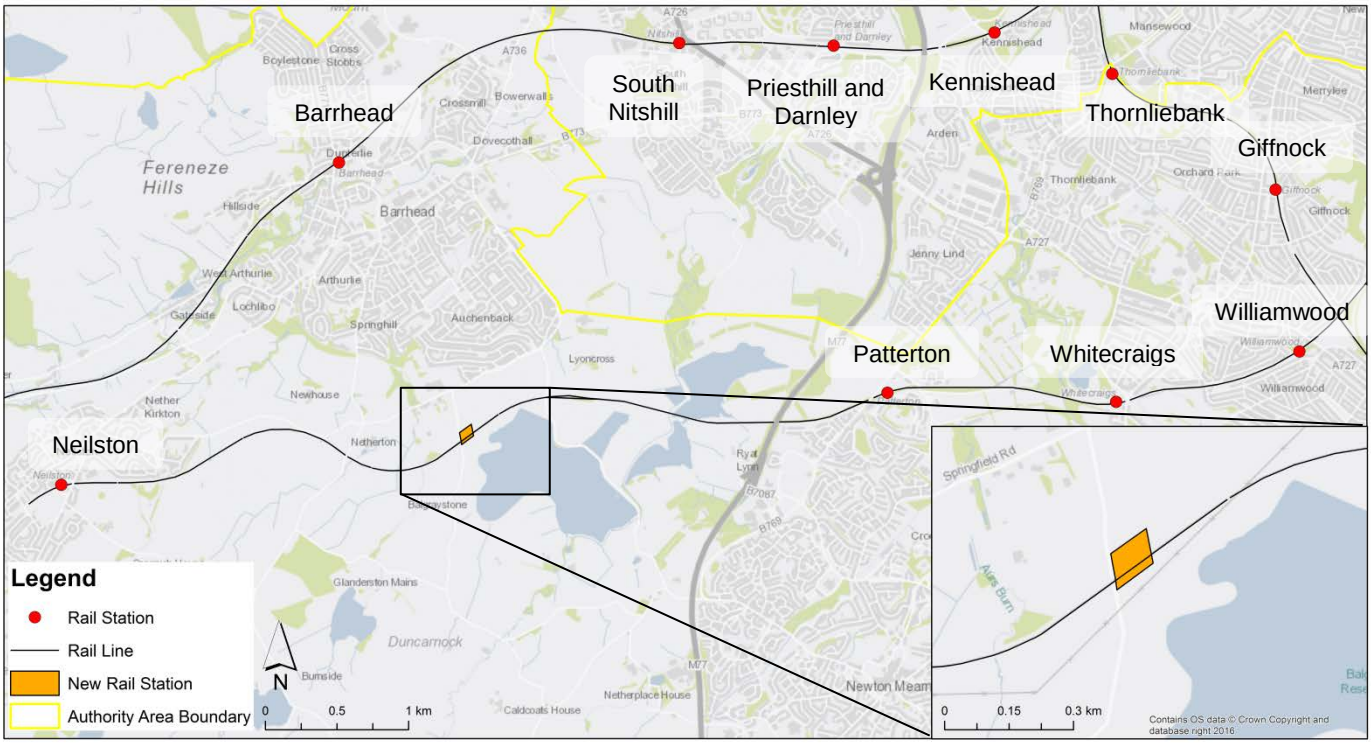

Figure 37 Map showing the location of the proposed new rail station in relation to the existing rail stations (Service Layer Credits: Contains OS data © Crown Copyright and database right 2016)

Rail station usage data available from the Office of Rail Regulation (ORR) indicates that Barrhead rail station has the highest number of passenger entries/exits in East Renfrewshire, and Neilston the third highest. The average annual growth over the past decade for Barrhead rail station is 3.8% and nearby Patterton is 3.7%. Neilston rail station, on the other hand, has a decadal reduction of 0.3%. This further suggests that Barrhead has adopted the role of a commuter town for Glasgow. The continued adoption of this role, coupled with an anticipated population increase from the Barrhead South development, will likely see such growth continue.

It is considered that each of the Packages would increase accessibility by public transport by realising key benefits for those who do not have access to a private car or choose not to travel by car for their whole journey due to factors such as cost and availability of parking at their destination, journey times, journey time unreliability etc. Benefits associated with improved public transport accessibility include:

Economic: the implementation of soft measures, such as bus service information and marketing, improved bus stop waiting environment, and the implementation of Real Time Passenger Information at bus stops (Packages 2, 3 and 4) would increase the attractiveness of bus as a mode of transport for both local trips, and commuting trips to locations such as Paisley and Glasgow, thereby increasing the number of people able to access local and city centre employment opportunities, as well as access to other leisure, social and domestic opportunities. However, there would be no increase in public transport coverage.

For rail-based measures (Package 4) the number of people able to access local and city centre employment opportunities would increase, given the speed and capacity characteristics of rail versus other modes. This could lead to increased demand for rail. The construction of a new rail station at Barrhead South would increase public transport network coverage, and would enable residents of Barrhead South to directly access Glasgow City Centre by rail for social, leisure and retail opportunities, as well as employment opportunities, without incurring interchange penalty costs/delays. The new rail station would also offer a faster, more direct service which has a consistent journey time (within a few minutes) compared to the bus which is constrained by the road network and the level of traffic upon it. In addition, the new rail station would act as a transport hub for visitors from further afield to the Dams and Darnley Country Park.

If a bus terminus facility is developed as part of Package 4, this would further increase public transport network coverage within the Barrhead South residential development and improve access to the new Barrhead South rail station and the Country Park. This would take the form of extensions to existing bus service routes, and it is assumed that there would be no new services introduced.

If a Park and Ride facility is developed as part of Package 4, this would increase the attractiveness of rail as a mode of transport for longer journeys, including commuter trips to / from Glasgow, and would potentially remove pressure from the local road network.

For Package 4, accessibility analysis undertaken[26] indicates that, ignoring the influence of Barrhead rail station on the resident population, there would be approximately 1,349 people within a 10min (800m) walk of the new Barrhead South rail station and 8,067 within a 25min (2km) walk. When the catchment is adjusted for overlapping with Barrhead rail station, the accessibility analysis indicates that there would be a 1,349 increase in the number of residents within a 10min walk of a station and a 2,027 overall within a 25min walk.

It is highly likely that as a result of the existing Barrhead rail station car park being at capacity, there would be a significant proportion of trips that would be diverted trips to the new Park and Ride facility adjacent to the new station, if this were to be implemented as part of Package 4. The private vehicle trips would originate from both Barrhead and localities outwith the town boundary. This does have an impact on accessibility, as some residents who are included within the Barrhead rail station catchment may divert to the new Barrhead South rail station due to parking issues at Barrhead and increase the potential ‘catchment’ of the new station, not captured by the accessibility analysis.

26 Auchenback and The Dams to Darnley Country Park STAG Appraisal (JMP Consultants Ltd. on behalf of East Renfrewshire Council, Edinburgh, 2008)

Environmental: public transport, particularly rail transport, has significant potential to lower CO_2 emissions through modal shift from car.

Social: by encouraging some motorists to switch modes for at least part of their journey, this will reduce congestion levels and deliver other qualitative benefits, including improved quality of life and amenity.

Stakeholder feedback and primary research suggest that CCTV, lighting and tarmac roads are an integral part of the overall design process in terms of encouraging users, and these features should be taken into account when designing the new rail station, and potential Park and Ride and bus terminus facilities, associated with Package 4. The absence of these 'complementary factors' would reduce the attractiveness of any new facility.

In terms of decongestion and environmental benefits, evidence has suggested that the impact associated with the provision of Park and Ride facilities at rail stations is negligible. Whilst some travellers may choose to use rail for a proportion of their journey as a result of increased availability of parking spaces, evidence suggests that this is offset by travellers previously walking/cycling/using other means of public transport to travel to the station now choosing to drive and park at the station[27].

13.1.1.2 Access to Local Services

The local accessibility criterion considers walking and cycling access to local activity centres and to public transport:

Packages 2, 3 and 4 are expected to have a minor positive impact on walking and cycling access to local services through the implementation of direct pedestrian / cycle links between Barrhead, Barrhead South and the Country Park; cycle links within Barrhead South and Main Street; and the upgrade of connecting footpaths in Barrhead South. Upgrading the stepped footpaths as part of these Packages would improve local accessibility within Barrhead South for those residents who currently do not use the footpaths due to personal safety fears.

Packages 2, 3 and 4 may promote further non-motorised trips to access local services through the provision of soft measures, including the enhancement of the local bus stop waiting environment and service information, which would increase the attractiveness of bus and improve access to services within Barrhead and also further afield in locations served by the bus network, such as Paisley, Glasgow City Centre, Neilston, Pollok, Irvine, Ardrossan and East Kilbride. This is expected to provide minor positive benefits.

This is particularly important in terms of tackling social exclusion and providing sustainable transport access to key services, facilities and employment for those without direct access to a car.

There are no anticipated issues relating to severance for pedestrians or cyclists as a result of implementation of any of the proposed Packages. The new rail station, bus terminus facility and Park and Ride facility (Package 4) should include facilities for cycle provision and pedestrian links to the surrounding facilities. In addition, consideration to access routes for pedestrians and cyclists will form a key element in the implementation of all Packages, and availability of cycle parking will be considered in the design of Package 4.

Overall the net impact on local accessibility for pedestrians and cyclists is likely to be minor to moderate positive.

13.1.2 Comparative Accessibility

The distribution of accessibility impacts is relevant in that it identifies the extent to which the proposals benefit certain social groups (for example, car availability, gender, age, employment status, mobility impairment, income, trip purpose) or geographical locations (for example regeneration, deprivation or development areas, areas of poor public transport provision) most in need of access by public transport to essential activities.

[27] STAG Technical Database, Section 11.6.4

13.1.2.1 Distribution of Impacts by People Group

The socio-economic analysis undertaken within the Pre Appraisal and STAG Part 1 Chapters of this report examined a number of measures of social exclusion, the key highlights of which are as follows:

- **An ageing population** - Barrhead South has a higher proportion of 45 – 59 year olds, when compared to the Scottish average.
- Barrhead South has **low levels of those of working age** (those aged between 16 and 59 years) but particularly those aged between 16 and 44 years, residing in the area.
- Within Barrhead South there is **a largely uneven age distribution** whereby some areas, particularly the north west, have a mean age of 53 – 69 years while other areas, particularly the south, have a mean age of 24 – 27 years.
- Barrhead South encompasses **pockets of high deprivation**. Whilst the level of income deprivation for the whole of East Renfrewshire is below that of Scotland as a whole, with just under 8% of the population of East Renfrewshire recorded as income deprived compared with 13.4% across Scotland, the Barrhead South community is ranked in the lowest 5-10% of deprived areas for employment and in the lowest 15-20% of areas for income.
- There are a **lack of high skill and high value employment opportunities within Barrhead** with much of these opportunities being provided in Glasgow. Compared with the Scottish average, a higher proportion of Barrhead South residents are employed within lower skill sectors, including construction; wholesale and retail trade; administration; and transport and storage.
- There is a **lack of commercial development sites in the area** limiting the scope for employment opportunities to arise in the local area.
- Due to a lack of high skill and high value employment opportunities the **majority of residents are required to travel outwith the local authority area to work or study**.
- Barrhead South experiences low levels of car ownership - the proportion of households in Barrhead and Barrhead South without access to a car is higher (33%) than the local authority area as a whole (19%).

SIMD (2016) data shows there are certain pockets in the study area (particularly within Auchenback) where the level of deprivation is between the 20-40% National 2016 Quintiles. These households would benefit from improved walking, cycling and public transport access to services and employment opportunities.

Table 44 summarises the age, gender and limiting long-term illness statistics for key standard Census datazones within the study area, compared to overall statistics for Barrhead, East Renfrewshire and Scotland.

Table 44 Age, Gender and Long-term Health Problem or Disability Ratios within the Study Area

Datazone	Age (years)			Gender		Long-Term Health Problem or Disability		
	% 0-15	% 16-64	% 65+	% Male	% Female	Day-to-day activities limited a lot	Day-to-day activities limited a little	Day-to-day activities not limited
S01008309	17%	63%	20%	45%	55%	16%	14%	70%
S01008310	14%	64%	22%	45%	55%	14%	12%	75%
S01008311	18%	68%	13%	53%	47%	10%	10%	80%
S01008312	20%	65%	15%	49%	51%	9%	8%	83%
S01008319	16%	58%	26%	45%	55%	15%	12%	73%
S01008320	9%	59%	31%	48%	52%	14%	13%	73%
S01008321	20%	71%	9%	48%	52%	4%	7%	89%
S01008323	24%	65%	12%	47%	53%	12%	10%	77%
S01008324	24%	66%	10%	49%	51%	11%	11%	78%
S01008325	27%	64%	8%	46%	54%	10%	10%	81%
S01008326	24%	63%	13%	47%	53%	12%	12%	77%
S01008327	17%	63%	20%	47%	53%	12%	12%	76%
Barrhead	19%	65%	16%	47%	53%	12%	10%	78%
East Renfrewshire	20%	62%	18%	48%	52%	8%	9%	83%
Scotland	17%	66%	17%	49%	51%	10%	10%	80%

As indicated within **Table 44**, five datazones display a higher proportion of population aged over 65 years (up to 31 %), when compared to the average for East Renfrewshire (18%) and Scotland (17 %). In addition, four of the datazones contain a higher proportion of population under 16 years (up to 27 %), when compared to the average for East Renfrewshire (20 %).

The data above also indicates that the gender profile across the study area is in line with that across East Renfrewshire as a whole, and across Scotland.

All of the datazones bar one display a higher level of population whose day-to-day activities are limited due to a long-term health problem or disability (up to 16 %) when compared to the statistics for East Renfrewshire (8 %).

Overall, it is considered that all Packages would have a positive impact, to varying degrees, in terms of encouraging sustainable modes of travel and improving accessibility to the public transport network. Whilst this will enhance the level of accessibility for those without the use of a car, existing car users will also be encouraged to leave their cars at home in favour of other modes. Packages 2 and 3 are expected to have a minor positive impact in this regard, through improved pedestrian / cycle links and

upgrades to the bus stop waiting environment. Whilst Package 3 includes improvements to the road network, removing traffic from Aurs Road and Main Street through the provision of an M77 link road would provide opportunities for modal shift, through creating a less congested environment for other users. Package 4 would be expected to perform best, through the provision of bus stop measures and pedestrian / cycle links, together with the provision of a new rail station, with or without a bus terminus facility. In addition, households located within the small pockets of deprivation in Barrhead South would particularly benefit from improved access to services and employment opportunities afforded by Package 4, and this Package is therefore expected to have a moderate positive benefit in this regard.

Upgrading of the stepped footpaths in Barrhead South (Packages 2, 3 and 4) would benefit all local residents, apart from the mobility impaired. However, the main beneficiaries of this measure would be the elderly residents and female residents, who, during the stakeholder consultation, expressed the greatest concern with respect to personal safety fears when using the paths.

13.1.2.2 Distribution of Impacts by Location

The discussion above has demonstrated that there is an overall positive gain in accessibility associated with each of the Packages, primarily through encouraging modal shift and reducing overall reliance on the private car for local and commuter trips. The areas where issues of social exclusion are most important, and those which are particularly dependent on public transport, would particularly benefit from this improvement.

As previously discussed, there is a substantial new housing development planned at Barrhead South, located to the south of Barrhead, bounded to the north by Springfield Road and to the south by the existing Neilston to Glasgow railway line. It is expected that approximately 1,050 homes are to be built in two phases; 470 homes by 2025 and 580 homes post-2025.

Clearly such development would benefit from improved accessibility brought about by improvements to public transport and road network provision.

Overall, it is anticipated that all of the Packages would have a positive impact on improving access to development and regeneration areas. Packages 2 and 3 would have a lesser impact, but a minor positive impact overall. It is expected that Package 4 would bring an increase in access to rail services from the Barrhead South residential area for pedestrians, cyclists, those who own a car (if Park and Ride were to form part of this Package), and also for those transferring from bus to rail (if a bus terminus facility were to form part of this Package) and thus this Package is expected to have a major positive impact.

13.1.3 Equality Impact Assessment

The Public Sector Equality Duty requires public authorities to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. It covers the 'protected characteristics' or age, race, disability, sex, religion or belief, sexual orientation, gender reassignment and pregnancy and maternity. As part of this requirement, public bodies should take due consideration of the impact of their policies and practices on their ability to meet the duty through the undertaking of an Equality Impact Assessment (EQIA).

EQIA considers how policies (including activities, functions, strategies, programmes, and services or processes) may impact, either positively or negatively, on different sectors of the population in different ways. It also helps to identify unlawful discrimination and opportunities for the advancement of equality.

An EQIA has been undertaken for each of the Packages being considered at STAG Part 2, and is presented within Appendix F. Overall, it is considered that the Packages presented at STAG Part 2 fulfil the requirements of the EQIA process, through the promotion of measures aimed at promoting active travel and public transport, which would reduce reliance on the car, at least for part of the journey, to make trips within, to and from the study area, thus benefiting all groups.

13.1.4 Summary

Table 45 on the following page provides a summary of the performance of each Package against the STAG Accessibility and Social Inclusion criteria.

Table 45 Performance against STAG Criteria: Accessibility and Social Inclusion

STAG Part 2 Packages	Integration Criteria				Summary Rational for Scoring
	Community Accessibility		Comparative Accessibility		
	Public Transport Network Coverage	Access to Other Local Services	Distributional / Spatial Impacts by Social Group	Distributional / Spatial Impacts by Area	
Do Minimum					Minor impact on walking and cycling access to local services through implementation of committed walking and cycling measures as part of the Barrhead South residential development. Realignment of Aurs Road to improve access between Barrhead and Newton Mearns.
Package 2	+1	+1	+1	+1	Increases accessibility by walking and cycling, and through providing a more attractive bus waiting environment, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. No increase in PT network coverage. Increases accessibility to development areas, primarily the Barrhead South residential development area, and also the Dams to Darnley Country Park. No severance issues.
Package 3	+1	+1	+1	+1	Increases accessibility by walking and cycling, and through providing a more attractive bus waiting environment, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Road upgrade aspects of this Package improve accessibility to the M77 and the Glasgow Southern Orbital for car users, and remove traffic from Aurs Road and Main Street. No increase in PT network coverage. Increases accessibility to development areas, primarily the Barrhead South residential development area, and also the Dams to Darnley Country Park. No severance issues anticipated although final design of Balgray Link would require consideration.
Package 4: New Rail Station	+2	+2	+2	+3	As per Package 2, plus: Increases access to rail services, and therefore an increase in PT network coverage and sustainable access to key services, employment and facilities, from the Barrhead South residential area for pedestrians, cyclists, those who own a car (if Park and Ride were to form part of this Package), and also for those transferring from bus to rail (if a bus terminus facility were to form part of this Package).
Package 4: New rail station & P&R	+2	+2	+2	+3	
Package 4: new rail station & bus terminus	+2	+2	+2	+3	
Package 4: new rail station & P&R & bus terminus	+2	+2	+2	+3	

14 Cost to Government

14.1 Introduction

STAG outlines that the likely net costs of a scheme from the public sector's point of view should be identified. This will enable a comparison with the total benefits of the scheme in order to assess the overall value for money.

Cost to Government refers to all costs incurred by the public sector as a whole, net of any revenues. The total net cost consists of investment costs, operating and maintenance costs, grant/subsidy payments, revenues, and taxation impacts.

Costs and revenues which are attributable to private sector operators are separately identified within Chapter Eleven (Economy).

14.2 Costs to Government

14.2.1 Capital Costs

Discussions with East Renfrewshire Council have indicated that the capital costs of the preferred Package(s) would be funded by a combination of developer contributions from the Barrhead South residential development, and the public sector, primarily through the City Deal funding stream. In relation to the rail-based Package (Package 4), potentially an element of funding may be available via the Scottish Stations Fund which is managed by Transport Scotland. It is unlikely that European Funding would be available.

Capital costs have been worked up to varying extents for the options and work is ongoing to refine these. The key components that have been costed are:

- Barrhead South Station - £10.95 million (2016 prices)
- Blagray Link - £10 million (but noted that this was costed in 2013 without vertical alignment or full details of any structures that may be required)

14.2.2 Operation and Maintenance Costs

There will be operating costs associated with the provision of Package 2 in operating additional lighting and CCTV. Any new bus services provided in response to the enhancements would incur operating costs but it is assumed that this would be provided on a commercial basis. Similarly, lighting costs associated with the road infrastructure in package 3 would add additional operating costs. Package 4 would add operating costs to the ScotRail franchise through the provision of a new station.

The new rail station, and potential Park and Ride facility, associated with Package 4 would also assume additional operating costs associated with Network Rail's Long Term Operating Charge – a charge that allows Network Rail to recover the efficient maintenance, renewal and repair costs associated with the stations that it owns.

Maintenance costs can be calculated based on experience of similar projects undertaken elsewhere. There would be a requirement to maintain public transport stops / stations, waiting facilities, car parking areas and access routes to an acceptable standard. The maintenance costs associated with individual Packages may include, but not be limited to, the following:

- Package 2: there will be the need for occasional road sweeping, winter maintenance, cleaning and general repairs associated with the enhanced bus stop measures, but these elements are currently undertaken for the existing bus stops and this could be added to existing contracts at minimal additional cost to the Council. CCTV and real time information systems, where appropriate, will require to be maintained in proper working order. It is considered that the costs could largely be built into existing maintenance regimes. Pedestrian and cycle links will also require to be maintained as above, together with route signing and lining. Again, it is anticipated that this could be incorporated within existing maintenance regimes.

- Package 3: there will be a need for occasional road sweeping, winter maintenance, cleaning, and general repairs of pot holes etc. associated with the road enhancements and additional car parking provision at the Country Park. Lighting will require ongoing maintenance, together with general maintenance of signing and lining, and CCTV, as appropriate.
- Package 4: waiting facilities at the new rail station will require to be maintained to an acceptable standard, including, for example, litter removal and winter maintenance which is assumed to fall under Abellio ScotRail's SQUIRE regime. CCTV and real time information systems will require to be maintained in proper working order. It is assumed that the station and ticket office will be unstaffed. The Park and Ride car park would require general winter maintenance such as snow clearance and gritting. Lighting would require ongoing maintenance, together with general maintenance of signing and lining, and CCTV. The bus terminus and associated bus waiting environment would require to be maintained to an acceptable standard. For those areas where additional lining is required, for example to mark out bus bays, there will be the occasional need for the refreshing / renewing of these lines.

15 Risk and Uncertainty

15.1 Introduction

STAG sets out the importance of adopting risk management strategies throughout the appraisal and implementation stages of proposals in order to ensure that steps have been taken to prevent and mitigate risks and uncertainties. Once reliable estimates of relevant costs are built up, risks are explicitly assessed and quantified, and work to minimise project-specific risks is undertaken, any optimism bias can be reduced.

STAG notes that once risk factors have been explicitly quantified and valued, adjustment should be made to the costs and benefits in order to calculate risk-adjusted "expected values". An expected value provides a single value for the expected impact of all risks. However, in general, even with a well-developed project, there will remain some risks which cannot be foreseen. In such cases it will not be possible to include these risks in the expected value, so instead a contingency figure should be added in order to take account of possible unanticipated risks.

Work is still underway to develop detailed costs. Package 2 would depend on the final design of interventions and will become clearer as the Barrhead South Strategic Development area progresses. The Balgray Link which forms a key part of Package 3 is currently being reviewed in terms of horizontal alignment; vertical alignment and cost estimates would follow. At present the most recent estimate is 2013[28] of £10million. This includes 10% contingencies but not Optimism Bias.

Work is progressing to determine the costs of a new rail station at Barrhead South and latest estimates are £10.95 million and has been developed with an Optimism Bias of 25%.

15.2 Optimism Bias

Experience has demonstrated a tendency for insufficient contingency costs or programme time to be made; a phenomenon known as Optimism Bias. HM Treasury's Green Book Guidance[29] has identified Optimism Bias as the systematic tendency for appraisers to be over-optimistic about key project parameters. Evidence from other projects in the U.K. has confirmed this to be a major issue. It is recommended that the Promoter and its advisers consider the implications of the Green Book Guidance should any of the transport measures appraised within this study be progressed.

15.3 Risk Management Process

STAG states that:

> ***"In appraisals there is always likely to be some difference between what is expected, and what eventually happens, because of biases unwittingly inherent in the appraisal, and risks and uncertainties that materialise. As a result, it is important to identify and mitigate risks, and make allowances for Optimism Bias."***

Risk management is a structured approach to identifying, assessing and controlling risks that emerge during the course of the project lifecycle. This supports better decision making by developing a more thorough understanding of the risks inherent within a proposal and their likely impact. STAG outlines that risk management involves:

- Identifying possible risks in advance and putting mechanisms in place to minimise the likelihood of their materialising with adverse effects;
- Having processes in place to monitor risks, and access to reliable, up-to-date information about risks;
- The right balance of control in place to mitigate the adverse consequences of the risks, if they should materialise; and
- Decision making processes supported by a framework of risk analysis and evaluation.

The Guidance further states that:

[28] Supporting Technical Report, Proposed Balgray Link Road, East Renfrewshire,18th January 2013
[29] The Green Book: Appraisal and Evaluation in Central Government, HM Treasury, refreshed July 2011

"At the level of individual transport projects, risk management strategies should be adopted in a way that is appropriate to their scale. The aim of risk management is not necessarily to completely eliminate risks, but to reduce them wherever the cost of mitigation is less than the cost of the risk."

It is acknowledged that the amount of time and resources applied to the quantification of risks should be dependent on the number of risks to be analysed, the difficulty of doing so and the materiality of these risks.

Furthermore, the risk management process is continuous through the appraisal process, with the assumptions included in the risk assessment and decisions relating to responses being kept under review.

The objectives of the risk management process are to:

- Identify risks from all sources;
- Assess the potential likelihood, impact and hence overall significance of those risks, thereby prioritising those most in need of management and mitigation;
- Identify appropriate mitigation strategy;
- Allocate responsibility for management of the mitigation process; and
- Periodically review progress towards mitigation and assess the resultant reduction in the Optimism Bias uplift factor.

15.4 Risk Identification

This process will involve inputs from all appropriate stakeholders: in this case, we would recommend that Transport Scotland, SPT and Network Rail be involved in discussions, together with rail and bus operators, as appropriate.

In order to reduce strategic risk, East Renfrewshire Council has taken steps to manage risks through the working groups established for the project to date and regular liaison with the key stakeholders.

A Project Risk Workshop specifically in relation to the preferred package(s) identified would be useful at an early stage. Prior to the workshop, attendees should be asked to advise areas of potential risk and from this, a list can be compiled to provide the basis for the discussions. If the study is taken forward by Network Rail (i.e. Package 4, the new rail station proposal), the identification of risks would form part of the GRIP process.

The workshop should assess risks for their potential likelihood and potential impact, in order to develop a priority for mitigation, and also to suggest an initial strategy for mitigation. During this process, further risks may be identified. Following the meeting an extended list can be compiled. This would form the basis of the Risk Register, which would be reviewed and updated regularly.

15.5 Risk Register

A comprehensive Risk Register should be developed for the preferred package/options being progressed. This should detail any identified risks that are likely to affect the delivery and operation of the package/options, and present this in the business case. This will include information on the status of the risk. The Risk Register should be continuously updated and reviewed throughout the risk management process.

The Risk Register should be structured to identify:

- A unique identification reference
- Author (who raised the risk)
- Date risk identified
- Date last updated
- A description of the risk

- The stage of scheme development at which the risk might materialise
    - Planning;
    - Procurement;
    - Construction; and
    - Operations.
- Elements impacted by the risk
    - Capital expenditure;
    - Operating expenditure;
    - Revenue;
    - Programme;
    - Quality;
    - Functionality;
    - Approvability; and
    - Safety.
- The likelihood of realisation of the risk, the likely impact of the risk and hence its significance (a rating for which is derived from the product of likelihood and impact)
    - Prior to mitigation; and
    - Following mitigation.
- Responsibility for mitigation management
    - Lead responsibility; and
    - Support to be provided to task leader.
- Mitigation strategy
- Action taken
- Mitigation factor achieved

The Risk Register would be a living document and subject to regular review and amendment.

15.6 Risks Identified Within STAG Appraisal

It is recognised that the identification of risks and uncertainties would form an ongoing process. At this stage, the following risks have been identified:

- Consent risk: legal and planning issues, specifically where planning approval or powers are required.
- Weight limit constraints on Aurs Road: There may be a 3T weight limit on Aurs Road, which will require to be investigated further prior to the design of any upgrades to this road.
- Environment: as detailed within this appraisal, various environmental issues have been identified as part of this study.
- Mining: It is not expected that there would be high risks of mineral instability so close to the railway line, but this would require further investigation in due course.
- Capacity constraints on rail network to accommodate rail station site and additional stops: to achieve new rail station, there could ultimately be a need for more investment e.g. extra lines to increase the capacity of the track and ensure services do not interrupt Glasgow city services.
- Resilience on the rail network: the additional stopping times associated with a new rail station in Barrhead South could impact on the resilience of the rail network. The level of impact and any associated risk would require to be discussed further with Network Rail and Transport Scotland should Package 4 be progressed.
- Public acceptability at future consultations.
- Availability of funding: issues relating to the commercial viability and funding of the preferred package/options. In addition, Scottish Planning Policy published in June 2014 states within Para 277 that:

"Agreement should be reached with Transport Scotland and Network Rail before rail proposals are included in a development plan or planning application and it should be noted that further technical assessment and design work will be required before any proposed new station can be confirmed as viable."

Design unknowns Work is underway to further explore the Balgray Link option. This has included a constraints mapping exercise and a horizontal alignment. As this work progresses, further risks may come to light.

15.7 Option Summary Tables

STAG notes that to facilitate the clear presentation of information to decision makers, an Option Summary Table (OST) should be completed for each of the options (packages) that have passed the full STAG process. As such, an OST has been prepared for each of the packages considered within the STAG 2 appraisal, and these are presented overleaf.

OSTs are presented in Appendix G

15.8 Summary

Consideration of risk and uncertainty is essential throughout project development. In addition to incorporating an initial Optimism Bias adjustment, ongoing requirements have been set out which are necessary to manage risk and uncertainty during development of the preferred package/options.

16 Monitoring and Evaluation

16.1 Introduction

The Scottish Government requires monitoring and evaluation to be undertaken and documented for any proposal for which it provides funding or approval.

STAG requires that a new project or strategy be subject to planned evaluation and monitoring, in addition to regular revalidation throughout its development.

Monitoring is an ongoing process of watching over the performance of a project, identifying problems as these arise and taking appropriate action; whilst Evaluation is used for specific, post-implementation events, designed to identify whether or not a project is performing as originally intended; whether, and to what extent, it is contributing to established policy directives; and whether the implemented project continues to represent value for money. Therefore, by gathering and interpreting information, monitoring and evaluation will demonstrate how the project or strategy performs against its objectives, identify any deficiencies and allow adjustments to be made.

Soon after implementation, the performance of the scheme should be assessed against the specified objectives. Recognising that certain projects require time before the full benefits can be realised, a further evaluation is required sometime after implementation.

In addition, regular monitoring of the scheme is essential against specified Key Performance Indicators (KPIs) to assess the ongoing effectiveness of the overall strategy and individual schemes.

This Chapter describes the measures which may be put in place by East Renfrewshire Council to meet the requirements of STAG with respect to monitoring and evaluation. An indicative monitoring process is indicated in **Figure 38**.

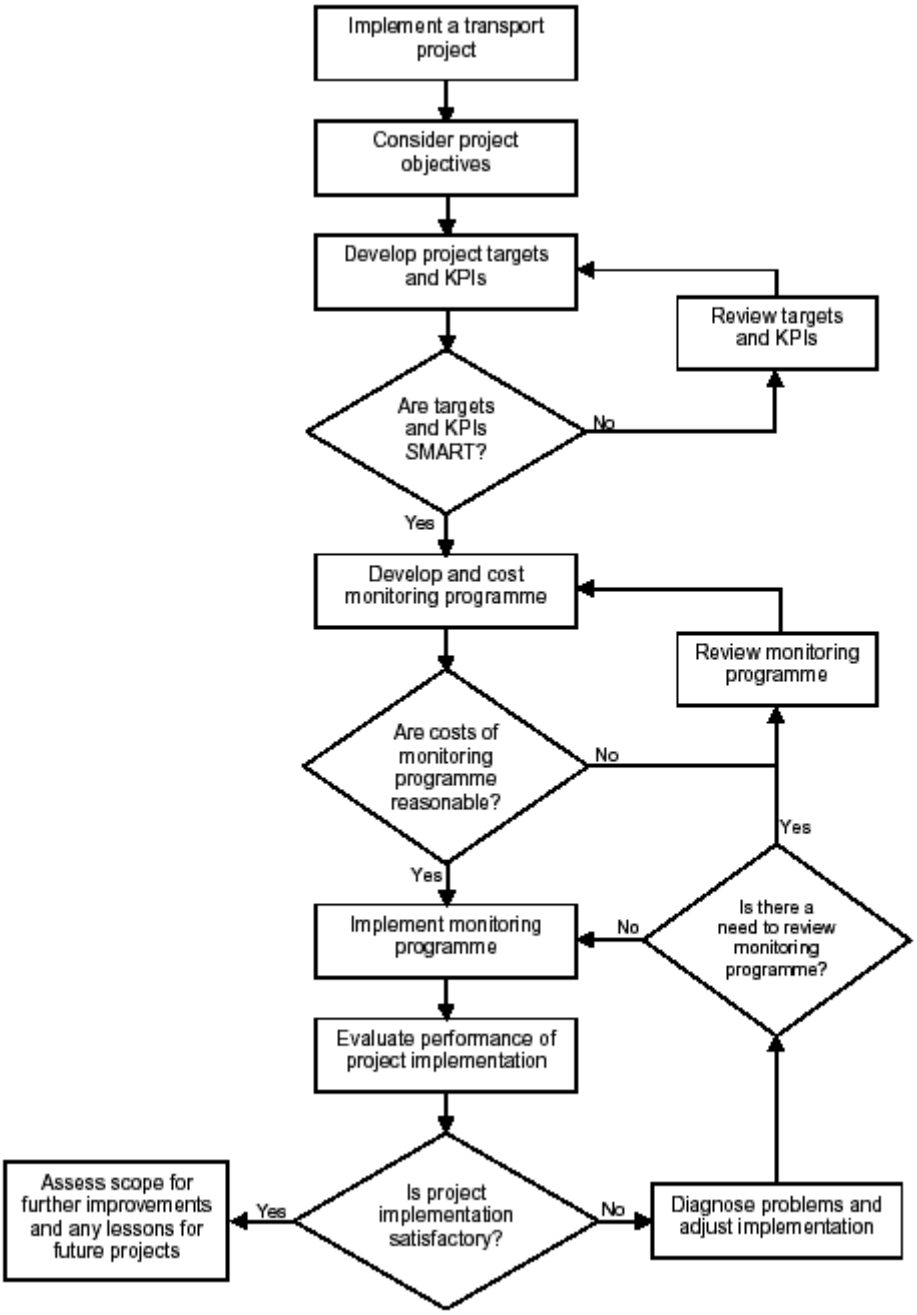

Figure 38 Indicative Monitoring Process

16.2 Objectives

16.2.1 Introduction

The objectives for the study are described in Chapter Five of this report. The specific project objectives have been derived from a range of national, regional and local policies reflecting transport and more diverse government and local authority strategies. The project objectives have also been developed to address the problems in the study area and to take on board the aspirations of stakeholders.

16.2.2 Transport Planning Objectives

The specific transport planning objectives developed for the study, and against which the preferred package/options will be evaluated and monitored, are as follows:

- To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor.
- To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield;
- To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns;
- To enable fully sustainable access to Springfield & the Dams to Darnley Country Park for local communities;
- To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield; and
- To mitigate any adverse transport impacts created by the Barrhead South Development.

16.3 Base Case

It is considered premature to be prescriptive in terms of the establishment of the collection and organisation of the data that will provide the Base Case. It is anticipated that this will be developed and agreed with East Renfrewshire Council, Transport Scotland, SPT, Network Rail and bus and rail operators, as appropriate, during the period immediately prior to completion / operation of each individual element of the preferred package/option.

It is likely that the baseline data may include, but will not necessarily be limited to:

- Data on noise, water quality, air quality, ecology etc.;
- Pedestrian, cyclist and public transport activity along sections of the study area which will be affected by the proposals;
- Junction performance, queue lengths, etc. at critical locations;
- Mode choice surveys; and
- Safety records.

It will be important to establish through discussions with other organisations (for example the neighbouring local authorities (Glasgow City Council, Renfrewshire Council, South Lanarkshire Council, East Ayrshire Council and North Ayrshire Council), train and bus operators) what information is available as part of their regular data gathering functions at that time, to avoid incurring additional cost and to limit the collection of new information to that which is strictly necessary to establish performance against the transport planning objectives.

It is also noted that it may be necessary to obtain some baseline data prior to start of construction to be certain that construction activities do not adversely impact the validity of any changes measured.

16.4 Project Development, Procurement and Construction

16.4.1 Project Validation

It is possible that circumstances may change within the time required for scheme development, approval and construction, which could affect the assumptions made regarding the proposals. During this time it will be necessary to keep under review the transport planning objectives, taking into account any changes in the underlying transport situation.

16.4.2 Cost and Revenue and Programme Monitoring

The process of monitoring cost and revenue and programme issues throughout the development and construction of the preferred package/options must be considered as part of a project execution plan or similar. Through this, any potential for changes in project costs and associated risks could be evaluated.

16.5 Operations

16.5.1 Process Evaluation

- Evaluations are specific post-implementation events designed to identify whether:
- A project has performed as intended (or under or beyond expectations);
- Established objectives have been achieved (fully or partially, and the reasons for any failures); and
- The project continues to represent value for money (also considering actual cost budget).

The Process Evaluation is conducted straight after the implementation. It will draw lessons for on-going implementation and for the design, management and implementation of future projects.

For the reasons given above with respect to Base Case data, it is not possible at this stage to be specific about the nature of the process evaluation. It seems likely at this stage that there will be a need to provide data which will measure changes in the baseline parameters mentioned above such as various environmental parameters, public transport passenger counts, mode choice surveys and junction performance.

Table 49, below, summarises a possible example which might be employed as the basis for the process evaluation:

Table 46 Evaluation Performance Indicators

Objective	Performance indicator/measure	Performance target	Source of indicator	Monitoring method and frequency
Costs	Proportion of actual costs over budget	• X% of budget exceedance	Project costs	Budget and cost comparison, after implementation
	Proportion of budget allocated to ERC which was actually spent within timescale	• X% budget spent by completion	Project costs by time	Project costs by time, after implementation

Views	The extent to which (stakeholder, public) consultation influenced outcomes	Significant number of views taken into account	Consultation process	Qualitative examination of consultation, by group
	Stakeholder's views on how well the project was designed and implemented	Overall positive views	Stakeholder interviews	Qualitative survey results by group, after implementation
Transport	The extent to which the transport model results reflect reality	• Traffic diversion • Congestion • Delays	Transport model and traffic surveys	Comparison between modelled and actual, after implementation and again one year later
Local economy	Actual impact on economic activity	• Employment • Commerce	Before and after surveys	Comparison between before and one year after implementation, by location and activity

Based upon the TPOs discussed in Section 16.2.2, above, the following performance indicators could be appropriate:

- Traffic levels:
  - Achieve a volume and mix of traffic within the study area, in line with the existing and future road hierarchy.
- Accessibility:
  - Improve access to public transport network;
  - Improve sustainable access to employment opportunities, particularly within Glasgow city centre;
  - Improve sustainable access to leisure, domestic and social opportunities, within East Renfrewshire and further afield;
  - Improve sustainable access to Springfield and the Dams to Darnley Country Park for local communities;
  - Maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield; and
  - Promote equal access to the transport system, for all users.
- Safety and Security:
  - Improve safety and security of sustainable transport modes for all transport users.

Table 50 summarises potential performance indicators and a possible monitoring programme.

Table 47 Potential Performance Indicators and Possible Monitoring Programme

Objective	Performance indicator	Definition of indicator	Performance target	Source of indicator/target	Monitoring method and frequency
Accessibility	Access to sustainable transport network	Percentage of population within 400 metres walk distance from a bus stop / service, and 800 metres walk distance from a rail station. Sustainable transport use.	X% by 2025 X million per year by 2025	Population (from Scottish Census)	Yearly population and distribution updates by ward. Continuous monitoring of bus and train ticketing. Ongoing public transport / cycle and pedestrian user surveys.
	Access to employment opportunities	Sustainable transport connections from Barrhead South Development to employment areas	X% sustainable transport use for travel to work (and school) by 2025, from Census data. X% increase in area's SIMD ranking / Geographic Access to Services by 2025.	Travel to Work (and School) Data from Census, or local surveys as appropriate. SIMD ranking / Geographic Access to Services.	Review of Census Travel to Work Data, and other local surveys as appropriate. Review of SIMD ranking / data as available.
	Access to leisure, domestic and social opportunities	Sustainable transport connections from Barrhead South Development to areas of leisure, domestic and social opportunity	X% increase in area's SIMD ranking / Geographic Access to Services by 2025.	SIMD ranking / Geographic Access to Services.	Review of SIMD ranking / data as available.
	Sustainable access to the Dams to Darnley Country Park.	Use of public transport, walk and cycle modes to access the Country Park, for both local communities (South Barrhead geographical area) and those travelling from further afield.	X% travelling to Country Park from local areas by sustainable modes, by 2025 X% travelling to Country Park from outwith local areas by sustainable modes, by 2025	Country Park visitor surveys	Country Park visitor surveys, biannually

	Equal access to transport system, for all	Use of transport network by elderly, mobility impaired and women travelling alone	X% sustainable transport use for travel to work (and school), and other key services, by 2025, from Census data.	Data from Census, or local surveys as appropriate.	Review of Census Data, and other local surveys as appropriate.
Traffic Levels	Traffic volumes - key routes	Average AM/PM, daily, weekly, monthly and annual traffic volumes on key routes. Changes in levels of car traffic.	Volume of traffic in line with existing and future road hierarchy by 2025	Traffic flow / volume surveys	Ongoing review of permanent/ temporary site automatic/manual traffic count programme. ERC roads standards manual.
Environmental Impact	Air Quality	Changes in key indicators of air quality	Meet or exceed the air quality management targets adopted by East Renfrewshire Council X% by 2025	Air quality monitoring	Ongoing review of ERC air quality monitoring programme
Economic Impact	Town centre vitality	Changes in town centre footfall and percentage of town centre retail vacancies vs total number of town centre retail units.	Meet or exceed targets adopted by ERC X% by 2025	ERC economic development including recent commission of the Scotland's Towns Partnerships to review the town centres of two towns including Barrhead	Refer to indicators quarterly set out within the ERC Economic Report.

Safety and Security Impact	Safety and security – sustainable modes	Changes in numbers of PIAs Changes in levels of transport-related crime Changes in levels of sustainable transport usage	X% reduction by 2025	Opinion of public & personal safety can be surveyed Mode share surveys Local Police monitoring reports.	Ongoing sustainable transport users' surveys Annual records from local Police

Before the monitoring programme is agreed upon, consideration must be given to the actual availability of the data, practicalities from collecting new data, its format, whether it will properly reflect the indicators proposed and the cost of obtaining it. Indicators and targets should be subject to regular reviews to ensure that they continue to properly reflect the performance of the project against its objectives, throughout the monitoring period.

16.6 Summary

This Chapter has set out the transport planning objectives, together with actions to be taken during the various phases from scheme development through to operation to meet the requirements of STAG with respect to monitoring and evaluation.

17 Conclusions and Recommendations

17.1 Introduction

This report has set out the details of a STAG appraisal considering surface access around the Barrhead area. This builds on an extensive body of work that has been undertaken and links with current work underway to progress City Deal projects with a view to improving economic performance across the Greater Glasgow and Clyde Valley area.

It is acknowledged that further work is required to develop our understanding of some of the options and it is also acknowledged that the forthcoming Strathclyde Regional Transport Model will allow improved assessment to be made of the impact of the various options. However, in the absence of the SRTM, efforts have been made where appropriate to consider the scale of demand and benefits of options. Given the existence of SRTM it is recommended that a review is undertaken using this model when available to provide a robust basis for investment as any business case progresses.

This Chapter will provide a brief summary of the key problems identified in the area, the objectives developed and the options which were considered worthy of assessment at STAG 2 stage.

17.2 Problems and Opportunities

A review has been undertaken of the socio-economic background of the area, the transport provision and aspirations the Council and the communities may have. The key problems identified were:

- An ageing population
- Low levels of those of working age
- A largely uneven age distribution
- Pockets of high deprivation levels
- Lack of high skill and high value employment opportunities within Barrhead
- Lack of commercial development sites
- Majority of Residents are required to travel outwith the local authority area to work or study
- Low levels of car ownership and high taxi and/or minicab usage
- Poor transport accessibility between Barrhead South and Glasgow City Centre
- Peak period congestion on routes in and out of Barrhead
- Poor access from Barrhead South to the Dams to Darnley Country Park
- Poor cycling provision
- Poor walk mode accessibility for the Barrhead South population to Barrhead Rail Station
- Insufficient provision for rail interchange by bus for Barrhead South residents
- Unsuitable access for potential bus services operating east/west
- Difficulty accessing the M77 Junctions 4 and 5 from Barrhead South
- Anticipated increase in traffic on the local network resulting from the Barrhead South Development
- Insufficient public transport provision for the Barrhead South Development area

A key message from this is the need to provide accessible transport options opening up access to services and employment opportunities acknowledging current inconsistency in socio-economics across the council area and providing for proposed new developments, particularly around the Barrhead South Development Opportunity.

In addition to the problems, a number of opportunities have been identified; two key areas of opportunity being the Barrhead South Development Opportunity which will see the construction of 1,050 houses and the aspirations to promote the country park and increase visitor numbers.

17.3 Transport Planning Objectives

Transport Planning Objectives have been developed for this study and reviewed against identified problems and opportunities along with consideration of their 'SMARTness'. The objectives are:

- To remedy acknowledged local transport inequalities for Barrhead South residents and increase accessibility to employment opportunities, particularly those in Glasgow City Centre, to which existing transport links are comparatively poor;
- To enhance accessibility for Barrhead South residents to other social amenities, particularly social, domestic and leisure opportunities within East Renfrewshire and further afield;
- To promote safety in the transport system, especially for those people and in those areas affected most by personal security concerns;
- To enable fully sustainable access to Springfield and the Dams to Darnley Country Park for local communities;
- To maximise the opportunity and sustainability of travel to the Dams to Darnley Country Park from further afield; and
- To mitigate any adverse transport impacts created by the Barrhead South Development.

17.4 Options and Packages

A long list of options was developed and considered against the Transport Planning Objectives. This allowed an initial sifting and a STAG part 1 appraisal to be completed. Following this, four packages were considered through the STAG Part 2 process. These packages are shown below:

Package	Measures
1: Do Minimum	• The Barrhead South Development; and • The realignment of Aurs Road.
2: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links	• The Barrhead South Development; • The realignment of Aurs Road; • **Improved public transport information and marketing**; • **Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South**; • **Real-Time updates at bus stops**; • **Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park**; • **Provide cycle links within Barrhead South and Main Street**; and • **Upgrade of connecting footpaths in Barrhead South**.
3: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS road enhancements including a link from Barrhead South to the M77	• The Barrhead South Development; • The realignment of Aurs Road; • Improved public transport information and marketing; • Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South; • Real-Time updates at bus stops; • Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park; • Provide cycle links within Barrhead South and Main Street; • Upgrade of connecting footpaths in Barrhead South; • **Parking for the Country Park**; • **Realignment and widening of Springfield Road**; and • **Development of a M77 link road**.

4: Do minimum PLUS investment in Softer Measures and Pedestrian / Cycling links PLUS provision of a new rail station at Barrhead South with or without a Park & Ride and with or without a bus terminus	• The Barrhead South Development; • The realignment of Aurs Road; • Improved public transport information and marketing; • Measures to improve security and journey quality for bus passengers at bus stops in Barrhead South; • Real-Time updates at bus stops; • Provide direct pedestrian/cycle link between Barrhead, Barrhead South and the Country Park; • Provide cycle links within Barrhead South and Main Street; • Upgrade of connecting footpaths in Barrhead South; • **Rail Station;** or • **Rail Station with Park & Ride**; or • **Rail Station with Bus Terminus**; or • **Rail Station with Bus Terminus and Park & Ride**

17.5 STAG assessment

The packages have been considered across the STAG criteria of Environment, Safety, Economy, Integration, Accessibility and Social Inclusion.

17.5.1 Package 1

Package 1 sees the delivery of the Barrhead South Development area, including 1,050 houses and the realignment of Aurs Road facilitating the use of the road by larger vehicles including small single decker buses. This option will bring a number of opportunities to the area through the extension of the urban area closer to the Country Park and through an increased population. On its own however, it could exacerbate existing problems. Whilst negotiations are ongoing with developers to ensure funding is unlocked to provide improvements to transport provision around the area, Barrhead South has some inherent problems with accessibility due to the lack of public transport options and long walk distances and challenging topography involved. The development will add traffic to the network and, with access to the M77 already under pressure, efforts will need to be made to encourage a move to sustainable transport modes.

The option is expected to have a largely neutral effect across the STAG criteria introducing some negative environmental impacts, such as landscape impacts and noise and vibration due to increased activity and traffic in the area. The realignment of Aurs Road offers the potential for better connections to the M77 and the possibility of public transport vehicles being able to use the road subject to weight restrictions.

17.5.2 Package 2

Package 2 sees the delivery of the Barrhead South Development and the realignment of Aurs Road along with other measures to improve public transport, walking and cycling around the wider Barrhead South area. This would be intended to address existing problems that reduce accessibility around the area including lack of accessible walking routes, perceived security concerns and lack of cycling opportunities. It is anticipated that this, in conjunction with good transport design within the Barrhead South development area, would help people move around Barrhead more easily and access services and employment opportunities in the town and further afield. However, the impact is expected to be relatively minor. The option is not expected to add additional environmental impacts above Package 1 and it should offer some improvements in safety particularly for pedestrians and cyclists. Accessibility and Social inclusion will be a positive impact at a local level.

17.5.3 Package 3

Package 3 sees the delivery of Packages 1 and 2 and also the provision of new road infrastructure linking Barrhead to the M77 at Junction 5, widening Springfield Road and providing additional car parking at the Country Park. This option would seek to improve the accessibility of Barrhead from the strategic network by road based modes and help to make the Country Park more

attractive as a result. More work needs to be done to understand the nature of the Balgray Link although preliminary work has provided a number of horizontal alignment options and cost estimates. It would be expected that this option would have negative environmental impacts through the construction of new infrastructure and the generation of car trips. However, the options would also provide traffic with an alternative route away from currently congested routes and possibly provide environmental benefits through reduced queuing and smoother traffic flow. Safety would be expected to benefit from the provision of a high quality link to the M77 and the improvements to Springfield Road. Pedestrians and cyclists would be catered for on the Balgray link offering a safer route for their use. The economics of the option have not been assessed in the absence of a design but it is anticipated that this option would yield positive economic impacts through the provision of a better links to and from Barrhead, particularly from the South and the freeing up of capacity to the north of the town. This in turn could help to make Barrhead a more popular destination and bring economic activity and investment. Access to the Country Park would be improved and help to secure the Country Park's place as a popular destination for people both within Barrhead and further afield bringing associated economic benefits.

17.5.4 Package 4

Package 4 sees the delivery of packages 1 and 2 and the provision of a new rail station at Barrhead South with the possibility of an associated park and ride and bus terminus. This option has been explored from an operational and technical perspective and it is considered that a station at this location could be provided. Demand forecasting and crowding analysis has been undertaken and shows that a new station at Barrhead South would generate demand, partly through abstraction from other stations. It also shows that the station would accelerate crowding issues on the Neilston line although this may be in part addressed by a flattening of the peak demand profile.

The new station would be ideally situation to access the Country Park providing increased accessibility by sustainable means to the park and located next to the new houses being developed at Barrhead South. Without the station, public transport to this development area will be limited.

It is considered that the package has little marginal impact on the environment above the impact of Package 1 and may encourage some modal shift to sustainable travel modes thus improving local air quality. Encouraging greater use of public transport over private transport should have a positive impact on safety and the economic assessment undertaken has suggested a positive benefit of the station. The option performs well in terms of accessibility and social inclusion and also in terms of integration. It is considered that this option could offer a real step change in accessibility for the existing residents of Barrhead South and in doing so improve the economic performance of the area.

Appendix A: Consultation

Thirteen consultations, in a variety of formats, have been carried out to discuss transport provision in both Barrhead South and in the wider local authority area since 2006. **Table A.1** contains the details of these consultations including when and where they were undertaken; who attended; and the intended purpose of the consultation activity, where details are available[30]. **Table A.2** sets out the key issues and themes emerging from the consultations.

Table A.1 Detail of the consultations undertaken in Barrhead South and the wider local authority area regarding transport provision

Date	Name	Location	Attendees	Purpose
23/08/2006 and 24/08/2006	Consultation for Barrhead – Newton Mearns Transport Link STAG - Area Forum Transport Issues	Not Detailed	• Not Detailed	A brief discussion of transport issues within the respective areas took place prior to the nomination of two members from each forum to attend the main consultation help on 29/08/2006.
29/08/2006	Barrhead – Newton Mearns Transport Links STAG Part 1 Consultation	ERC Offices, Barrhead	• East Renfrewshire Council: Joe Devine, Alec Knox, Fraser Brown, Tracy Butler, Mike Crichton, Stephen McHenry, Gillian McNamara • Transport Scotland: Scott Lees • SPT: Allen Doyle • Newton Mearns Area Forum: George Butler, Forest Alexander • Arriva: Jim Jackson, William Dunsmore • JMP: Jason Gillespie, Amy Tig, Tim Steiner • Firstbus: Bryan Tennant • Barrhead, Neilson and Uplawmoor Area Forum: Gilbert Baird	Stakeholder workshop. This was undertaken in addition to consultation with the Barrhead and Newton Mearns Area Forum Groups.
26/03/2008	Local Stakeholder workshop	Not Detailed	• Not Detailed	Not Detailed
16/04/2008	Auchenback Active Group 'walkabout'	Not Detailed	• Not Detailed	Not Detailed
2008	One to one consultations with Council staff and transport operators	Not Detailed	• Not Detailed	Not Detailed
05/09/2008	Auchenback Health and Open Space Project	Not Detailed	• Not Detailed	Presentation about the STAG appraisal was given to the attendees from the local community, council, NHS and local schools.

[30] East Renfrewshire Strategic Transport Issues, Appendix A: Consultation and Studies Undertaken to Date, JMP, 2010.

14/05/2009	Key Stakeholder Workshop	Eastwood House, Eastwood Park, Rouken Glen Road, Giffnock	• East Renfrewshire Council Transportation: Iain Shields, Charlie Armstrong, Scott Gibson, Sharon McMurtie • East Renfrewshire Council Planning: John Drugan, Dorothy McDonald • East Renfrewshire Council Economic Development: Phil Prentice • Transport Scotland Rail Policy: Peter Lloyd • Transport Scotland Trunk Road Policy: Trevor McIlhatton • Transport Scotland Strategy and Investment: Alison Irvine, Andrew Davidson • Transport Scotland M77 Route Manager: Ian McFetridge • First ScotRail: John Yellowlees • SPT: Neil Sturrock • Network Rail: Mark Quinn	To use the collective knowledge of key delivery partners to assist in identifying appropriate interventions during a workshop session.
16/06/2009	Newton Mearns South, Busby Clarkston and Eaglesham Area Forum	Mearns Castle high School	• Four Councillors • Busby Tenants and Residents Association • Eaglesham Community Council • East Renfrewshire Neighbourhood Watch Association • East Renfrewshire Community Health and Care Partnership • Clarkston Community Council • Age Concern Eastwood	To invite opinions from the forum on the transport options proposed in the Finalised Local Plan and opinions on other options that should be considered.
17/06/2009	Giffnock and Thornliebank, Netherlee, Stamperland and Williamwood Area Forum	Williamwood High School	• Three Councillors • Strathclyde Fire and Rescue • The Disability Action Group East Renfrewshire • The Jewish Representative Council • Eastwood Crime Prevention Panel • Giffnock Community Council • East Renfrewshire Health and Care Partnership • Thornliebank Community Council • Thornliebank Seniors Forum • Tornliebank Tenants and Residents Association	To invite opinions from the forum on the transport options proposed in the Finalised Local Plan and opinions on other options that should be considered.
18/06/2009	Neilston, Uplawmoor and Newton Mearns North and Barrhead Area Forum	Council Offices, Main Street. Barrhead	• Five Councillors • Uplawmoor Community Council • Neilston Community Council • Hillside Tenants and Residents Association • Dunterlie Tenant Action Group • Barrhead Community Council • Newton Mearns Community Council • East Renfrewshire Community Health and Care Partnership	To invite opinions from the forum on the transport options proposed in the Finalised Local Plan and opinions on other options that should be considered.
July 2009	Website Consultation	Online	• Four responses received	To get the views of residents, people working in or operating local businesses and visitors to the area about the rail network and M77 access.

August 2009	Barrhead/Newton Mearns Business and Organisation Consultation	Letter	• Sport Village Corporation Limited • Leggat Plant Limited, Crossmill Barrhead • Abbey Coaches, Neilston • Self Drive Excavators, Neilston • TM Andrew, Neilston • Uplawmoor hotel • DAS Securities Group • Adam Millar & Sons Ltd, Barrhead • East Renfrewshire Community Health and Care Partnership • Scottish Development International • Visit Scotland • Greenlaw Park Ltd • East Renfrewshire Chamber of Commerce • Elphinstone Estates • The Greenlaw Development company Ltd • Moorgarth Group Ltd • James Barr • Clarkston Business Improvement District • Renfrewshire Chamber of Commerce • BTW Shiells • Cruden Estates • George Leslie Ltd • Reid Kerr College • Tesco Stores • FM Commercial Investment Ltd • Levern Engineering	Consulted a number of businesses and organisations in East Renfrewshire via letter regarding proposals for the Barrhead to M77 link road and the provision of south-facing slips at M77 Junction 4.
30/05/2013	Stakeholder Consultation	Not Detailed	• East Renfrewshire Council • SPT • Transport Scotland	To review and agree the local objectives

Table A.2 – Key Issues Emerging from Consultations

Key Issue	Comment	Opportunity
Bus Services are poor or non-existent after 6pm, especially for internal trips within Barrhead, therefore many local residents use taxis instead.	McGill's currently operate four services after 6pm albeit on a more reduced service from that of during the day. However, two of those services terminate soon after 8pm.	To ensure that there is an adequate bus service operating after 6pm and in the areas where there is demand. To also investigate if there is a demand to extend the operating hours of the service.
It would be useful if the trains start earlier with the earliest service leaving Neilston at 7 am	Services on the Neilston line begin at 6:30 am on weekdays with a half hourly service operating until 7:30 pm after which the headway reduces. Furthermore, services operate from 5:46 am on the Barrhead line.	To determine whether the rail service provision at present meets demand.
The public transport timetabling and routing means that shift workers in the area have no alternative but to use the private car		
The Darnley Road/ East Kilbride Service 395 was noted as being good in terms of disabled access but only has an hourly service	The service is hourly and does not operate on a Sunday.	Investigate if there is demand for the service to operate at an increased frequency and on a Sunday. To also ensure that the disabled access praised is applied across all services.
It was stated that it was difficult to get to Thornliebank by bus	The 395/6 service operates on the A727 with bus stops situated within a kilometre of Thornliebank.	Investigate if there is a demand for a service to operate from Barrhead to within Thornliebank.
The existing rail service between Barrhead and Glasgow was considered to be reliable. There was a general consensus that train services are viewed as more reliable than bus services	During site visits, 27 bus stops were identified within Barrhead South, the high frequency of stops will be a contributing factor to the reliability of the bus services.	Consider measures to increase the reliability of bus services within optioneering process.
The high costs of short distance rail travel was raised and it was stated that it was more expensive to go a couple of stops locally than to get a return to Glasgow	ScotRail appear to have rectified this issue.	
It was noted there was no direct way of getting to Barrhead from Newton Mearns except by means of an extremely limited bus service	The service 375/6 is the only bus that offer a direct service between Barrhead and Newton Mearns. This is in part due to height and weight restrictions on the more direct road links to Newton Mearns.	Consider ways in which a more direct bus service could be provided within optioneering process.
It was felt that the cost of travelling by bus is quite expensive with many Auchenback residents using taxis for the return journey from Barrhead with shopping as this short journey by taxi is not much more expensive than bus travel	Passengers are able to purchase day, week and 4-week tickets for use on McGill's buses which can reduce the cost of bus travel compared to purchasing single fares.	Consider measures to encourage the use of bus services including consideration of ticketing / cost within optioneering process.

The area suffers from a number of social problems, the most severe of which is drug related crime, resulting in significant personal safety fears for many residents which substantially reduce travel opportunities.		Safety will be considered within the STAG process.
Locals believe drug related crime is due to a lack of access to leisure and social facilities for young people		Safety will be considered within the STAG process.
Residents have concerns about the poor maintenance of footways in the area and in particular the stepped lanes as they present significant problems for residents with mobility issues	A site visit confirmed that sever stepped lanes exist with significant diversions necessary to avoid them. Some of the stepped lanes have been upgraded where new residential areas have been developed but many remain poorly maintained.	Consider measures that will improve the stepped lanes and provide improved access for residents with mobility issues within optioneering process.
The connecting lanes have inadequate lighting and do not have natural surveillance from the surrounding properties which limits the willingness of many residents to use these routes, especially at night	A site visit confirmed that many of the connecting footpaths and stepped lanes are not appropriately lit and are situated between houses in narrowed alleys	Consider measures that will improve the appeal of the stepped lanes and connecting footpaths within optioneering process.
There is insufficient parking on Aurs Road and fishermen stand on the road to fish.	A site visit confirmed that there is space for 5 cars parked in parallel on the east-bound side of the road. Aspirations for the park set out in the Local Development Plan 2015's Supplementary Planning Guidance aim to address this.	Consider measures to improve parking provision and access to the Balgray Reservoir within optioneering process.
There is congestion on: • Aurs Road; • Allan's Roundabout; • Radial Route; • Nitshall Road • Hurlet; and • M77 junctions.		This will be taken into consideration in the identification of problems, development of TPOs and generation of options, as appropriate.
There are no roads with bus priority		
Residents perceive Aurs Road as busy and have safety concerns using it at night.	The alignment is such that there are several tight bends, the road is unlit and has height and weight restrictions. Analysis of road accident data has shown that in the past five years there have been six accidents of 'slight' severity.	This will be taken into consideration in the identification of problems, development of TPOs and generation of options, as appropriate.
The Kilmarnock to Barrhead train service is of limited frequency and often overcrowded.		

Appendix B: Established Policy Directives

B1.1. Introduction

The established policy directives considered to be of particular relevance to this study, are set out within this Appendix, and include:

National:

- Government Purpose and the National Performance Framework (2016)
- Scotland's National Transport Strategy (2016)
- Scotland's Economic Strategy (2015)
- Climate Change Act (2009)
- Infrastructure Investment Plan (2015)
- National Planning Framework 3 (2014)
- Scottish Planning Policy (2014)

Regional:

- Glasgow and Clyde Valley Strategic Development Plan (2012)
- A Catalyst for Change: The Regional Transport Strategy for the West of Scotland 2008-2021

Local:

- East Renfrewshire Council Local Transport Strategy 2008 - 2011
- East Renfrewshire Council Local Development Plan 2015
- East Renfrewshire Council Supplementary Planning Guidance: Dams to Darnley Country Park 2015
- Single Outcome Agreement 2013-2016
- Economic Development Strategy 2008-2013

B1.2 National

Government Purpose and the National Performance Framework (2016)

The National Performance Framework underpins delivery of the Scottish Government's agenda. It recognises the positive contribution transport can make to maximising opportunities for economic growth and how it contributes to the prosperity and quality of life of every person in Scotland. The Government's purpose is:

> ***"To focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth"***

This purpose is underpinned by sixteen strategic objectives, as outlined in **Figure B.1**.

Figure B.1 Government Purpose and the National Performance Framework strategic objectives

Scotland's National Transport Strategy (2016)

The original National Transport Strategy was published in 2006. A process of refreshing the strategy began in 2015 with the final document being published in 2016. The vision is for:

> ***"An accessible Scotland with safe, integrated and reliable transport that supports economic growth, provides opportunities for all and is easy to use; a transport system that meets everyone's needs, respects our environment and contributes to health; services recognised internationally for quality, technology and innovation, and for effective and well-maintained networks; a culture where transport providers and planners***

respond to the changing needs of businesses, communities and users, and where one ticket will get you anywhere."

The National Transport Strategy (NTS) identifies five high level objectives:

- Promote economic growth by building, enhancing managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- Protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- Improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and
- Improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

These five high level objectives are to be achieved through three strategic outcomes:

- Improved journey times and connections, to tackle congestion and lack of integration and connections in transport.
- Reduced emissions, to tackle climate change, air quality, health improvement.
- Improved quality, accessibility and affordability, to give choice of public transport, better quality services and value for money, or alternative to car.

Scotland's Economic Strategy (2015)

The Government Economic Strategy supports the delivery of the Government's Purpose, that is, to focus the Government and public services on:

"Creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable growth"

The strategy gives clear priority to accelerating economic recovery, with a range of measures to tackle unemployment and promote employability.

The strategy outlines four economic priorities:

- **Investing** in our people and our infrastructure in a sustainable way;
- Fostering a culture of **innovation** and research and development;
- Promoting **inclusive growth** and creating opportunity through a fair and inclusive jobs market and regional cohesion; and
- Promoting Scotland on the **international** stage to boost our trade and investment, influence and networks.

All four of these economic priorities relate to transport provision.

Climate Change Act (2009)

The Climate Change (Scotland) Act was passed by the Scottish Parliament in 2009. It is an Act of the Scottish Parliament to set a target for the year 2050, an interim target for the year 2020, and to provide for annual targets, for the reduction of greenhouse gas emissions. The transition to a Low Carbon Economy is a challenge, but one which the Scottish Government is embracing as a driver of economic growth.

A Low Carbon Economic Strategy for Scotland (2009)

The Low Carbon Economic Strategy sets out an approach to delivering a low carbon Scotland. The aspiration is for:

> ***"The transition to a low carbon economy [which] heralds an exciting but challenging economic and social transformation"***

With the aim:

> ***"To reduce emissions by 42% by 2020, and by 80% by 2050, and to seize business opportunities and a better quality of life"***

In terms of transport, the following three targets have been set:

- Almost complete decarbonisation of road transport by 2050.
- Significant decarbonisation of rail by 2050.
- 10% of our transport use from renewable sources by 2020.

Infrastructure Investment Plan (2015)

The Infrastructure Investment Plan provides an overview of the Scottish Government's plans for infrastructure investment over the coming decades. It sets out why the Scottish Government invests, how it invests and what it intends to invest. The Plan sets out a number of priorities for investment in infrastructure across transport, water, digital, waste and other sectors. In preparing the Plan, to assist with decisions on prioritisation of projects, the Infrastructure Investment Board broke down the Scottish Government's purpose into four prioritisation criteria, and each new investment proposal is considered against these criteria.

- Delivering sustainable economic growth through increasing competitiveness and tackling inequality;
- Managing the transition to a more resource efficient, lower carbon economy;
- Supporting delivery of efficient and high quality public services; and
- Supporting employment and opportunity across Scotland.

The Plan recognises that investment in infrastructure is a key driver of both short- and long-term economic growth performance and makes a vital contribution to delivering the ambitions set out in the Government Economic Strategy. The Plan also notes that enhancing transport infrastructure and services more generally can open up new markets, increase access to employment and help to drive up competitiveness and deliver growth. It recognises that investment in transport infrastructure plays an essential role in creating the right conditions for successful and sustainable growth in a low carbon economy.

National Planning Framework 3 (2014)

Scotland's Third National Planning Framework (NPF3) presents the Scottish Government's spatial strategy. It is the spatial expression of the Government Economic Strategy, and sets out national priorities for development and infrastructure investment.

NPF3 describes the Glasgow and Clyde Valley region (including East Renfrewshire) as Scotland's biggest economic region. It promotes opportunities for sustainable growth across the region with regeneration being a key focus. With local authorities working together across the region, NPF3 supports the concept of a city deal to drive employment and economic development.

The Framework also highlights the important role of towns in the city region outside of Glasgow City, with considerable progress being made in the transformation of towns who are finding creative and distinctive ways to encourage local economic growth.

Scottish Planning Policy (2014)

In 2014, the Scottish Government published a revised Scottish Planning Policy and launched the Town Centre First principle. This policy acknowledges that the economy relies on efficient transport connections and also highlights the need to address the development requirements of businesses and enable key opportunities for investment to be realised.

The purpose of the Scottish Planning Policy is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land.

The policy sets out four outcomes. The fourth outcomes relates to transport and aims to achieve a more connected place – supporting better transport and digital connectivity.

B1.3 Regional

Glasgow and Clyde Valley Strategic Development Plan (2012)

The Glasgow and Clyde Valley Strategic Development Plan (SDP) was published in May 2012. It is a statutory document, alongside Local Development Plans, and takes a strategic, region-wide view of spatial needs across the Glasgow and Clyde Valley region. The Spatial Development Strategy element of the SDP includes Community Growth Areas – these focus on housing, economic activity and supporting infrastructure. Furthermore, a series of Strategic Economic Investment Locations (SEIL) are identified.

The Scottish and UK Governments, and local leaders, have come together to develop a City Deal for the Glasgow and Clyde Valley region. One of the largest ever, it is an agreement between the UK and Scottish Governments and eight local authorities across the region. Over its lifetime local leaders in Glasgow and the Clyde Valley estimate this City Deal will:

- Support an overall increase in the economy of around 29,000 jobs in the city region.
- Work with 19,000 unemployed residents and support over 5,500 back into sustained employment.
- Secure £1 billion of Scottish Government and UK Government capital funding to support proposed infrastructure investment programme for the area. This will be complemented by a minimum of £130 million of investment from Glasgow and Clyde Valley local authorities.
- Lever in an estimated £3.3 billion of private sector investment into the proposed infrastructure investment programme.
- Spread the benefits of economic growth across Glasgow and Clyde Valley, ensuring deprived areas benefit from this growth.

A Catalyst for Change: The Regional Transport Strategy for the West of Scotland 2008-2021

The Regional Transport Strategy's vision is for:

"A world-class transport system that acts as a catalyst for an improved quality of life for all"

The Strategy identifies four regional transport outcomes (**in bold)** and 17 strategic priorities that set the scope for SPT's role:

- **Improved Connectivity**
    - Developing the mass transit network
    - Improving access to key gateways
    - Improving cross-city and cross region links on strategic corridors
    - Improving sustainable connectivity for business and freight
    - Planning for the provision of transport for the Commonwealth Games 2014, tourism and major events
- **Access for All**
    - Planning and providing transport for regeneration areas
    - Improving access to services, including healthcare and education
    - Improving socially necessary public transport, including Demand Responsive Transport and Community Transport
    - Improving connections for rural areas
    - Promoting equality, including making journeys safer and addressing transport affordability
- **Reduced Emissions**
    - Encouraging modal shift to more sustainable modes
    - Promoting 'smarter choices' travel planning and active travel
- **Attractive, Seamless Reliable Travel**
    - Plan and provide a 'step change' for bus services, standards and infrastructure
    - Revitalising the subway network
    - Improving interchange between modes
    - Improving Travel information
    - Developing integrated ticketing

B1.4 Local

East Renfrewshire Council Local Transport Strategy 2008 - 2011

The ERC Local Transport Strategy 2008 - 2011 set out the policies, projects and proposals for transportation within East Renfrewshire and beyond. The LTS sits in a hierarchy of transport plans beneath the National and Regional Transport Strategies and its core objectives are;

- Modal Shift & Demand Management: Encouraging modal shift from cars to more sustainable alternatives like walking, cycling and public transport along with associated demand management measures, if necessary, to help reduce car use;
- Transport & Land-use: Greater integration between transport and land-use will reduce the need to travel and encourage local economic activity;
- Accessibility & Social Inclusion: Improvements to accessibility will facilitate social inclusion for people who experience barriers to transport;
- Network Management: This is important to ensure safe, efficient and effective operation of the existing transport network; and
- Environment: The relationship between transport and the environment and how these issues can be reconciled.

The key elements of this Strategy that the Council aims to deliver are;

- A safer and more secure environment for people when travelling;
- More accessible transport infrastructure and services for people who experience particular difficulties in using these facilities;
- Improvements in the condition and management of the road network;
- Improved access to local and surrounding areas of economic activity;
- Contribution to the regeneration of Barrhead and other parts of East Renfrewshire through complementary transport schemes including a new link road between Barrhead and the M77;
- The use of Transport Assessments, Travel Plans and other measures to ensure transport considerations are taken into account when planning new developments;
- Consideration of travel demand management measures where appropriate;
- Reducing environmental impacts, particularly air quality and greenhouse gas emissions;
- Improvements to bus services through liaison with SPT and operators including consideration of using the statutory powers available to the Council to do this;
- Investigation of improved public transport links into Newton Mearns;
- Improvements to rail services to reduce overcrowding and increase their attractiveness to people including enhancements to Park & Ride where possible; and
- Supporting freight transport and ensuring that it is carried out in a manner that minimises impacts on local residents.

There has not been a refresh or a more up to date document produced to replace the 2008-2011 Local Transport Strategy.

East Renfrewshire Council Local Development Plan 2015

The East Renfrewshire Local Development Plan sets out policies and proposals for the use, development and protection of land within East Renfrewshire and was adopted on 25 June 2015. The Local Development Plan is a Statutory Document that must be in line with Government policies and the Glasgow and Clyde Valley Strategic Development Plan.

The Local Development Plan provides the Council with a land use development strategy to guide the future sustainable growth of East Renfrewshire up to 2025 and beyond and provides an appropriate basis for determining planning applications.

Overcoming issues of accessibility to jobs, community and social facilities by a range of transport modes are key elements of the Local Development Plan, which recognises a need to provide and maintain public transport to serve a growing and ageing population.

- The Local Development Plan contains five objectives:
- Promote the principles of sustainable economic growth.
- Provide for local needs and equality of access to housing, jobs, facilities and services, particularly to assist social inclusion.
- Protect and enhance heritage and environmental resources and seek to provide opportunities for improving physical well-being.
- Facilitate reducing the overall need to travel and the reliance on car use.
- To promote sustainable development and reduce carbon emissions.

Policy M2.2 of the Local Development Plan details the provision for the safeguarding of land for a Barrhead South Rail Station, promotes the investigation into improved connectivity between Barrhead and Newton Mearns and details the need for Aurs Road to be upgraded.

Policy SG10 relates to the sustainable transport network and sets out a list of criteria that proposals should meet:

- Ensure the required upgrades to infrastructure resulting from development are provided.
- Safeguard the existing and proposed transportation infrastructure from development that could prejudice its ability to function. In particular the Glasgow Southern Orbital and M77 will be reserved as transport corridors.
- Ensure new development is designed to prioritise accessibility, safety and sustainable modes of travel through a choice of walking, cycling and public transport and are integrated as part of the green and core path networks.
- Ensure walking and cycling enhancements by improving community links and utilising and maximising the existing networks.
- Ensure that opportunities to promote walking and cycling along linear routes are not lost, the solums of any former railway lines with such potential will be safeguarded for this purpose.
- Ensure new transport infrastructure is compatible with local environment, amenity and public safety.
- Ensure new development, where appropriate, identifies land capacity and road layouts to provide public transport infrastructure and services.
- Prioritise improvements to public transport including the need for enhancements to bus and rail infrastructure and services to maintain or increase patronage within the area.

East Renfrewshire Council Supplementary Planning Guidance: Dams to Darnley Country Park 2015

This supplementary planning guidance to the Local Development Plan focuses specifically on the Dams to Darnley Country Park. Emphasis has been placed on improving access to the Park both for local residents and for those from further afield.

The Guidance details enhancements based upon four themes:

- Access;
- Facilities;

- Natural and built heritage; and
- Promotion and management.

With regards to Access the following four problems have been identified:

- The lack of car parking within the heart of the Country Park;
- The absence of safe access to the Country Park from Newton Mearns and Barrhead, adjacent to Aurs Road;
- A lack of circular path routes; and
- Limited public transport options.

Single Outcome Agreement 2013-2016

Improvements to the transport network have been identified as intermediate outcomes aimed at addressing the following five outcomes set by East Renfrewshire Council:

SOA1: All children in East Renfrewshire experience a stable and secure start to their lives and are supported to succeed.

SOA2: East Renfrewshire residents are fit and active and have the skills for learning, life and work.

SOA3: East Renfrewshire is a thriving, attractive and sustainable place for residents and businesses to grow.

SOA4: East Renfrewshire residents are safe and supported in their communities and homes.

SOA5: Older people in East Renfrewshire are valued; their voices are heard and they are supported to enjoy full and positive lives for longer.

Economic Development Strategy 2008-2013

The Economic Development Strategy is a five-year vision for economic development and regeneration within East Renfrewshire. Five key outcomes have been established:

- Create a highly skilled and successful working age population by increasing opportunities for education and lifelong learning.
- Strengthen the local economy to improve the competitiveness of local businesses and increase employment and training opportunities for all.
- Increasing the percentage of children and young people achieving their maximum potential, in education, training and employment.
- Regenerate the most disadvantaged communities.
- Enhance transport provision in East Renfrewshire to improve access to key services, including health care services, leisure facilities and employment opportunities.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]