

# East Dunbartonshire Part 2 Transport Appraisal – Kirkintilloch/Lenzie- Bishopbriggs-Glasgow Corridor Study

Final Report



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## **Executive Summary**

# Executive Summary

## Introduction

In September 2014, AECOM was commissioned by Strathclyde Partnership for Transport (hereafter SPT) and East Dunbartonshire Council (EDC) to carry out a STAG Part 2 Transport Appraisal of sustainable transport options within the Kirkintilloch / Lenzie - Bishopbriggs-Glasgow corridor. This report follows on from the Pre-Appraisal STAG study undertaken by EDC in 2013 and the Part 1 Multi-Modal Appraisal carried out by AECOM in early-2014 (both under separate cover). This study aims to support delivery of the Council's Local Transport Strategy (LTS) 2013-2017 and emerging Local Plan 2. Building upon the previous work, this commission involves a detailed appraisal undertaken in line with the Scottish Transport Appraisal Guidance (STAG) to appraise a sifted list of interventions on the corridor.

## The Study Area

East Dunbartonshire has a population of 105,900 people and trends suggest that the population is both ageing and declining. Located to the north of Glasgow, East Dunbartonshire is home to many commuter towns and villages supplying the city. Economic activity rates in East Dunbartonshire are above the Scottish average with 76% of the working population in employment. Just over 80% of households in the Council area have access to a car, ranking the Council among the top areas for car ownership in Scotland.

The study area under consideration as part of this commission primarily focuses on the larger settlements of Bishopbriggs, Kirkintilloch and Lenzie but also includes surrounding settlements. It considers trips made within its boundaries between settlements and trip attractors and trips made from the study area to trip attractors elsewhere such as Glasgow and Edinburgh.

## Key Problems

The key problems currently facing the study area can be summarised as follows:

- Peak congestion, particularly on the A803 through Bishopbriggs, with associated impact on journey time reliability and air quality.
- High levels of through-traffic with a potential negative effect on local traffic movement.
- Parking pressures around rail stations (Lenzie), and on-street parking in Bishopbriggs including the A803.
- Bus journey time reliability on the A803 during peak times, and also on the M8 approach to Glasgow (express services from East Dunbartonshire via the A806).
- High demand for rail services from the study area, particularly on peak services between Lenzie / Bishopbriggs and Glasgow.
- Future growth in economic and housing developments including areas such as Woodilee and Westerhill which will potentially generate up to 3,000 extra trips during peak periods on the transport network.
- Relatively high private car ownership, with higher than national average use of car for travel to work and study.

Overall it can be said that congestion associated with high levels of car ownership and parking pressures at rail stations, expected to be exacerbated by future growth in demand as a result of key development areas, are the most prevalent issues in the study area. Whilst completion of the Bishopbriggs Relief Road (BRR) will alleviate traffic congestion in some areas, it may cause congestion on adjoining routes and if the scheme does not promote sustainable transport it may lead to an increase in emissions.

## **Transport Planning Objectives**

Through consideration of the range of problems that affect transport in the study area, the aspirations of stakeholders, and both local and national policy, five planning objectives were considered suitable to be taken forward as part of the STAG appraisal, as follows:

- Promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.
- Improve public transport journey times and journey time reliability through the study area.
- Improve accessibility by sustainable transport modes to key trip attractors within the study area.
- Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
- Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.

## **Project Options**

During STAG 1, a long-list of potential options was developed, appraised and sifted. The appraisal identified the following options as potentially suitable and feasible for further investigation at STAG 2:

- Option 1 - Do Minimum.
- Option 2 - A803 Quality Bus Corridor Package.
- Option 3 - Bus Hub in Kirkintilloch.
- Option 4 - Bus Park & Ride in the vicinity of the B757 / KLR.
- Option 5 - Bus Park & Ride adjacent to BRR.
- Option 6 - Kirkintilloch / Lenzie Loop Bus.
- Option 7 - Increase parking Provision at Lenzie Rail Station.
- Option 8 - Develop a New Rail Station at Woodilee (with Park & Ride).
- Option 9 - Develop a New Rail Station at Westerhill (with Park & Ride).

## **Option Development**

As required by STAG 2, work has been undertaken to provide further detail and definition to the options being taken forward for appraisal. This has largely related to the proposed new stations (Options 8 and 9) and has included additional rail timetabling work undertaken using AECOM's ARTEM train performance model which has indicated that whilst theoretically feasible, it should be noted that the rail industry may question the acceptability of additional stops on the Edinburgh – Glasgow rail network, in particular the associated impact on resilience. In addition, should one, or both, of the new stations be taken forward for further consideration, the proposed locations should be reviewed against the infrastructure requirements of the Edinburgh – Glasgow Improvement Programme (EGIP) Phase 2.

## **Consultation**

Consultation has formed a key part of the STAG 2 process to gain feedback on each of the options being considered and an indication of public acceptability. The consultation has comprised three key strands:

- An appraisal workshop with key external stakeholders representing local communities and organisations covering active travel, bus, rail, health and economic development, including local businesses.
- Telephone interviews with stakeholders who were unable to participate in the workshops but expressed an interest in being involved.
- Key stakeholder engagement - meetings, discussions and written communication, as appropriate, to allow the opportunity for key stakeholders to contribute to the appraisal process.

## **STAG 2 Appraisal**

The nine Options have been assessed in terms of the Government's objectives: Environment, Safety, Integration, Economy, Integration, and Accessibility and Social Inclusion. Consideration has also been given to Cost, Deliverability and Public Acceptance.

### ***Environmental Appraisal***

There are a number of ways in which the environment can be affected through the implementation of the Options, and each has been assessed according to the impacts they might have on noise and vibration; air quality; water quality, drainage and flood defence; geology; biodiversity; landscape and visual amenity; agriculture and soils; and cultural heritage. A Strategic Environmental Assessment has also been undertaken and is available under separate cover.

In general terms it is considered that the Quality Bus measures (Option 2) and Kirkintilloch Loop Bus (Option 6) are unlikely to result in adverse environmental impacts as they involve minimal changes to existing infrastructure.

The other Options involve the construction of new infrastructure and will have associated adverse environmental impacts which may, in general terms, include permanent (operational) noise and vibration disturbance to receptors within the near vicinity of their location; pollutants and potential contaminants entering watercourses via surface water run-off during construction activities; impact upon visual amenity for local residents; impacts on agriculture should new infrastructure result in the loss or severance of agricultural land; soils impacted where excavation is required, and/or earthworks for site establishment; and cultural heritage potentially directly impacted from physical damage due to construction activities and / or vibration, or indirectly from impacts on their setting depending on the location, scale and design of the intervention. There is also the potential that there are unknown archaeological assets located at the proposed Park & Ride / new rail station locations.

A number of specific impacts have also been identified. Kirkintilloch town centre (proposed location of the Bus Hub, Option 3) is located within a Conservation Area and Townscape Protection Area. The Woodilee (KLR) site (Options 4 and 8) is within / immediately adjacent to the south Lenzie Conservation Area and Townscape Area and adjacent to a pocket of Ancient Woodland listed within the Ancient Woodland Inventory (AWI). This is also surrounded by residential areas and a long-distance pathway and Core Path along the Bothlin Burn. The B757 Park & Ride site (Option 4) is located within close proximity to the south Lenzie Conservation Area and Townscape Area and the Gadloch water body. At the Westerhill site adjacent to the BRR (Options 5 and 9), the railway line is identified as an important ecological corridor. Lenzie Rail Station is listed and is located within the south Lenzie Conservation Area and Townscape Area. It is surrounded by residential areas and the Lenzie Moss Local Nature Reserve (LNR) and Core Path, all of which may be adversely affected by expansion of the car park area (Option 7).



## ***Safety Appraisal***

### Accidents

In terms of the number of Personal Injury Accidents and the change to the balance of severity of accidents associated with each Option, it is expected that Options which result in a smoother flow of traffic (through modal shift from private car) would see a reduction in link speeds which should in turn result in a reduction in the number and severity of accidents. It is anticipated that the Quality Bus measures (Option 2), and new rail stations at Woodilee / Westerhill (Options 8 and 9) would have a minor positive impact in this regard. All other Options are expected to have a neutral impact, with the exception of Option 7 whereby the increase in parking provision at Lenzie Rail Station may generate additional local traffic in populated areas, leading to possible safety concerns.

### Security

The STAG 2 appraisal has considered that safety is of particular relevance in relation to the development of transport schemes. 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 Options would achieve a positive impact in this regard.

## ***Economic Appraisal***

Options have been assessed using Transport Scotland's Central Scotland Transport Model (CSTM12). Adopting a common modelling platform to assess the options provides consistent results enabling direct comparisons to be made. CSTM12 was considered to be the most fit for purpose tool available for the purposes of this study given the inclusion of the proposals for new rail stations at Woodilee (Option 8) and Westerhill (Option 9) and the need to assess the likely impacts of these options on the wider transport network across Central Scotland. However, there are a number of limitations associated with the model including that the scale of some of the options are relatively small in comparison to the overall modelled area. Nevertheless the results provide a reasonable indication of the relative attractiveness of the options. Should a preferred Option(s) be taken forward for further consideration, additional modelling will be required.

### Transport Economic Efficiency

A key component of the STAG appraisal is the assessment of the Transport Economic Efficiency (TEE) of Options. The results for each of the Options are summarised below, in relation to the Do Minimum and Reference Cases respectively. The exception to this is Option 3 (Kirkintilloch Bus Hub) and Option 6 (Kirkintilloch/Lenzie Loop Bus) which cannot be assessed using CSTM12. The Reference Case considers the impact of a new Park & Ride rail station at Robroyston.

**Table A.1: TEE Summary for Options vs Do Minimum**

<b>Criterion</b>  <i>(Values are in £000s)</i>	<b>Option</b>					
	<b>2 – A803 QBC Package</b>	<b>4 – Bus Park &amp; Ride in Vicinity of B757 / KLR</b>	<b>5 – Bus Park &amp; Ride Adjacent to BRR<sup>1</sup></b>	<b>7 – Increased Parking Provision at Lenzie Station</b>	<b>8 – New Rail Station at Woodilee (with Park &amp; Ride)<sup>2</sup></b>	<b>9 – New Rail Station at Westerhill (with Park &amp; Ride)<sup>3</sup></b>
PVB	£34,748	£30,593	£31,250	£8	£26,515	£35,320
PVC	£1,024	£2,363	£2,363* / £10,084	£2,702	£8,810 / £6,339	£9,070 / £5,820

<sup>1</sup> Note, results provided for two sub-options which results in differing operating costs; operation of bus-based Park & Ride with services provided by existing bus services\* / operation of bus-based Park & Ride with services provided by new bus services.

<sup>2</sup> Note, results provided for two sub-options; manned / unmanned stations.

<sup>3</sup> Note, results provided for two sub-options; manned / unmanned stations.

NPV	£33,724	£28,230	£28,887* / £21,166	-£2,694	£17,705 / £20,176	£26,250 / £29,518
BCR	33.9	12.9	13.2* / 3.1	0.003	3.0 / 4.2	3.9 / 6.1

**Table A.2: TEE Summary for Options vs Reference Case**

Criterion (Values are in £000s)	Option					
	2 – A803 QBC Package	4 – Bus Park & Ride in Vicinity of B757 / KLR	5 – Bus Park & Ride Adjacent to BRR <sup>4</sup>	7 – Increased Parking Provision at Lenzie Rail Station	8 – New Rail Station at Woodilee (with Park & Ride) <sup>5</sup>	9 – New Rail Station at Westerhill (with Park & Ride) <sup>6</sup>
PVB	£35,293	-£10,003	-£8,718	£769	-£4,385	-£1,561
PVC	£1,024	£2,363	£2,363* / £10,084	£2,702	£8,810 / £6,339	£9,070 / £5,802
NPV	£34,269	-£12,366	-£11,081* / -£18,802	-£1,933	-£13,195 / -£10,724	-£10,631 / -£7,363
BCR	34.5	-4.2	-3.7* / -0.9	0.3	-0.5 / -0.7	-0.2 / -0.3

As a comparison, the results indicate that the bus-based Options (Options 2, 4 and 5) are expected to generate greater positive economic benefit cost ratio (BCR) than the rail-based Options, primarily as these Options are not as costly as the rail Options.

The inclusion of a new Park & Ride rail station at Robroyston, however, has a significant impact on the level of benefits generated by the bus- and rail-based Park & Ride schemes (Options 4, 5, 8 and 9). This is because previously generated benefits are abstracted by Robroyston station, as car users are attracted onto public transport at Robroyston. As a result, it is estimated that there would be fewer passengers using the proposed bus- and rail-based Park & Ride stations and any passengers of the new stations will be existing public transport users rather than people switching mode. This results in a significant public transport user dis-benefit for these Options and is the primary reason for the significant differences between the present value of benefits (PVB) for these Options when compared against the Do Minimum or Reference Case scenario.

The exception to the above is the A803 Quality Bus Corridor Package (Option 2) which does not appear to be impacted by the availability of a new Robroyston station and generates positive impacts in both the Do Minimum and Reference Case scenarios.

#### Economic and Locational Impacts

The STAG Economic and Locational Impact (EALI) analysis has considered impacts of each Option, including an expression of the levels of economic activity by type and location of business / land-use activity. Overall, it is considered that each of the Options may help to support local economic development opportunities through a contribution of managed congestion brought about by increased accessibility, and improved journey times particularly along the A803 corridor.

Option 2, through the implementation of Quality Bus measures, and Options 4 and 5 through the provision of bus-based Park & Ride facilities, may have wider economic impacts through improving public transport and accessibility to Glasgow. Options 5 and 9 specifically would also be expected support local development and economic growth in the study area by improving access by public transport to Westerhill Business Park. The implementation of a bus hub in Kirkintilloch (Option 3) may have a marginal impact on the economy of Kirkintilloch through reduced congestion and improved accessibility through the town centre attributable to the rationalisation of bus stops. Option 6 may have wider economic impacts through improving public transport

<sup>4</sup> Note, results provided for two sub-options which results in differing operating costs; operation of bus-based Park & Ride with services provided by existing bus services\* / operation of bus-based Park & Ride with services provided by new bus services.

<sup>5</sup> Note, results provided for two sub-options; manned / unmanned stations.

<sup>6</sup> Note, results provided for two sub-options; manned / unmanned stations.

access between Lenzie and Kirkintilloch, however this may be negated if the implementation of a loop bus service opens up the local economy of Kirkintilloch to more competition through improving access to the rail network and associated wider economic centres. The increased parking provision associated with Option 7 may have wider economic benefits through improving public transport and accessibility to Glasgow and other economic centres served by the rail network. Options 8 and 9, through the implementation of new rail stations, are likely to have the greatest economic impact through improving public transport and accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail line.

A number of developments have been identified in the local area which could be influenced by the implementation of the Options. It is considered in qualitative terms that each of the Options will act as a fundamental 'building block' in the continuing competitiveness of East Dunbartonshire, and Glasgow, as strategic investment locations.

The Bus Hub (Option 3), Park & Ride in vicinity of B757 / KLR (Option 4) and Loop Bus (Option 6) may provide greater accessibility for the pocket of deprivation within Kirkintilloch (Hillhead), and there may be a small positive benefit to the area of deprivation within Lennoxton afforded by Options 3 and 6.

## ***Integration Appraisal***

### **Transport Integration**

It is considered that all of the Options, except Option 7, will have a positive impact on transport integration through improved integration between modes and a reduction in reliance on private car use. The Quality Bus measures (Option 2), Bus Hub (Option 3), Bus-Based Park & Ride (Options 4 and 5), and new rail stations (Options 8 and 9) would be designed with consideration given to quality of infrastructure, layout, information provision and ticketing arrangements, in addition to measures to assist accessibility for the elderly and mobility impaired.

Whilst the Options involving Park & Ride (Options 4, 5, 8 and 9) would encourage people to transfer from cars to bus services for journeys to and from Glasgow, this may be negated by an increase in more local car trips to the Park & Ride / new station facility and this would require to be considered appropriately at the design stage. Due cognisance would require to be given to Option 8 and 9 which impact on the wider rail network, specifically the EGIP proposals, to ensure effective integration.

The potential new loop bus service (Option 6) would link key locations and would be timetabled to dovetail with rail services at Lenzie Rail Station, thus significantly improving integration between bus and rail modes. This Option includes the potential for integrated bus-rail ticketing. Increased parking at Lenzie Station (Option 7) would encourage modal shift from car to rail thus improving the level of integration between the modes for longer journeys. However, this may be negated by an increase in more local car trips to the rail station.

### **Land-Use Transport Integration**

In terms of overall land-use transport integration, the Quality Bus measures (Option 2) would have a minor positive impact through improved bus journey times and journey time reliability, and could provide improved access primarily for residents from Bishopbriggs commuting to / from Glasgow, and also potentially improve public transport access to the Strathkelvin Retail Park, Westerhill and the surplus Bishopbriggs Academy site (when developed). The Bus Hub (Option 3) is aimed at providing a more attractive bus system within Kirkintilloch, which is likely to attract public transport users to this mode and will support wider regeneration plans for the town.

The Park & Ride and new station Options (Options 4, 5, 8 and 9) are expected to have a positive impact through promoting modal shift for commuting journeys between the study area and Glasgow, and providing access to a variety of land uses in the wider area. It is expected that the Park & Ride facility in the vicinity of the B757 / KLR (Option 4) and the new rail station at Woodilee (Option 8) would integrate with residential properties located to the east of the Link Road (Woodilee), where public transport services are currently limited. It is also expected that the Park & Ride facility adjacent to the BRR (Option 5) and new station at Westerhill (Option 9) would integrate with existing and proposed residential developments in Bishopbriggs and also offer sustainable access to Westerhill Business Park.

The Kirkintilloch / Lenzie loop bus (Option 6) is expected to have a moderate positive impact through linking Lenzie Rail Station to a variety of land uses in the local area including shopping, housing, education, employment and transport; and increased Parking Provision at Lenzie Station (Option 7) is expected to enhance access to the rail network and thus also having a minor positive impact on land-use integration through improved access to land uses in the wider area.

Overall, it is considered that none of the land required for the proposals is reserved for uses which are incompatible for transport, and none of the proposals conflict with any other existing or planned development.

#### Policy Integration

The policy integration appraisal examines whether the proposed scheme contributed to, and is consistent with, other Government policies beyond transport.

All Options have been assessed in line with STAG's Policy Assessment Framework (PAF). In general terms, it is considered that all Options promote sustainability and reduce the need to travel to varying degrees through encouraging modal shift and assisting in achieving a healthy, prosperous and inclusive society, albeit the impact of this may be negated in relation to Option 7 if increased parking at Lenzie Rail Station results in additional traffic on local roads. All Options which involve the construction of new infrastructure will be designed to take due cognisance of the Equality Act 2010.

### **Accessibility and Social Inclusion Appraisal**

#### Community Accessibility

*Public Transport Network Coverage* is measured by the changes in the number of people with public transport access to key services and destinations. It is considered that each of the Options would increase accessibility by public transport to varying degrees 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.

For rail-based Options (Options 8 and 9) the number of people able to access local and city centre employment opportunities will increase, given the speed and capacity characteristics of rail versus other modes. This could lead to increased demand for rail. Options 8 and 9, through the construction of new rail stations, would increase public transport network coverage. The implementation of Quality Bus measures (Option 2) would improve bus journey times and journey time reliability for both local trips and also commuter trips to / from Glasgow via the A803, albeit there would be no increase in level of public transport coverage. The development of a bus hub in Kirkintilloch (Option 3) could assist in reducing town centre congestion through the centralisation of bus stop locations, and improve bus journey times and journey time reliability for local trips, albeit, again, there would be no increase in public transport coverage. The implementation of bus-based Park & Ride (Options 4 and 5) could increase the attractiveness of bus as a mode of transport for commuting trips to / from Glasgow and would potentially remove pressure from the rail network and assist in alleviating Lenzie Rail Station parking difficulties. The introduction of a Kirkintilloch / Lenzie loop bus service (Option 6) would increase public transport network coverage and improve access to Lenzie Rail Station, thereby increasing the number of people able to access local and city centre employment opportunities. Furthermore, the loop bus service would assist in improving access to employment opportunities within Kirkintilloch town centre, both for those who would make the journey entirely by bus and those who would interchange with rail services at Lenzie.

The *Access to Local Services* criterion considers walking and cycling access to local activity centres and public transport. It is considered that Options 2 and 3 may promote further non-motorised trips to access local services through the provision of quality bus measures and improved public transport provision. This, together with complementary measures to improve accessibility for pedestrians and cyclists, is expected to provide minor positive benefits. The bus improvements associated with the loop bus service (Option 6) will also be of benefit in improving access to local services, particularly within Kirkintilloch and providing linkages to Lenzie. 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 rail station. In addition, Options 4, 5, 8 and 9 may promote non-motorised access to local services through the provision of Park & Ride / new station facilities.

There are no anticipated issues relating to severance for pedestrians or cyclists as a result of implementation of any of the proposed Options. The new Park & Ride facilities (Options 4, 5, 8 and 9) 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 Options, and availability of cycle parking should be considered where appropriate.

Overall the impact on local accessibility is expected to be positive, with the exception of Option 7 whereby the net impact is likely to be neutral due to the impact of increased traffic levels on local roads negating any accessibility benefits to pedestrians and cyclists.

#### 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.

In terms of *Distribution of Impacts by People Group* it is considered that Options 2, 4, 5, 8 and 9 would have a minor positive impact in terms of tackling the problem of private car use by encouraging a modal shift towards public transport and 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. In addition, households located within the small pockets of deprivation in Kirkintilloch would particularly benefit from improved access to services and employment opportunities afforded by the bus hub (Option 3) and loop bus (Option 6), and these Options are therefore expected to have a moderate positive impact in this regard.

Option 7, however, would be anticipated to bring a slight increase in access to rail services to those who own a car only; therefore, this Option is expected to have an overall neutral impact.

In terms of *Distribution of Impacts by Location*, there is an overall positive gain in accessibility associated with each of the Options, primarily through encouraging modal shift and reducing overall reliance on the private car. It is further anticipated that all Options would have a positive impact on improving access to development and regeneration areas to varying degrees, with the exception of Option 7 which would bring a slight increase in access to rail services for those who own a car, but is unlikely to provide improved access to development and regeneration sites.

#### ***Deliverability and Public Acceptability***

It is recognised that the preferred Option should deliver transport measures to address the issues relating to high car ownership and rising levels of traffic and congestion in the study area. Furthermore, it should be compatible with potential long-term development strategies within the study area. Construction and operational risks associated with the implementation of the preferred Option should be minimised.

It is considered that each of the Options could, theoretically, be delivered successfully. Specifically in relation to the bus-based Park & Ride Options (Options 4 and 5), future implementation of hard-shoulder running on the M80 (understood to be under consideration by Transport Scotland) could enhance the deliverability of these Options through providing improved journey times and journey time reliability during periods of high traffic volumes.

There are however, certain issues pertaining to deliverability that have been identified, including capacity constraints on the rail network to accommodate additional stops associated with the new rail station sites; impact of new rail station sites on EGIP Phase 2; resilience of the rail network in terms of impact and risk associated with additional stopping times should either, or indeed, both new stations be implemented; availability of funding and issues relating to the commercial viability and funding of the bus-based Options, in particular the Kirkintilloch loop bus (Option 6) and the new stations (Options 8 and 9); completion of the BRR; and land acquisition. In addition, the potential Park & Ride facility at Westerhill (Option 4) would perhaps be less effective should the proposed Park & Ride facilities at Robroyston and the M80 Hornhill Junction (under consideration by North Lanarkshire Council) be implemented in the future.

In general terms, public consultation has established that Options which will reduce congestion and improve journey time reliability along the A803 would be publically acceptable, together with Options which improve accessibility to key services and destinations. In the context of the bus hub (Option 3) it was generally considered that simpler measures such as improved shelters and facilities, real time information at bus stops and the general creation of a more pleasant waiting environment would add greater value. It was suggested that increased parking provision at Lenzie Station (Option 7) would attract more traffic into the area - this would not be publically acceptable. The potential reduction of recreational green space associated with extending Lenzie Station parking (Option 7) at the surface level was not supported, and there was strong opposition to the decking due to the impact on visual amenity. There was general support for the new rail stations (Options 8 and 9), albeit consideration would require to be given to potential deliverability and capacity constraints associated with implementing new stations on the Edinburgh – Glasgow rail line.

Consultations with EDC have established that all Options are consistent with local policies for the area, and the Kirkintilloch Masterplan team has indicated that the measures to create a bus hub associated with Option 3 would complement wider development proposals for the regeneration of Kirkintilloch town centre.

Transport Scotland and Glasgow City Council have queried the resilience of the rail network to accommodate new rail stations at Westerhill and Woodilee. In addition, SPT has queried the commercial viability of a loop bus service. Further work would be required to establish the feasibility and market demand for these Options, should they emerge as preferred Options.

### **Costs to Government**

The estimated capital cost associated with each Option is displayed within Table A.3, below.

**Table A.3: Capital Costs<sup>7</sup>**

Option	Capital Cost (based on specified assumptions and estimated uncertainty - / +30%)	Optimism Bias			Estimated Timescale for Implementation
		Rate	Applied to estimating uncertainty - / +30%	Applied to base cost	
	(£)	%	(£)	(£)	
Option 1 – Do Minimum	Committed Funding				Ongoing
2 – A803 QBC Package *	630,000 - 1,170,000	44%	907,200 - 1,684,800	<b>1,296,000</b>	36 months
3 – Kirkintilloch Bus Hub	105,000 - 195,000	44%	151,200 - 280,800	<b>216,000</b>	12 months
4 – Park & Ride in Vicinity of B757 / KLR	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
5a – Park & Ride Adjacent to BRR (served by existing buses)	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
5b – Park & Ride Adjacent to BRR (served by new services)	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
6 – Loop Bus	7,000 – 13,000	44%	10,080 – 18,720	<b>14,400</b>	6 months
7a – Lenzie Station Parking (Surface)	350,000 - 650,000	66%	581,000 – 1,079,000	<b>830,000</b>	2-3 years

<sup>7</sup> It should be noted that costs provided do not account for land acquisition, utilities or design. Costs associated with the provision of a bus-based Park and Ride facility assume a six to twelve-month construction period, with no protracted local planning issues.

Extension)					
7b – Lenzie Station Parking (Decking)	1,519,000 - 2,821,000	66%	2,521,540 - 4,682,860	<b>3,602,200</b>	3-5 years
8a – Woodilee Rail Station (40-50 spaces)	3,199,000 - 5,941,000	66%	5,310,340 - 9,862,060	<b>7,586,200</b>	5+ years
8b – Woodilee Rail Station (300+ spaces)	4,599,000 - 8,541,000	66%	7,634,340 – 14,178,060	<b>10,906,200</b>	5+ years
9 – Westerhill Rail Station	2,870,000 - 5,330,000	66%	4,764,200 - 8,847,800	<b>6,806,000</b>	5+ years
* There are multiple potential measures relating to the QBC package - the cost provided relates to a comprehensive and wide-ranging package of measures.					

### **Monitoring and Evaluation**

The Scottish Government requires monitoring and evaluation to be undertaken and documented for any proposal for which it provides funding or approval. For the purposes of this study, it is anticipated that the Base Case will be developed and agreed with EDC, Transport Scotland, SPT, Network Rail and bus operators, as appropriate, during the period immediately prior to completion / operation of the preferred Option. It is not possible at this stage to be specific about the nature of the process evaluation. It seems likely that there will be a need to provide data which will measure changes in the baseline scenario such as various environmental parameters, public transport passenger counts, mode choice surveys and junction performance.

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.

### **Risk and Uncertainty**

Consideration of risk and uncertainty is essential throughout project development. The identification, management and mitigation of risks will involve inputs from all appropriate stakeholders and it is recommended that Transport Scotland and SPT be involved in discussions, together with Network Rail and rail and bus operators, as appropriate.

It is recognised that the identification of risks and uncertainties will form an ongoing process. At this stage, risks have been identified in relation to land acquisition, and associated costs, in terms of the bus-based Park & Ride sites (Options 4 and 5) and the new rail station sites (Options 8 and 9); capacity constraints on the rail network and resilience of rail timetabling in relation to accommodating new rail station sites and additional stops (Options 8 and 9); availability of funding for the bus-based Options, in particular the Kirkintilloch loop bus (Option 6); and impact on identified environmental sites, particularly for the bus-based Park & Ride facilities (Options 4 and 5) and the new rail stations (Options 8 and 9), and also expansion of parking at Lenzie Station (Option 7). In addition, if roadspace priority is afforded to public transport it is possible that there may be adverse impacts on local traffic movements, particularly through already constrained networks, if Phases 4 and 5 of the BRR are not completed.

### **Conclusions and Recommendations**

On the basis of the appraisal, the following recommendations are made:

- Overall, the development of Quality Bus measures on the A803 (Option 2) performs strongly against the transport planning objectives of the study, the STAG criteria and is considered to be technically and operationally feasible. Unlike other options, the Quality Bus measures are estimated to deliver benefits under scenarios both with and without the implementation of a new station at Robroyston. By way of next steps, it is recommended that a detailed feasibility study is undertaken to examine the specific Quality Bus measures that could be implemented along the corridor phased with the development of the BRR. This will ensure that the benefits of the BRR are 'locked in' on the A803 and allow partners

to put forward the case for investment in bus measures on the A803 as part of future work looking at enhancing bus quality corridors across the wider SPT area.

- The Kirkintilloch Bus Hub (Option 3) does not perform as strongly against the transport planning objectives of this study but does have the potential to deliver local benefits for public transport users in Kirkintilloch. It is therefore recommended that the findings from the review of the Bus Hub are taken on board as part of the future and ongoing masterplanning works for the regeneration of the town centre.
- Both bus-based Park & Ride options (Options 4 and 5) would positively address the transport planning objectives of this study. Option 5 in particular has the potential to deliver benefits not only for public transport users travelling into Glasgow, but also for commuters travelling into East Dunbartonshire owing to its vicinity to Westerhill Business Park. If these Options are taken forward, it would be recommended that more detailed site specific investigation is undertaken into potential locations for Park & Ride facilities at both locations. For both Options, and in particular the Westerhill Option (Option 5) which could require the development of a new service or diversion of existing services, it is to be noted that there would be a need for a minimum level of patronage in order for Park & Ride operations to be sustainable and this would require further examination. These Options should also be kept under review pending potential developments in the form of potential new Park & Ride facilities on the M80 Hornhill junction and the Robroyston Park & Ride station, both of which have the potential to impact on the feasibility of the East Dunbartonshire proposals.
- The Kirkintilloch/Lenzie loop bus (Option 6) performs positively against the transport planning objectives, specifically as it promotes integration and would improve accessibility between a number of key locations within the study area, and should encourage interchange opportunities with Lenzie Rail Station, which could relieve parking pressures at the Station. However, there are serious question marks over the commercial viability of this service and it is therefore recommended that this Option is not advanced at this stage. As an alternative, community and demand responsive transport can play an important role in improving local accessibility and in the absence of a commercially viable service may be more appropriate to promote for local passengers.
- Given the public concerns and potential environmental impacts around increasing car parking provision at Lenzie Rail Station (Option 7), it would be recommended that this Option is not considered further and instead opportunities are examined to improve and promote local access to the Station by sustainable transport means (i.e. walking and cycling) as an alternative approach to relieving parking pressures.
- Both rail-based Park & Ride Options (Options 8 and 9) perform strongly against the transport planning objectives of this study and the rail operational review undertaken as part of this study has suggested that both are theoretically feasible. However, significant concerns have been raised about the deliverability and acceptability of additional stops on the Edinburgh–Glasgow rail network in terms of the impact of reduced resilience on the line which would likely face opposition in the context of EGIP. In addition, whilst both Options would improve accessibility to the Woodilee and Westerhill areas, the transport modelling exercise undertaken has suggested that benefits of the new stations would be abstracted with a new Robroyston Station in place; a proposal which has been advanced considerably further in rail planning terms. If there remains an aspiration to take forward these Options, it would be recommended that more detailed operational modelling is undertaken to investigate the impacts of the schemes on the wider resilience of the rail network. It would also be recommended that should either (or, indeed both) of the new stations be taken forward, the proposed locations should be reviewed against the infrastructure requirements of EGIP Phase 2.
- Finally, a number of wider schemes outlined within the Council's LTS, and proposed by partner organisations, have the potential to contribute to the delivery of the study's objectives and improve local travel choice and conditions throughout the study area. Whilst the Options appraised at STAG 2 have focused on infrastructure-based measures, to be a success and deliver the transport planning objectives of this study, including modal shift, these need to be complemented by local access improvements such as walking and cycling facilities, and wider publicity and awareness campaigns. Wider schemes being considered at the regional level around integrated ticketing and passenger information should also continue to be supported given the contribution these can make in delivering a step-change in public transport use.



## **1 Introduction**

# 1 Introduction

## 1.1 Background

In September 2014, AECOM was commissioned by Strathclyde Partnership for Transport (hereafter SPT) and East Dunbartonshire Council (EDC) to carry out a STAG Part 2 Transport Appraisal of sustainable transport options within the Kirkintilloch / Lenzie - Bishopbriggs-Glasgow corridor.

This report follows on from the Pre-Appraisal STAG study undertaken by East Dunbartonshire Council in 2013 and the Part 1 Multi-Modal Appraisal carried out by AECOM in early-2014. This study will support delivery of the Council's Local Transport Strategy (LTS) 2013-2017 and emerging Local Plan 2. Building upon the previous work, this commission involves a detailed appraisal undertaken in line with the Scottish Transport Appraisal Guidance (STAG) to appraise a sifted list of interventions on the corridor.

## 1.2 STAG Appraisal

STAG is the official appraisal framework developed by the Scottish Government 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.

STAG has three parts:

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

Appraisal Summary Tables (ASTs) are used to present summaries of the appraisals: AST1 tables are used for Part 1 appraisals, and AST2 tables for Part 2 appraisals. In addition, Option Summary Tables (OSTs) are used to summarise each of the options which have passed through the full STAG process.

The transport modelling approach taken to the appraisal has been conducted through the use of the Central Scotland Traffic Model (CSTM12). In addition, rail operational feasibility has been appraised using AECOM's ARTEM train performance model.

Initial stages of problem identification and quantification were undertaken through reviews of national and local policy, analysis of Census and other statistical information, and consultation with stakeholders. This was further supplemented with interrogation of the CSTM12 model. Planning objectives were developed from the review of problems and opportunities, and in consultation with stakeholders.

An initial long list of possible measures for improving the transport situation in the study area (across all modes of transport) was developed. Each measure was subsequently appraised at STAG Part 1 level.

This process was then followed by the STAG Part 2 appraisal of options.

## 1.3 Structure of Report

This report provides an overview of the findings from the STAG Part 1 appraisal, and details the option development which has subsequently been undertaken. This report also details the approach to the STAG 2, and the STAG Part 2 appraisal itself, in line with the five STAG criteria of Economy, Safety, Environment, Integration, and Accessibility and Social Inclusion. Consideration is also given to consultation, monitoring and evaluation, and risk and uncertainty issues. This is set out within the following Chapters:

- Chapter 2 – Overview of STAG Part 1 Appraisal;
- Chapter 3 – Option Development;
- Chapter 4 – STAG Part 2 Consultation;
- Chapter 5 – STAG Part 2 Appraisal;
- Chapter 6 – Monitoring and Evaluation;
- Chapter 7 – Risk and Uncertainty; and
- Chapter 8 – Conclusions.

In addition, this report contains nine Appendices, as follows:

- Appendix A – Problems vs. Objectives Matrix;
- Appendix B – Option Appraisal Assumptions;
- Appendix C – Rail Feasibility Review of Rail Station Sites;
- Appendix D – Rail Operational Review of Rail Station Sites;
- Appendix E – Workshop Outcomes Handbook;
- Appendix F – AST2s;
- Appendix G – Equality Impact Assessment;
- Appendix H – Policy Appraisal Framework;
- Appendix I – Accessibility Mapping.

## **2 Overview of STAG Part 1 Appraisal**

## 2 Overview of STAG Part 1 Appraisal

### 2.1 Introduction

This Chapter will provide an overview of the STAG Part 1 appraisal. The full STAG Part 1 appraisal is documented under separate cover (Part 1 Transport Appraisal, AECOM, April 2014).

### 2.2 Study Area

East Dunbartonshire covers approximately 17,000 hectares. The authority has a population of 105,900 people and trends suggest that the population is both ageing and declining. Located to the north of Glasgow, East Dunbartonshire is home to many commuter towns and villages supplying the city. Economic activity rates in East Dunbartonshire are above the Scottish average with 76% of the working population in employment<sup>8</sup>. Just over 80% of households in the Council area have access to a car, ranking the Council among the top areas for car ownership in Scotland<sup>9</sup>.

The study area under consideration as part of this commission is shown in Figure 2.1 (highlighted in red)<sup>10</sup>. The study area primarily focuses on the larger settlements of Bishopbriggs, Kirkintilloch and Lenzie but also includes surrounding settlements, such as Torrance, Twechar, Lennoxtown and Milton of Campsie.

The study area therefore considers trips made within its boundaries between settlements and trip attractors, and trips made from the study area to trip attractors elsewhere such as Glasgow and Edinburgh.

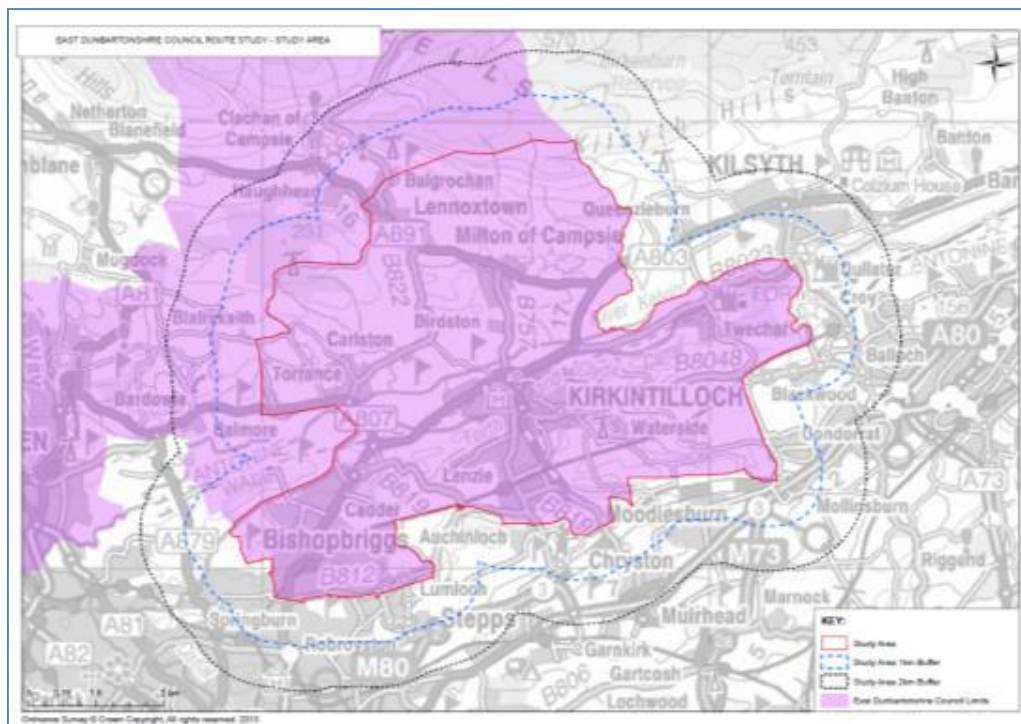


Figure 2.1 – The Study Area

<sup>8</sup> <http://www.nomisweb.co.uk/reports/lmp/la/1946157413/report.aspx>

<sup>9</sup> <http://www.scotlandscensus.gov.uk/ods-web/area.html>

<sup>10</sup> Buffer zones are shown for illustrative purposes only

### 2.3 Key Problems

The key problems currently facing the study area can be summarised as follows:

- Peak congestion, particularly on the A803 through Bishopbriggs, with associated impact on journey time reliability and air quality.
- High levels of through-traffic with a potential negative effect on local traffic movement.
- Parking pressures around rail stations (for example Lenzie) and on-street parking in Bishopbriggs including on the A803. (However, the latter may be controlled further through the Council's Parking Action Plan and forthcoming decriminalised parking regime).
- Bus journey time reliability on the A803 during peak times, and also on the M8 approach to Glasgow (express services from East Dunbartonshire via the A806).
- High demand for rail services from the study area, particularly on peak services between Lenzie / Bishopbriggs and Glasgow.
- Future growth in economic and housing developments including areas such as Woodilee and Westerhill which will potentially generate up to 3,000 extra trips during peak periods on the transport network.
- Relatively high private car ownership, with higher than national average use of car for travel to work and study.
- Low uptake of walking and cycling for key journeys in some areas. Most on-road cycling is not segregated from normal vehicular traffic.

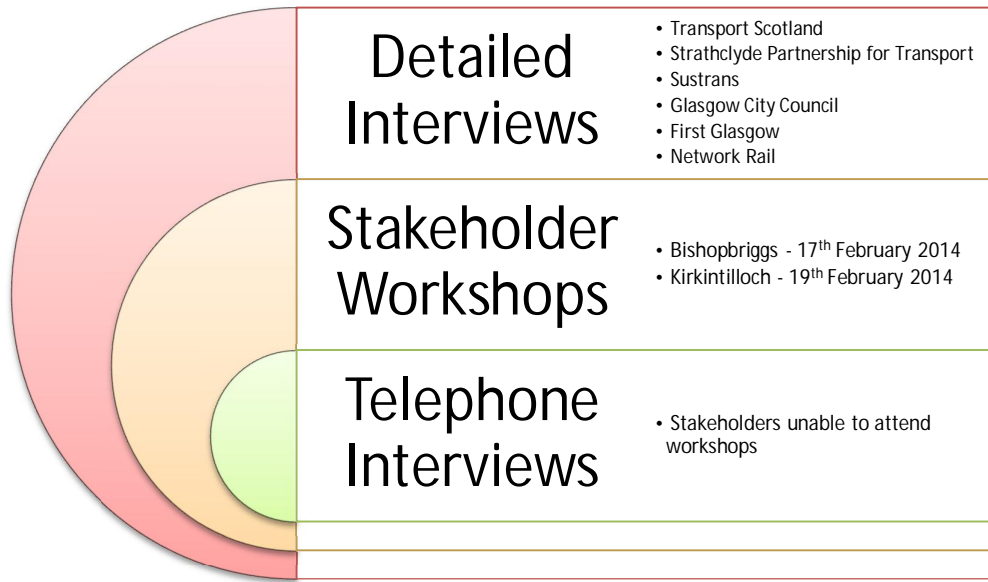
Overall it can be said that congestion associated with high levels of car ownership and parking pressures at rail stations, expected to be exacerbated by future growth in demand as a result of key development areas, are the most prevalent issues in the study area. Whilst the Bishopbriggs Relief Road completion will alleviate traffic congestion in some areas, it may cause congestion on adjoining routes and if the scheme does not promote sustainable transport it may lead to an increase in emissions. Further information on the identified problems and opportunities that this study seeks to address is presented in the Pre-Appraisal and STAG Part 1 Reports, although a summary is presented in Appendix A.

### 2.4 Consultation

The consultation process undertaken as part of STAG Part 1 comprised the following methods:

- Detailed interviews with key stakeholders, namely Transport Scotland, SPT, Sustrans, Glasgow City Council, First Glasgow and Network Rail;
- Transport Appraisal Workshops (in Bishopbriggs and Kirkintilloch on 17 February and 19 February 2014) with invited stakeholders representing local communities and organisations covering active travel, bus, rail, health, tourism and economic development, including local businesses; and
- Telephone interviews with stakeholders who were unable to participate in the workshops but expressed an interest in being involved.

This is illustrated in the diagram below:



The results from these consultations informed the following aspects of the STAG Part 1 appraisal:

- Discussion of problems and opportunities affecting the study area;
- Confirmation of the objectives developed for the study; and
- Identification and appraisal of the different transport interventions proposed for the corridor.

In particular, the consultation outcomes were reflected in revised transport planning objective (TPOs), option development, and assessment of the deliverability of options.

## 2.5 Issues, Constraints, Uncertainties and Opportunities

Key issues affecting the study area can be summarised as follows:

- Private car ownership in East Dunbartonshire is higher than national average.
- Use of car for travel to work and study is higher than the Scottish average (Census 2011).
- A large number of residents work or study out with the Council area, particularly in Glasgow (c.50%).
- Growing demand in the future from key development areas such as Woodilee and Westerhill.
- Anecdotal evidence that residents in East Dunbartonshire may drive to rail stations in neighbouring areas with greater car parking opportunities (for example Croy, Milngavie).
- General retraction in the commercial bus market (national trend due to rising fuel costs, less subsidy etc.) – some communities are left without bus services (although SPT monitor and provide services where deemed necessary).

Key constraints and uncertainties relating to the study area can be summarised as follows:

- Parking capacity in and around Lenzie rail station is insufficient and there is no dedicated car parking at Bishopbriggs rail station.
- Capacity on peak rail services between Bishopbriggs and Glasgow and Lenzie and Glasgow, where there is evidence of overcrowding on services.<sup>11</sup>
- Carriageway space is limited in some parts of the A803 therefore most on-road cycling is not segregated from normal vehicular traffic.
- Lack of connectivity / interchange between local bus services and rail.
- There are various environmental constraints in the area including an Air Quality Management Area (AQMA), Conservation Areas, Heritage Sites (Antonine Wall) and important wildlife corridors.
- Transport Scotland's Edinburgh-Glasgow Improvement Programme (EGIP) has a target journey time on the Edinburgh-Glasgow rail line, which limits the prospects for additional stops for existing services (unless existing stops are dropped).
- The presence of Park & Ride facilities at rail stations within the vicinity of the study area could be viewed as both an opportunity and a constraint. For example, it has been reported that residents in the study area will drive to Croy to access rail services, and even Milngavie. Future proposals for Park & Ride, and potentially a new rail station at Robroyston would also abstract rail and bus patronage from the study area.
- Availability of road space to create further bus priority and space for cyclists, without having a significant impact on general traffic.
- Environmental impacts of additional car parking related to existing rail stations.
- With respect to bus-based public transport, East Dunbartonshire Council can only seek to influence the provision of commercially operated public transport provision, although they do have powers to provide subsidised public transport provision for services which are not commercially viable.
- As with buses, East Dunbartonshire Council have no direct powers over rail services, but can seek to influence facilities and provision.
- Capital and revenue funding will be dependent upon funding from East Dunbartonshire Council, SPT and the Scottish Government.

The most significant uncertainties affecting the proposal are those which will physically or materially impact upon the strategy options. At present the key uncertainties appear to be:

- Land ownership – some options may require development of land that may not be owned by East Dunbartonshire Council.
- Public and stakeholder acceptability issues for some of the options, and approvals required for new rail stations in particular.
- Impact of additional rail stops in the context of EGIP and timetabling on rail services from Stirling/Alloa and Edinburgh.

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<sup>11</sup> In addition, the Network Rail Scotland Route Utilisation Strategy Generation 2 (June 2011) states that "the morning peak arrivals at major centres can often experience load factors in excess of 100 per cent as they serve both interurban and local commuter markets. This occurs on the approach to both Glasgow and Edinburgh." It should also be noted that data from the model development report for CSTM, which derives rail demand based on amongst others travel diary and ticketing data, lists Stirling in to GQS as one of most congested parts of the network.



- Availability of funding for larger interventions.

There are a number of opportunities however which can support improving sustainable travel choices in the study area. These include:

- Building on the legacy of the Healthy Habits campaign in Kirkintilloch, and potentially extending the concept to other settlements.
- Linking to regeneration and masterplanning proposals for Kirkintilloch, and potential improvements to the Canal towpath by Scottish Canals.
- A new franchisee for the Scottish rail network, and any changes to services and infrastructure this may bring. The Scottish Stations Fund may also facilitate improvements to rail stations.
- Across the study area, there is an opportunity to work with partners to secure improvements to sustainable transport services and infrastructure.

## **2.6 Transport Planning Objectives**

Through consideration of the range of problems, issues, opportunities and constraints that affect transport in the study area, the aspirations of stakeholders, and both local and national policy, five key planning objectives were considered suitable to be taken forward to the STAG appraisal. These are as follows:

- Promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.
- Improve public transport journey times and journey time reliability through the study area.
- Improve accessibility by sustainable transport modes to key trip attractors within the study area.
- Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
- Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.

Following subsequent discussions with Transport Scotland, the transport planning objectives developed for the STAG Part 1 have been further “SMARTened”, to include specific targets. Details can be found within Chapter 5.

## 2.7 Options

Fifteen individual options were generated for inclusion in the STAG Part 1 appraisal. In addition, the 'Do Minimum' was carried forward for further appraisal in order to provide a reference case. The selected options are set out within Table 2.1, below.

**Table 2.1: Options Appraised At STAG 1**

Option Ref.	Option Name	Option Description
1.	Bishopbriggs Sustainability Package	Combines options relating to: <i>Wayfinding signage and route designation for pedestrians</i> in town centres particularly; <i>Enhancing the quality, safety and routing of paths and footways to town centres, key trip generators, key bus routes and railway stations; Better cycle parking facilities at central / trip attracting sites; Priority parking for low-emission emitting / high occupancy vehicles at transport stations and town centres.</i>
2.	Sustainable Transport in Kirkintilloch/Lenzie	Combines options relating to: <i>Wayfinding signage and route designation for pedestrians</i> in town centres particularly; <i>Enhancing the quality, safety and routing of paths and footways to town centres, key trip generators, key bus routes and railway stations; Better cycle parking facilities at central / trip attracting sites; Priority parking for low-emission emitting / high occupancy vehicles at transport stations and town centres; Footways on the Kirkintilloch Link Road.</i>
3.	Strategic Active Travel Corridors	Creation of a cycle corridor for longer distance cycling trips to Glasgow in particular and other areas of major employment. Potentially on-road A803 or off-road – to be defined.
4.	Introduce Cycle Hire Facilities	Cycle hire scheme, potentially in combination with measures to promote the visitor economy at Kirkintilloch in particular.
5.	A803 Quality Bus Corridor Package	Quality bus corridor in partnership with operators and SPT on the A803, to provide dedicated space and measures to improve bus journey times and journey time reliability for all bus movements on this corridor. Includes measures to improve bottlenecks to support bus flow in particular. Option also includes options identified from the Pre Appraisal stage including: <i>Introduction of low-emission vehicles; Implementation of real-time bus information; Better marketing of public transport on key routes, perhaps using variable message signs (VMS). Delivery mechanism likely to be via a sQP in order to secure enhancements to bus services where appropriate. This option could be the precursor to Bus Rapid Transit (as per Fastlink) on this corridor in the future, subject to demand levels.</i>
6.	Bus Hub in Kirkintilloch and associated Measures	Bus hub in Kirkintilloch and associated measures. Scale of intervention to be further defined – higher cost option would involve potential landtake to bring bus stops closer together into an interchange area in the town centre, whilst lower cost measures could include bus priority, pedestrian and cycling access improvements, more public transport information, ticket purchasing equipment, improved shelters. Includes Pre-Appraisal option of repositioning bus stops in Kirkintilloch.
7.	Bus Park & Ride adjacent to KLR and associated Bus	Bus Park & Ride adjacent to the KLR (location to be defined) or the B757 and associated bus priority measures to support access and egress by buses to

Option Ref.	Option Name	Option Description
	Priority	and from the local and strategic road network.
8.	Bus Park & Ride adjacent to BRR and associated Bus Priority	Bus Park & Ride adjacent to the BRR (location to be defined) and associated bus priority measures to support access and egress by buses to and from the local and strategic road network.
9.	Bus Service Improvements and New Services (including Kirkintilloch / Lenzie Loop Bus)	A potential new loop bus service linking key locations such as Lenzie Railway Station, Kirkintilloch Town Centre, Woodilee, residential areas and the Council main offices. Other service improvements / new services linked to new development areas in particular, to be defined.
10.	Public Transport Integration and Promotion Package	Combines options relating to: <i>Wayfinding signage and route designation for pedestrians to / from rail and bus stations; Enhancing the quality, safety and routing of paths and footways to town centres, key trip generators, key bus routes and railway stations; Better cycle parking facilities at central / trip attracting sites; Improving bus passenger information and shelters; Improving integration between bus and rail services; Better marketing of public transport on key routes.</i>
11.	Increase Parking Provision at Bishopbriggs Rail Station	Increase parking provision at Bishopbriggs Rail Station – location to be defined.
12.	Increase Parking Provision at Lenzie Rail Station	Increase parking provision at Lenzie Rail Station. Two sub-options exist; one based on extending the surface car park to the north and the other involving the creation of a new deck over the existing car parks/railway line.
13.	Develop a New Rail Station at Woodilee (with Park & Ride)	Develop a new rail station at Woodilee with Park & Ride.
14.	Develop a New Rail Station at Westerhill (with Park & Ride)	Develop a new rail station at Westerhill with Park & Ride.
15.	Encourage and / or develop a Car Club	Encourage and / or develop a car club by securing dedicated car club parking spaces and potentially using the services of an existing car club in neighbouring areas. Potential to link to Council buildings for employee use. Potential to secure developer contributions to fund cost of spaces linked to new developments.

It should be noted that all options have equal importance and that there are no options which are considered to be of a higher priority than others.

## 2.8 Performance Against Planning Objectives, Government Objectives and Implementability

The initial assessment of the options against the planning objectives and the Government's objectives is detailed in the STAG Part 1 report, AECOM, April 2014. Also detailed in this STAG Part 1 report is the implementability assessment concerning technical feasibility, operational feasibility, financial feasibility and public acceptability.

## **2.9 Outcome of Appraisal**

The appraisal found that the following options are potentially suitable and are considered to be feasible for further investigation:

- A803 Quality Bus Corridor Package.
- Bus Hub in Kirkintilloch.
- Bus Park & Ride in the vicinity of B757 / KLR.
- Bus Park & Ride adjacent to BRR.
- Kirkintilloch / Lenzie Loop Bus.
- Increase parking Provision at Lenzie Rail Station.
- Develop a New Rail Station at Woodilee (with Park & Ride) and Promote Sustainable Access.
- Develop a New Rail Station at Westerhill (with Park & Ride) and Promote Sustainable Access.

## **2.10 Summary**

This Chapter has provided a brief overview of the STAG Part 1 appraisal, including the key problems pertaining to the study area. This has also included:

- Constraints, uncertainties, issues and opportunities;
- An overview of the consultation process;
- An outline of the planning objectives;
- Options developed; and
- An outline of those options and scenarios which were recommended for further consideration during the option development process.

Full details of the STAG Part 1 appraisal can be found in the STAG Part 1 report, AECOM, April 2014.

The following Chapter considers the option development subsequent to the STAG Part 1 appraisal.

### **3 Option Development**

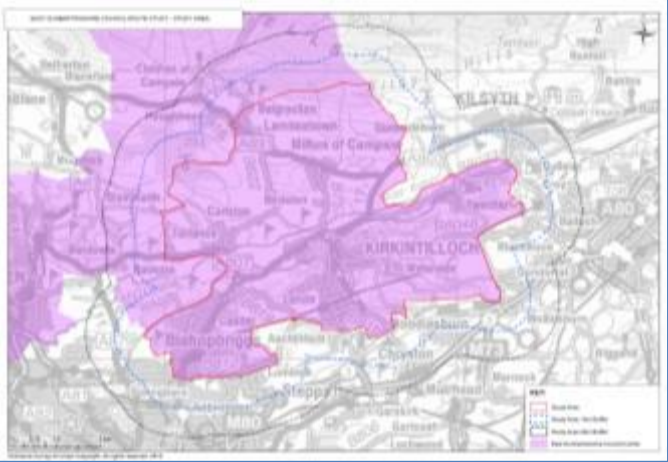

## 3 Option Development

### 3.1 Introduction

This Chapter describes the additional technical work which has been undertaken following the STAG Part 1 process, to “flesh out” the recommended Options in more detail. It describes the additional rail timetabling work undertaken using AECOM's ARTEM train performance model.

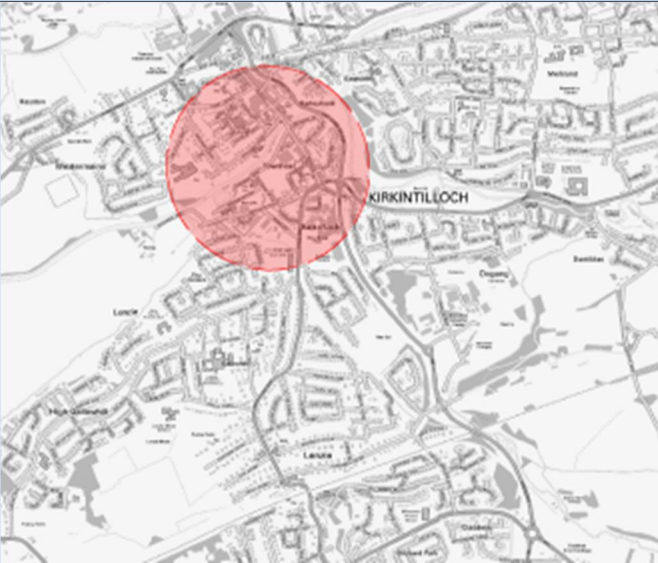

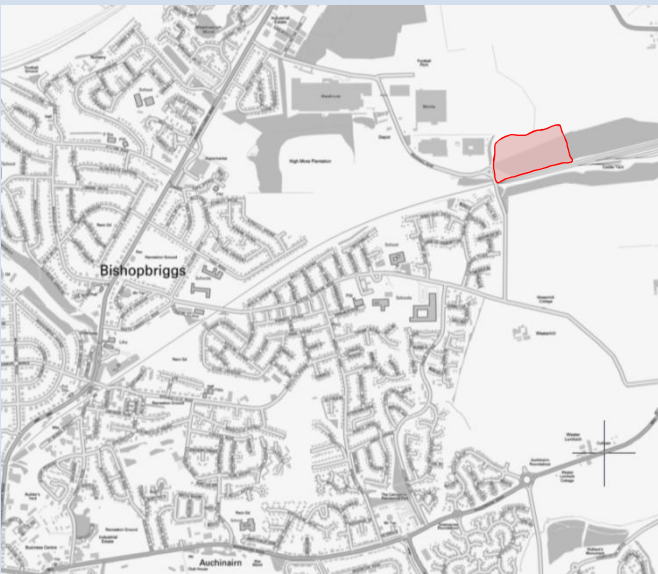
By their nature, a number of the options emerging from the pre-appraisal for assessment and packaging as part of the STAG Part 1 were defined at a relatively high level. In order to facilitate more detailed appraisal, as required under the STAG Part 2, work has been undertaken to provide further detail and definition to the options being taken forward for appraisal. This work is presented in Table 3.1 on the following page.

Table 3.1: STAG 2 Option Overview

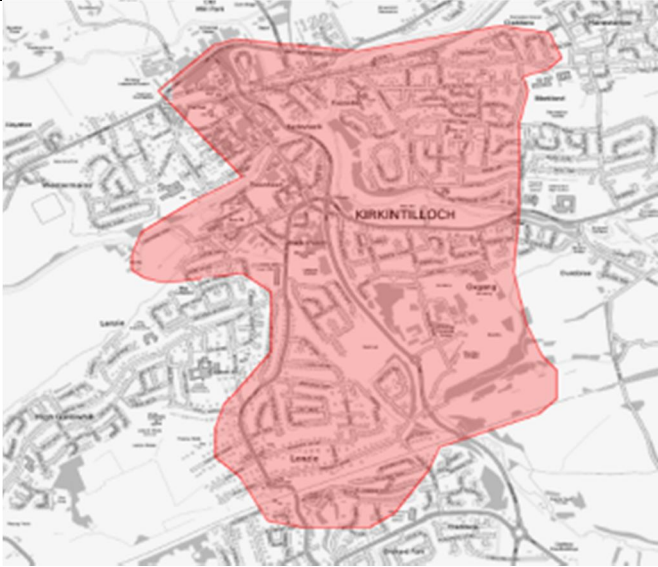
Option	What is it?	Rationale for taking forward to STAG 2	Who is it aimed at / Who would use it?	Why would people change to this mode?	How competitive is it with other modes/options?	Anticipated benefits: Users and Non-Users	Indicative Location
<b>1 - Do Minimum</b>	<p>Assumed interventions included as part of the Do Minimum for this project include:</p> <ul style="list-style-type: none"> <li>BRR (up to and including phase 5);</li> <li>SCOOT;</li> <li>Kirkintilloch Town Centre Regeneration;</li> <li>Parking Strategy and Decriminalised Parking Enforcement;</li> <li>EGIP Phase 1; and</li> <li>Glasgow City Council City Centre Strategy.</li> </ul>	<p>This option considers the impacts on the local transport network if no improvements are made other than those set out within the definition of the Do Minimum.</p>					
<b>2 - A803 Quality Bus Corridor Package</b>	<p>Quality Bus Corridor in partnership with operators and EDC/SPT on the A803 between Torrance Roundabout and Colston Road, to provide measures to improve bus journey times and journey time reliability for all bus movements on this corridor.</p> <p>Traffic Engineering measures could include:</p> <ul style="list-style-type: none"> <li>Congestion by-pass lanes;</li> <li>Discontinuous bus lanes;</li> <li>Parking restrictions at peak periods;</li> <li>Infill bus stop lay-bys;</li> <li>Alteration to traffic turning movements and lane priority; and</li> <li>Priority through SCOOT controlled signalised junctions.</li> </ul> <p>Other options to enhance bus transportation could include:</p> <ul style="list-style-type: none"> <li>Implementation of real-time bus information.</li> </ul> <p>The development of a QBC along the A803 could act as a precursor to a Bus Rapid Transit (as per <i>Fastlink</i>) subject to demand on this corridor.</p> <p>The range of proposed options would be enhanced with a fully implemented BRR.</p>	<p>Without the full implementation of the BRR this option may have a negative effect on general road traffic, however it will enhance bus journey times and reliability.</p> <p>This option is likely to address current traffic issues and alleviate bus-based congestion along the A803 if the BRR is delivered.</p>	<p>Residents from Bishopbriggs (including proposed developments such as Bishopbriggs East) commuting into/from Glasgow.</p> <p>Residents from surrounding towns (i.e. Torrance) commuting into/from Glasgow.</p>	<p>The option would aim to deliver reduced bus journey times and improved bus journey time reliability between Bishopbriggs and Glasgow, addressing bus-based congestion issues and pinch-points currently experienced during peak periods.</p>	<p>- Option designed to provide comparatively better journey times than private car along the A803.</p> <p>- Difficult to compete with the train for commuting to/from Glasgow (current train journey times between Bishopbriggs and Queen street are approximately 8 minutes).</p>	<p>- <i>Users:</i> Shorter and more reliable bus journey times along the A803<sup>12</sup>.</p> <p>- <i>Non-Users:</i> a) This option may remove private cars from the A803, alleviating congestion problems and benefiting all road users. b) Modal shift from rail to bus would release capacity for rail services (where there is anecdotally overcrowding at present).</p>	




<sup>12</sup> Previous studies ("Proposed A803 Quality Bus Corridor and Bishopbriggs Relief Road – STAG Part 1 Appraisal" – Jacobs (March 2007)) have suggested that delivery of a QBC is more attractive following full completion of the BRR as a means of locking in the benefits of the additional road capacity provided by the route.




Option	What is it?	Rationale for taking forward to STAG 2	Who is it aimed at / Who would use it?	Why would people change to this mode?	How competitive is it with other modes/options?	Anticipated benefits: Users and Non-Users	Indicative Location
<b>3 - Bus Hub in Kirkintilloch</b>	Bus hub in Kirkintilloch and associated measures. Bring bus stops closer together into an interchange area in the town centre, supplemented by lower cost measures such as pedestrian and cycling access improvements, more public transport information and improved shelters. The option may require land take. It includes the Pre-Appraisal option of repositioning bus stops in Kirkintilloch.	It has been identified through consultation that the current positioning of bus stops in Kirkintilloch Town Centre could be contributing to congestion. This option would seek to address this problem and deliver improved information for passengers.	In principle, this is mainly a local measure directed at residents in Kirkintilloch and potentially Lenzie (possibly also surrounding towns such as Milton of Campsie and Lennoxton).	The option is aimed at providing a more attractive bus system (more information, improved infrastructure) within Kirkintilloch, which is likely to attract public transport users to this mode.	Local measure which is aimed at serving public transport users in Kirkintilloch, not at competing with other modes/options.	<p>- <i>Users</i>: improved access to bus services (interchange area concept) and better overall bus standards.</p> <p>- <i>Non-Users</i>: benefits to road users if a degree of modal shift is achieved and road capacity is released (reducing congestion issues through Townhead/Cowgate).</p>	
<b>4 - Bus Park &amp; Ride in the vicinity of B757 / KLR</b>	<p>Bus Park &amp; Ride in vicinity of KLR or the B757 (location to be defined).</p> <p>It is anticipated that the facility would accommodate existing express services which link Kirkintilloch and Lenzie with Glasgow via the M80 and M8. The facility could be designed similarly to the Hampden Park &amp; Ride in Glasgow. Such a layout is preferable to the main bus operator in the area.</p> <p>The frequency of bus services would be dictated by commercial viability. For the purposes of the appraisal it is assumed that the facility would be served by existing buses and no new buses would be required (although locating the Park &amp; Ride facility adjacent to the KLR would require the diverting of some services that use the B757): an approximate 15-minute service is assumed during the peak period.</p>	<p>A bus-based Park &amp; Ride facility located along the B757 (existing bus route) or KLR aimed at promoting a modal shift for commuting journeys between the study area and Glasgow would be expected to encourage modal shift from car to bus for journeys leaving the study area.</p> <p>A convenient bus-based Park &amp; Ride facility could help to reduce parking issues at Lenzie Rail Station by encouraging access and patronage from rail to bus.</p>	Mainly residents from Kirkintilloch/Lenzie commuting into/from Glasgow; possibly residents from communities to the north (Milton of Campsie and Lennoxton).	This option would provide a facility where people could park their private car and transfer to bus to commute into Glasgow. One of the issues associated with other modes (i.e. rail) is the lack of parking spaces at stations. Therefore, it is expected that this intervention could achieve a degree of modal shift. As the Park & Ride site would be serviced by existing buses making one additional stop, the impact on existing bus journey times is expected to be minimal.	<p>In terms of travel times, existing services suggest that bus is comparatively slower than rail. Typical rail journey times are 13-14mins while bus times are around 21 mins. However, rail is more expensive than bus: a peak rail return ticket is £4.90 versus the bus where a day ticket is £4.10.</p> <p>Furthermore, the provision of car parking spaces may make bus more attractive.</p>	<p>- <i>Users</i>: better access to bus services by provision of parking spaces.</p> <p>- <i>Non-Users</i>: modal shift (if achieved) would release road and rail capacity.</p>	
<b>5 - Bus Park &amp; Ride adjacent to BRR</b>	<p>Bus Park &amp; Ride adjacent to BRR (location to be defined).</p> <p>It is anticipated that the facility would accommodate extension to existing services which link the Auchinairn, Woodhill and Westerhill areas of Bishopbriggs with Glasgow via local roads onto the A803. Extension of existing services would require further discussion with bus operators and it should be noted that First Glasgow indicated during the consultation process that extension of existing services would not be attractive. This option would also benefit from a service which directly serves the site from Glasgow, via the BRR, M80 and M8.</p> <p>The facility could be designed similarly to the Hampden Park &amp; Ride in Glasgow. Such a layout is preferable to</p>	<p>This intervention is generally aimed at journeys leaving the study area and is expected to perform strongly against objectives related to promoting modal shift for these journeys.</p> <p>However, given the proximity of the large commercial / industrial units at the Westerhill business park the enhanced bus services could also offer sustainable access to Westerhill.</p> <p>Full implementation of the BRR may increase the viability of this option and maximise modal shift</p>	<p>Mainly residents from Bishopbriggs (including proposed developments such as Bishopbriggs East) commuting into/from Glasgow.</p> <p>Employees of the Westerhill Business Park by enabling enhanced bus services to the Westerhill area.</p>	<p>This option would provide a facility where people could park their private car and transfer to bus to commute into Glasgow via the BRR, M80 and M8. One of the issues associated with other modes (i.e. rail) is the lack of parking spaces at stations. Therefore, it is expected that this intervention could achieve a degree of modal shift.</p> <p>Lack of low cost parking in Glasgow, combined with the issues around the stations at Bishopbriggs and Lenzie.</p>	<p>In terms of travel times, existing services suggest that bus is comparatively worse than rail.</p> <p>However, the provision of car parking spaces may make bus more attractive.</p> <p>Typical journey times by bus from Westerhill to Glasgow are approximately 40mins. The existing service to which this time relates does not represent a journey time of an express service. The X81</p>	<p>- <i>Users</i>: better access to bus services by provision of parking spaces.</p> <p>Improved sustainable access to Westerhill Business Park.</p> <p>- <i>Non-Users</i>: modal shift (if achieved) would release road and rail capacity.</p> <p>Potentially help mitigate traffic increases generated by the new housing developments in East Bishopbriggs.</p>	



Option	What is it?	Rationale for taking forward to STAG 2	Who is it aimed at / Who would use it?	Why would people change to this mode?	How competitive is it with other modes/options?	Anticipated benefits: Users and Non-Users	Indicative Location
	<p>the main bus operator in the area.</p> <p>This facility may need to be subject to parking management otherwise it could be used as an effective overspill car park for workers at the Westerhill Business Park. Without restriction it may increase car travel rather than reduce, and limit spaces for commuters to Glasgow.</p> <p>The frequency of bus services would be dictated by commercial viability. For the purposes of the appraisal it is assumed that the facility would be served by new buses, in addition to the possibility of diverting the existing express X81 service, in discussion with First Glasgow. The appraisal assumes a service frequency of 15 minutes in the peak period and 30 minutes in the off-peak period.</p>	opportunities.			which terminates near Westerhill has a journey time of approximately 25mins therefore it is likely an express service from Westerhill would have a 30mins journey time.		
<b>6 - Kirkintilloch / Lenzie Loop Bus</b>	<p>A potential new loop bus service linking key locations such as Lenzie Railway Station, Kirkintilloch Town Centre, Woodilee, residential areas and the Council main offices.</p> <p>The frequency of bus services would be dictated by commercial viability, however for the purposes of the appraisal it is assumed that the service would operate every 15 minutes in each direction during the peak period and every 30 minutes in each direction during the off-peak period.</p>	<p>This option requires further definition but overall, it is designed to improve access to key trip attractors within the study area by public transport, and will benefit the local population in particular, with some potential modal shift impacts.</p> <p>Currently Lenzie Rail Station is remote and not accessible to many residents of Kirkintilloch and Woodilee in particular. The use of Lenzie Rail Station for a large number of residents is dependent on the car.</p> <p>Furthermore for those employed in Kirkintilloch, Lenzie Rail Station is remote therefore many will commute by car. The creation of a bus link to key employment areas could encourage modal shift to the train.</p>	<p>Residents of Kirkintilloch and Lenzie.</p> <p>Commuters to Kirkintilloch and Lenzie.</p> <p>Car park users of Lenzie Rail Station if a number of people who currently drive to the rail station switch and use the bus.</p>	A new bus service linking key locations is likely to attract users making local trips.	Being a local measure, this option has the potential to encourage modal shift from car to bus for short journeys.	<p>Localised measure aimed at improving accessibility. No major impacts on mode shift anticipated.</p> <p>- <i>Users</i>: better access to rail services by provision of link bus service.</p>	

Option	What is it?	Rationale for taking forward to STAG 2	Who is it aimed at / Who would use it?	Why would people change to this mode?	How competitive is it with other modes/options?	Anticipated benefits: Users and Non-Users	Indicative Location
<b>7 - Increase parking Provision at Lenzie Rail Station</b>	<p>a) <i>Surface access:</i></p> <p>Potential to extend northern car park to create 100 additional spaces. Potential to combine with any works to make station more accessible (current footbridge with stairs only).</p> <p>b) <i>Deck over Lenzie Rail station:</i></p> <p>Surface access Car parking deck over one, or both, of the existing car parks, and possibly over the track. Up to 200 new parking spaces. Potential to combine with any works to make station more accessible (current footbridge with stairs only).</p>	The existing car park at Lenzie rail station is currently operating at capacity after the weekday AM commuting peak. The limited growth in rail patronage at Lenzie station in comparison to other local stations with similar service levels suggests there is some constraint on growth, which may be due to the unavailability of reliable parking at the station.	Users of Lenzie rail station primarily, although there is a possibility that it would be used by non-users who need to park in the vicinity of the rail station.	<p>The car park at Lenzie station currently operates above capacity, which leads to parking demand overspilling onto the surrounding residential streets.</p> <p>Park &amp; Ride surveys undertaken by SPT<sup>13</sup> show that the main reason for on street parking (74%) is the car park at Lenzie station is too busy.</p>	Although this option does not apply to a specific mode itself, it is associated with rail. It has already been commented that rail journey times are comparatively better than car or bus and thus providing increased station parking would increase the attractiveness of rail.	<p>- <i>Users:</i> better access to rail services by increased provision of parking spaces. This, however, may lead to increased rail patronage and hence more overcrowding.</p> <p>- <i>Non-Users:</i> provision of more parking spaces would reduce on-street parking, benefiting residents near Lenzie station. On the other hand, this option is likely to have a negative environmental impact on the Lenzie Moss Local Nature Reserve.</p>	 
<b>8 - Develop a New Rail Station at Woodilee (with Park &amp; Ride) and Promote Sustainable Access</b>	A new rail station to improve sustainable access to Woodilee. Possible location for a rail station is between the A806 Initiative Road and Calfmuir Road in the existing railway cutting. Depending on the size of rail station required, a station building and car park may be best located on land to the south of the track, since there is more land adjacent to the tracks available there, without the constraints of the recent residential developments that have taken place on the northern side. A car park with 50 spaces is assumed. Trains to and from Stirling would provide a 30 minute frequency.	The new Woodilee housing development will increase the demands on the local transport network. A broad area of land has been identified within Local Plan 2 and the draft Local Development Plan for a potential rail station with Park & Ride. However, there are significant deliverability issues with this option.	Primarily aimed at residents of the Woodilee site, which is currently being developed. It could also be used by residents in Kirkintilloch, specifically those living to the east of the KLR (as this station would be closer than Lenzie station).	For commuting trips into Glasgow primarily, but also Edinburgh, rail is comparatively faster than other modes (i.e. car or bus). A new station would make rail more accessible to certain people, who may in turn consider this mode over others.	Rail journey times between the study area and Glasgow are shorter than car or bus journey times.	<p>- <i>Users:</i> increased access to rail to a certain part of the population. However, new stations are likely to increase rail patronage on already overcrowded services (as suggested by anecdotal evidence).</p> <p>- <i>Non-Users:</i> Although technically and operationally feasible in theoretical terms, there remain uncertainties over the introduction of a new stop on the Edinburgh-Glasgow line. This would have a negative impact on overall journey times between Glasgow and Edinburgh. The site is also in relatively close proximity to Lenzie station.</p>	

<sup>13</sup> "Park & Ride in the SPT Area: Results from 2013 User Surveys"

Option	What is it?	Rationale for taking forward to STAG 2	Who is it aimed at / Who would use it?	Why would people change to this mode?	How competitive is it with other modes/options?	Anticipated benefits: Users and Non-Users	Indicative Location
<b>9 - Develop a New Rail Station at Westerhill (with Park &amp; Ride) and Promote Sustainable Access</b>	<p>A new rail station to improve sustainable access to Westerhill. Potential locations would be to the east or west of Westerhill Road Bridge (EGM1/109) and phase 4 of the BRR. The rail station would be located adjacent to the BRR which would better enable car users to access the rail network. This could also act as a Park &amp; Ride facility for strategic traffic.</p> <p>The Park &amp; Ride element of this facility may need to be subject to parking management as it could be used as an effective overspill car park for workers at the Westerhill Business Park. Without restriction it may increase car travel rather than reduce, and limit spaces for commuters to Glasgow.</p> <p>A car park with 300 spaces is assumed. Trains to and from Stirling would provide a 30 minute frequency.</p>	<p>A rail station at Westerhill would encourage more sustainable travel to the Westerhill Business Park, which is seen as a growing economic centre. In addition there is a large area of residential properties nearby. The rail station would be located adjacent to the BRR which would better enable car users to access the rail network. This could also act as a Park &amp; Ride facility for strategic traffic. A broad area of land has been identified within Local Plan 2 and the draft Local Development Plan for a potential rail station with Park &amp; Ride. However, there are significant deliverability issues with this option.</p>	<p>Residents from Bishopbriggs (including proposed developments such as Bishopbriggs East), as well as employees from Aviva and HarperCollins (both located in the Westerhill site) and potentially staff and visitors to H.M. Prison Low Moss. This option would support aspirations for increased economic development in the Westerhill area.</p>	<p>For commuting trips into Glasgow primarily, but also Edinburgh, rail is comparatively faster than other modes (i.e. car or bus). A new station would make rail more accessible to certain people, who may in turn consider this mode over others.</p>	<p>Rail journey times between the study area and Glasgow are shorter than car or bus journey times.</p>	<p>- <i>Users</i>: increased access to rail to a certain part of the population. However, new stations are likely to increase rail patronage on already overcrowded services.</p> <p>- <i>Non-Users</i>: Although theoretically technically and operationally feasible, there are question marks over the introduction of a new stop on the Edinburgh-Glasgow line. This would have a negative impact on overall journey times between Glasgow and Edinburgh. The site is also in relatively close proximity to Bishopbriggs station.</p>	



It should be noted that at STAG 1 stage, the bus-based Park & Ride Options (Options 4 and 5) were described as having associated bus priority measures. Subsequent consideration of these Options and site investigations of potential locations have deemed the implementation of bus priority as being unrealistic at this stage. For the purposes of the STAG Part 2 appraisal reference to bus priority has been removed.

More detailed information relating to the option appraisal assumptions can be found within Appendix B.

### **3.2 The Key Issues**

The key issues affecting the implementation of the options can be summarised as follows:

- Affordability – the cost of the measures requires to be in proportion to the benefits that they achieve, and also the availability of funding.
- Degree to which modal shift can be effectively achieved – modal shift depends not only upon the quality of the alternatives to car use, but also on the available restraints to car use.
- Optimising of individual elements – the most effective strategy will be determined from a combination of mode share measures, and targeted infrastructure improvements.
- Delivery – many aspects of delivery remain out with the control of East Dunbartonshire Council. These include many operational issues related to bus and rail services, wider government policy regarding sustainable transport, and wider social responses towards policies which encourage a change in travel patterns.

### **3.3 Rail Station Feasibility Review**

The work undertaken during STAG Part 1 included a Rail Feasibility Review to consider key issues pertaining to the provision of additional parking at the existing Lenzie station (and Bishopbriggs station, an Option which has been set aside following the STAG Part 1 appraisal), and the feasibility of two additional rail stations on the same railway line (Westerhill and Woodilee). The feasibility review undertaken at STAG Part 1 has subsequently been revisited in light of the more recent Rail Operational Modelling outputs (see below) and it is noted that there are no material changes identified. However, for completeness and to aid the reader, the Rail Feasibility Review is provided within Appendix C.

### **3.4 Rail Operational Modelling**

#### **3.4.1 Overview**

Following the STAG 1 appraisal and prior to the STAG 2 appraisal, additional work was undertaken to assess the timetabling issues arising from the addition of stops at the potential Woodilee and Westerhill rail stations to ascertain if these Options would, in theoretical terms, be feasible. It is assumed that the proposed new rail stations would be served by the stopping trains that run about every 30 minutes in the off-peak timetable between Glasgow Queen Street and Stirling (continuing to Dunblane or Alloa). With the exception of shorter journey times arising from the use of electric trains, it is assumed that the infrastructure and factors governing timetable planning remain. It is also necessary to make certain assumptions regarding the service pattern and rolling stock types that will apply in the future, and further details are provided within Appendix D.

The route currently carries trains about every 15 minutes between Glasgow and Edinburgh, which join and leave the Stirling route at Greenhill Upper Junction. Alternate trains stop at Croy with the others being non-stop over this section. Thus there are four “gaps” between fast trains in every hour. The Stirling stopping trains occupy two of these with an Aberdeen or Inverness fast train occupying one or two, leaving some capacity available for other services.

All passenger services are currently operated by and timed for diesel multiple unit trains. However committed electrification schemes will see the Glasgow-Edinburgh and Stirling stopping trains replaced by electric multiple units (EMUs) with greater acceleration. Hence the baseline assumes that these workings run at current frequencies but in faster timings consistent with the performance of modern EMUs with a top speed of 100mph. These timings have been estimated using AECOM's ARTEM train performance model, which has been shown to give good correlation with working timetables on a wide variety of projects and when set to give the appropriate diesel timings also correlates well with the times of the stopping services between Glasgow and Stirling. As an example, Table 3.2 shows the correlation between the Working Timetable for an existing stopping service and the time predicted by the ARTEM model using the equivalent train characteristic.

**Table 3.2: ARTEM/Working Timetable Correlation**

Location	Out time	WTT
Glasgow Queen St High Level	0:00:00	0:00:00
A	0:06:04	0:06:00
Bishopbriggs	0:06:34	0:06:30
A	0:10:39	0:11:00
Lenzie	0:11:39	0:12:00
A	0:17:36	0:18:00
Croy	0:18:06	0:18:30
Greenhill Upper Jn	0:24:03	0:24:30
Greenhill Lower Jn	0:24:36	0:25:00
Larbert Jn	0:27:20	0:28:00

### 3.4.2 Outcomes

#### 3.4.2.1 Off-Peak Baseline Timetable

With current stopping patterns ARTEM indicates that the electric stopping train requires 8.5 minutes from leaving Croy to arriving at Bishopbriggs or vice versa, inclusive of an intermediate stop at Lenzie. This increases to 11.5 minutes with the two extra stops, each with a dwell time of 30 seconds as used at other stops on the route, or to 12 minutes if a 60 second stop is made at Lenzie as happens with the current service. Even with these stops included it is possible for the stopping train to fit into the “window” between Edinburgh trains, provided that, as now, it precedes the service that stops at Croy out of Glasgow and follows it into Glasgow. All intervals between trains are compliant with Network Rail's Timetable Planning Rules and the timetable has been checked to be conflict-free with Glasgow trains as far as Dunblane and Alloa (trains between these stations and Edinburgh are assumed to be adjusted to fit the electric timetable and thus not to constrain the Glasgow trains).

Therefore it may be concluded that these two stops are operationally feasible under a timetable giving Glasgow-Edinburgh services about every 15 minutes, assuming the stopping services are operated by modern 100mph electric units.

#### 3.4.2.2 Peak Services Timetable

The peak extra services in today's timetable<sup>14</sup> have also been assessed, including associated empty workings, based on today's timetable with electric units substituted on those services that do not run beyond the future electrified network. To achieve this, the trains concerned have been re-timed in some cases, and some timing margins have been reduced where they are above the

<sup>14</sup> As of November 2014

minimum stipulated in the Network Rail timetable planning rules. Arrival and departure times at Glasgow Queen Street have remained the same as per the current timetable.

- The Dundee to Glasgow Queen St service arriving 07.34 cannot stop at Woodilee or Westerhill.
- The Lenzie to Glasgow Queen St service arriving 07.47 can come into service at Croy and serve one of the new stations, or could serve both if a train from Edinburgh ran 1½min later.
- The Alloa to Glasgow Queen St service arriving at 08.04 can stop additionally at Woodilee and Westerhill.
- The Perth to Glasgow Queen St service arriving 08.19 can stop additionally at Woodilee and Westerhill.
- The Aberdeen to Glasgow Queen St service arriving 08.34 can stop additionally at Woodilee and Westerhill.
- The Alloa to Glasgow Queen St service arriving 08.52 cannot stop at Woodilee or Westerhill unless several trains are re-timed.
- The Dunblane to Glasgow Queen St service arriving 09.03 cannot stop at Woodilee or Westerhill.
- The 16:33 departure from Glasgow Queen St to Lenzie can be extended to Croy with stops at Westerhill and Woodilee.
- The 16.48 departure from Glasgow Queen St to Dunblane can stop additionally at Westerhill and Woodilee.
- The 17:03 departure from Glasgow Queen St to Falkirk Grahamston can stop additionally at Westerhill and Woodilee.
- The 17.19 departure from Glasgow Queen St to Alloa can stop additionally at Westerhill and Woodilee.
- The 17.33 departure from Glasgow Queen St to Markinch cannot stop at Westerhill or Woodilee unless several trains are re-timed.
- The 17.49 departure from Glasgow Queen St to Dunblane can stop additionally at Westerhill and Woodilee.

In practice, the provision of peak services is affected by a range of issues including the level of crowding on existing trains and the times at which extra trains and timetable paths are available. While the basic off-peak service pattern is likely to stay broadly similar under electrification, the extra peak services (and extra stops in services that normally do not stop) could change significantly. Hence the results above are no more than indicative of the type of peak provision that might be possible, provided there is capacity on the trains in question.

### 3.4.3 Summary

Whilst theoretically feasible, it should be noted that the rail industry may question the acceptability of additional stops on the Edinburgh – Glasgow rail network, in particular the associated impact on resilience.

It is recommended that if these two stations are taken forward, the proposed locations should be reviewed against the infrastructure requirements of EGIP Phase 2<sup>15</sup>. If EGIP Phase 2 affects the station design and is a committed scheme by that time, then it would be most cost-effective to defer the new stations to be implemented at or after EGIP Phase 2. Otherwise consideration should be given to making the stations easily modifiable for any EGIP Phase 2 requirements, for example setting the station buildings back from the platform edge and building the platforms from modular elements which allow them to be reduced in width to accommodate future slow lines.

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<sup>15</sup> There is currently no timescale associated with EGIP Phase 2, however EGIP Phase 1 is scheduled for completion in 2016.

### **3.5 Summary**

This Chapter has provided an overview of the additional work undertaken following the STAG Part 1 appraisal. It has provided a brief overview of the option development process undertaken to further define those Options which will be reviewed during the STAG Part 2 appraisal. It has also outlined the additional rail modelling work which has been undertaken to further assess the operational feasibility of implementing new rail stations at Woodilee and Westerhill, and the rail station feasibility work undertaken at STAG Part 1 has been revisited.

The following Chapter outlines the consultation which has been undertaken to inform the STAG Part 2.

## **4    STAG Part 2 Consultation**



## 4 STAG Part 2 Consultation

### 4.1 Introduction

Following the STAG Part 1 appraisal and identification of options to be taken through to the STAG Part 2 process, further consultation was undertaken to inform STAG Part 2. The consultation comprised three key strands:

- An appraisal workshop with key external stakeholders.
- Telephone interviews with stakeholders who were unable to participate in the workshops but expressed an interest in being involved.
- Key stakeholder engagement.

Each strand of consultation is considered within the Sections below.

### 4.2 Appraisal Workshop

An appraisal workshop was held at East Dunbartonshire Council's Head Quarters in Kirkintilloch on 06 November 2014 to discuss options being considered in the STAG 2 process and to gain feedback on each of the options and an indication of public acceptability. Invitations were sent to an extensive list of key stakeholders representing local communities and organisations covering active travel, bus, rail, health, tourism and economic development, including local businesses.

Details of those organisations who attended the workshop, together with those who were invited to the workshop but unable to attend, are provided in the Workshop Outcomes Handbook which is contained within Appendix E.

The workshop commenced with a review of the findings from the STAG Part 1 appraisal and an overview of the options being considered. The attendees were split into three groups, each with one facilitator, to discuss the options taken forward to the STAG Part 2 appraisal. The findings of the workshop are set out within the Workshop Outcomes Handbook, and a summary is provided within Chapter Five (Public Acceptability).

Workshop invitees were provided with a comments form and contact details to enable further or additional comments to be made in advance of, or following, the workshop.

### 4.3 Telephone Interviews

Telephone interviews were offered to workshop invitees who were unable to attend the workshop but who were keen to provide input to the study. At the time of reporting, one telephone interview had been requested and undertaken by members of the AECOM study team, as follows:

- Sustrans' – Cycling Officer for East Dunbartonshire

A telephone interview was undertaken with the Sustrans Cycling Officer for East Dunbartonshire in mid-November 2014. In general terms the discussion centred on the rationale for setting aside specific active travel and cycling Options following the STAG 1 appraisal. It was indicated that such measures would be considered by East Dunbartonshire Council through existing local transport policies, for example the Local Transport Strategy. It was further acknowledged that although specific active travel options were not being considered, some of the proposed Options had active travel measures associated with them and, where possible, links to active travel provision would be maximised.

#### 4.4 Key Stakeholder Engagement

During the STAG 2 process, key stakeholders have been further engaged through meetings, discussions and written communication. The purpose of this engagement has been to inform stakeholders of the work being undertaken and to allow the opportunity for stakeholders to contribute to the appraisal process. A brief summary of key stakeholder input is provided below.

- **Transport Scotland**

A meeting was undertaken in October 2014 with representative of the Technical Analysis team within Transport Scotland and their consultants JMP to discuss the outcomes of the STAG Part 1 process and the proposed approach for the STAG Part 2. A key point in Transport Scotland's response related to a requirement for greater clarity on the nature, location and scale of the evidence-based transport problems and how these link to the TPOs from the Pre-Appraisal and Initial Appraisal exercises. In response to this, Appendix A presents further information on the problems in the study area and seeks to clarify the relationship between the TPOs and identified problems and opportunities. Other key issues arising from this meeting related to a requirement to further "SMARTen" the transport planning objectives for the study, in particular the inclusion of clearer measurable targets, and to revisit the Options relating to provision of new rail stations at Woodilee and Westerhill in terms of meeting the transport planning objectives and STAG criteria prior to taking these options forward to a full STAG Part 2 appraisal. It is considered that these comments have been dealt with, as discussed within Section 5.3 (transport planning objectives) and Chapter Three (rail modelling).

- **Kirkintilloch Masterplan Team**

A meeting was undertaken in November 2014 with representatives from the Kirkintilloch Masterplan Team. The purpose of this meeting was to further explore the Masterplan aspirations for Kirkintilloch town centre and, in particular, to ensure that proposals associated with the creation of a bus hub within Kirkintilloch town centre would complement the wider Masterplan proposals. The meeting was useful to gain a greater understanding of the Masterplan proposals and concluded that the option to create a bus hub within Kirkintilloch town centre would fit with wider plans and policies for the Kirkintilloch area.

During the meeting it was confirmed that the proposals for Kirkintilloch Town Centre include the creation of shared surface areas throughout the town centre; enhanced public realm and spaces; enhanced walking, cycling and bus facilities; and improved crossing facilities. It was indicated that the Masterplan team are due to consult on design principles in mid-December prior to undertaking a detailed design exercise. It is anticipated that construction will commence in July 2015.

- **North Lanarkshire Council**

It was noted during the consultation workshops that North Lanarkshire Council has outlined a proposal within its City Deal bid to provide a Park & Ride facility south of the M80 Hornhill Junction (Junction 3). Further discussions were undertaken with a member of the Traffic and Transportation Team within North Lanarkshire Council to establish the status of the proposal and how it would impact upon the Option to provide a Park & Ride facility in the vicinity of the B757 / KLR (Option 4). It was noted that the proposal is highlighted within North Lanarkshire Council's City Deal bid, which is still being worked upon and has had no formal approval, and thus it was considered appropriate to progress with the Park & Ride Option within Lenzie, but with due cognisance to North Lanarkshire Council's Hornhill Junction proposals.

- **Glasgow City Council**

E-mail communication was received from a representative from Glasgow City Council's Development and Regeneration Service's department following the stakeholder workshop. Key points to note related to a requirement for the new rail station options (Options 8 and 9) to avoid jeopardising the benefits that EGIP will generate for "inter-city" rail services - in particular the flagship Glasgow to Edinburgh shuttle; and due consideration to be given to the relative close proximity of a new station at Westerhill to the new Park & Ride station that Glasgow City Council / SPT is seeking to construct at Robroyston (at the time of reporting, Network Rail were in the process of being commissioned to produce a GRIP 4 design).

- Network Rail

AECOM undertook consultations with Network Rail via a tele-conference in December 2014. The primary purpose of this exercise was to discuss the engineering and operational feasibility of rail stations at Westerhill and Woodilee. The general feedback received was any station proposal would need to demonstrate that it had no disbenefit to rail operations, including the emerging EGIP works.

- SPT

A telephone consultation was undertaken with a member of the Network and Planning Team within SPT to discuss the Kirkintilloch loop bus Option. Concerns were raised over the commercial viability of a bus loop service in Kirkintilloch / Lenzie. It was noted that a similar loop service operates in Bishopbriggs and costs £1,550 per week for an off-peak level of service, equating to a subsidy of £4 per passenger. For a Kirkintilloch loop bus service to be viable, it is expected that a large level of subsidy funding would be required and this could not be met by SPT.

- EDC Councillor Members' Briefing

A presentation on the study was given to Members of EDC's Transportation Working Group on 27<sup>th</sup> January 2015. The purpose of this was to provide Members with an update on the study's progress and to gain feedback on the emerging issues, including views on the options under consideration.

#### 4.5 Summary

This Chapter has provided an overview of the consultation process undertaken to inform the STAG Part 2 appraisal.

The following Chapter details the STAG Part 2 appraisal of each option.

## **5    STAG Part 2 Appraisal**

## 5 STAG Part 2 Appraisal

### 5.1 Introduction

The sections below present the outcomes from the STAG Part 2 appraisal and focus in turn on each of the objectives of Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion. Consideration is also given to Cost to Government, Deliverability and Public Acceptance. AST2s for the scenarios appraised are contained within Appendix F.

### 5.2 Options

As outlined earlier within the report, following the STAG Part 1 appraisal, and discussions with the Client group, the following options have been selected for appraisal at STAG Part 2 level:

- Option 1 - Do Minimum – committed schemes including Bishopbriggs Relief Road (i.e. up to and including phase 5); Split Cycle Offset Optimisation Technique (SCOOT); Kirkintilloch Town Centre Regeneration; Parking Strategy and Decriminalised Parking Enforcement; EGIP Phase 1; Glasgow City Council family cycling routes; and Glasgow City Council City Centre Strategy.
- Option 2 - A803 Quality Bus Corridor Package.
- Option 3 - Bus Hub in Kirkintilloch.
- Option 4 - Bus Park & Ride in the vicinity of the B757 / KLR.
- Option 5 - Bus Park & Ride adjacent to BRR.
- Option 6 - Kirkintilloch / Lenzie Loop Bus.
- Option 7 - Increase parking Provision at Lenzie Rail Station.
- Option 8 - Develop a New Rail Station at Woodilee (with Park & Ride).
- Option 9 - Develop a New Rail Station at Westerhill (with Park & Ride).

Further details regarding the Option assumptions are set out within Appendix B.

### 5.3 Transport Planning Objectives

Following feedback from Transport Scotland, the transport planning objectives developed for STAG Part 1 have been further refined such that they more clearly meet the SMART (Specific, Measurable, Attainable, Relevant and Timed) criteria required by STAG. The objectives are set out within Table 5.1, below. It should be noted that the transport planning objectives remain unchanged, but additional clarity has been provided to give better definition.

**Table 5.1: SMART Transport Planning Objectives**

<b>TPO</b>	<b>Specific</b>	<b>Measurable</b>	<b>Attainable</b>	<b>Relevant</b>	<b>Timed</b>
<b>1: To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.</b>	Objective relates to modal shift and can be attributed from trips generated from specific geographical areas.	Travel to Work (and school) Data from various sources. Census data.  Halt increase in car use for travel to work journeys.	Requires a joined-up and multi-agency approach, requiring support from transport providers and policy makers at all levels.	This objective accords to policy at all levels seeking a transfer from car trips to other modes. Modal shift will assist in the reduction of future traffic growth during peak times.	A base datum can be taken i.e. 2011, in line with the most recent travel to work data. The objective should be related to a 10-year period e.g. to 2024.
<b>2: Improve public transport journey times and journey time reliability through the study area.</b>	Objective relates to reducing the impacts of congestion and vehicle queuing in the study area by delivering options that improve journey times for public transport users and car drivers.	Journey time surveys through the study area. Moving Observer Method.  Seek 2-minute improvement on 2014 AM Peak survey results (Strathkelvin Retail Park to Bishopbriggs, Bus Average JT 16 mins, car 11 mins)	Requires investment in measures to reduce levels of queuing, including both infrastructure and service improvements i.e. partnership working with public transport operators will be required.	Known congestion issues through town centres and sections of A803 through to Glasgow boundary.	This objective should be related to a 10-year period from 2014 to 2024.
<b>3: Improve accessibility by sustainable transport modes to key trip attractors within the study area.</b>	Objective relates to improving access and increase the uptake of sustainable modes of transport.	Accessibility can be measured through accessibility mapping, focusing on extent of populations within a specified journey time.  This Objective would be measured through use of the SIMD Geographical Access to Services tool, comparing changes over time, and seeking to achieve a reduction in journey times to key services, as defined within SIMD.	Requires investment in both hard and soft measures to raise awareness to the availability of sustainable modes and increase their attractiveness.	Accessibility from the study area is arguably good, with the presence of rail networks and services. Accessibility to locations within the study area could be improved.	This objective should be related to a 10-year period from 2014 to 2024.

TPO	Specific	Measurable	Attainable	Relevant	Timed
<b>4: Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.</b>	Objective seeks to address issues of air quality, healthy living and environmental protection.	<p>Air quality monitoring; increases in the uptake of active travel, and implementation of any mitigation measures will be used to monitor the impact of this objective.</p> <p>Objective should be to meet or exceed the air quality management targets as set out within Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297): annual mean NO<sub>2</sub> concentration 40 µg/m<sup>3</sup>; annual mean PM<sub>10</sub> concentration 18 µg/m<sup>3</sup>.</p>	Delivery of measures that have a reduced environmental impact will help to deliver this objective.	Bishopbriggs has a designated Air Quality Management Area. There are also various sites of environmental and historical importance within the study area and impacts should be minimised.	This objective should be related to a 10 year period from 2014 to 2024.
<b>5: Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.</b>	Objective relates to the use of transport interventions to encourage inward investment and economic growth, as well as the development of vibrant, attractive town centres.	Footfall and vacancy rates are national indicators that are used to assess the health of town centres. Town centre footfall and percentage of town centre retail vacancies vs total number of town centre retail units will be monitored in line with targets set out within EDC's Development and Regeneration Business and Improvement Plan 2015-18 (e.g. annual target 2015/16: footfall 3M, vacancy rate 11%)	Objective requires partnership work of various agencies - both transport, planning and enterprise, from the public and private sectors, to deliver transport interventions that support this goal.	Local planning issues have been identified as an issue for consideration as part of this study. EDC also aspire to encourage wider economic growth and sustainable place making such as through the Kirkintilloch Town Centre Masterplan.	This objective should be related to a 10-year period from 2014 to 2024 and support the proposals outlined in the existing and emerging EDC LDP. It should also be monitored in line with the monitoring schedule set out within EDC's Development and Regeneration Business and Improvement Plan 2015-18, and subsequent publications.

## 5.4 Transport Modelling Overview

The transport modelling approach adopted for the appraisal has been conducted through the use of CSTM12, a multi-modal transport model covering the main road and public transport network of the Central Belt of Scotland. CSTM12 has been developed by Transport Scotland and contains road and public transport assignment models and Park & Ride and demand model processes. These provide a forecasting methodology to predict changes in travel demand and transport costs over time. CSTM12 also provides an appraisal tool that can be used to assess the operational, economic and environmental impact of transport schemes, policy proposals and development strategies.

CSTM12 was developed using Cube Voyager software and it reflects traffic and travel conditions in a 2012 Base Year. It also provides forecast year scenarios which predict transport-related impacts associated with various transport interventions and development plans. This programme has allowed the options to be tested and evaluated in line with STAG requirements.

Appendix B sets out details of the Option development and appraisal assumptions.

## 5.5 Environment

There are a number of ways the environment can be affected through implementation of the above Options. In the following sections, each Option is assessed according to the impacts it might have on noise and vibration pollution, air quality, water quality, flooding and drainage, geology, biodiversity, agriculture and soils, visual amenity and cultural heritage.

Potential impacts on environmental receptors are dependent upon the nature and proximity of the proposals and the works associated with their development. Therefore where the final location or defined description of the Options is not available, the potential effects described within the Sections below and the magnitude of these effects are subject to change. General mitigation measures have been included for each environmental topic area. The exact mitigation measures and extent of mitigation required cannot be determined until detailed design stage.

It is also to be noted that to accompany this STAG report, a separate Strategic Environmental Assessment (SEA) has been undertaken.

### 5.5.1 Noise and Vibration

#### 5.5.1.1 Introduction (including key issues)

Road traffic noise is one of the most extensive sources of environmental noise pollution. Exposure to high levels of noise and vibration can have an adverse impact on both human health and on the perceived quality of life. The magnitude of effect will vary amongst individuals; however, for the purpose of the STAG assessment the potential effects of noise and vibration are considered on a community basis.

It should be noted, that this assessment has been informed by a desk study only and that no site surveys measuring existing ambient noise, noise contour modelling or vibration modelling has been undertaken.

A number of factors can influence the level of noise and vibration generated by traffic. These include:

- Traffic volumes;
- Percentage of HGVs within the total traffic volume;
- Speed of traffic;
- Road surface material;
- Distance between noise / vibration source and receptor;



- Ground cover between noise/ vibration source and receptor; and
- Screening of intervening land between the source and the receiver.

#### *Option 1: Do Minimum*

The schemes included within the Do Minimum approach are unlikely to result in significant disturbance from noise and / or vibration. Those at greatest risk to increased disturbance are residents within Bishopbriggs East and industry and business based at Westerhill Business Park which will experience construction and increased traffic noise from the Bishopbriggs Relief Road (BRR). However given that the BRR (along with the other schemes as part of the Do Minimum scenario) has been consented (up to Phase 4) by East Dunbartonshire Council it is assumed that adequate mitigation measures have / will be incorporated at project level to reduce or avoid any potentially significant impacts.

#### *Option 2: A803 Quality Bus Corridor Package*

Changes to service patterns on existing routes are unlikely to have significant effects from noise or vibration. The introduction of discontinuous bus priority lanes may result in greater congestion of private vehicles between Torrance Roundabout and Colston Road and associated increased noise and vibration levels from idling vehicles and frustrated road users, however this is not likely to be significant.

#### *Option 3: Bus Hub in Kirkintilloch*

Noise and vibration disturbance from this Option is highly dependent upon the final design of the Option and the scale of the intervention(s) adopted. Regardless, any new infrastructure requirement will bring temporary (construction) noise and vibration disturbance to the town centre area which is utilised for residential, employment and socialising / leisure purposes. Should the Option propose to develop a single centralised bus hub, it is likely that there will be permanent (operational) noise and vibration disturbance to receptors within the near vicinity of its location. This represents the worst-case-scenario for this Option.

Other softer interventions proposed within the Option, such as access improvements, improved shelters, and greater public transport information may require some construction activities but will not result in any significant increase in noise or vibration levels.

Noise levels will depend on the detailed alignments, elevations, topography and the proximity and sensitivity of noise sensitive receptors.

#### *Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

The development of a Park & Ride scheme would draw volumes of traffic to that particular location that did not previously experience such volumes of traffic, therefore increasing noise disturbance within the area. The Park & Ride scheme will ultimately aid a modal shift to more sustainable transport method and reduce traffic levels, however this reduction will not be significant. Noise sensitive receptors and the magnitude of effects are dependent on the final location of the facility.

There are two preliminary locations identified for the Park & Ride scheme – adjacent to the KLR or adjacent to the B757. Of the two locations it is likely that a greater number of receptors will be impacted from development of a Park & Ride scheme adjacent to the KLR. The significance of effect is dependent on the detailed alignments, elevations, topography and any potential mitigation measures included within detailed design and construction practices.

It is anticipated that the majority of noise effects may be mitigated for, during construction and incorporating noise barriers in to the final design of the scheme. Permanent impacts from noise and vibration from the development of a Park & Ride scheme are not likely to be significant.

#### *Option 5: Bus Park & Ride adjacent to BRR*

The development of a Park & Ride scheme would draw volumes of traffic to the immediate east of Westerhill Business Park and nearby residential areas, however this is also adjacent to the BRR which will increase noise in the area regardless of the Park & Ride scheme. The Park & Ride will ultimately result in reduced traffic levels, however this reduction is not likely to be significant. Noise sensitive receptors and the magnitude of the effects are dependent on the final location of the Park & Ride facility.

Permanent noise emitted from the Park & Ride will depend on the detailed alignments, elevations, topography and mitigation measures incorporated during construction and included within the detailed design.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

As there are no construction activities associated with this Option there will be no adverse noise or vibration impacts from constructing new infrastructure. There is minimal modal shift anticipated as a result of the implementation of this scheme, therefore there are unlikely to be any long-term effects (beneficial or negative) from noise and/or vibration effects.

*Option 7: Increase parking Provision at Lenzie Rail Station*

Impacts from noise and vibration disturbance are likely to be negative over the long-term duration of the intervention, with some short-term negative effects during the construction phase due to the surrounding residential areas offering numerous sensitive receptors. Effects are dependent on the location of the additional parking facilities. Developing on top of the existing facilities may increase noise levels due to the higher elevation. Whereas developing on ground adjacent to the existing facilities will likely bring areas of noise generation closer to the surrounding noise sensitive receptors (residential properties).

Although the increased provision of car parking will draw a greater number of vehicles to the location of the rail station, it will deter rail patrons from using the surrounding residential streets for parking as an alternative.

It is anticipated that any increased noise and / or vibration effects would be minimal, and where necessary mitigation measures could also be utilised to further reduce these effects.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

To develop a new rail station and associated access will require significant infrastructure development, resulting in temporary noise and vibration effects. Given the close proximity of the proposed location to the Woodilee residential area, the increase in additional traffic within the area will also likely increase noise and vibration during the operation of the rail station.

Noise and vibration mitigation measures implemented during construction and incorporated within the final design of the scheme will aid in reducing or avoiding any significant impacts from increased noise or vibration levels.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

To develop a new rail station and associated access will require significant infrastructure development, resulting in temporary noise and vibration effects. Any anticipated increase in traffic volumes to the area are likely to be incorporated within the users of the BRR once completed and would not likely increase volumes to a significant level. Increased noise and vibration disturbance will primarily impact the residential areas within Bishopbriggs East and Westerhill Business Park, to the west of the proposed station location.

Noise and vibration mitigation measures implemented during construction and incorporated within the final design of the scheme will aid in reducing or avoiding any significant impacts from increased noise or vibration levels.

#### 5.5.1.2 Mitigation

Mitigation measures will be required for all Options that require new infrastructure to be constructed, that increase or generate additional noise and / or vibration or cause sensitive receptors to come within close proximity to new sources of noise and / or vibration.

General mitigation measures that may be developed to reduce or avoid significant impacts from noise and vibration are noted below. These have been separated between temporary (construction) and permanent (operation) mitigation measures.

Temporary mitigation should include:

- The use of fencing or other appropriate noise barriers around construction sites;
- Housing of continuous running plant in acoustic enclosures;
- Adherence to the codes of practice for construction working and piling given in British Standard BS 5228:1992;
- In particularly sensitive locations, the use of electrical items of plant as opposed to diesel plant; and
- Where practicable, avoid working during times most susceptible to noise and vibration effects (i.e. evenings and weekends).

Permanent mitigation should include:

- The use of acoustic noise barriers;
- Implementation of speed management measures such as traffic calming or speed cameras; and
- Where appropriate, noise insulation for receptors that may experience a major negative impact as a result of ongoing noise.

#### 5.5.1.3 Summary

Table 5.2 below highlights the overall assessment of impacts from noise and vibration from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence of environmental modelling data, these impacts are based on professional judgement only.

**Table 5.2: Noise and Vibration Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Minor Negative	Negligible
Option 2	Negligible	Neutral
Option 3	Minor Negative	Minor Negative
Option 4	Moderate Negative	Minor Negative
Option 5	Minor Negative	Neutral
Option 6	Neutral	Neutral
Option 7	Moderate Negative	Minor Negative
Option 8	Moderate Negative	Moderate Negative
Option 9	Moderate Negative	Neutral

## 5.5.2 Air Quality

### 5.5.2.1 Introduction

Air quality is assessed at both local and global levels. Local air quality is impacted by the development of transport schemes based on the reduction or increase in emissions of pollutants such as: carbon monoxide (CO), volatile organic compounds (VOCs), nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>), all of which can potentially negatively impact on human health, flora and fauna. Local air quality is measured directly against levels of NO<sub>2</sub> and PM<sub>10</sub>.

At a global level, transport schemes can cause an increase or decrease in the release of carbon dioxide (CO<sub>2</sub>), singled out as the most important transport induced greenhouse gas having a direct impact on global warming. In STAG 2 appraisals, CO<sub>2</sub> is taken as a proxy for global air quality. Given the scale of the study area and the level to which any modal shift will be achieved from the development of these Options, global air quality is not likely to be significantly impacted upon and has therefore been scoped out of assessment as part of this study.

The development of transport schemes can impact on air quality through their influence on the volume of traffic, type of traffic and travel time (or congestion) of traffic within a given network. The main ways in which a transport scheme may impact on air quality are detailed below:

- Volume of traffic - public and sustainable transport, and developing greater, more accessible cycle and walking networks there may be a modal shift away from the use of private vehicles.
- Reduced congestion – by implementing junction improvements, increasing network capacity and initiating signalling improvements can cut the time which vehicles are left idling within a given stretch of road increasing pollutants within the area.

The following sections outline the potential effects on air quality from the development of the proposed Options.

#### *Option 1: Do Minimum*

Implementation of the Do Minimum scenario is likely to result in negative impacts on local air quality from the attraction of vehicle users to the area from reduced journey times. Should traffic be diverted away from the A803 route and signalling improvements ease congestion, there may be some beneficial impacts on the existing Air Quality Management Area (AQMA) located in Bishopbriggs on the A803 between Colston Road and the Torrance Roundabout. These benefits are not likely to be significant.

#### *Option 2: A803 Quality Bus Corridor Package*

Negative impacts on local air quality may be experienced on the A803 should bus priority measures be put in place, particularly at the already sensitive Bishopbriggs AQMA as a result of greater congestion of private vehicles along the route. Assuming the BRR is completed these effects should be largely mitigated by diverting through-traffic from this area. However, should a modal shift from private vehicles to quicker, more reliable buses be attained localised air quality benefits may be realised across the wider study area.

#### *Option 3: Bus Hub in Kirkintilloch*

The impact on air quality from the development of this Option is dependent upon the level of intervention implemented. Temporary effects will result from the construction of any new infrastructure required as part of the chosen intervention(s), however the magnitude of these effects will vary with construction effort.

Should there be a modal shift to bus usage within the town centre and traffic levels reduce air quality may improve.

The softer interventions associated with this Option, such as increasing accessibility by walking and cycling and improving bus shelters are unlikely to impact air quality – unless they contribute to reducing traffic volumes within the town centre.

*Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

There are likely to be negative effects on air quality from the construction of a Park & Ride scheme. The overall significance of these impacts is dependent upon the scale of the scheme and the mitigation measures that can be put in place to reduce or avoid these effects.

Long-term effects will likely occur as a result in a minor improvement in local air quality through the promoting of more sustainable modes of transport than the use of private vehicles. However this is provided that the Park & Ride does not abstract from users of rail or other bus services, which potentially it may.

*Option 5: Bus Park & Ride adjacent to BRR*

There are likely to be negative effects on air quality from the construction of a Park & Ride scheme. The overall significance of these impacts is dependent upon the scale of the scheme and the mitigation measures that can be put in place to reduce or avoid these effects.

Long-term effects will likely occur as a result in a minor improvement in local air quality through the promoting of more sustainable modes of transport. However this is provided that the Park & Ride does not abstract from users of rail or other bus services, which potentially it may.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

The development of this Option is not likely to result in any notable effects on air quality.

*Option 7: Increase parking Provision at Lenzie Rail Station*

Short-term effects are likely to occur during the construction of this Option, particularly with sensitive residential areas within the near vicinity.

Long-term effects on air quality are likely to be neutral, although it may increase rail patronage as a result of increased accessibility.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

There are likely to be negative effects on air quality from the construction of the rail station and associated infrastructure and access requirements. The overall significance of these impacts is dependent upon the scale of the scheme and the mitigation measures that can be put in place to reduce or avoid these effects.

Long-term effects on air quality are likely to be neutral to minor positive. The Option encourages the use of more sustainable means of transport than private vehicles. The magnitude of the resultant decrease in emissions is dependent on the success of this modal shift.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

There are likely to be negative effects on air quality from the construction of the rail station and associated infrastructure and access requirements. The overall significance of these impacts is dependent upon the scale of the scheme and the mitigation measures that can be put in place to reduce or avoid these effects.

As with Option 8, the long-term effects on air quality are likely to be neutral to minor beneficial. The Option will encourage the use of more sustainable forms of transport (than private vehicles) and therefore reduce emissions. The magnitude of these beneficial effects is dependent on the scale of modal shift achieved from the implementation of this Option.

### 5.5.2.2 Mitigation

Mitigation proposals for air quality mainly relate to construction issues and there are a number of mitigation measures that could be employed to lessen the potential impacts of any dust and PM10 generated during construction activities, should these situations arise:

- Increasing the distance of dust-generating activities and any sensitive receptors;
- Adoption of good working practices on the construction site (e.g. plant handling techniques, dampening of site, regular cleaning, good site maintenance);
- Specific construction traffic management measures; and
- The use of dense vegetation screens or barriers.

All potential dust-generating activities and locations should be identified prior to commencement of work.

### 5.5.2.3 Summary

Table 5.3 below highlights the overall assessment of impacts on air quality from the development of the Options. The assessment assumes that good construction practices will be followed where development is required and that appropriate mitigation measures are incorporated within the final design. In the absence of environmental modelling data, these impacts are based on professional judgement only.

**Table 5.3: Air Quality Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Minor Negative	Negligible
Option 2	Negligible	Negligible
Option 3	Minor Negative	Negligible - Minor Positive
Option 4	Minor Negative	Minor Positive
Option 5	Minor Negative	Minor Positive
Option 6	Neutral	Neutral
Option 7	Minor Negative	Neutral
Option 8	Minor Negative	Neutral – Minor Positive
Option 9	Minor Negative	Neutral – Minor Positive

## 5.5.3 Water Quality, Drainage and Flood Defence

### 5.5.3.1 Introduction

This section considers the potential effects of developing the Options may have on the water environment. For the purpose of this study the water environment includes water quality, drainage and flooding. A baseline desk study has been undertaken and surface waterbodies located within 500m of each element of the Options has been considered.

The development of transport schemes can impact on the water environment in a number of ways, during construction and from the operation of various transport interventions. Temporary effects on the water environment from the construction of a transport

scheme are detailed below. It should be noted that these are only likely where there are significant construction requirements, and receptors within the near vicinity:

- The natural drainage of the area will be altered during construction as a result of earthwork activities and dewatering of any excavations present on site;
- Water quality is likely to be heavily impacted during construction activities through increased sedimentation in runoff from earthworks, vegetation stripping and stockpiled material. The presence of plant and vehicles on site also presents the risk of pollution or contamination events from the leakage or spills of oils, fuel, hydraulic fluids, cement and concrete and other materials;
- Where development is proposed on current 'green space', increasing hardstanding areas will increase runoff rates/decreased infiltration rates which could increase flood risk downstream of the development. Similarly, development within an existing flood plain or area at risk to flooding may result in greater flood extents due to reduced flood capacity; and
- Works on the banks of watercourses, channel modification and where watercourses are required to be crossed will alter channel geomorphology.

Permanent effects from the operation of a transport scheme will vary significantly between the various different types of schemes, and therefore have been described within the assessment of each Option in the sub-sections below. It should be noted that no water quality monitoring was undertaken as part of this assessment.

#### *Option 1: Do Minimum*

The development of the Do Minimum is not likely to result in any impacts on the water environment. Although there is some significant development (e.g. BRR) and development within close proximity to water resources (e.g. Kirkintilloch town centre regeneration – Forth and Clyde Canal), as the various components of the Option are committed, any likely impacts are assumed to have been mitigated to an acceptable level at project level.

#### *Option 2: A803 Quality Bus Corridor Package*

Improving bus journey times and reliability will have no impact on water quality, drainage or flood defences.

#### *Option 3: Bus Hub in Kirkintilloch*

Impacts on the water environment are dependent on the scale of the intervention(s) adopted as part of this Option, and also the location of the development in relation to the water resources within the surrounding area.

The River Kelvin and the Forth and Clyde Canal both lie within close proximity to Kirkintilloch. Although of varying water quality (bad / poor ecological potential, and good ecological potential, respectively), both water bodies are designated under the Freshwater Fish Directive for salmonid waters. Where impacts may be experienced during the construction of the intervention(s), it is unlikely that any long-term impacts would result on the water environment, assuming any drainage systems meet regulatory requirements.

#### *Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

Impacts on the water environment are dependent upon the final location of the Park & Ride scheme. With the location not yet known, the resources that may be impacted upon and the proximity of the development to these receptors is unclear.

Based on outline locations considered, temporary effects are likely to impact either Bothlin Burn (Woodilee site) or Gadloch (B757 site). There are unlikely to be any permanent effects from a Park & Ride scheme within the B757 location, assuming mitigation measures are adopted as noted within the Mitigation section below.

Development of a Park & Ride scheme at the site adjacent to Woodilee may result in exacerbated flood risk of the Bothlin Burn due to increased runoff from hardstanding areas and reduced holding capacity within the catchment.

*Option 5: Bus Park & Ride adjacent to BRR*

Water resources within the surrounding area of the proposed Park & Ride scheme are limited to small field drains and areas of surface water as a result of poor drainage. Although these water bodies may be part of the wider River Kelvin catchment, temporary effects during construction are not likely to be significant.

The area to the south of the railway track is noted as being at risk to surface water flooding. The development of hardstanding area within the near vicinity may either displace or contribute to this area of floor risk. If so, a detailed flood risk assessment would be required.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

Changes to service patterns on existing sections of the road network are unlikely to have significant impacts on the water environment.

*Option 7: Increase parking Provision at Lenzie Rail Station*

Temporary effects on the water environment during the construction of increased parking at Lenzie Rail Station would introduce a number of pollutants and potential contaminants which may impact on water resources that support the Lenzie Moss immediately adjacent to the site.

Permanent effects may also include the introduction of pollutants such as oils and fuels from parked vehicles to this area via the drainage system incorporated within the car park design. Although not monitored, the water resources within this area would deteriorate in quality. These impacts can be mitigated from the incorporation of appropriate SUDS measures within the drainage design, such as oil interceptors.

Secondary impacts on the ecology of the Lenzie Moss site are assessed within the Biodiversity and Habitats Section.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

Impacts of the development of a rail station at Woodilee are dependent upon the final location of the station and its associated infrastructure and access point. However it is likely that temporary effects from increased presence of pollutants and potential contaminants will impact on the Bothlin Burn, to the immediate west of the site. The wider area surrounding the site is also subject to flood risk from surface water and from the Bothlin Burn which may be increased during earthworks and compaction of soils from site activity.

Permanent impacts will likely be as a result of increased flood extents and potential water quality deterioration of the Bothlin Burn from oils and fuels leaking from parked vehicles. It is expected that these impacts can be mitigated within the design of the scheme.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

Water resources within the surrounding area of the proposed rail station are limited to small field drains and areas of surface water as a result of poor drainage. Although these water bodies may be part of the wider River Kelvin catchment, temporary effects during construction are not likely to be significant.

The area to the south of the railway track is noted as being at risk to surface water flooding. The development of hardstanding area within the near vicinity may either displace or contribute to this area of floor risk. If so, a detailed flood risk assessment would be required. These impacts can be mitigated within the design of the scheme.



### 5.5.3.2 Mitigation

Temporary mitigation should include:

- Where any construction or engineering works are required within the water environment, the appropriate licenses will be held, as governed by SEPA (such as (WEWS) and the Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR), and Pollution Prevention Guidelines (PPGs));
- All construction activities will follow good practice guidelines (such as Code of Construction Practice (CoCP)) and also the measures set out within an Environmental Management Plan prepared by the appointed Contractor;
- Temporary site drainage and treatment procedures, based on Sustainable Urban Drainage Systems (SUDS), will be put in place to manage surface water runoff and accidental spills of fuel, etc.;
- Measures would be put in place to prevent pollutants and/or suspended sediments entering surface watercourses;
- Should any development be proposed within an area at risk to flooding, a flood risk assessment will be carried out, addressing potential effects and additional relevant mitigation measures; and
- Temporary and permanent works, in particular culverts, would be designed such that they minimise the disruptions to flow and do not increase the risk of flooding.

Permanent mitigation should include:

- An appropriately designed drainage system that would collect and treat surface runoff from any hardstanding infrastructure development or improvements;
- The discharge of polluted surface water runoff into receiving watercourses could be mitigated by minimising the number of discharge points along the scheme length and using existing surface water drainage where possible;
- Adequate pollution control, such as oil/petrol interceptors would be incorporated into the drainage system of all new and upgraded road linkages; and
- Any engineering works undertaken within the water environment will be designed to ensure that the hydraulic capacity, resilience to flood risk, and morphology of the watercourse are not impeded or deteriorated. Where any negative impacts may occur, these may be offset by improvements made elsewhere.

### 5.5.3.3 Summary

Table 5.4 highlights the overall assessment of impacts on water quality, drainage and flood defence from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence of water quality monitoring data, these impacts are based on professional judgement only.

**Table 5.4: Water Environment Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Negligible	Neutral
Option 2	Neutral	Neutral
Option 3	Minor Negative	Neutral
Option 4	Minor Negative	Neutral

<b>Option 5</b>	Negligible	Negligible
<b>Option 6</b>	Neutral	Neutral
<b>Option 7</b>	Minor Negative	Negligible
<b>Option 8</b>	Minor Negative	Negligible
<b>Option 9</b>	Negligible	Negligible

#### 5.5.4 Geology

##### 5.5.4.1 Introduction

Transport schemes could impact on geology in a number of ways including:

- Through damage to geologically valuable sites such as geological Sites of Special Scientific Interest (SSSIs) or Regionally Important Geological Sites (RIGS);
- Overloading of geological strata; and
- Damage to important mineral reserves that could be worked in the future.

Baseline geological information was obtained by means of a desk study review of currently available information. This included a review of published British Geological Survey (BGS) maps.

There are no geological SSSIs or non-statutory RIGS within the study area that may be affected by the Options. There are also no areas identified as being of importance for mineral deposits or areas previous used for extraction purposes. The solid geology that underlies the entire study area is the Clackmannan Group (an upper limestone formation). Superficial deposits within the study area include till, alluvium and small areas of peat.

As there are no sensitive geological receptors within the study area, any impacts on geological resources are not likely to be significant. Where geology (solid and superficial) will be affected will be during the construction of Options 4, 5, 7, 8 and 9 where excavation, extraction of material for development and/or to develop foundations for the structures. These effects will be permanent, but will not be significant.

The impact on geology from the development of Options 4, 5, 7, 8 and 9 will be Minor Negative. The impact from developing the remaining Options would be Negligible.

#### 5.5.5 Biodiversity and Habitats

##### 5.5.5.1 Introduction

This section considers the effects of the Options on the local biodiversity within the study area and its surrounding area. A review of designated sites and satellite images were carried out to determine key ecological issues. The key issues are set out in order dealing with protected species followed by protected sites. In both cases the hierarchy is descending from European (International) importance to UK (national) to local/ regional.

There are no statutory designated sites within the study area, however Cadder Wilderness and Possil Marsh SSSI are located just outwith the study area to the north and west of Bishopbriggs, respectively. Possil Marsh is also designated as a Scottish Wildlife Trust Reserve. There are several pockets of trees throughout the study area which are within the Ancient Woodland Inventory (AWI). There are also two Local Nature Reserves (LNR) within the study area – Merklands and Lenzie Moss. The Forth and Clyde Canal, River Kelvin and the railway line all offer important wildlife corridors through the centre of the study area.

From review of protected species records on NBN Gateway, there are records of European water vole (*Arvicola amphibious*), European Otter (*Lutra lutra*), and various bat species. Although other species may not have records of presence within the study area, this does not mean they are not there. Protected species and breeding bird should be further considered at project level should an impact assessment be required on any of the Options.

*Option 1: Do Minimum*

Given that the multiple components of the Do Minimum have been consented, any effects on ecological receptors or habitat areas are not likely to be significant, or have been mitigated at project level to avoid or reduce any potential impacts.

Of the projects within this Option, it is presumed that ecological impacts would result from the development of the BRR, which requires substantial land take and passes within close proximity to a pocket of woodland listed within the AWI.

Impacts on biodiversity and habitats as a result of the Do Minimum are likely to be Minor Negative.

*Option 2: A803 Quality Bus Corridor Package*

Should the development of this Option result in a modal shift to more sustainable transport, it is likely that there will be improved local air quality. As a result of this there may be improved biodiversity within local habitats surrounding the A803 corridor. These effects are not likely to be significant.

*Option 3: Bus Hub in Kirkintilloch*

The impacts from the development of this Option are dependent upon the location and intervention(s) adopted as part of this scheme. Biodiversity and habitats of relevance within Kirkintilloch town centre will be limited to parks and fragmented habitats. Should there be a proposed new bus hub where construction effort would likely be greatest, there may be scope to include habitat creation within design places to enhance the towns' biodiversity.

Impacts on biodiversity from the development of this Option are not likely to be significant.

*Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

Impacts on the habitat areas are dependent upon the final location of the Park & Ride scheme. With the location not yet known, the resources that may be impacted upon and the proximity of the development to these receptors is unclear.

To develop the Park & Ride scheme at either location would likely result in land-take from areas of potential habitat value and probable tree removal to accommodate infrastructure. The wooded area at the site adjacent to Woodilee is also adjacent to a pocket of Ancient woodland listed within the AWI, which may be directly or indirectly impacted upon as a result of the construction and / or operation of a Park & Ride scheme in this area.

*Option 5: Bus Park & Ride adjacent to BRR*

The area proposed for the development of this Option is currently used for agricultural purposes or woodland immediately adjacent to the north and south sides of the rail track. The railway line is identified as an important ecological corridor by East Dunbartonshire Council. The magnitude of effect on these areas is subject to the design of the scheme and the land-take required to accommodate the footprint of the Park & Ride scheme and associated access routes.

The woodland habitat and surrounding fields provide good foraging and potential roosting habitat for bats, and potentially other protected species such as badgers. Breeding birds may also be impacted should works be undertaken within the breeding season.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

Changes to service patterns on existing sections of the road network are not likely to result in significant impacts on biodiversity and habitats within the study area.

*Option 7: Increase parking Provision at Lenzie Rail Station*

The extent of impacts from the development of this Option is dependent upon the choice of location of the additional car parking spaces, and its associated land-take.

To the immediate west of the current rail station to the north of the track is the Lenzie Moss LNR. To accommodate additional car parking that does not lie over either of the existing car parks would likely require land take from this area, resulting in the removal of several trees. Any decrease in air quality of the area during construction may also result in a deterioration of the biodiversity of this LNR site.

Permanent effects of the development would likely be limited to the use of lighting of the car park for safety and security purposes. Lighting this area may disturb bats that will be in use of the rail corridor for foraging, and potentially the woodland area within Lenzie Moss LNR for roosting.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

Impacts on the habitat areas are dependent upon the final location of the rail station, associated infrastructure and access.

The development of a rail station at this location would require the removal of mature trees and other areas of potential habitat value and introducing additional light sources to the area. These in turn would result in greater disturbance to protected species such as bats, badgers and breeding birds should they be in use of the area, and fragment an existing mature habitat area. There is also a pocket of Ancient woodland listed within the AWI directly north of this site, which may be directly or indirectly impacted upon as a result of the construction and/or operation of a rail station.

Negative effects on local biodiversity may also result from increased pollutants within the environment during construction and decreased air quality.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

The area proposed for the development of this Option is currently an area of potential habitat value to the south of the railway line, with the area to north of the track being developed for housing. The track is lined to the north and south by mature and young trees. The railway line is identified as an important ecological corridor by East Dunbartonshire Council. The magnitude of effect on this area is subject to the design of the scheme and the land take required to accommodate the footprint of the rail station, associated infrastructure and access routes.

The woodland habitat and surrounding fields provide good foraging and potential roosting habitat for bats, and potentially other protected species such as badgers. Breeding birds may also be impacted should works be undertaken within the breeding season.

#### 5.5.5.2 Mitigation

Mitigation measures noted within this section are generic measures that can be applied to all Options where relevant actions discussed are anticipated to be required as part of the construction or operation of the intervention(s) within the Option.

- Removal of trees and hedges should be avoided if possible during the breeding bird season (March-September inclusive) and only undertaken after they have been checked for nesting birds. The pre-removal check should be carried out by a qualified and experienced Ecologist.
- A tree and bat survey should be carried out by a licensed bat worker before the removal of any mature trees. If bats are found a licence should be obtained from Scottish Natural Heritage (SNH) before any works commence.

- Where possible, if lighting is required on site, this should be directional. Lighting columns should be avoided wherever possible to prevent disturbance to bats.
- Measures to prevent pollution of watercourses should be implemented prior to and during construction to avoid any potential impacts on aquatic ecology or protected species in use of the resources.
- Wherever wildlife habitats remain alongside working areas, provision would be made to prevent encroachment onto valuable ecological areas that are not essentially required for construction. This would include the provision of secure fencing where appropriate.
- Where habitat areas are lost permanently to the footprint of new development, consideration should be given to offsetting these impacts by recreating or enhancing habitats elsewhere, or limiting the effects by reinstating as much habitat as possible following completion of construction activities.

#### 5.5.5.3 Summary

Table 5.5 highlights the overall assessment of impacts on biodiversity and habitats from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence of survey data, these impacts are based on professional judgement only.

**Table 5.5: Biodiversity and Habitat Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Minor Negative	Neutral
Option 2	Neutral	Negligible
Option 3	Neutral	Negligible (positive)
Option 4	Minor Negative	Negligible
Option 5	Minor Negative	Negligible
Option 6	Neutral	Neutral
Option 7	Minor Negative	Negligible
Option 8	Minor Negative	Negligible
Option 9	Minor Negative	Negligible

### 5.5.6 Landscape and Visual Amenity

#### 5.5.6.1 Introduction

Transport related developments can, as a result of the physical infrastructure associated with them, have a major impact on landscape. Impacts such as the removal of boundaries or vegetation or the introduction of foreign materials can affect specific components of the landscape which are fundamental to landscape or townscape character.

The landscape appraisal of the Options has involved a review of published documentation (including development plans, Ordnance Survey mapping, aerial imagery and data on conservation interests in the study area). A review of the SNH Landscape Character Assessments for Glasgow and the Clyde Valley has also been undertaken with particular consideration given to the landscape areas and types within study area.

The main criteria used to evaluate the potential impact on landscape character comprise the following:

- The extent to which existing landscape components and features would be lost or modified by the proposals (such as lost woodland or modified landform);
- The existence of the proposed form of development within the landscape and its current role as a determinant of existing character; and
- The extent to which new or additional development of the type proposed would alter the balance and hence perception of the landscape character of the area development.

Impacts can be detrimental where features or key characteristics such as established planting, old buildings or structures have to be removed. Alternatively it can prove beneficial where derelict buildings or poorly maintained landscape features are repaired, replaced and maintained or there is the introduction of new tree planting and a landscape structure where none currently exists.

#### *Option 1: Do Minimum*

There are not likely to be any significant impacts on the landscape or visual amenity from the Do Minimum scenario. Any projects developed within this Option likely to result in any adverse landscape or visual effects are presumed to incorporate adequate mitigation to avoid or reduce these effects.

#### *Option 2: A803 Quality Bus Corridor Package*

A modal shift from private vehicles to buses will have no impact on the surrounding landscape or visual amenity.

#### *Option 3: Bus Hub in Kirkintilloch*

It is not likely that a centralised bus hub will result in any impacts on landscape or visual amenity. However the Kirkintilloch town centre Conservation Area will have to be considered in the design of the scheme to ensure it is in keeping with its surroundings. It is likely that this can be mitigated during design of the Option.

#### *Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

The introduction of a new structure within the landscape has the potential to result in adverse effects on the landscape and visual amenity of the area. Of the two sites proposed for the scheme, the Woodilee site is within/ immediately adjacent to the south Lenzie Conservation Area and Townscape Area. This is also surrounded by residential areas and a long-distance pathway and Core Path along the Bothlin Burn. Depending on the scale, location and design of Park & Ride at this location there may be significant adverse effects.

The B757 site is also located within close proximity to the south Lenzie Conservation Area and Townscape Area, however is located in an area adjacent to fields and Lenzie Golf Course. Depending on the scale, design and final location of a Park & Ride in this area, there may be significant adverse effects on visual amenity due to the development breaking existing landscape.

#### *Option 5: Bus Park & Ride adjacent to BRR*

Development of a Park & Ride scheme at this location will result in the loss of agricultural land, and potentially some woodland areas. There may be effects on visual amenity however these are dependent on the location and design of the scheme although lighting is likely to be required resulting in potential impacts from lighting/ light spillage. Given the development of Westerhill Business Park and the BRR to the west of this location, the Park & Ride would be mostly in keeping with the surrounding area.

It is likely that other potentially adverse views of the development could be screened.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

Changes to service patterns on existing sections of the road network are unlikely to have any impacts on the landscape or visual amenity.

*Option 7: Increase parking Provision at Lenzie Rail Station*

The existing rail station is located within the south Lenzie Conservation Area and Townscape Area, and is surrounded by residential areas and the Lenzie Moss LNR and Core Path. Depending on the scale, location and design of parking at this location there may be significant adverse effects on the landscape or visual amenity.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

The area to the immediate south of this site is currently being developed for housing. To accommodate the rail station there will likely be the requirement to remove trees currently screening the railway track to the south, and there may also be wider impacts on visual amenity depending on the final scale of the scheme. The south Lenzie Conservation Area and Townscape Area and a long-distance pathway and Core Path along the Bothlin Burn are also within close proximity to this proposed location.

There are potentially significant visual impacts as a result of a rail station within this area.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

Development of a rail station at this location will result in the loss of agricultural land, and potentially some woodland areas. There may be effects on visual amenity however these are dependent on the location and design of the scheme. Given the development of Westerhill Business Park and the BRR to the west of this location, the new station would be mostly in keeping with the surround area.

It is likely that other potentially adverse views of the development could be screened.

#### 5.5.6.2 Mitigation

Mitigation measures provided within this section are general and can be applied to any Option where new infrastructure is required to be developed. The scale and nature of mitigation required is dependent upon the scale and type of infrastructure proposed. Mitigation measures, typically planting or landform, could minimise potentially detrimental impacts or improve the landscape composition of the area.

During construction of new transport infrastructure, fencing around the perimeter of construction sites can reduce the negative impacts on landscape.

In the long-term, soft landscaping such as planting of trees, bushes and long grasses should be used to reduce the visual prominence of structures such as the rail stations and Park & Ride schemes. Landscaping will to some extent reduce the negative impacts on landscape quality however, it will not compensate for the loss of the amenity land.

#### 5.5.6.3 Summary

Table 5.6 highlights the overall assessment of impacts on landscape and visual amenity from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence survey data, these impacts are based on professional judgement only.

**Table 5.6: Landscape and Visual Amenity Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
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<b>Option 1</b>	Negligible	Negligible
<b>Option 2</b>	Neutral	Neutral
<b>Option 3</b>	Minor Negative	Minor Negative
<b>Option 4</b>	Moderate Negative	Moderate Negative
<b>Option 5</b>	Minor Negative	Negligible
<b>Option 6</b>	Neutral	Neutral
<b>Option 7</b>	Minor Negative	Minor Negative
<b>Option 8</b>	Moderate Negative	Minor Negative
<b>Option 9</b>	Minor Negative	Negligible

#### 5.5.7 Agriculture and Soils

##### 5.5.7.1 Introduction

This assessment considers the effect of the proposed Options on agricultural land, soil and contaminated land. Baseline information was obtained by means of a desk study review of designated areas, land classification maps and aerial photography.

##### Agricultural Land Quality

Agricultural land is classified using the Land Capability Classification for Agriculture (LCA) produced by the Macaulay Land Use Research Institute (MLURI). This classification integrates soils data with both climate and topographical knowledge to assign land into classes for their suitability for various agricultural crops and management practices. There are 7 classes some of which are subdivided, where classes 1, 2 and 3 are regarded as the best and most versatile and are collectively termed prime quality land.

##### Designated Agricultural Areas

Agricultural land is not generally formally protected under a specific designation; however, it is included within other national or local designations. These include: Environmentally Sensitive Areas (ESAs), a national designation, which are areas of special landscape, wildlife or historic interest which can be protected or enhanced by supporting specific agricultural practices. These areas are not necessarily areas of particularly good quality agricultural land. Greenbelt and Countryside Areas are local policy areas that relate to open land in the rural areas which may be either cultivated or uncultivated.

##### Soils

The loss of valuable agricultural soil during construction can occur even if it is kept stored and reinstated; as it is liable to degradation in quality. It is also typical for soils to take a number of years to restore their structure after being reinstated. However appropriate storage methods and the establishment of suitable crops and additional drainage once reinstated can help the process.

##### Contaminated Land

Although contaminated land is primarily an engineering consideration for any development, the construction process in particular can provide a pathway for contaminants leading to potential effects on the environment and/or human health.

##### *Option 1: Do Minimum*

Greatest impacts on agriculture and soils from the development of the Do Minimum are from land-take to accommodate the BRR. However given this has been commissioned the impacts from this are not likely to be significant.



*Option 2: A803 Quality Bus Corridor Package*

There is not anticipated to be any impact on agriculture or soils associated with the development of this option.

*Option 3: Bus Hub in Kirkintilloch*

The development of this Option will be within an urban area. Any land required to accommodate the development of this will not impact on agricultural land.

*Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

Of the two proposed locations, the location adjacent to the B757 would likely require land-take from current agricultural use. The extent of this area is dependent upon the final location and the scale of the Park & Ride scheme. The agricultural land surrounding this area is regarded as being of Class 3.2 – capable of supporting ‘mixed agriculture’.

*Option 5: Bus Park & Ride adjacent to BRR*

This Option is proposed in an area that predominantly utilised for agricultural purposes. This land is regarded as being of Class 3.2 – capable of supporting ‘mixed agriculture’.

It is likely that land take from current agricultural use would be required in order to accommodate the Park & Ride scheme and its associated infrastructure. The extent of this area and therefore the magnitude of impact is dependent upon the final location and the scale of the Park & Ride scheme.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

Changes to service patterns on existing sections of the road network will not impact agriculture or soils.

*Option 7: Increase parking Provision at Lenzie Rail Station*

The existing rail station is located within an urban area and impacts on agriculture are not likely to result from the development of this Option.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

The area south of the rail tracks is utilised for agriculture. Potential impacts from land-take or potential contamination of soils is dependent on the final location and scale of rail station and associated Park & Ride infrastructure.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

This Option is proposed in an area that is predominantly utilised for agricultural purposes. This land is regarded as being of Class 3.2 – capable of supporting ‘mixed agriculture’.

It is likely that land take from current agricultural use would be required in order to accommodate the rail station and associated Park & Ride scheme. The extent of this area and therefore the magnitude of impact is dependent upon the final location and the scale of the Option.

#### 5.5.7.2 Mitigation

Where agricultural land is affected by construction activities, mitigation will involve:

- Taking due care during construction;
- Maintenance of access;

- Repair and replacement of agricultural drains; and
- Where applicable, reinstatement of agricultural fields to enable continued farming practices to be carried out correctly.

Mitigation to prevent impacts on soils would include ensuring that soils are adequately protected and/or temporarily removed during construction works, then restored/replaced after construction works have been completed.

Compensation has been assumed for areas of permanent agricultural land loss as well as agricultural land which may no longer be viable for farming use due to severance.

#### 5.5.7.3 Summary

Table 5.7 highlights the overall assessment of impacts on agriculture and soils from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence of survey data, these impacts are based on professional judgement only.

**Table 5.7: Agriculture and Soils Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Minor Negative	Negligible
Option 2	Negligible	Neutral
Option 3	Neutral	Neutral
Option 4	Minor Negative	Minor Negative
Option 5	Minor Negative	Minor Negative
Option 6	Neutral	Neutral
Option 7	Neutral	Neutral
Option 8	Minor Negative	Minor Negative
Option 9	Minor Negative	Minor Negative

#### 5.5.8 Cultural Heritage

##### 5.5.8.1 Introduction

Cultural heritage encompasses elements of the built environment such as historic buildings and monuments and known/unknown archaeology. Transport schemes can result in direct and indirect impacts on cultural heritage interests including physical impacts to buildings or archaeological sites or impacts on the setting of historic buildings or monuments.

This assessment has been informed by a desk study only. The presence of cultural heritage designations including listed buildings, scheduled ancient monuments and conservation areas has been confirmed by a review of Historic Scotland data and East Dunbartonshire Council's Local Development Plan 2.

The key considerations with respect to the Options are:

- **Potential increase/decrease in traffic flows** - The noise and vibration generated by vehicles can cause physical damage to historic buildings and monuments.

- **Impacts on setting** - Historic buildings and monuments as well as conservation areas are vulnerable to improper development. Modern developments can impact on their wider setting and affect the historical context and value of a building or area.
- **Potential loss of unknown archaeology** - Physical developments may result in the loss of previously unrecorded archaeological interests. Buried items may be damaged or lost as a result of construction activities associated with, for example, the development of the Park & Ride facilities and new rail stations. This would also apply in relation to increased parking at Lenzie if this was progressed with a view on developing on additional ground adjacent to the existing facilities.

There are a large number of cultural and archaeological importance within the study area, including the Antonine Wall World Heritage Site (WHS) and its buffer zone, the Forth and Clyde Canal Scheduled Ancient Monument (SAM), the Lenzie, south Lenzie and Kirkintilloch Conservation Areas and Kirkintilloch Townscape Protection Area, and numerous listed buildings located throughout the study area.

#### *Option 1: Do Minimum*

The implementation of the Do Minimum Option is not likely to result in any significant impacts on cultural heritage. Where potential impacts may occur are as a result of the construction of the BRR which may uncover previously unknown archaeological assets. Works within Kirkintilloch town centre will also be undertaken within close proximity to a number of sensitive cultural heritage sites, such as the Antonine Wall WHS and its buffer zone, the Forth and Clyde Canal SAM, the Kirkintilloch Conservation Area and Townscape Protection Area, and numerous listed buildings. These sites may be impacted through physical damage from vibration during the construction / and or operation of the schemes within this Option.

These potential effects will have been mitigated for in the proposals for the BRR. Potential effects on cultural heritage are Minor Negative.

#### *Option 2: A803 Quality Bus Corridor Package*

The creation of a quality bus corridor on this route is not likely to result in any impacts on cultural heritage assets. However it should be noted that there are three listed buildings along the route: it passes both the Coltpark Avenue/Stuart Drive and Balmuildy/Kirkintilloch Road Conservation Areas within Bishopbriggs and the northern section of the route is located within the Antonine Wall WHS buffer zone. Careful consideration of each of these assets will be required when designing the scheme.

#### *Option 3: Bus Hub in Kirkintilloch*

The Kirkintilloch town centre is a culturally sensitive area, bounded to the north by the Antonine Wall WHS and to the south by the Forth and Clyde Canal SAM. The centre itself is a Conservation Area and Townscape Protection Area with a high density of listed buildings including the Category A listed St Mary old parish church.

Provided that the design of any new infrastructure is in keeping with the Conservation and Townscape Area, it is likely that impacts on cultural assets will be during construction, with increased vibration from heavy plant operating and potential accidents/ damage to buildings when accessing site. The magnitude of these effects are dependent upon the final design of the scheme and its location in relation to cultural assets.

#### *Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

The cultural assets that may be impacted upon from the development of this Option is dependent upon its location. The location adjacent to the KLR is within the Lenzie Conservation Area, and immediately adjacent to an area of woodland within the Ancient Woodland Inventory. The site adjacent to the B757 is on the edge of the south Lenzie Conservation Area. Impacts on these receptors are dependent upon the final design and scale of the Park & Ride scheme.

There remains the potential that there are unknown archaeological assets located at these locations. Prior to any development, an archaeological survey will be required to ensure no other assets are present that may be impacted from the development.

*Option 5: Bus Park & Ride adjacent to BRR*

The only known cultural heritage asset within the near vicinity of the proposed site is the Category C listed building at Cadder Yard. The impact on this building is dependent upon the final location and design of the Option.

There remains the potential that there are unknown archaeological assets located at this location. Prior to any development, an archaeological survey will be required to ensure no other assets are present that may be impacted from the development.

*Option 6: Kirkintilloch / Lenzie Loop Bus*

Changes to service patterns on existing sections of the road network are not likely to result in any impacts on cultural heritage.

*Option 7: Increase parking Provision at Lenzie Rail Station*

The rail station is a listed building, and lies within the Lenzie and south Lenzie Conservation Area. There are also a number of other listed buildings located within the Conservation Areas.

The impacts on the Conservation Areas and the listed buildings within it are dependent on the type of proposal chosen to increase the parking at the station, and also its design. However it is likely that there will be adverse effects either directly during construction and/or permanently on the setting of these features and the area.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

The proposed site is located within close proximity to a Category B listed building. Other features within the surrounding area include an area of woodland listed within the AWI and also the Lenzie Conservation Area to the east. These may be either directly or indirectly impacted upon during the construction and operation of this Option, however the magnitude of these effects is dependent upon the location and scale of the rail station and Park & Ride scheme.

There remains the potential that there are unknown archaeological assets located at this location. Prior to any development, an archaeological survey will be required to ensure no other assets are present that may be impacted from the development.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

The only known cultural heritage asset within the near vicinity of the proposed site is the Category C listed building at Cadder Yard. The impact on this building is dependent upon the final location and design of the Option.

There remains the potential that there are unknown archaeological assets located at this location. Prior to any development, an archaeological survey will be required to ensure no other assets are present that may be impacted from the development.

#### 5.5.8.2 Mitigation

All new infrastructure developed should be designed such that it is integrated with the existing heritage character and do not impact on the setting of any listed buildings.

The development of any infrastructure within amenity land/ open ground should have an archaeological survey undertaken prior to works commencing to determine the potential presence of any unknown archaeological assets.

### 5.5.8.3 Summary

Table 5.8 highlights the overall assessment of impacts on archaeology and cultural heritage from the development of the Options. The assessment assumes that good construction practices will be followed where development is required, and that appropriate mitigation measures are incorporated within the final design. In the absence of survey data, these impacts are based on professional judgement only.

**Table 5.8: Cultural Heritage Impact Summary**

Option	Magnitude of Temporary Impacts	Magnitude of Permanent Impacts
Option 1	Minor Negative	Negligible
Option 2	Negligible	Neutral
Option 3	Moderate Negative	Minor Negative
Option 4	Minor Negative	Minor Negative
Option 5	Minor Negative	Negligible
Option 6	Neutral	Neutral
Option 7	Moderate Negative	Moderate Negative
Option 8	Minor Negative	Minor Negative
Option 9	Minor Negative	Negligible

## 5.6 Safety

The following Sections discuss the impacts of the proposals on the two safety sub-objectives: Accidents and Security.

### 5.6.1 Accidents

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

In the Do Minimum case, danger to pedestrians, cyclists and other drivers is mitigated through improved road signage and through general improvements for walking and cycling, for example through implementation of the Kirkintilloch Town Centre Regeneration Strategy and other committed Council strategies. The Do Minimum case also increases safety by reducing queuing traffic through the implementation of schemes such as the BRR.

It is considered that each of the Options, through the promotion of public transport, will increase levels of safety to varying degrees as follows:

- A803 Quality Bus Corridor Package (Option 2)

The introduction of Quality Bus measures would potentially smooth out traffic flow and reduce link speeds, which is expected to have a beneficial impact on Personal Injury Accidents. In addition, this Option could possibly reduce the number of road casualties by removing cars from the road network, but this effect will depend on the degree of modal shift generated from private modes. It is anticipated that this Option would have a minor positive impact on safety.

- Bus Hub in Kirkintilloch (Option 3)

The integration of bus stops associated with this measure would reduce the incidence of traffic congestion through Kirkintilloch town centre to a small degree. It is not expected that this Option would notably increase the mode share for public transport, and thus this Option is expected to have an overall neutral effect on Personal Injury Accidents.

- **Bus-Based Options (Option 4, 5 and 6)**

These Options are anticipated to have a neutral impact on safety: the Options could possibly reduce the number of road casualties by removing cars from the road network, but this effect will depend on the degree of modal shift generated from private modes.

- **Increased Parking Provision at Lenzie Station (Option 7)**

This Option is expected to remove cars from the road network by encouraging modal shift from car to rail. However it may generate more local traffic in populated areas, thus increasing the risk of pedestrian casualties, and is therefore expected to have an overall neutral impact on Personal Injury Accidents.

- **New Rail Stations (Options 8 and 9)**

These Options may transfer some trips by car to a safer mode, rail, thus having a minor positive benefit.

In terms of change to the balance of severity of accidents associated with each Option, it is expected that Options which result in a smoother flow of traffic (through modal shift from private car) would see a reduction in link speeds which should in turn result in a reduction in the severity of accidents. It is anticipated that Options 2, 8 and 9 would have a minor positive impact in this regard. All other Options are expected to have a neutral impact, with the exception of Option 7 whereby the increase in parking provision at Lenzie Rail Station may generate more local traffic in populated areas.

#### 5.6.1.1 Accident Costs

Analysis has also been undertaken 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. This is undertaken by relating levels of traffic on the road (measured by vehicle kilometres) to the number of accidents via the application of an accident rate.

Changes in highway kilometres have been taken from the option modelling using CSTM and applied against standard accident and cost rates from NESA. Accident costs associated with each option against the Do Minimum scenario is presented in Table 5.9. It is to be noted it has not been possible to assess Option 3 (Kirkintilloch Bus Hub) due to the localised nature of this option.

**Table 5.9: Assessment of Security Sub-Criterion**

Annual Numbers of	Do Minimum	Options compared to Do Minimum						
		Option 2	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
<b>Fatal</b>	22.40	0.00	-0.01	-0.01	0.00	0.00	0.00	-0.01
<b>Serious</b>	223.85	0.01	-0.06	-0.06	0.00	0.00	-0.03	-0.07
<b>Slight</b>	2,655.13	0.05	-0.73	-0.76	-0.02	0.00	-0.39	-0.80
<b>Damage only</b>	30,464.67	0.91	-8.18	-8.72	0.18	0.00	-4.42	-9.09
<b>Total Cost [£]</b>	218,047,470	5,160	-60,428	-62,140	-2,758	-10	-32,600	-65,508

Table 5.9 indicates that on the whole, over a 60 year appraisal period, each of the options are anticipated to have a negligible impact on accident costs. With the exception of Option 2 (QBC) which appears to result in a very small increase in the number of damage only accidents, each of the options are anticipated to improve safety and reduce accident costs. The greatest benefits appear to be related to the development of the bus-based Park & Ride sites (Options 4 and 5) and new rail stations (Options 8 and 9), although overall impacts are negligible.

Against the Reference Case (i.e. with Robroyston Station), total accident costs are marginally lower than in the Do-Minimum Scenario. However, again the impact of each option against the Reference Case remains negligible and it is not anticipated that in quantitative terms, any of the options will have a significant impact in improving or otherwise the level and severity of accidents in the study area.

### 5.6.2 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, bus priority, and the development of Park & Ride facilities and new rail stations. These facilities require to incorporate 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.

Park & 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 Options would achieve a positive impact in this regard. Further details are set out within Table 5.10: it should be noted that not all mitigating facilities will be relevant to all Options.

**Table 5.10: 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	Poor	Moderate / High: Positive use of landscaping features (design, plants etc.) to contribute to visibility and

		alone.		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.

### 5.6.3 Summary

Table 5.11 provides a summary of the performance of each Option against the STAG Safety criteria.



Table 5.11: Performance against STAG Criteria: Safety

STAG Part 2 Options										
Safety Criteria	Safety Sub-Objective	1 – Do Minimum	2 – A803 QBC Package	3 – Bus Hub in Kirkintilloch and Associated Measures	4 – Bus Park & Ride in Vicinity of B757 / KLR	5 – Bus Park & Ride Adjacent to BRR	6 – Kirkintilloch / Lenzie Loop Bus	7 – Increased Parking Provision at Lenzie Rail Station	8 – New Rail Station at Woodilee (with Park & Ride)	9 – New Rail Station at Westerhill (with Park & Ride)
Accidents	Change in Personal Injury Accidents	+1	+1	0	0	0	0	-1	+1	+1
	Change in Balance of Severity	+1	+1	0	0	0	0	-1	+1	+1
	Total Discounted Savings <sup>16</sup>	£218,047,470	+£5,160	-	-£60,428	-£62,140	-£2,758	-£10	-£32,600	-£65,508
Security		0	+2	+2	+2	+2	+2	+2	+2	+2
Summary Rational for Scoring		Danger to pedestrians, cyclists and other drivers mitigated by improved road signage and general improvements for walking and cycling through implementation of committed schemes and Council strategies. Increased safety by reducing queuing traffic through the implementation of schemes such as BRR.	QBC measures would potentially smooth out traffic flow and reduce link speeds, with beneficial impact on PIAs. 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 to address the personal security concerns of many individuals.	Anticipated small reduction in traffic congestion due to integration of bus stops. Neutral effect on PIAs as no notable increase in PT mode share expected. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from road network, dependent on degree of modal shift from private car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift from private car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift from private car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from the road network, but dependent on degree of modal shift from private car. Rail is considered a safer mode than car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from the road network, but dependent on degree of modal shift from private car. Rail is considered a safer mode than car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	Could possibly reduce number of road casualties by removing cars from the road network, but dependent on degree of modal shift from private car. Rail is considered a safer mode than car. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.

<sup>16</sup> Shows comparison against Do-Minimum

## 5.7 Economy

### 5.7.1 Introduction

Within STAG, the Economy Criterion has three sub-criteria for assessment:

- Transport Economic Efficiency (TEE) covers the benefits ordinarily captured by standard cost-benefit analysis – the transport impacts of an option.
- Wider Economic Benefits (WEBs) relate to the notion of potential transport impacts on agglomeration and the relationship between agglomeration and productivity; and
- Economic Activity and Location Impacts (EALIs) allow the impact of an option to be expressed in terms of the net effects of the option on the local and/or national economy.

It is to be noted that analysis presented in this study is based on an assessment of TEE and EALI, and no study of WEBs has been undertaken.

### 5.7.2 CSTM Modelling Analysis

Options have been assessed using Transport Scotland's Central Scotland Transport Model (CSTM12). Adopting a common modelling platform to assess the options provides consistent results enabling direct comparisons to be made. CSTM12 was considered to be the most fit for purpose tool available for the purposes of this study given the inclusion of the proposals for new rail stations at Woodilee (Option 8) and Westerhill (Option 9) and the need to assess the likely impacts of these options on the wider transport network across Central Scotland. However, there are a number of limitations associated with the model including that the scale of some of the options are relatively small in comparison to the overall modelled area. Nevertheless the results provide a reasonable indication of the relative attractiveness of the options. Should a preferred Option(s) be taken forward for further consideration, additional modelling will be required.

Each of the options under consideration as part of this Route Corridor Study have been modelled, with and without the Robroyston Park & Ride (the Reference Case). The exception to this is Option 3 (Kirkintilloch Bus Hub) and Option 6 (Kirkintilloch/Lenzie Loop Bus) which cannot be assessed using CSTM12.

### 5.7.3 Demand Analysis

Based on the model output, analysis has been undertaken of car (highway) and passenger (public transport) matrix totals, and estimated annual boarding and alighting passenger numbers at stations, compared to the relevant Do-Minimum and Reference Case. On the whole, changes in total car and public transport numbers (i.e. as a comparison between the Do-Minimum scenario and each of the options tested) are relatively negligible and this is because these are representative of changes across the whole modelled area covered by CSTM. This does not mean however that there are not local changes in travel distribution and it has been possible to draw out some broad observations from the results of the CSTM as presented in the follow sections.

#### *Option 1: Do Minimum*

- The Do Minimum sets the baseline against which other options are compared. One observation to be noted is that CSTM12 appears to significantly underestimate the number of users at rail stations across in the study area (i.e. when compared to published ORR station usage figures). This underestimation applies across all option tests.

#### *Option 2: A803 Quality Bus Corridor Package*

- Changes in car matrix totals in a scenario with Option 2 in place are negligible.

- Changes in public transport totals in a scenario with Option 2 in place are negligible.
- Changes in station usage figures indicate that under a scenario with Option 2 in place, usage at Bishopbriggs Station drops by 5% and at Lenzie station by 4%, which could be related to the availability of a more attractive bus link on the A803 as assumed under this option.

*Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

- Changes in car matrix totals in a scenario with Option 4 in place are negligible.
- Changes in public transport totals in a scenario with Option 4 in place are negligible.
- Changes in station usage figures indicate that under a scenario with Option 4 in place, usage at Bishopbriggs Station remains the same while Lenzie shows a marginal reduction in passenger figures which may possibly be related to a transfer of trips from Lenzie rail station to a new Park & Ride on the outskirts of the village.
- A new Park & Ride in this location is estimated to generate annual patronage in the region of 46,000 (around 100 passengers during the AM peak period).

*Option 5: Bus Park & Ride adjacent to BRR*

- Changes in car matrix totals in a scenario with Option 5 in place are negligible.
- Changes in public transport totals in a scenario with Option 5 in place are negligible.
- Changes in station usage figures indicate that under a scenario with Option 5 in place, passenger numbers at Bishopbriggs and Lenzie Station drop slightly which may be due to the transfer of trips to the Park & Ride option.
- A new Park & Ride in this location is estimated to generate annual patronage in the region of 39,000 (around 120 passengers during the AM peak period).

*Option 7: Increase Parking Provision at Lenzie Rail Station*

- Changes in car matrix totals in a scenario with Option 7 in place are negligible.
- Changes in public transport totals in a scenario with Option 7 in place are negligible.
- Changes in station usage figures in a scenario with Option 7 in place are negligible.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

- Changes in car matrix totals in a scenario with Option 8 in place are negligible.
- Changes in public transport totals in a scenario with Option 8 in place are negligible.
- Changes in station usage figures indicate that with a new Woodilee Station, there would be a negligible impact on passenger numbers at Bishopbriggs and a very slight reduction in passenger numbers at Lenzie rail station.
- A new station at Woodilee is estimated to generate annual patronage in the region of 21,000 (approximately 50 passengers in the AM peak period).

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

- Changes in car matrix totals in a scenario with Option 8 in place are negligible.
- Changes in public transport totals in a scenario with Option 8 in place are negligible.
- Changes in station usage figures indicate that with a new Westerhill Station there would be a negligible impact on passenger numbers at Bishopbriggs and Lenzie rail stations.
- A new station at Westerhill is estimated to generate annual patronage in the region of 51,000 (approximately 100 passengers in the AM peak period).

5.7.4 Transport Economic Efficiency (TEE)

The economic appraisal of the various options has been undertaken using the software Transport User Benefit Appraisal (TUBA – version 1.9.5). TUBA uses a 60 year appraisal period to assess scheme costs and benefits. All of the options have been assessed for a 60 year appraisal period starting in the scheme opening year.

Tables 5.12 and 5.13 present a summary of the overall TEE outputs comparing the economic performance of options against Do-Minimum and Reference Case scenario's respectively. This is followed by analysis of individual option performance.

**Table 5.12: TEE Summary for Options vs Do-Minimum**

Totals (Values are in £000s)						
	2 – A803 QBC Package	4 – Bus Park & Ride in Vicinity of B757 / KLR	5 – Bus Park & Ride Adjacent to BRR <sup>17</sup>	7 – Increased Parking Provision at Lenzie Rail Station	8 – New Rail Station at Woodilee (with Park & Ride) <sup>18</sup>	9 – New Rail Station at Westerhill (with Park & Ride) <sup>19</sup>
<b>Environment</b>						
Greenhouse Gases	£100	£837	£823	£0	£489	£863
<b>Safety</b>						
Accidents	Considered separately – see Section 5.6					
<b>Economy (TEE)</b>						
Travel Time	£33,300	£6,437	£6,232	£9	£7,006	£13,335
User Charges	£123	-£4,379	-£4,183	£215	-£2,518	-£3,046
VOC	£964	£2,160	£2,126	£0	£1,247	£1,881
<b>Cost to Public Sector</b>						
Investment Costs	£0	£0	£0	£0	£0	£0
Operating Costs	£0	£1,363	£1,363* / £9,084	£0	£3,587 / £1,116	£4,384 / £1,116
Grant/Subsidy Payments	£0	£0	£0	£0	£0	£0
Revenues	£566	£32,472	£33,263	-£258	£25,171	£28,416
Taxation impacts	-£305	-£6,934	-£7,010	£39	-£4,881	-£6,133
Cost to Funding Agency						
<b>Economy</b>						
PVB	£34,748	£30,593	£31,250	£8	£26,515	£35,320
PVC	£1,024	£2,363	£2,363* / £10,084	£2,702	£8,810 / £6,339	£9,070 / £5,820
NPV	£33,724	£28,230	£28,887* / £21,166	-£2,694	£17,705 / £20,176	£26,250 / £29,518
BCR	33.9	12.9	13.2* / 3.1	0.003	3.0 / 4.2	3.9 / 6.1

<sup>17</sup> Note, results provided for two sub-options which results in differing operating costs; operation of bus-based Park & Ride with services provided by existing bus services\* / operation of bus-based Park & Ride with services provided by new bus services.

<sup>18</sup> Note, results provided for two sub-options; manned / unmanned stations.

<sup>19</sup> Note, results provided for two sub-options; manned / unmanned stations.

**Table 5.13: TEE Summary for Options vs Reference Case**

<b>Totals (Values are in £000s)</b>						
	<b>2 – A803 QBC Package</b>	<b>4 – Bus Park &amp; Ride in Vicinity of B757 / KLR</b>	<b>5 – Bus Park &amp; Ride Adjacent to BRR<sup>20</sup></b>	<b>7 – Increased Parking Provision at Lenzie Rail Station</b>	<b>8 – New Rail Station at Woodilee (with Park &amp; Ride)<sup>21</sup></b>	<b>9 – New Rail Station at Westerhill (with Park &amp; Ride)<sup>22</sup></b>
<b>Environment</b>						
Greenhouse Gases	£111	£48	£73	£1	-£25	£64
<b>Safety</b>						
Accidents	Considered separately – see Section 5.6					
<b>Economy (TEE)</b>						
Travel Time	£33,728	-£9,959	-£9,667	£805	-£5,846	-£3,520
User Charges	£234	-£852	-£1,435	-£37	-£47	£13
VOC	£1,075	-£133	£42	£4	-£364	-£269
<b>Cost to Public Sector</b>						
Investment Costs	£0	£0	£0	£0	£0	£0
Operating Costs	£0	£1,363	£1,363* / £9,084	£0	£3,587 / £1,116	£4,384 / £1,116
Grant/Subsidy Payments	£0	£0	£0	£0	£0	£0
Revenues	£466	£1,099	£2,735	£3	£2,129	£2,650
Taxation impacts	-£322	-£208	-£466	-£3	-£234	-£499
Cost to Funding Agency						
<b>Economy</b>						
PVB	£35,293	-£10,003	-£8,718	£769	-£4,385	-£1,561
PVC	£1,024	£2,363	£2,363* / £10,084	£2,702	£8,810 / £6,339	£9,070 / £5,802
NPV	£34,269	-£12,366	-£11,081* / -£18,802	-£1,933	-£13,195 / -£10,724	-£10,631 / -£7,363
BCR	34.5	-4.2	-3.7* / -0.9	0.3	-0.5 / -0.7	-0.2 / -0.3

<sup>20</sup> Note, results provided for two sub-options which results in differing operating costs; operation of bus-based Park & Ride with services provided by existing bus services\* / operation of bus-based Park & Ride with services provided by new bus services.

<sup>21</sup> Note, results provided for two sub-options; manned / unmanned stations.

<sup>22</sup> Note, results provided for two sub-options; manned / unmanned stations.

#### *Option 1: Do Minimum*

- The Do Minimum sets the baseline against which other options are compared.

#### *Option 2: A803 Quality Bus Corridor Package*

- The primary source of benefits derived under this option is travel time savings. This benefit is primarily borne by public transport users who will benefit from improved bus journey times.
- However, albeit lower, a level of benefit is also anticipated amongst road users who will benefit through a transfer of trips to bus, which it is assumed will result in a level of reduction on the surrounding road network, contributing to travel time savings. From detailed analysis, the majority of benefits are for commuters as opposed to business.
- Overall, based on the results of modelling, this option is estimated to deliver a strong positive BCR. Care should be taken when assessing BCR due to previously discussed modelling limitations.
- Under the reference scenario, this option performs similarly, with a marginal increase in benefits derived, potentially linked to additional journey time benefits on the road network due to the transfer of trips to the proposed Robroyston Park & Ride.

#### *Option 4: Bus Park & Ride in the vicinity of B757 / KLR*

- Analysis indicates that the main benefits generated under this option are travel time savings. Road users, as opposed to public transport users, are the key benefactors of this option. It is considered that this is because the transfer of trips to the Park & Ride assumed under this option results in reduced levels of congestion/traffic queuing within the study area, therefore delivering benefits in the form of travel time savings and reduced vehicle operating costs.
- Conversely, there is limited benefit for public transport users in monetised terms. For example, this option assumes that while there would be more people using public transport at the Park & Ride at a local level, there is no reduction in public transport time, rather just the provision of a service. There would also be user charges associated with using the Park & Ride which would have a cost implication for public transport users.
- Overall, based on the results of modelling, this option is estimated to deliver a strong positive BCR.
- However under the reference case scenario with Robroyston Park & Ride station in place, the option performs very differently and is estimated to generate a negative BCR. This is because in a situation with Robroyston station in place, there is not the same level of trips transferring to the proposed new Park & Ride at the B757/KLR (i.e. there is not the same level of abstraction of highway trips off the network as the modelling predicts that these will already have been taken by Robroyston). In other words, under the reference case scenario, the generated benefits are attributed to the Robroyston station proposal, possibly due to its accessible location from the motorway network.

#### *Option 5: Bus Park & Ride adjacent to BRR*

- Analysis of the modelling results shows that Option 5 performs very similarly to Option 4 with the main benefits derived for highway users. The level of benefit is also relatively consistent to that of Option 4, which suggests that the Park & Ride options have been modelled similarly.
- Overall, this option is estimated to deliver a positive BCR. Assuming that the Park & Ride would be served by existing bus services, this option generates a slightly higher BCR than Option 4. However, if it is to be assumed that there would be additional operating costs associated with providing and operating new bus services under this Option, a lower positive BCR than Option 4 is anticipated.

- Similar to Option 4, in a scenario with Robroyston Park & Ride in place (the reference case), the option does not perform favourably and is estimated to generate a negative BCR with benefits previously generated abstracted by the availability of the proposed Robroyston Park & Ride.

*Option 7: Increase Parking Provision at Lenzie Rail Station*

- On the whole, this option appears to have limited impact in terms of generating benefits. Although additional parking is provided, as shown by the demand analysis there appears to be little change in demand or travel distribution locally. As such, little benefit is generated.
- Instead, additional costs are generated associated with a reduction in public transport revenues associated with an increase in parking availability at Lenzie station. On the whole, it is considered that this scheme is too small to be realistically assessed by the strategic model and due to the scale of benefits, it is difficult to draw any clear conclusions.
- Under the reference case scenario, marginally higher benefits are generated. Benefits are primarily generated by improvements in travel time for public transport users (potentially due to a greater opportunity to travel by rail at Lenzie in a situation where additional parking is provided and a new station at Robroyston is in place). However, overall the impact is negligible and this option is still estimated to generate a BCR lower than 1.

*Option 8: Develop a New Rail Station at Woodilee (with Park & Ride)*

- Analysis of the TEE outputs indicates that the major benefits derived with this option is travel time savings for road users, which it is assumed is associated with a reduction in congestion on the local road network due to an increase in public transport users linked to a new rail station at Woodilee.
- There also appears to be some benefit generated for public transport users which is to be anticipated with the provision of new rail station, although this benefit is limited to consumer others and business users as opposed to commuters. Indeed it is to be noted that in comparison to Option 9 (Westerhill Park & Ride – discussed below), the level of benefit generated by travel time savings is estimated to be lower overall, and this new station is estimated to have a negative impact on public transport commuter users. One explanation for this higher travel time from Woodilee could be the increased time it could take motorists to access the site. Overall however, as indicated above, travel time savings generate a positive economic impact because of the benefits delivered to car users through reduced traffic levels on the local road network.
- Overall, this option is estimated to deliver a positive BCR under the Do-Minimum scenario.
- However, in a scenario with Robroyston Park & Ride in place (the reference case), the option does not perform favourably and is estimated to generate a negative BCR with benefits previously generated abstracted by the availability of the proposed Robroyston Park & Ride.

*Option 9: Develop a New Rail Station at Westerhill (with Park & Ride)*

- Analysis of the TEE outputs indicates that the primary source of benefits associated with a new rail station at Westerhill is travel time savings. Benefits are generated primarily for road users. As per previous, it is estimated that this is due to a reduction in local traffic and congestion associated with increased numbers using public transport. However, this option also generates benefits for public transport users who will gain from faster travel times associated with the provision of a new rail station in this location.
- Overall, this option is estimated to deliver a positive BCR under the Do-Minimum scenario.



- Similar to Option 8, in a scenario with the Robroyston Park & Ride proposal in place (the reference case), the option does not perform favourably and is estimated to generate a negative BCR with benefits previously generated abstracted by the availability of the proposed Robroyston Park & Ride.

#### 5.7.5 Summary of TUBA Results

As a comparison, the results indicate that the bus based options (Options 2, 4 and 5) are expected to generate greater positive economic benefit cost ratio than the rail based options, primarily as these options are not as costly as the rail options.

The inclusion of a new Park & Ride rail station at Robroyston however has a significant impact on the level of benefits generated by the bus and rail-based Park & Ride schemes (Options 4, 5, 8 and 9). This is because previously generated benefits are abstracted by Robroyston station, as car users are attracted onto public transport at Robroyston. As a result, it is estimated that there would be fewer passengers using the proposed bus and rail-based Park & Ride stations and any passengers of the new stations will be existing public transport users rather than people switching mode. This results in a significant public transport user dis-benefit for these options and is the primary reason for the significant differences between the PVB for these options when compared against the Do Minimum or Reference Case scenario.

The exception to the above is the A803 Quality Bus Corridor Package (Option 2) which does not appear to be impacted by the availability of a new Robroyston station and generates positive impacts in both the Do-Minimum and Reference Case scenarios.

#### 5.7.6 Economic Activity and Location Impacts

The STAG Part 2 appraisal requires an assessment of the economic activity and location impacts (EALI) of the Options. This assessment is undertaken at the local or regional level and at the wider Scottish level. The analysis is also intended to identify how impacts will be distributed across geographical locations and at differing spatial levels.

##### 5.7.6.1 Option Impacts

The link between transport investment and economic performance has been widely debated, and depends heavily upon local circumstances. Whilst there is a theoretical basis for assuming that transport improvements will lead to improved economic competitiveness, empirical evidence is less clear. At best, it appears that transport investment is one of a number of issues affecting economic performance, but is by no means the most important or critical factor. At worst, there is a risk that improved transport infrastructure may open up the local economy to more competition, and thus cause a net disbenefit to the local economy.

Overall, it is considered that each of the Options may help to support local economic development opportunities on the Kirkintilloch / Lenzie – Bishopbriggs – Glasgow corridor through a contribution of managed congestion brought about by increased accessibility and improved journey times particularly along the A803 corridor.

Option 2, through the implementation of Quality Bus measures, and Options 4 and 5 through the provision of bus-based Park & Ride facilities, may have wider economic impacts through improving public transport and accessibility to Glasgow. Option 5 would also improve public transport accessibility for trips to the study area and specifically the large employers at Westerhill Business Park, promoting further development at the Business Park.

The implementation of a bus hub in Kirkintilloch (Option 3) may have a marginal impact on the economy of Kirkintilloch through reduced congestion and improved accessibility through the town centre attributable to the rationalisation of bus stops.

Option 6 may have wider economic impacts through improving public transport access between Lenzie and Kirkintilloch, however this may be negated if the implementation of a loop bus service opens up the local economy of Kirkintilloch to more competition through improving access to the rail network and associated wider economic centres.

The increased parking provision associated with Option 7 may have wider economic benefits through improving public transport and accessibility to Glasgow and other economic centres served by the rail network.

Options 8 and 9, through the implementation of new rail stations, are likely to have the greatest economic impact through improving public transport and accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail line. The development of a new station at Westerhill (Option 9) would also be expected support local development and economic growth in the study area by improving access by rail to Westerhill Business Park.

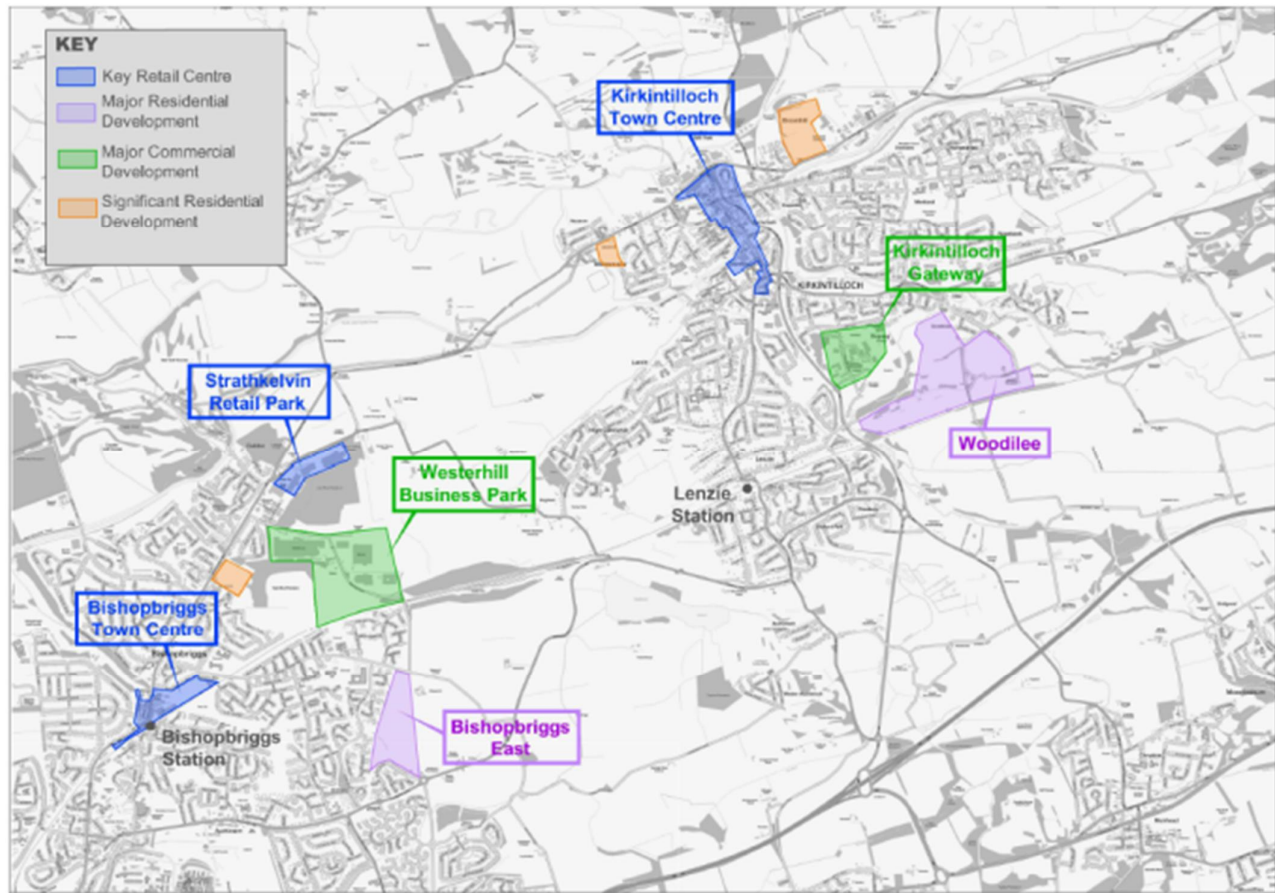
#### 5.7.6.2 Developments Likely to Benefit from Scheme Options

Although many of the proposed and committed developments within the study area are already planned to proceed, there may be some development areas where the full development potential or realisation, as well as the timing and scale of development, could be influenced by the implementation of the Options.

These developments and areas may comprise:

- Surplus Bishopbriggs Academy site: an opportunity to generate higher levels of town centre visitors; a larger town centre resident population; and improved town centre layout and environment, through the development of a masterplan which may include consideration of new convenience retail floor space; new residential development; centrally located building(s) suitable for community uses; a new central civic area; improved existing public realm; and long-stay parking provision.
- Kirkintilloch: it is the Council's aim to create strong place identity for Kirkintilloch Town Centre, increase visitor and local footfall, and attract higher levels of inward investment. Throughout the town centre this will be achieved through improvements to public realm, access and parking and business support.
- Kirkintilloch Masterplan: In addition to the general approach to improvement, the Local Plan 2 identifies an area to be the subject to a Masterplan: a mixed use, redevelopment for the area bounded to the west by the Kirkintilloch Link Road, to the north by the existing residential area around Loch Road and to the south and east by Woodilee Road. The Masterplan sets a vision for the Kirkintilloch Gateway which is to create a thriving business location with a range of high quality, flexible business units. Reflecting the location of the site, the main focus will be Class 4 and 5 business accommodation, as well as Class 6 warehousing/distribution. Such business accommodation should integrate with the adjacent housing developments.
- Strathkelvin Retail Park: Improving the range and quality of East Dunbartonshire's comparison goods retail offer at Strathkelvin Retail Park will allow East Dunbartonshire to compete more effectively with surrounding areas, including Robroyston, Cumbernauld, Clydebank and Glasgow. The Council will continue to support comparison goods retailing at this location where it has been demonstrated that these cannot be accommodated in, or on the edge of, a town centre. In particular there may be opportunities to incorporate leisure uses in order to enhance its vitality and attractiveness.
- The Strategic Industrial and Business Location at Westerhill, Bishopbriggs: the Local Plan 2 states that this location should continue to be protected and developed for economic growth. The development of ancillary land uses which support the growing business community will also be encouraged.
- Woodilee: A new 800+ housing development potentially comprising retail, nursery and commercial facilities. It is located off the A806 Kirkintilloch Link Road, southeast of Kirkintilloch, which links the development with the strategic road network.
- Bishopbriggs East – A new 200+ housing development which is located near the Glasgow City Council boundary. The BRR passes to the east of this new development site.
- New Housing Development – The Local Plan 2 identifies sites across Bishopbriggs, Kirkintilloch and Lenzie for housing development. These sites are estimated to provide at least 380 units, not including the housing units provided by Bishopbriggs East and Woodilee. The sites are scattered throughout the study area.

The location of these development areas, in relation to the study area, is displayed within Figure 5.1.



**Figure 5.1 – Key Developments in the Study Area**

#### 5.7.6.3 Property Related Impacts at Scotland Level

STAG indicates that potential impacts of transport projects should also be examined at the national level. It is considered in qualitative terms that each of the Options studies for the Kirkintilloch / Lenzie – Bishopbriggs - Glasgow corridor will act as a fundamental 'building block' in the continuing competitiveness of East Dunbartonshire, and Glasgow, as strategic investment locations.

#### 5.7.6.4 Property Related Impacts at Regeneration Area Level

As identified within STAG 1, the study area is considered to be relatively affluent, with low levels of unemployment and high levels of car ownership, and therefore the proposed Options considered for the corridor will have limited overall impact in terms of providing greater accessibility for the more deprived and social excluded regeneration areas. Despite the relative affluence of

the study area, there is a small pocket of deprivation within Kirkintilloch in a portion of Hillhead (specifically datazones S01001512 and S01001513). This area is among the 5% most deprived areas in Scotland and scores poorly in the indicators of income, employment and health<sup>23</sup>. It is likely that this area would benefit from the increased public transport provision relating to Options 3, 4 and 6. In addition, the provision of complementary public transport, cycling and walking measures will provide a greater choice of transport, and improve local and regional accessibility. Hillhead is an area identified for regeneration under the management of a Community Planning Partnership.

There is a further area of deprivation in Lennoxton (datazone S01001546) which is also amongst the 10% most deprived areas in Scotland<sup>24</sup>. Lennoxton is located to the north of the study area and is unlikely to benefit directly from the Options being considered to any great degree due to the distance from the Options; however there may be a small positive benefit to the residents of Lennoxton in relation to Options 3 and 6.

It is very difficult to provide an estimate as to the degree of benefit for these local regeneration areas, but it will clearly depend upon the extent to which the residents of these small areas are able to access the public transport services to subsequently gain access to new employment opportunities throughout the East Dunbartonshire area, and indeed elsewhere within the wider area of Glasgow, and locations on the Glasgow – Stirling / Alloa and Glasgow - Edinburgh rail line for Options 8 and 9.

#### 5.7.6.5 Regeneration Areas

The Scottish Indices of Multiple Deprivation (SIMD) measure levels of deprivation through means of seven key indicators: housing, crime, access, education, employment, health and income. The SIMD (2012) indicate that three of East Dunbartonshire's 127 datazones were amongst the 10% most deprived datazones in Scotland. All three of these datazones are within the study area: two are adjacent to each other in the Hillhead area of Kirkintilloch and the third is in Lennoxton, as previously discussed.

Furthermore, the SIMD (2012) indicates that within East Dunbartonshire 8% of the population is classified as having income deprivation, which is below that of Scotland as a whole (13% of the population). Likewise, the level of employment deprivation is below that of the Scottish average, with 8% of the working age population in East Dunbartonshire being classified as employment deprived compared to 13% across Scotland as a whole.

The following demonstrates the percentage of the population within certain age brackets that claim key benefits in East Dunbartonshire with comparisons to the Scottish average:

- The percentage of the population aged 16 to 24 claiming key benefits in East Dunbartonshire was 9% compared to a Scottish average of 13%;
- The percentage of the population aged 25 to 49 claiming key benefits in East Dunbartonshire was 11% compared to a Scottish average of 15%; and,
- The percentage of the population aged 50 to 64 claiming key benefits in East Dunbartonshire was 12% compared to a Scottish average of 19%.

According to the Annual Population Survey<sup>25</sup> (2013), the unemployment rate for people aged 16 or over for East Dunbartonshire was 5%; this was lower than the 8% rate for Scotland as a whole.

According to the Housing Statistics for Scotland<sup>26</sup> (2013), 12% of the dwellings in East Dunbartonshire were socially rented dwellings; this was less than the average for Scotland as a whole which stood at 24%.

<sup>23</sup> <http://www.sns.gov.uk/Simd/Simd.aspx>

<sup>24</sup> <http://www.sns.gov.uk/Simd/Simd.aspx>

<sup>25</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Labour-Market/Local-Authority-Tables>

<sup>26</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Housing-Regeneration/HSfS/KeyInfoTables>

The Scottish Household Survey<sup>27</sup> (2012/2013) provides details on the number of cars available for private use by household. The results for East Dunbartonshire are as follows:

- 17% of the population had no access to a private car, compared with 31% for Scotland as a whole;
- 45% of the population had access to one car, compared with 44% for Scotland as a whole;
- 32% of the population had access to two or more cars, compared with 21% for Scotland as a whole; and
- 6% of the population had access to three or more cars, compared with 5% for Scotland as a whole.

The above statistics indicate that East Dunbartonshire, and by association the study area, is reasonably affluent when compared with Scotland as a whole. However, it is anticipated that the small pockets of deprivation in Hillhead and, to a lesser degree, Lennoxton, will seek to benefit from the transport improvements proposed for the study area, primarily by virtue of increased accessibility to job and labour market opportunities being created within and outside the study area.

## 5.8 Integration

Environment integration is considered in Section 5.3 and integration with social inclusion is dealt with in Section 5.7. Issues relating to transport, land-use and policy integration will be reviewed in this Section.

### 5.8.1 Transport Integration

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 considers the integration of different elements of the public transport network (ticketing, interchanges, timetables, inter-modal opportunities), but extends to include opportunities such as Park & Ride, and even Park and Share facilities.

It is considered that all of the Options will have a positive impact on transport integration through encouraging modal shift, with the exception of Option 7 whereby any positive impact would be negated by an increase in local traffic through populated areas as a result of additional parking at Lenzie Station.

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. Discussions with SPT have indicated that while 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:

- Option 1 (Do Minimum) may achieve improvements to integration through the implementation of travel planning and walking and cycling measures, and measures implemented through the Kirkintilloch Town Centre Regeneration strategy and Glasgow City Council City Centre Strategy, however the overall impact on transport integration is expected to be neutral.

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<sup>27</sup> <http://www.transportscotland.gov.uk/statistics/scottish-household-survey-local-area-analysis>

- Options 2 to 6, and Options 8 and 9 will have a positive impact on transport integration through the measures that they promote:
  - Quality Bus Corridor Package (Option 2): potential for improved information and signalling technology, together with a range of bus priority measures on the A803 between the Torrance Roundabout and Colston Road junction, together with improved access for pedestrians and cyclists, will improve integration between modes and reduce reliance on private car use.
  - Bus Hub (Option 3): the development of a centralised bus hub would bring bus stops closer together into an interchange area in Kirkintilloch town centre and thus improve integration of bus services and make travel by bus more attractive. In addition, it is expected that design of the bus hub would incorporate clear, accessible and wider availability of information; improved waiting facilities (which may include, for example, quantity and quality of seating, and enhanced weather protection through improved shelter); and measures such as raised kerbs and bus boarders to assist accessibility for the elderly and mobility impaired. The bus hub would aim to provide a key bus interchange location and thus the distances between boarding points for different services would be reduced. It is proposed that the bus hub facility would be located in the centre of Kirkintilloch adjacent to the main pedestrian thoroughfare and would incorporate pedestrian and cycling access improvements thereby enhancing integration between walking, cycling and bus modes.
  - Bus Park & Ride Facilities (Options 4 and 5): these would encourage people to transfer from cars to bus services for journeys to and from Glasgow. However, this may be negated by an increase in more local car trips to the Park & Ride facility and this would require to be considered appropriately at the design stage. The Park & Ride interchange sites would be designed with consideration given to quality of infrastructure, layout and information provision.
  - Kirkintilloch / Lenzie Loop Bus (Option 6): the potential new loop bus service would link key locations such as Lenzie Rail Station, Kirkintilloch town centre, Woodilee, residential areas and the Council main offices, and would be timetabled to dovetail with rail services at Lenzie Rail Station, thus significantly improving integration between bus and rail modes.
  - Increased rail station car parking at Lenzie (Option 7): this will encourage people to transfer from cars to rail services, thus improving the level of integration between the modes for longer journeys. However, this may be negated by an increase in more local car trips to the rail station and this would require to be considered appropriately at the design stage.
  - New Rail Station and Park & Ride Facilities (Options 8 and 9): these Options will encourage people to transfer from cars to rail services, and Park & Ride facilities will be provided at dedicated interchange sites. However, this may be negated by an increase in more local car trips to the Park & Ride facility and this would require to be considered appropriately at the design stage. The interchange sites would be designed with consideration given to quality of infrastructure, layout and information provision. Due cognisance would require to be given to Options which impact on the wider rail network, specifically the EGIP proposals, to ensure effective integration. In addition, there is potential to broaden the halt at Westerhill (Option 9) to include provision as a freight interchange which would aid road-rail integration, however the feasibility of doing so would require a separate technical study.

### 5.8.2 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 serious 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 the NPF.

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, East Dunbartonshire Council adopted the Local Plan 2 in October 2011. The Local Plan 2 presents a number of policies and proposals for integrating land use and transportation in East Dunbartonshire. Of particular relevance to this study are the following proposals:

- TRANS 1 – Development and Transport: the Council will take an integrated approach to development and transport with the aims of ensuring that the need for travel is reduced, that active and travel by public transport is facilitated and encouraged and the effect of air quality is ameliorated;
- TRANS 2 – Road Design Guidance and Parking Standards: Development proposals must ensure that road layout and design ensures the safety of all users;
- TRANS 4 – Rail Network and Park & Ride Facilities: the Council will support proposals which encourage extended capacity of rail infrastructure as opportunities arise; and
- TRANS 5 – Active Travel Network, the Council will develop proposals defining and enhancing a safe and comprehensive active travel network, incorporating footpaths, cycleways and bridleways.

TRANS 4 further states that *“The Council will support proposals which encourage extended capacity of rail infrastructure as opportunities arise. The Council will define and reserve sites...for new rail halts at Woodilee, Westerhill and Allander, pending an investigation... into the merits, costs and feasibility of these facilities. The Council will support the principle of expanded Park & Ride capacity, and related provision for active travel (including secure cycle storage) and convenient feeder bus services”*.

East Dunbartonshire Council is in the process of preparing a new Local Development Plan (LDP) for the area, which will replace the Local Plan 2. It is expected that the LDP will be adopted in 2016 and will guide the future use of land, set out proposals for development and provide the framework for dealing with planning applications.

**‘A Catalyst for Change’ – The Regional Strategy for the West of Scotland 2007-2021** was published in 2007 by SPT. The vision of the Regional Transport Strategy (RTS) is:

*“A world-class, sustainable transport system that acts as a catalyst for an improved quality of life for all”.*

Of specific relevance to the study area, the RTS Delivery Plan (2014-17) outlines SPT’s commitment to help deliver a new station at Robroyston and to develop proposals for a strategic Park & Ride site in conjunction with proposals for Robroyston station; together with SPT’s involvement in delivering the Kirkintilloch Masterplan.

Discussions with the Kirkintilloch Masterplan team and East Dunbartonshire Council’s local planning team have indicated that none of the Options conflict with wider land-use proposals.

The following general statements can be made in terms of overall land-use transport integration:

- The Do Minimum scenario will have a neutral impact on land-use integration through the construction of committed schemes.
- Option 2 (A803 Quality Bus Corridor Package) – This proposal has a minor positive impact on land-use integration through the implementation of quality bus measures to improve bus journey times and journey time reliability for all bus movements on the A803 corridor between the Torrance Roundabout and Colston Road junction. It is considered that this could provide improved access primarily for residents from Bishopbriggs commuting to / from Glasgow, and also potentially improve public transport access to the Strathkelvin Retail Park, Westerhill and the surplus Bishopbriggs Academy site. In addition, this Option has the potential to improve public transport access to Stobhill Hospital which is located in close proximity to the Colston Road junction. However, this Option will enhance existing levels of service provision and will not serve any new land-use areas.
- Option 3 (Bus Hub in Kirkintilloch) – This option is aimed at providing a more attractive bus system (more information, improved infrastructure) within Kirkintilloch, which is likely to attract public transport users to this mode. It is expected to have a minor positive impact on land-use integration through its support of wider regeneration plans for the town.
- Option 4 (Bus Park & Ride in the vicinity of B757 / KLR) and Option 5 (Bus Park & Ride adjacent to Bishopbriggs Relief Road) – These proposals have a moderate positive impact on land-use integration through the construction of bus-based Park & Ride facilities aimed at promoting a modal shift for commuting journeys between the study area and Glasgow, and providing access to a variety of land uses in the wider area including shopping, employment and transport. It is expected that the Park & Ride facility in the vicinity of the B757 / KLR (Option 4) would integrate with residential properties located to the east of the Link Road; and the Park & Ride facility adjacent to the BRR (Option 5) would integrate with existing and proposed residential developments in Bishopbriggs (for example, the Bishopbriggs East site). In addition, given the proximity of the large commercial / industrial units at the Westerhill business park, enhanced bus services associated with Option 5 could also offer sustainable access to Westerhill. It is understood that Transport Scotland has aspirations to implement hard-shoulder running on the M80 and, should this proposal be progressed in the future, it could complement the operation of the bus-based Park & Ride sites.



- Option 6 (Kirkintilloch / Lenzie loop bus) – This option includes a potential new loop bus service linking key locations such as Lenzie Railway Station, Kirkintilloch Town Centre, Woodilee, residential areas and the Council main offices. This Option is expected to have a moderate positive impact on land-use integration through linking Lenzie rail station to a variety of land uses in the local area including shopping, housing, education, employment and transport.
- Option 7 (Increased Parking Provision at Lenzie Station) – Through enhanced access to the rail network, this Option is expected to have a minor positive impact on land-use integration through improved access to land uses in the wider area.
- Option 8 (New Rail Station at Woodilee) – This Option is primarily aimed at residents of Kirkintilloch. It could be used specifically by those living to the east of the KLR, and would support wider development in the area. It is anticipated that this Option would have a moderate positive impact on land use integration through the provision of access to a variety of land uses in the wider area including shopping, housing, education, employment and transport.
- Option 9 (New Rail Station at Westerhill) – A rail station at Westerhill would encourage more sustainable travel to the Westerhill Business Park, which is seen as a growing economic centre. The rail station would be located adjacent to the BRR which would better enable car users to access the rail network, thus having a moderate positive impact on access to land uses in the wider area including education, employment and shopping. This option is expected to have a moderate positive impact on commuting trips to / from Glasgow, particularly for residents from Bishopbriggs (including proposed developments such as Bishopbriggs East), as well as employees from large employers such as Aviva and HarperCollins (both located in Westerhill). This Option may also encourage sustainable travel for staff and visitors to the H.M. Low Moss Prison. In addition, there is potential to broaden the station to include provision as a freight interchange which would aid economic development, however the feasibility of doing so would require a separate technical review.

Overall, it is considered that each of the Options 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 in relation to the new rail stations (Options 8 and 9), it is noted that land to accommodate these Options is safeguarded within East Dunbartonshire Council's Local Plan 2. In addition, none of the proposals conflict with any other existing or planned development.

It is understood that North Lanarkshire Council is considering a Park & Ride facility at the Hornshill Junction within its City Deal bid, and due cognisance would require to be given to this proposal should Option 4 emerge as a preferred scheme.

### 5.8.3 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 1 and Pre-Appraisal stages of this study and no conflicts have been identified. A brief overview of key transport planning policies is provided below, together with consideration of wider Government policies.

In addition, a Planning Appraisal Framework (PAF) was used as part of the Initial Appraisal, to assess and demonstrate the contribution of each option to meeting current Scottish Government transport policy objectives. This has been refreshed in light of the STAG 2 appraisal, and is presented within Appendix H.

At a regional level, the **SPT RTS** supports a wealthier, fairer, healthier, safer, stronger, smarter, greener Scotland. It is considered that each of the Options 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 Options 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 Competitiveness 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.

*Schedule 4 – Public Transport Corridors and the Range of Potential Options for Public Transport Step-Change* of the SDP identifies 14 public transport radial corridors across the city region (all of which converge on the city centre of Glasgow), as well

as a range of potential broad-level strategic options and interventions which could meet the need for step-change. Specifically, corridor R2 includes the A803 corridor:

- Corridor R2 – Bishopbriggs / Kirkintilloch / Kilsyth: potential public transport change options along this corridor are to improve core bus frequencies and routing. In addition, Kirkintilloch is identified as a strategic centre due to its historic town centre with strong civic, community, cultural and visitor functions. In order to support this role in the future, opportunities to deliver regeneration (investment in the quality of the public realm) and to improve the range and quality of the retail offer are identified.

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<sub>2</sub> emissions should be reduced by at least 26% of their 1990 baseline levels. It is considered that each of the Options, through the promotion of public transport, 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 Option 2 (Quality Bus Corridor), Option 3 (Bus Hub) and Option 6 (Loop Bus), for example high access kerbs, shelters, tactile paving and information provision. The new Park & Ride and station facilities (Options 4, 5, 8 and 9) 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. Option 7 (Increased Parking Provision at Lenzie Station) 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 **EDC Joint Health Improvement Plan (2013-2016)** sets out the commitment of East Dunbartonshire Council, East Dunbartonshire Community Health Partnership and partners to work together to improve the health and wellbeing of people living in East Dunbartonshire and to reduce health inequalities throughout the area. The relevant high level outcomes which the Options contribute to are as follows:

- Improve active travel infrastructure (all Options through the provision of sustainable transport and / or sustainable access measures);
- Improve access to training and employment opportunities (all Options through increased access to, and / or extension of, public transport provision);
- Increase community safety (all Options through the promotion of public transport); and
- Improve transport infrastructure to improve access to health, leisure services and employment (all Options).

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

- Do Minimum – minor / negligible impact on policy integration through the implementation of measures such as travel plans and sustainable travel policies, together with proposals for the Kirkintilloch Town Centre Regeneration and Glasgow City Council City Centre Strategy, which will encourage modal shift.
- All Options promote sustainability and reduce the need to travel to varying degrees through the provision of Quality Bus measures, Park & Ride facilities, new rail stations, new bus services, improved interchange facilities and improved access to existing public transport facilities, all of which could encourage modal shift and assist in achieving a healthy, prosperous and inclusive society.

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

- **Disability** – The design of the Park & Ride facilities (Options 4 and 5), new rail stations (Options 8 and 9) and bus hub (Option 3) 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 quality bus measures (Option 2) and bus service improvements / new bus services (Option 6) would also assist in providing easier access to bus services for the mobility impaired through low-floor vehicles and bus boarders. The increased parking provision at Lenzie rail station (Option 7) would be designed to take due cognisance of the Equality Act 2010 and there would be potential to combine with any works to make the station more accessible (current footbridge with stairs only);
- **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, albeit the impact of this may be negated in relation to Option 7 if increased parking at Lenzie Rail Station results in additional traffic on local roads;
- **Rural affairs** – The Options 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 Options, except Option 7, 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 Options 3 and 6 would perform best in this regard, by improving access to the public transport network for those residing within the Hillhead area of Kirkintilloch.

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

#### 5.8.4 Summary

Table 5.14, on the following page, provides a summary of the performance of each Option against the STAG Integration criteria.

Table 5.14: Performance Against STAG Criteria: Integration

STAG Part 2 Options										
Integration Criteria	Integration Sub-Objective	1 – Do Minimum	2 – A803 QBC Package	3 – Bus Hub in Kirkintilloch and Associated Measures	4 – Bus Park & Ride in Vicinity of B757 / KLR	5 – Bus Park & Ride Adjacent to BRR	6 – Kirkintilloch / Lenzie Loop Bus	7 – Increased Parking Provision at Lenzie Rail Station	8 – New Rail Station at Woodilee (with Park & Ride)	9 – New Rail Station at Westerhill (with Park & Ride)
Transport Interchanges	Services and Ticketing	0	+1	+2	+2	+2	+2	0	+1	+1
	Infrastructure and Information	0	+2	+2	+2	+2	+2	+1	+2	+2
Land-Use Integration	-	0	+1	+1	+2	+2	+2	+1	+2	+2
Policy Integration	-	0	+2	+2	+2	+2	+2	+1	+1	+1
Summary Rational for Scoring		Overall neutral impact on integration through implementation of committed schemes.	QBC measures expected to improve integration between modes and reduce car use. Will enhance existing levels of service provision but not serve new land-use areas. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	Enhances integration between walking, cycling and bus modes. Supports wider regeneration plans for Kirkintilloch town centre. Improves accessibility for socially excluded and those without car access. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	Encourages transfer of trips from car to bus. Integrates with residential development at Woodilee and to east of KLR. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	Encourages transfer of trips from car to bus. Integrates with existing and proposed residential development e.g. Bishopbriggs East. Provides sustainable access to Westerhill business park. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	Enhances bus – rail integration, linking key land use destinations. Improves accessibility for socially excluded and those without car access. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	Encourages transfer of trips from car to rail for longer journeys but impact may be negated by increase in more local car trips to Lenzie station. Improves access to 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, but impact negated if increased parking results in increased traffic on local roads. Maximises use of existing infrastructure.	Encourages transfer of trips from car to rail. Improves access to 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, but impact negated if increased parking results in increased traffic on local roads. Land safeguarded in Local Plan 2.	Encourages transfer of trips from car to rail. Improves access to Westerhill business 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, but impact negated if increased parking results in increased traffic on local roads. Land safeguarded in Local Plan 2.

## 5.9 Accessibility and Social Inclusion

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.

### 5.9.1 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.

#### 5.9.1.1 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 Express services with limited stops to Glasgow. The STAG 1 report provides details of bus service provision within the study area, and a summary of services is provided within Table 5.15.

**Table 5.15: Bus Service Provision within Study Area<sup>28</sup>**

Mode	Bishopbriggs town centre and rail station	Lenzie town centre and rail station	Kirkintilloch	Surrounding towns	Key trip generators
<b>Bus</b>					
Bus Supply	147 to Scotstoun, every 30mins AM 27 and 24 (Kirkintilloch, Bishopbriggs)-Glasgow, hourly 88 (A,C) Kirkintilloch/ Bishopbriggs – Glasgow, every 15mins (30mins Sunday) 142 Bishopbriggs Auchinairn/Westerhill, every 40mins 147 Scotstoun-Bishopbriggs, limited service 57, 57A – Westerhill/Auchinairn-Glasgow, every 15min (every 20min on Sundays)	178 to Kirkintilloch / Moodiesburn, hourly X81 Woodhill-Glasgow, every 30mins, Mon-Fri 72 Glasgow-Lenzie / Kirkintilloch - hourly	X85, X86, X87 to Glasgow – between every 12min and hourly Mon-Sat 47/47A Milngavie-Monklands Hospital via Kirkintilloch, every 30mins 84 Twechar-Kirkintilloch, hourly 88 (A,C) Kirkintilloch/ Bishopbriggs – Glasgow, every 15mins (30mins Sunday) 72 Glasgow- Lenzie / Kirkintilloch - hourly 27 and 24 (Kirkintilloch, Bishopbriggs)-Glasgow – hourly 178 to Kirkintilloch / Moodiesburn, hourly	84 Twechar Kirkintilloch 344 Twechar-Croy Station, AM and PM Twechar, hourly Sunday 47/47A Torrance	142 / 57 Westerhill, X81 Woodhill (although does not penetrate the residential estate)

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. However, bus operator consultation and journey time surveys indicate some services on the A803 are subject to significant journey time variability during peak times due to high levels of traffic and queuing which affect journey times and reliability thus reducing the attractiveness of bus as mode of transport along this corridor during peak periods.

Within Kirkintilloch town centre, evidence gathered through the STAG Part 1 consultation process indicated that bus stops are not conveniently located and do not support integration between services, thus making travel by bus and bus-to-bus interchange unattractive to users. It has been identified that bus journey time reliability on the A806 is an issue, particularly during peak times. The lack of information on available bus services operating through Kirkintilloch town centre was also raised as a recurring theme during consultation.

<sup>28</sup> As at February 2014

Bishopbriggs and Lenzie rail stations are located within the study area, in addition to the proposed stations at Westerhill and Woodilee, as shown in Figure 5.2. These stations are both situated on the Edinburgh - Glasgow line. They provide direct services between East Dunbartonshire, Glasgow, Stirling, Dunblane and Alloa. A small number of direct services operate between the stations and Edinburgh via the Falkirk line during peak travel periods. Table 5.16 summarises rail service provision.

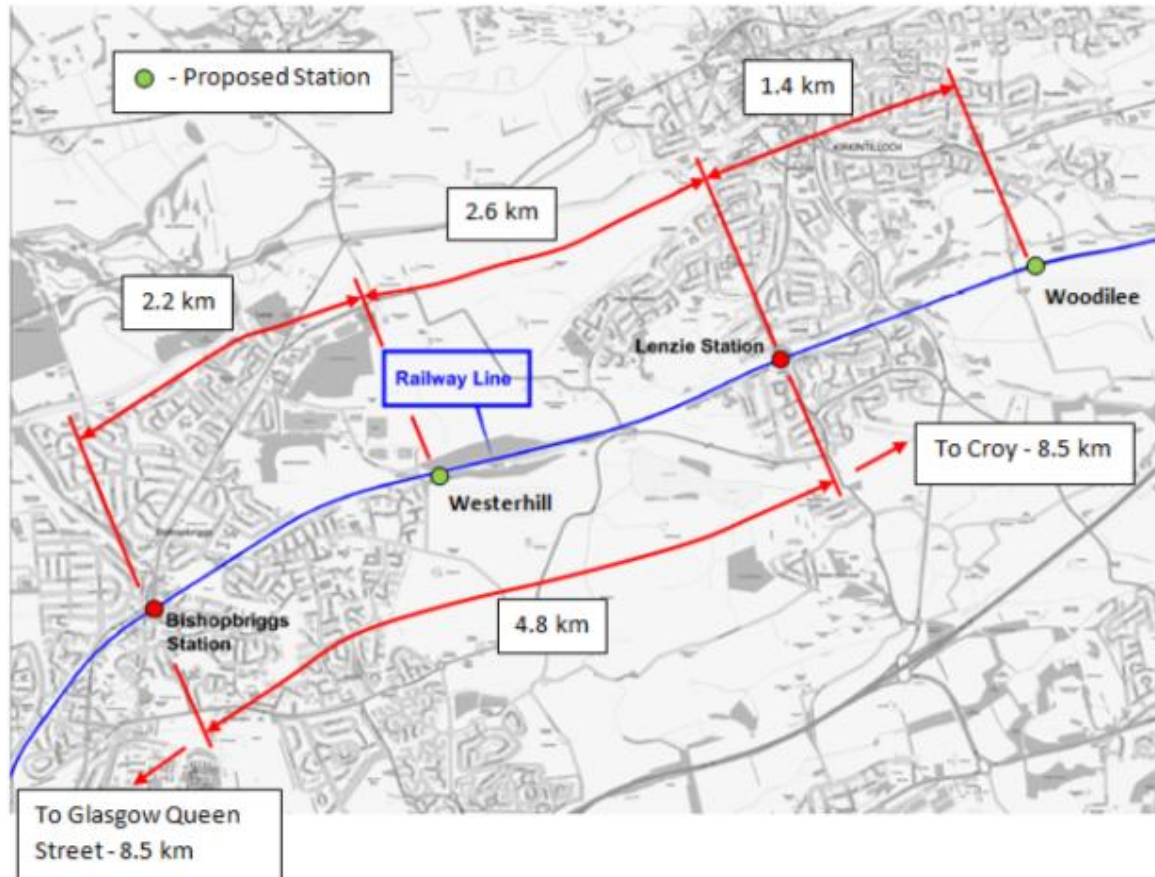


Figure 5.2 – Location of Bishopbriggs and Lenzie Rail Stations in relation to proposed stations



**Table 5.16: Rail Service Provision within Study Area**

Rail	Bishopbriggs	Lenzie	Kirkintilloch	Surrounding towns and other trip generators
Rail Supply	Existing rail service, served by Stirling/Alloa-Glasgow trains, and Edinburgh-Glasgow via Falkirk High trains (limited stop)  Approx. 2 direct train services per hour to Glasgow off peak, up to 4 during peak. Hourly in the evenings and Sundays.  Journey time to Glasgow 8-11 minutes	Existing rail service, served by Stirling/Alloa-Glasgow trains, and Edinburgh-Glasgow trains (limited stop)  Approx. 2 direct train services per hour to Glasgow off peak, up to 6 during peak. Hourly in the evenings and Sundays.  Journey time to Glasgow 13-16 minutes	Not connected to the rail network.  Closest rail connections via Bishopbriggs (15min journey by First service 27) or Lenzie (7 min journey by First service X87/X85). Also only 5.6 miles to Croy rail station (although no direct bus), or 8.2miles to Milngavie and 25min bus journey (Henderson Travel 47).  Comparable service levels to Glasgow from Croy and Milngavie.	Not connected to the rail network.  Closest rail stations – Bishopbriggs, Lenzie, Croy, Milngavie.  E.g. Torrance - 13min journey time by bus (First Glasgow 89B) to Bishopbriggs rail station, or 17min journey by bus (Henderson Travel 47) to Milngavie station.
Rail Demand	ORR data – rail station usage forecasts, rising demand at Bishopbriggs and continuing to grow.	ORR data – no significant growth in usage at Lenzie.	ORR data – growing demand at both Milngavie and Croy stations, but no significant growth at Lenzie.	ORR data – growing demand at Bishopbriggs, Milngavie and Croy stations but no significant growth at Lenzie.
Evidence of Issues	Standing room only on peak trains to Glasgow <sup>29</sup> .  No parking at Bishopbriggs rail station but no evidence that this is acting as a constraint – adjacent free, public car park (at Bishopbriggs public park, 5 mins walk from station) is under-utilised).  May be some rail-related parking on adjacent residential streets primarily Brackenbrae Avenue (EDC Parking Strategy 2008)	Standing room only on peak trains to Glasgow.  Existing car parks at Lenzie (some 149 spaces) are full after the weekday peak and may be acting as a deterrent to further rail growth.  SPT surveys <sup>30</sup> suggest a lower than average proportion of drivers using Lenzie rail station park at the official car park, citing lack of available space as a reason.  Woodilee Transport Assessment suggests that Lenzie Station is "well used, with the car park being always full and parking demand overspilling onto the surrounding residential streets".	Anecdotal - lack of parking at Lenzie means some prefer to drive to Milngavie or Croy to use rail services and Park & Ride.  Direct bus services are available from Kirkintilloch to both Bishopbriggs and Lenzie rail stations. Frequency of rail services during the peak mean that timetable integration is not a major issue. May be more of an issue inter-peak / off-peak.	Anecdotal - lack of parking at Lenzie means some prefer to drive to Milngavie or Croy to use rail services and Park & Ride.  Direct bus services are available from some settlements to rail stations in the study area, although Milngavie may be more accessible depending on location.

<sup>29</sup> In addition, the Network Rail Scotland Route Utilisation Strategy Generation 2 (June 2011) states that "the morning peak arrivals at major centres can often experience load factors in excess of 100 per cent as they serve both interurban and local commuter markets. This occurs on the approach to both Glasgow and Edinburgh." It should also be noted that data from the model development report for CSTM, which derives rail demand based on amongst others travel diary and ticketing data, lists Stirling in to GQS as one of most congested parts of the network.

<sup>30</sup> Park & Ride in the SPT Area: Results from 2013 User Surveys

Overall, East Dunbartonshire has experienced considerable growth in rail patronage over recent years, and the Office of Rail Regulation (ORR) rail station usage forecasts expect demand at Bishopbriggs to continue to grow. Investment in infrastructure enhancements, including the extension of platform lengths at Bishopbriggs rail station, has both supported and attracted rail patronage. Although patronage growth at Lenzie rail station has been low in comparison to other stations, it is East Dunbartonshire's second busiest station and primarily serves a large area of population (Lenzie and Kirkintilloch). Growth at this station may be constrained due to the lack of available car parking for rail passengers to use, especially during the inter-peak travel period and in comparison to that provided at Croy rail station. Anecdotal evidence gathered during stakeholder consultations undertaken during STAG 1 and STAG 2 suggests that existing car parks at Lenzie (some 149 spaces) are full after the weekday peak and may be acting as a deterrent to further rail growth.

There is no rail station within Kirkintilloch and lack of parking at Lenzie means some prefer to drive to Milngavie or Croy to use rail services and Park & Ride. Direct bus services are available from Kirkintilloch to both Bishopbriggs and Lenzie rail stations and the frequency of rail services during the peak mean that timetable integration is not a major issue. However, it is anticipated that the associated journey and interchange times do not make this an attractive travel option, particularly during inter-peak / off-peak times when the rail service is limited to half-hourly.

It is considered that each of the Options 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:** for rail-based options (Options 7, 8 and 9) the number of people able to access local and city centre employment opportunities will increase, given the speed and capacity characteristics of rail versus other modes. This could lead to increased demand for rail. Options 8 and 9, through the construction of new rail stations would increase public transport network coverage. The implementation of Quality Bus measures (Option 2) would improve bus journey times and journey time reliability for both local trips and also commuter trips to / from Glasgow via the A803, albeit there would be no increase in level of public transport coverage. The development of a bus hub in Kirkintilloch (Option 3) could assist in reducing town centre congestion through the centralisation of bus stop locations, and would improve bus journey times and journey time reliability for local trips, albeit, again, there would be no increase in public transport coverage. The implementation of bus-based Park & Ride (Options 4 and 5) would increase the attractiveness of bus as a mode of transport for commuting trips to / from Glasgow and would potentially remove pressure from the rail network and assist in alleviating Lenzie Rail Station parking difficulties. The introduction of a Kirkintilloch / Lenzie loop bus service (Option 6) would increase public transport network coverage and improve access to Lenzie rail station, thereby increasing the number of people able to access local and city centre employment opportunities. Furthermore, the loop bus service would assist in improving access to employment opportunities within Kirkintilloch town centre, both for those who would make the journey entirely by bus and those who would interchange with rail services at Lenzie.

**Environmental:** public transport, particularly rail transport, has significant potential to lower CO2 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 Park & Ride facilities associated with Options 4, 5, 8 and 9. The absence of these 'complementary factors' would reduce the attractiveness of any Park & Ride facility.

In terms of decongestion and environmental benefits, evidence has suggested that the impact associated with the provision of Park & 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<sup>31</sup>. This is also considered relevant in terms of bus-based Park & Ride sites.

#### 5.9.1.2 Access to Local Services

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

The Do Minimum is expected to have a minor positive impact on walking and cycling access to local services through the implementation of walking and cycling measures through, for example, the Kirkintilloch Town Centre Regeneration plans and the implementation of other local sustainable travel policies.

Options 2 and 3 may promote further non-motorised trips to access local services through the provision of quality bus measures and improved public transport provision. This, together with complementary measures to improve accessibility for pedestrians and cyclists, is expected to provide minor positive benefits. The bus improvements associated with the loop service (Option 6) will also be of benefit in improving access to local services, particularly within Kirkintilloch and providing linkages to Lenzie. 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 rail station, and Option 6 is anticipated to provide a moderate positive impact in this regard. In addition, Options 4, 5, 8 and 9 may also promote non-motorised access to local services through the provision of a Park & Ride facility.

There are no anticipated issues relating to severance for pedestrians or cyclists as a result of implementation of any of the proposed Options. The new Park & Ride facilities (Options 4, 5, 8 and 9) 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 Options, and availability of cycle parking will be considered in the design of Options 4, 5, 7, 8 and 9.

Overall the impact on local accessibility is expected to be minor positive for the Do Minimum. The net impact for the other Options is likely to be minor to moderate positive, with the exception of Option 7 whereby the net impact is likely to be neutral due to the impact of increased levels of traffic on local roads negating any accessibility benefits to pedestrians and cyclists.

#### 5.9.2 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.

##### 5.9.2.1 Distribution of Impacts by People Group

The Socio Economic analysis undertaken within the Pre Appraisal and STAG Part 1 reports examined a number of measures of social exclusion and concluded that the study area is largely affluent when compared to the rest of Scotland and the U.K.

Key highlights are as follows:

- Unemployment within the study area is relatively low, compared to levels within Scotland and the U.K.;

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<sup>31</sup> STAG Technical Database, Section 11.6.4

- Employment within the study area is skewed towards highly skilled occupations and industries - the health, education and financial services are the largest employers;
- Workers within the EDC area enjoy above average level of wages;
- The study area experiences high levels of car ownership; and
- Most of the study area has been classified as having the lowest levels of deprivation in Scotland.

The pressing issue in terms of the socio-economic make-up of the study area is that car ownership is particularly high. This is an indicator of the other trends uncovered in the analysis towards highly skilled employment, above average wages and low overall deprivation. The result of this high level of car ownership and employment centred in Glasgow is that the private car is the most popular mode of travel along the A803 Corridor.

Despite being a generally affluent area, the Scottish Index of Multiple Deprivation (SIMD 2012)<sup>32</sup> shows there are certain pockets in the study corridor (particularly around Kirkintilloch) where the level of deprivation is between the 20-40% National 2012 Quintiles. These households would benefit from improved walking, cycling and public transport access to services and employment opportunities.

Table 5.17 summarises the age, gender and limiting long-term illness statistics for key standard Census wards within the study area, compared to statistics for East Dunbartonshire and Scotland.

**Table 5.17: Age, Gender and Long-term Health Problem or Disability Ratios within the Study Area**

Ward	Age (years)			Gender		Long-Term Health Problem or Disability		
	%	%	%	% Male	% Female	Day-to-day activities limited a lot	Day-to-day activities limited a little	Day-to-day activities not limited
	0-15	16-64	65+					
Lenzie and Kirkintilloch South	17.3%	63.8%	18.8%	48.9%	51.1%	7.6%	9.5%	82.9%
Kirkintilloch East and Twechar	19.0%	65.4%	15.6%	48.4%	51.6%	11.2%	10.2%	78.6%
Campsie and Kirkintilloch North	17.0%	65.2%	17.7%	47.8%	52.2%	9.5%	9.4%	81.1%
Bishopbriggs South	17.8%	65.3%	17.0%	47.8%	52.2%	8.6%	9.8%	81.7%
Bishopbriggs North and Torrance	17.0%	61.4%	21.6%	48.4%	51.6%	7.4%	9.6%	83.0%
East Dunbartonshire	17.8%	62.7%	19.5%	48.2%	51.8%	7.8%	9.5%	82.6%
Scotland	17.3%	65.9%	16.8%	48.5%	51.5%	9.6%	10.1%	80.4%

<sup>32</sup> <http://www.scotland.gov.uk/Resource/0041/00410724.pdf>

As indicated within Table 5.17, the Bishopbriggs North and Torrance ward displays a higher proportion of population aged over 65 years (21.6%), when compared to the average for East Dunbartonshire (19.5%) and Scotland (16.8%). In addition, the ward of Kirkintilloch East and Twechar contains a higher proportion of population under 16 years (19.0%), when compared to the average for East Dunbartonshire (17.8%) and Scotland (17.3%).

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

The Kirkintilloch East and Twechar ward displays a lower level of population whose day-to-day activities are not limited due to a long-term health problem or disability (78.6%) when compared to the statistics for East Dunbartonshire (82.6%) and Scotland (80.4%).

Overall, the Do Minimum is expected to have a minor positive impact through the implementation of local sustainable travel policies.

It is considered that Options 2, 4, 5, 8 and 9 would have a minor positive impact in terms of tackling the problem of private car use by encouraging a modal shift towards public transport and 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. In addition, households located within the small pockets of deprivation in Kirkintilloch would particularly benefit from improved access to services and employment opportunities afforded by Options 3 and 6, and these Options are therefore expected to have a moderate positive impact in this regard.

Option 7, however, would be anticipated to bring a slight increase in access to rail services to those who own a car only; therefore, this Option is expected have an overall neutral impact.

#### 5.9.2.2 Distribution of Impacts by Location

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

As previously discussed, a number of key developments are proposed within the study area, including a masterplan for the surplus Bishopbriggs Academy site; the redevelopment of Kirkintilloch town centre; a mixed—use redevelopment plan for the Kirkintilloch Business Gateway; improving the comparison goods retail offer at Strathkelvin Retail Park; protection and development of the Strategic Industrial and Business Location at Westerhill, Bishopbriggs; and various new housing sites across the study area. In addition, there are substantial new housing developments located at Woodilee and Bishopbriggs East. This proposed development will create growth in housing, employment, office and business accommodation, and potentially leisure facilities, and commercial and retain developments.

The A803 provides a strategic route through the study area, and a key route into Glasgow, together with the B747 and A806 (Kirkintilloch Relief Road). As previously discussed, the A803 currently experiences operational problems, particularly during peak periods, and further development in the local area would create increased congestion problems. As outlined above, the trend for increased activity is set to continue with further development within the local area. Clearly such development areas would benefit from improved accessibility brought about by improvements to public transport provision.

Figure 5.3 illustrates key development proposals in the study area, together with the location of each Option. Overall, it is expected that the Do Minimum would have a neutral impact on improving access to development and regeneration areas. It is further anticipated that Options 2, 6, 8 and 9 would have a moderate positive impact. Options 3, 4 and 5 would have a lesser impact, but a minor positive impact overall. It is expected that Option 7 would bring a slight increase in access to rail services for those who own a car, but is unlikely to provide improved access to development and regeneration sites and thus this Option is expected to have a neutral impact.

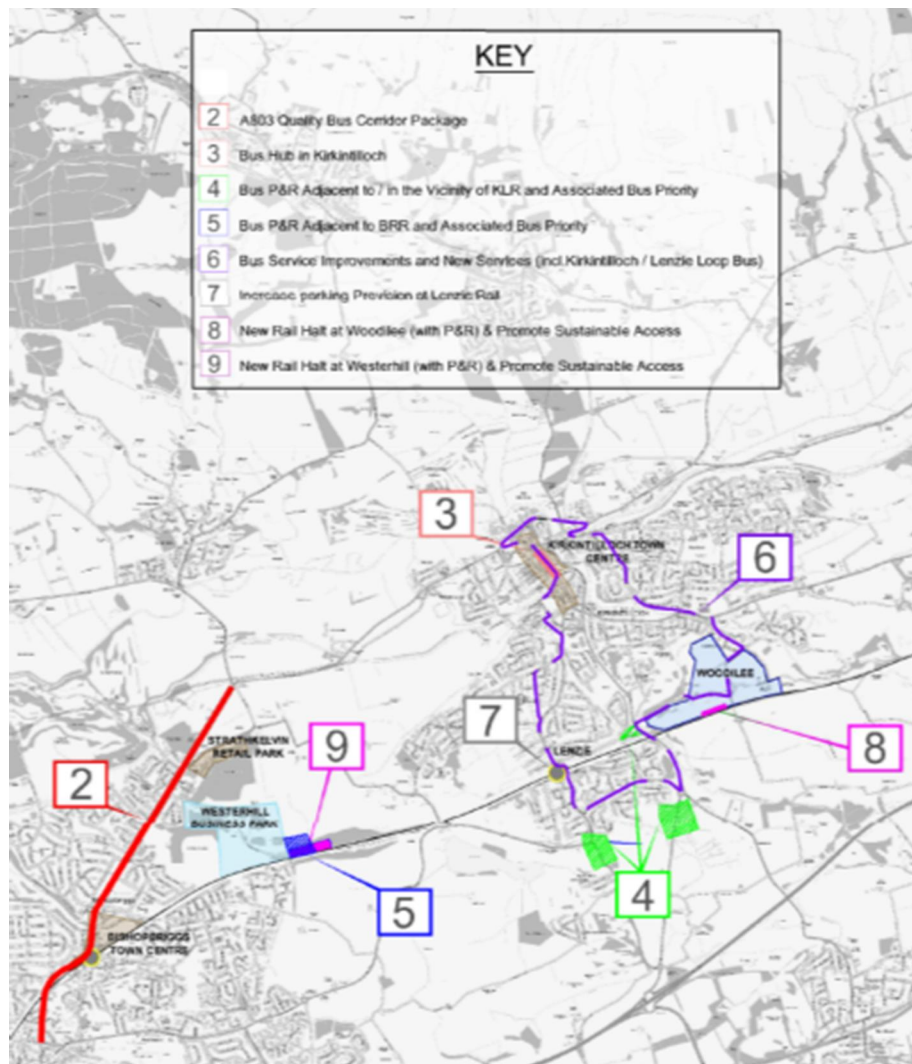


Figure 5.3 – Key Development Proposals and Option Locations

### 5.9.3 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 was undertaken at STAG 1. The EQIA has been refreshed in light of the Options being considered at STAG 2, and is presented within Appendix G. Overall, it is considered that the Options presented at STAG 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 along the study corridor thus benefiting all groups.

### 5.9.4 Accessibility Mapping

Accessibility mapping has been produced for those Options which involve a change in levels of public transport accessibility, namely the bus-based Park & Ride Options (Options 4 and 5), the loop bus (Option 6), and the new rail stations (Options 8 and 9), using Accession software. For these Options, the accessibility mapping shows the existing accessibility and the future accessibility should each Option be implemented. The accessibility mapping considers walking, bus, and train as modes of travel but not the private car. The accessibility mapping is provided in Appendix I and a summary of the main results is as follows:

#### Option 4:

- The proposed locations for the Park & Ride site adjacent to the B757 are adjacent to existing bus stops so this Option does not improve accessibility from this location. However, this Option would make the bus more accessible for those who live at a distance from this location and could drive to the Park & Ride site (albeit this is not shown on the accessibility mapping as private car is not considered as a mode of travel). For example, it may be attractive for those living in Kirkintilloch and Lenzie, who are not within a 10-minute walk of an express service to Glasgow, to drive to the Park & Ride site to use such an express service.
- The Park & Ride facility adjacent to the KLR with the X86 services stopping at the site would improve accessibility. As above, this Option would make the express service to Glasgow more accessible for those who live at a distance from this location and could drive to the Park & Ride site.

#### Option 5:

- The proposed location for the Park & Ride site adjacent to the BRR with a 15-minute frequency would improve accessibility from this location to Glasgow City Centre and the west and north west of the City Centre.

#### Option 6:

- The proposed bus loop service increases accessibility from Lenzie rail station to the east of Kirkintilloch (and vice versa); the area of Hillhead for example, which is included in the 5% of most deprived areas in Scotland.

#### Option 8:

- It should be noted that within the accessibility mapping there appears to be an existing accessibility by rail from Woodilee. This is due to the software considering that one could, in theory, walk from Woodilee to Lenzie and then use a train for their onward journey. However, due to the distance involved this is unlikely to be attractive.

- The proposed rail station at Woodilee improves accessibility to Croy, Lenzie, Bishopbriggs and Glasgow city centre. These locations are currently accessible by bus (as can be seen in Drawing-008-002, Appendix I) but travel by rail would improve journey times to Glasgow city centre by approximately 10 minutes, Bishopbriggs by 15 minutes and Lenzie by 5 minutes. The new station would be particularly accessible from the Woodilee development which is not currently well served by public transport.

Option 9:

- As is the case with Option 8, within the accessibility mapping there appears to be an existing accessibility by rail from Westerhill. This is due to the software considering that one could, in theory, walk from Westerhill to Bishopbriggs and then use a train for their onward journey. However, due to the distance involved this is unlikely to be attractive.
- The proposed rail station at Westerhill improves accessibility to Croy, Lenzie, Bishopbriggs and Glasgow city centre. These locations are currently accessible by bus (as can be seen in Drawing-009-002, Appendix I) but the train would improve journey times to Glasgow city centre by approximately 10 minutes, Bishopbriggs by 5 minutes and Lenzie by 20 minutes. The Westerhill station would be accessible by foot for those living in proximity of Wester Cleddens Road and the Westerhill business park is within a 5- to 15-minute walk from the proposed station.

#### 5.9.5 Summary

Table 5.18, on the following page, provides a summary of the performance of each Option against the STAG Accessibility and Social Inclusion criteria.



Table 5.18: Performance against STAG Criteria: Accessibility and Social Inclusion

STAG Part 2 Options										
Accessibility and Social Inclusion Criteria	Accessibility and Social Inclusion Sub-Objective	1 – Do Minimum	2 – A803 QBC Package	3 – Bus Hub in Kirkintilloch and Associated Measures	4 – Bus Park & Ride in Vicinity of B757 / KLR	5 – Bus Park & Ride Adjacent to BRR	6 – Kirkintilloch / Lenzie Loop Bus	7 – Increased Parking Provision at Lenzie Rail Station	8 – New Rail Station at Woodilee (with Park & Ride)	9 – New Rail Station at Westerhill (with Park & Ride)
Community Accessibility	Public Transport Network Coverage	0	0	0	+1	+1	+2	0	+2	+2
	Access to Other Local Services	+1	+1	+1	+1	+1	+2	0	+1	+1
Comparative Accessibility	Distributional / Spatial Impacts by Social Group	+1	+1	+2	+1	+1	+2	0	+1	+1
	Distributional / Spatial Impacts by Area	0	+2	+1	+1	+1	+2	0	+2	+2
Summary Rational for Scoring		Minor impact on walking and cycling access to local services through implementation of committed walking and cycling measures.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers enhanced service provision but no increase in PT network coverage. Increases accessibility to development areas e.g. Bishopbriggs Academy site, Strathkelvin Retail Park. No severance issues.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers enhanced service provision but no increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee. Pockets of deprivation in Kirkintilloch would benefit from increased access to services and employment opportunities. No severance issues.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee. No severance issues.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Bishopbriggs East, Westerhill. No severance issues.	Increases accessibility by PT, realising key benefits for those without access to a private car. Offers increase in PT network coverage and sustainable access to key services, employment and facilities and provides linkage to rail network. Increases accessibility to development areas e.g. Woodilee. Pockets of deprivation in Kirkintilloch would benefit from increased access to services and employment opportunities. No severance issues.	Increases accessibility by PT, realising key benefits for those who choose not to travel by car for their whole journey. Offers no increase in PT network coverage. Increases in traffic on local roads as a result of additional parking may create severance for pedestrians and cyclists.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee. No severance issues.	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Bishopbriggs East, Westerhill. No severance issues.

### 5.10 Costs to Government

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.

#### 5.10.1 Capital Costs

Table 5.19, below, provides outline capital cost estimates associated with each Option.

**Table 5.19: Capital Costs**

Option	Capital Cost (based on specified assumptions and estimated uncertainty - / +30%)	Optimism Bias			Estimated Timescale for Implementation
		Rate	Applied to estimating uncertainty - / +30%	Applied to base cost	
	(£)	%	(£)	(£)	
Option 1 – Do Minimum	Committed Funding				Ongoing
2 – A803 QBC Package *	630,000 - 1,170,000	44%	907,200 - 1,684,800	<b>1,296,000</b>	36 months
3 – Kirkintilloch Bus Hub	105,000 - 195,000	44%	151,200 - 280,800	<b>216,000</b>	12 months
4 – Park & Ride in Vicinity of B757 / KLR	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
5a – Park & Ride Adjacent to BRR (served by existing buses)	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
5b – Park & Ride Adjacent to BRR (served by new services)	616,000 - 1,144,000	44%	887,040 - 1,647,360	<b>1,267,200</b>	12 months
6 – Loop Bus	7,000 – 13,000	44%	10,080 – 18,720	<b>14,400</b>	6 months
7a – Lenzie Station Parking (Surface Extension)	350,000 - 650,000	66%	581,000 – 1,079,000	<b>830,000</b>	2-3 years
7b – Lenzie Station Parking (Decking)	1,519,000 - 2,821,000	66%	2,521,540 - 4,682,860	<b>3,602,200</b>	3-5 years
8a – Woodilee Rail Station (40-50 spaces)	3,199,000 - 5,941,000	66%	5,310,340 - 9,862,060	<b>7,586,200</b>	5+ years
8b – Woodilee Rail Station (300+ spaces)	4,599,000 - 8,541,000	66%	7,634,340 – 14,178,060	<b>10,906,200</b>	5+ years
9 – Westerhill Rail Station	2,870,000 - 5,330,000	66%	4,764,200 - 8,847,800	<b>6,806,000</b>	5+ years
* There are multiple potential measures relating to the QBC package - the cost provided relates to a comprehensive and wide-ranging package of measures.					

Estimating uncertainty and optimism bias has been built into the cost estimates although do not account for land acquisition, utilities or design. These costs represent high level estimated costs based on the assumptions presented in Appendix B. Further work would be required to develop detailed cost estimates for any options taken forward.

Discussions with East Dunbartonshire Council have indicated that the capital costs of the preferred Option(s) would be funded by the public sector. In relation to the rail-based Options, in particular the Option to increase parking at Lenzie Rail Station, 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.

Table 5.19 also sets out an estimated timescale for implementation associated with each of the options, assuming no protracted local planning issues.

#### 5.10.2 Operation and Maintenance Costs

An estimate of operational costs has also been included as part of the economic appraisal although for the bus-based options in particular further discussion would be required with operators.

It is considered that the operating costs associated with the Park & Ride shuttle bus adjacent to the BRR (Option 5), and the loop bus service (Option 6) would cover most direct costs of running a bus such as staff, fuel, tax, a contribution to overheads, a nominal profit margin and an allowance for additional administration costs on the part of operators in organising the operations (assumed approximately £40 per hour), based on experience elsewhere. The operational costs have been calculated as outlined within Table 5.20, Table 5.21 and Table 5.22.

For Option 5, two potential scenarios have been considered: the first considers that all new services would be required to serve the Park & Ride site (Table 5.20), and the second considers that one existing service per hour would be diverted via the new Park & Ride site (Table 5.21).

For the loop bus service, it is assumed that two vehicles per direction are required in the peak periods (four vehicles in total) and one vehicle per direction is required in the off-peak periods (two vehicles in total).

**Table 5.20: Operating Costs Associated With Park & Ride Shuttle Bus Service Adjacent to BRR (Option 5) – Assumes All New Services**

Operating Period	Service Frequency	Estimated Number of Vehicles Required Per Hour	Estimated Total Number of Operating Hours Per Annum
0630 – 0930 hours, M-F	Every 15 minutes	4	3,200
0930 – 1600 hours, M-F	Every 30 minutes	2	1,600
1600 – 1900 hours, M-F	Every 15 minutes	4	3,200
1900 – 2200 hours, M-F	Every 30 minutes	2	1,600
0630 – 2200 hours, Saturday	Every 30 minutes	2	1,600
<b>Estimated Total Cost: £375k-£425k</b>			

**Table 5.21: Operating Costs Associated With Park & Ride Shuttle Bus Service Adjacent to BRR (Option 5) – Assumes Diversion of One Existing Service Per Hour**

Operating Period	Service Frequency	Estimated Number of Vehicles Required Per Hour	Estimated Total Number of Operating Hours Per Annum
0630 – 0930 hours, M-F	Every 15 minutes	4 (3 new services)	2,400

0930 – 1600 hours, M-F	Every 30 minutes	2 (1 new service)	800
1600 – 1900 hours, M-F	Every 15 minutes	4 (3 new services)	2,400
1900 – 2200 hours, M-F	Every 30 minutes	2 (1 new service)	800
0630 – 2200 hours, Saturday	Every 30 minutes	3 (1 new service)	800
<b>Estimated Total Cost: £250k-£300k</b>			

**Table 5.22: Operating Costs Associated With Loop Bus Service (Option 6)**

Operating Period	Service Frequency	Estimated Number of Vehicles Required Per Hour	Estimated Total Number of Operating Hours Per Annum
0630 – 0930 hours, M-F	Every 15 minutes	4	3,200
0930 – 1600 hours, M-F	Every 30 minutes	2	1,600
1600 – 1900 hours, M-F	Every 15 minutes	4	3,200
<b>Estimated Total Cost: £250k-£300k</b>			

Measures such as the bus loop service, and potentially the bus-based Park & Ride services, may require an ongoing level of subsidy to sustain their operation. Whilst assumptions have been made in relation to the frequency of bus service provision for the purposes of deriving operational costs, ultimately the level of service will be dictated by commercial viability. Further detailed work on the specification of the services would be required to ascertain the level of support needed. There may be a requirement to “man” the ticket offices associated with new stations. The rail-based Park & Ride options would also be associated with 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 stations, waiting facilities, car parking areas and access routes to an acceptable standard. The maintenance costs associated with individual Options may include, but not be limited to, the following:

- Option 2 - there will be the need for occasional road sweeping, winter maintenance and carriageway repairs associated with the Quality Bus Corridor measures, but these elements are currently undertaken for the existing corridor. For those parts of the corridor where additional lining is required, congestion by-pass lanes or bus lanes for example, there will be the occasional need for refreshing / renewing of these lines. Real time information systems, where appropriate, will require to be maintained in proper working order. It is considered however that the costs could largely be built into existing maintenance regimes.
- Option 3 - bus shelters at the new bus hub will require to be cleaned regularly and this could be added to existing contracts at minimal additional cost to the Council, together with general maintenance of signing and lining. Real time information systems and ticketing machines, where appropriate, will require to be maintained in proper working order. Again, it is considered that these costs could largely be covered by existing programmes.
- Options 4, 5, 7, 8 and 9 - car parks will require general winter maintenance such as snow clearance and gritting. The car parks will contain lighting which will require ongoing maintenance, together with general maintenance of signing and

lining. There will be maintenance costs associated with new buses required as part of Option 5. Waiting facilities at public transport stops and stations will require to be maintained to an acceptable standard, including, for example, litter removal. CCTV, real time information systems, where appropriate, will require to be maintained in proper working order.

- Option 6 involves a loop bus service with maintenance costs associated with new buses. Waiting facilities at bus stops will 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.

A summary of annual operational costs over the 60 year appraisal period is presented in Table 5.23 below:

**Table 5.23: Estimating Operation and Maintenance Costs associated with Options**

Option	Operating Cost <sup>33</sup>	Comments
Do-Minimum	£0	-
2 – QBC Package	£0	Considered that maintenance would be built into existing regimes.
3 – Bus Hub in Kirkintilloch	£0	Considered that maintenance would be built into existing regimes.
4 – Bus P&R on KLR/B757	£4,800,000	Based on estimate for a manned Park & Ride station and associated costs.
5a – Bus P&R on BRR (served by existing services)	£4,800,000	Based on estimate for a manned Park & Ride station and associated costs.
5b – Bus P&R on BRR (served by new bus services)	£32,640,000	Operating Cost based on estimate for a manned Park & Ride station and associated costs. Option also assumes for purchase of new buses (replaced every 10 years) + bus operating costs.
6 – Kirkintilloch/Lenzie Loop bus	£18,420,000	Operating cost assumes purchase of new buses (replaced every 10 years) + bus operating costs.
7a – Increased Parking at Lenzie Station – Surface Level Car Park (100 space)	£600,000	Operating cost assumes car park replacement after 25 years.
7b – Increased Parking at Lenzie Station – Decked Car Park (200 space)	£0	Assumed decked car park would not require replacement during appraisal period.
8a – Rail P&R at Woodilee (50 space)	£4,200,000 (unmanned) - £13,500,000 (manned)	Estimated operating costs for manned and unmanned rail stations.
8b – Rail P&R at Woodilee (300 space)	£4,200,000 (unmanned) - £16,500,000 (manned)	Estimated operating costs for manned and unmanned rail stations.
9 – Rail P&R at Westerhill	£4,200,000 (unmanned) - £16,500,000 (manned)	Estimated operating costs for manned and unmanned rail stations.

## 5.11 Deliverability and Public Acceptability

### 5.11.1 Deliverability

Deliverability has been a key consideration during the development of the Options. Clearly, any Option which cannot be delivered could not be taken forward.

The Option(s) taken forward should deliver transport measures to address the issues relating to high car ownership and rising levels of traffic and congestion in the study area. Furthermore, Option implementation should involve minimum disruption to the transport network and the travelling public and should also be compatible with potential long-term development strategies within the study area. Construction and operational risks associated with Option implementation should be minimised.

<sup>33</sup> Costs have been calculated over a 60 year appraisal period. Costs presented in Table 5.10 are undiscounted, but have been discounted for the purposes of the economic appraisal.

It is considered that each of the Options could, theoretically, be delivered successfully. Specifically in relation to the bus-based Park & Ride Options (Options 4 and 5), future implementation of hard-shoulder running on the M80 (currently understood to be under consideration by Transport Scotland) could enhance the attractiveness of these Options through providing improved journey times and journey time reliability during periods of high traffic volumes.

There are however, certain issues pertaining to deliverability that are worthy of mention:

- Capacity constraints on the rail network to accommodate additional stops associated with the new rail station sites – To achieve new rail stations, there could ultimately be a need for more investment (for example to increase the capacity of the track and ensure services do not interrupt Edinburgh-Glasgow services). This may involve widening to four tracks and implementing parallel slow tracks to allow overtaking, which would result in a significant undertaking (with significant additional costs).
- Should either (or, indeed both) of the new station Options be taken forward, the proposed locations should be reviewed against the infrastructure requirements of EGIP Phase 2. If EGIP Phase 2 affects the station design and is a committed scheme by that time, then it would be most cost-effective to defer the new stations to be implemented at or after EGIP Phase 2. Otherwise consideration should be given to making the stations easily modifiable for any EGIP Phase 2 requirements, for example setting the station buildings back from the platform edge and building the platforms from modular elements which allow them to be reduced in width to accommodate future slow lines.
- Resilience on rail network – The additional stopping times associated with new rail stations at Westerhill and / or Woodilee would have a detrimental impact on the resilience and capacity of the main Edinburgh - Glasgow rail line and may be viewed negatively / not supported by the rail industry. The level of impact and any associated risk would require to be discussed further with Network Rail and Transport Scotland should these Options be progressed. It is likely that these Options would need to go through the GRIP 4 process for rail investment which is a costly exercise and would not guarantee implementation support. A significant level of further expenditure will be required before a determination on the implementability of these Options can be made, and this may be abortive expenditure.
- Availability of funding – Issues relating to the commercial viability and funding of the bus-based Options, in particular the Kirkintilloch loop bus (Option 6), would require to be discussed further with bus operators and SPT. 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.”
- Completion of BRR – If roadspace priority is afforded to public transport it is possible that there may be adverse impacts on local traffic movements, particularly through already constrained networks, unless the BRR is fully completed.
- Land Acquisition – The Option to provide a new rail station at Woodilee would involve building on land which is considered to be extremely valuable. Option 4 (bus-based Park & Ride if located in vicinity of KLR) would potentially involve building on land which is not owned by East Dunbartonshire Council.
- Access Constraints – There is no clear access to a new station at Woodilee and if this option is taken forward, further investigation would be required. Considering access through the Woodilee residential area, this may be accessible for pedestrians and cyclists, but would involve private vehicles travelling through residential traffic calmed streets, and would most likely be unpopular to local residents. A route of this nature would also not be visible from the main road (i.e. the KLR) and may therefore be unattractive to potential rail users. Alternatively, access from the KLR or via Calmuir Road would involve significant construction works including potential bridge widening.
- Implementation of other Park & Ride sites – The potential Park & Ride facility at Westerhill (Option 5) would perhaps be less effective should the proposed Park & Ride facilities at Robroyston and the M80 Hornhill Junction (North Lanarkshire City Deal bid) be implemented in the future.

#### 5.11.2 Public Acceptability

In terms of public acceptability, this Section of the report seeks to anticipate any issues that may arise with implementation of the Options and predict the likely reactions of the general public against each measure. Details of the consultation undertaken during the STAG 1 process are provided within Chapter Two, and a summary of the consultation process undertaken to inform the STAG 2 is provided within Chapter Four. Appendix E contains details of the Workshops undertaken during STAG 2.

Table 5.24 presents a summary of key outcomes from the consultation exercises undertaken as part of STAG 1 and 2, with a specific focus on issues concerning the public acceptability of options.

Table 5.24: Consultation Outcomes

Option	Public Acceptability	
	Comments Gathered During STAG 1 Consultation	Additional Comments Gathered During STAG 2 Consultation
<i>A803 Quality Bus Corridor Package</i>	Implementation of the measures associated with the A803 QBC are only likely to be publically acceptable upon full completion of the BRR. If roadspace priority is afforded to public transport as part of these measures, there is a chance that some may question any adverse impacts on local traffic movements, particularly through already constrained networks.	<p>Due cognisance to be given to HGV access and parking (particularly for the mobility impaired) if sections of bus lanes are implemented. Likely to be greater public acceptability to this Option if sections of bus lane did not overly penalise motorists e.g. only operational at peak times and at key pinch points. Generally considered that any improvements to bus service provision and waiting environment would be welcome.</p> <p>General appetite for this Option amongst bus operators and transport bodies.</p> <p>If Option achieves reduced congestion levels through Bishopbriggs, it would have a positive economic impact on the town centre which would increase public acceptability.</p>
<i>Bus Hub in Kirkintilloch</i>	A bus hub in Kirkintilloch is likely to be popular with communities. However, interface with parking and traffic flow would need to be considered further, and deem if these issues may affect overall acceptability.	<p>Generally considered that simpler measures such as improved shelters and facilities, real time information at bus stops and the general creation of a more pleasant waiting environment would add greater value.</p> <p>Some concern that people would not like to walk further to a hub.</p> <p>Bus operators highlighted that essentially there are already two existing informal bus hubs in Kirkintilloch town centre for buses coming from/leaving to Glasgow: Catherine Street and Townhead, respectively.</p> <p>Care should be taken to ensure that any Option does not encourage people to travel out of Kirkintilloch to access services elsewhere, thus having a negative impact on the economic vitality of the town centre.</p>
<i>Bus Park &amp; Ride in vicinity of B757 / KLR</i>	No significant public acceptability issues are anticipated provided it does not generate additional traffic on local residential streets.	<p>No significant public acceptability issues expected.</p> <p>Localised objections to Park &amp; Ride expected depending on site selection.</p> <p>If modal shift was achieved, it was anticipated that this Option would help to mitigate rail overcrowding issues, thereby being publically acceptable.</p> <p>Option generally felt to be attractive (particularly by bus operators and transport bodies).</p> <p>Option considered attractive for commuter trips, but noted that non-peak time services are also important.</p>
<i>Bus Park &amp; Ride adjacent to BRR</i>	No significant public acceptability issues are anticipated provided it does not generate additional traffic on local residential streets.	<p>No significant public acceptability issues expected.</p> <p>Localised objections to Park &amp; Ride expected depending on site selection.</p> <p>This Option could be a driver of economic development at Westerhill and may attract other businesses into the area, which would gain public support.</p> <p>Considered that this Option may ease congestion through the A803 as it may attract residents from more remote communities (i.e. Lennoxton, Torrance, Milton of Campsie) who are travelling into Glasgow.</p> <p>The transfer of trips from car to bus would help reduce congestion on the A803 which could increase accessibility through Bishopbriggs town centre, reduce parking problems and increase access to locations such as Stobhill Hospital, all of which are publically acceptable.</p> <p>However, it was considered that bus journey times between the Westerhill site and Glasgow would be constrained by delays on the M80 and could not compete with rail, thereby raising concerns regarding the viability of this Option. Should hard-shoulder running be implemented on the M80 in the future, this may improve the deliverability of this Option.</p>
<i>Kirkintilloch / Lenzie Loop Bus</i>	Consultation revealed support for improved local bus services, particularly serving key destinations, including the Woodilee village. This measure may also release parking at Lenzie station by promoting increased sustainable access.	<p>Consultation confirmed support for more local bus services, particularly linking key destinations to Lenzie Rail Station. This could address current parking problems at the Station, albeit it was noted that existing buses do already link directly (or with one change) to Lenzie Station but people continue to drive, so it was felt unlikely that this behaviour would change significantly by implementing this Option.</p> <p>It was suggested that the bus loop could help improve access to local amenities, and provision of such a service, coupled with existing parking issues in the area, may achieve a degree of modal shift from car which would be publically acceptable.</p> <p>Some concerns expressed regarding commercial viability and funding.</p>



Option		Public Acceptability	
		Comments Gathered During STAG 1 Consultation	Additional Comments Gathered During STAG 2 Consultation
<i>Increase parking Provision at Lenzie Rail Station</i>	<i>Surface access</i>	<p>Evidence from Park &amp; Ride User Surveys<sup>34</sup> suggest that the percentage of drivers who do not use the official car park at Lenzie is relatively high in comparison to the wider SPT, with 74% of those who do not use it arguing it is too busy. Therefore, it is expected that providing additional parking spaces will be accepted by the general public.</p> <p>However, expanding the car park into designated areas / area of local importance may be questioned by Scottish Natural Heritage and local communities.</p>	<p>Some consultees suggested that increased parking provision at Lenzie would attract more traffic into the area, contributing to already existing congestion issues around Lenzie station. Additional parking could have a ‘honeypot’ effect and this would not be publically acceptable.</p> <p>The potential reduction of recreational green space associated with extending parking at the surface level was not supported.</p>
	<i>Creating a car park on a deck over Lenzie Rail station</i>	This option implies a highly visible structure, particularly if the deck bridges the track. Being adjacent to a designated area (Conservation Area and Townscape Protection Area), it may be questioned by Scottish Natural Heritage and local communities.	<p>Unlikely to gain public acceptance.</p> <p>Strong opposition to the decking Option, as it was felt it would generate a negative visual impact.</p>
<i>Develop a New Rail Station at Woodilee (with Park &amp; Ride) and Promote Sustainable Access</i>		<p>Stakeholder consultation suggested Lenzie residents may welcome an additional rail station at Woodilee to alleviate overspill car parking impacts from Lenzie rail station. However, there may be concerns that the development of a Woodilee station may be at the expense of Lenzie rail station given the short distance between the stations, and it is considered that removal of Lenzie station would not be publically acceptable given this would leave a substantial station-centred community without a rail service. Depending on access arrangements, there could be local impacts at Woodilee from traffic accessing the Park &amp; Ride site.</p>	<p>There was general support for a rail station at Woodilee to be delivered together with a Park &amp; Ride facility.</p> <p>Localised objections to Park &amp; Ride expected depending on site selection.</p> <p>Generally it was suggested that the proposed Woodilee station should be assessed as a complementary station to Lenzie. The importance of providing people with travel choices was noted.</p> <p>Some considered that there would be scope in delivering a new rail station following electrification of the rail line associated with EGIP (which will deliver faster trains).</p> <p>Concerns were raised about rail users possibly using Woodilee station instead of the other stations in the area (i.e. Lenzie and Bishopbriggs), simply to access trains before other passengers and to be able to get a seat, thus heightening problems of overcrowding down the line.</p> <p>Consideration would require to be given to potential deliverability and capacity constraints associated with implementing new stations on the Edinburgh – Glasgow rail line.</p>
<i>Develop a New Rail Station at Westerhill (with Park &amp; Ride) and Promote Sustainable Access</i>		<p>Consultation revealed support for the concept of developing a new rail station at Westerhill.</p>	<p>There was general support for a rail station at Westerhill to be delivered together with a Park &amp; Ride facility.</p> <p>Localised objections to Park &amp; Ride expected depending on site selection.</p> <p>Generally considered that providing a rail station at Westerhill would be attractive for businesses established in the area, and increased accessibility provided by the station would possibly attract other businesses to the Westerhill site, generating economic development in the area, which would be publically acceptable.</p> <p>A rail Park &amp; Ride at Westerhill could enhance access for visitors to the HM Prison at Low Moss.</p> <p>It was considered that a station in this location could alleviate parking problems in Bishopbriggs town centre, thereby having a positive impact on air quality, thus gaining public support.</p> <p>It was considered that full implementation of the BRR would enhance, but not preclude, the successful implementation of this Option.</p> <p>Consideration would require to be given to potential deliverability and capacity constraints associated with implementing new stations on the Edinburgh – Glasgow rail line.</p>

<sup>34</sup> “Park & Ride in the SPT Area: Results from 2013 User Surveys” – SPT, 2013.

Consultations with East Dunbartonshire Council have established that all Options are consistent with local policies for the area. Furthermore, consultations with the Kirkintilloch Masterplan team have indicated that the measures to create a bus hub associated with Option 3 would complement wider development proposals for the regeneration of Kirkintilloch town centre.

Transport Scotland and Glasgow City Council have queried the resilience of the rail network to accommodate new rail stations at Westerhill and Woodilee. In addition, SPT has queried the commercial viability of a loop bus service. Further work would be required to establish the feasibility and market demand for these Options, should they emerge as preferred Options.

## **5.12 Summary of Appraisal**

### **5.12.1 Option Summary Tables**

This Chapter has considered the key elements of the appraisal summarising the operational aspects and the performance of the appraised options against the five STAG criteria of Environment; Economy; Safety; Integration; Accessibility and Social Inclusion. In addition, consideration has also been given to the Costs to Government, Deliverability and Public Acceptability.

Option Summary Tables have been developed for each Option, as presented below.

Option 1 Summary Table			East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor					Option title: Do Minimum			
<b>Option description:</b> Considers impacts on local transport network if no improvements are made other than those which are committed. Assumed interventions include: BRR (up to and including phase 5); SCOOT; Kirkintilloch Town Centre Regeneration; Parking Strategy and Decriminalised Parking Enforcement; EGIP Phase 1; and GCC City Centre Strategy.			<b>Capital Costs/grant (2010 Prices)</b> <b>Annual Revenue Support (2010 Prices)</b> <b>Present Value (PV) of Cost to Government</b>								
<b>Summary of impact on the five STAG criteria</b>	<b>Impacts (Monetary and Non-Monetary)</b>							<b>Monetary only (£m)</b>	<b>Monetary impact ratio (if relevant)</b>		
		---	--	-	0	+	++			+++	
	Accessibility and Social Inclusion										
	Environment										
	Integration										
	Safety										
	Economy										
	<b>Including Wider Economic Benefits</b>									<b>NPV:</b>	<b>BCR:</b>
										<b>NPV(WEB):</b>	<b>BCR(WEB):</b>
<b>Assessment against Transport Planning Objectives</b>	TPO Target 1:	---	--	-	0	+	++	+++			
	TPO Target 2:										
	TPO Target 3:										
	TPO Target 4:										
	TPO Target 5:										
<b>Contribution toward the Government Purpose:</b> The Do Minimum comprises insufficient measures to encourage modal shift away from private car. Levels of congestion are expected to rise, with associated negative impacts on journey times and journey time reliability. Full construction of the BRR is anticipated to generate induced traffic, which would attract more vehicles into the study area in the longer-term. Insufficient improvements to public transport to support local development. Increased future road congestion, alongside insufficient measures to encourage modal shift away from private car, are key factors which will adversely affect the ability to successfully operate the Do Minimum scenario in the longer-term.											

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Minor impact on walking and cycling access to local services through implementation of committed walking and cycling measures.	<b>Technical</b>	Based on a number of committed schemes and thus considered technically feasible. There may be some disruption during construction of some elements of the Do Minimum, for example BRR. There are no untried technologies, and no associated technical risks, involved in implementation of Do Minimum.
<b>Safety</b>	Danger to pedestrians, cyclists and other drivers mitigated by improved road signage and general improvements for walking and cycling through implementation of committed schemes and Council strategies. Increased safety by reducing queuing traffic through the implementation of schemes such as BRR.	<b>Operational</b>	Increased future road congestion, alongside insufficient measures to encourage modal shift away from private car, are key factors which will adversely affect the ability to successfully operate the Do Minimum scenario in the longer-term.
<b>Economy</b>	An enhanced transport network in the study area (delivered mainly through the BRR) could support economic development through increasing the attractiveness of the area as a place to work and live, and improve the efficiency of freight and business travel. Kirkintilloch regeneration would also be expected to support local development and increase the attractiveness of the town for employment and retail.	<b>Financial</b>	Comprises measures which are committed and have funding secured. Likely to be funded through combination of developer contributions, local authority investment, SPT investment, and potentially Scottish Government support and European Funding. No operating subsidies associated with the Do Minimum.
<b>Integration</b>	Overall neutral impact on integration through implementation of committed schemes	<b>Public Acceptability</b>	Stakeholder consultation highlighted a requirement to manage congestion along the A803 corridor.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	It is likely that noise and vibration disturbance from the Do Minimum will not be significant. Impacts will likely be of greatest magnitude during the construction of new infrastructure. Given the scale of the study area, and the level to which any modal shift will be achieved from the development of the Do Minimum, global air quality is not predicted to be significantly impacted upon. Full construction of the BRR is anticipated to generate induced traffic, which would attract more vehicles into the study area. This would have a detrimental environmental impact associated with increased vehicle emissions. The development of the Do Minimum is not predicted to result in any permanent impacts on the water environment. Ground investigation / earthworks create potential for ground contamination and / or creation of pollution leakages. There is land take and habitat removal required to accommodate some interventions within the Do Minimum, and subsequently habitat for protected species such as bats, breeding birds and badgers may be lost or disturbed. The introduction of a new transport corridor (the BRR) within the landscape has potential to result in adverse effects on landscape / townscape and visual amenity of the area. Impacts on agriculture are likely to occur should new infrastructure result in loss or severance of agricultural land. Soils are also likely to be impacted where excavation is required, and / or earthworks for site establishment. Implementation of the Do Minimum is not predicted to result in any significant impacts on cultural heritage, however construction of the BRR may uncover previously unknown archaeological assets.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

Option 2 Summary Table				East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor				Option title: A803 QBC Package					
<b>Option description:</b> The development of a Quality Bus Corridor (QBC) in partnership with operators and SPT along the A803, to provide dedicated space and measures to improve bus journey times and journey time reliability for all bus movements on this corridor, with a particular focus on improving bus flow at bottlenecks. Delivery of the improvements could be made via an SQP to secure enhancements to bus services where appropriate.						<b>Capital Costs/grant (2010 Prices)</b> <b>Annual Revenue Support (2010 Prices)</b> <b>Present Value (PV) of Cost to Government</b>			<b>£1,024,000</b>				
<b>Summary of impact on the five STAG criteria</b>	<b>Impacts (Monetary and Non-Monetary)</b>							<b>Monetary only (£m)</b>	<b>Monetary impact ratio (if relevant)</b>				
		---	--	-	0	+	++				+++		
	<b>Accessibility and Social Inclusion</b>												
	<b>Environment</b>												
	<b>Integration</b>												
	<b>Safety</b>												
	<b>Economy</b>												
	<b>NPV:</b>										<b>£33,724,000</b>	<b>BCR:</b>	<b>33.93</b>
	<b>NPV(WEB):</b>											<b>BCR(WEB):</b>	
	<b>Assessment against Transport Planning Objectives</b>	<b>TPO Target 1:</b>											
<b>TPO Target 2:</b>													
<b>TPO Target 3:</b>													
<b>TPO Target 4:</b>													
<b>TPO Target 5:</b>													
<b>Contribution toward the Government Purpose:</b> Expected to achieve modal shift and reduce the number of car-based commuter trips through the study area, with associated positive impacts on journey times and journey time reliability. Improvements to public transport could support local development by increasing the attractiveness of the study area for employment and delivering benefits for local residents and business travel, including Bishopbriggs East, Strathkelvin Retail Park, Westerhill and the surplus Bishopbriggs Academy site (when developed). A reduction in volumes of car-based trips would have a positive impact on air quality and human health. Could also reduce the number of road casualties by removing cars from the road network, but this effect will depend on the degree of modal shift generated from private modes. Integrates well with the wider transport network through providing the potential for improved information, ticketing and signalling technology, together with a range of bus priority measures, and improved access for pedestrians and cyclists. Accords well with transport planning policy, however will enhance existing levels of service provision and will not serve any new land-use areas.													

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers enhanced service provision but no increase in PT network coverage. Increases accessibility to development areas. No severance issues.	<b>Technical</b>	This proposal is considered to be technically feasible, with no untried technologies. There may be disruption to traffic during implementation of the QBC measures.
<b>Safety</b>	Would potentially smooth out traffic flow and reduce link speeds, with beneficial impact on PIAs. Road casualties could be reduced dependent on degree of modal shift from private car. Mitigating facilities would be designed into scheme development to address personal security concerns of many individuals.	<b>Operational</b>	If road space priority is afforded to public transport it is possible that there may be adverse impacts on local traffic movements, particularly through already constrained networks, unless Phases 4 and 5 of the BRR are completed. Requires PT patronage levels to at least be sustained in order to be commercially viable and operate successfully over projected life. Should additional buses be required, there will be associated operational costs. Requirement to maintain the QBC measures.
<b>Economy</b>	Development of a QBC with associated bus priority would be expected to improve journey time reliability for users of the A803, delivering benefits for local resident and business travel and contributing to local economic development. Option has a positive impact in TEE terms, with traffic time savings generated for public transport users who will benefit from improved bus journey times, and also highway users who will experience travel time savings associated with reduced congestion.	<b>Financial</b>	Option would likely be funded through a combination of local authority investment, SPT funding, local bus operator funding and Scottish Government funding.
<b>Integration</b>	QBC measures expected to improve integration between modes and reduce car use. Will enhance existing levels of service provision but not serve new land-use areas. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	<b>Public Acceptability</b>	Likely to receive support from key stakeholders, pending full completion of BRR. Some may question adverse impacts on local traffic movements if road space priority afforded to PT, particularly through already constrained networks. Likely to be greater public acceptability if bus lane sections did not overly penalise motorists e.g. only operational at peak times and at key pinch points. Generally considered any improvements to bus service provision and waiting environment would be welcome. General appetite for this Option amongst bus operators and transport bodies.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	Environmental impacts across the ten sub-criteria are generally considered to be neutral or negligible as changes to service patterns on existing routes are unlikely to have significant impacts. Smoother traffic flows expected to have a negligible (positive) impact on local air quality which would benefit the area local to the A803 corridor (including impact on biodiversity) and the conditions within the Bishopbriggs AQMA. The reduction of emissions is dependent on project traffic flow volumes, however this is not predicted to be significant.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

Option 3 Summary Table				East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor				Option title: Kirkintilloch Bus Hub				
<b>Option description:</b> Development of a bus hub in Kirkintilloch and associated measures. While the scale of intervention requires further definition, it is considered that higher cost options would involve bringing bus stops closer together into an interchange area in the town centre, whilst lower cost measures could include pedestrian and cycling access improvements, more PT information, and improved shelters.						<b>Capital Costs/grant (2010 Prices)</b> <b>Annual Revenue Support (2010 Prices)</b> <b>Present Value (PV) of Cost to Government</b>			<b>£182,000</b>			
<b>Summary of impact on the five STAG criteria</b>	<b>Impacts (Monetary and Non-Monetary)</b>							<b>Monetary only (£m)</b>	<b>Monetary impact ratio (if relevant)</b>			
		---	--	-	0	+	++			+++		
	<b>Accessibility and Social Inclusion</b>											
	<b>Environment</b>											
	<b>Integration</b>											
	<b>Safety</b>											
	<b>Economy</b>											
	<b>NPV:</b>									<b>N/A</b>	<b>BCR:</b>	<b>N/A</b>
	<b>NPV(WEB):</b>											<b>BCR(WEB):</b>
	<b>Including Wider Economic Benefits</b>											
<b>Assessment against Transport Planning Objectives</b>	<b>TPO Target 1:</b>	---	--	-	0	+	++	+++				
	<b>TPO Target 2:</b>											
	<b>TPO Target 3:</b>											
	<b>TPO Target 4:</b>											
	<b>TPO Target 5:</b>											
<b>Contribution toward the Government Purpose:</b> Delivery of an integrated bus hub with associated facility enhancements in Kirkintilloch could increase the attractiveness of bus services in the area and support wider regeneration plans for the town. Associated measures such as pedestrian and cycling access improvements and information improvements would make it easier for bus users to access services. However, unlikely to have a significant impact on journey times or journey time reliability and no increase in public transport coverage. Bringing all services into one area with associated access improvements should reduce traffic congestion in the town centre and support local air quality improvements. May have a marginal impact on economy of Kirkintilloch through reduced congestion and improved accessibility through the town centre attributable to the rationalisation of bus stops. Small pockets of deprivation in Hillhead and, to a lesser degree, Lennox town, may benefit, primarily by virtue of increased accessibility to job and labour market opportunities being created within and outside the study area.												



STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Offers enhanced service provision but no increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee. Pockets of deprivation in Kirkintilloch would benefit from increased access to services and employment opportunities. No severance issues.	<b>Technical</b>	This proposal is considered to be technically feasible, with no untried technologies. There may be disruption to traffic during implementation of the bus hub facility.
<b>Safety</b>	Anticipated small reduction in traffic congestion due to integration of bus stops. Neutral effect on PIAs as no notable increase in PT mode share expected. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	<b>Operational</b>	Requirement for general maintenance of signing and lining, cleaning of bus shelters etc., which could form part of existing contracts. RTI systems and ticketing machines, where appropriate, will require to be maintained in full working order.
<b>Economy</b>	An interchange point at Kirkintilloch would link more bus services with the town centre, opening up employment opportunities and access to town centre retail. The development of enhanced facilities would also be expected to support the regeneration proposals for the town.	<b>Financial</b>	Option would likely be funded through a combination of local authority investment, SPT funding, local bus operator funding and Scottish Government funding.
<b>Integration</b>	Enhances integration between walking, cycling and bus modes. Supports wider regeneration plans for Kirkintilloch. Improves accessibility for socially excluded and those without car access. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	<b>Public Acceptability</b>	Generally considered that simpler measures such as improved shelters and facilities, real time information at bus stops and the general creation of a more pleasant waiting environment would add greater value and would be welcomed by the public. Bus operators highlighted there are already two informal bus hubs in Kirkintilloch.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	Kirkintilloch is a culturally sensitive area, bounded by the Antonine Wall WHS (north) and to the Forth and Clyde Canal SAM (south). The town centre is a Conservation Area and Townscape Protection Area with a high density of listed buildings. Provided any new infrastructure is designed in keeping with the area, it is predicted that greatest impacts on cultural assets will be during construction. Increased vibration from heavy plant operating and potential damage to buildings when accessing site may directly impact these assets, resulting in an overall moderate negative impact. The River Kelvin and the Canal are designated under the Freshwater Fish Directive for salmonid waters. Where impacts may be experienced during the construction, it is predicted unlikely that any long-term impacts would result on the water environment, and overall minor negative impact is expected. Development of a central hub is likely to bring permanent (operational) noise and vibration disturbance to receptors in the near vicinity of its location, with overall minor negative impact. The impact across the other sub-criteria is generally expected to be neutral / negligible.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		



Option 4 Summary Table		East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor					Option title: Bus P&R In Vicinity of B757/KLR				
Option description: Provision a bus-based Park & Ride facility adjacent to, or in the vicinity of, the B757 or Kirkintilloch Link Road (location to be defined), providing express services to Glasgow via the M80.					Capital Costs/grant (2010 Prices) Annual Revenue Support (2010 Prices) Present Value (PV) of Cost to Government			£2,363,000			
Summary of impact on the five STAG criteria	Impacts (Monetary and Non-Monetary)							Monetary only (£m)	Monetary impact ratio (if relevant)		
		---	--	-	0	+	++			+++	
	Accessibility and Social Inclusion										
	Environment										
	Integration										
	Safety										
	Economy										
	NPV:									£28,230,000	BCR:
	NPV(WEB):										BCR(WEB):
	Including Wider Economic Benefits										
Assessment against Transport Planning Objectives		---	--	-	0	+	++	+++			
	TPO Target 1:										
	TPO Target 2:										
	TPO Target 3:										
	TPO Target 4:										
	TPO Target 5:										
	Contribution toward the Government Purpose: A bus-based Park & Ride facility would be expected to encourage modal shift from car to bus for journeys leaving the study area, with resultant positive impacts on journey times and journey time reliability within the study area. However, locally, there may be some negative environmental impacts associated with land-take and the generation of local traffic to access the Park & Ride. Could open up opportunities to connect the study area with the strategic road network, which in turn would facilitate travelling to and from major areas of employment and a variety of land uses in the wider area including shopping, employment and transport. However, depending on the location of any future possible facility, there is a risk that a Park & Ride site outwith the town centre could have a negative economic impact on the local town associated with a displacement of trips. It is expected that the Park & Ride facility would integrate with residential properties located to the east of the KLR, and would support wider regeneration plans for the town.										

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee. No severance issues.	<b>Technical</b>	This proposal is considered to be technically feasible, with no untried technologies. There may be disruption to traffic during construction of the Park & Ride facility.
<b>Safety</b>	Could reduce number of road casualties by removing cars from road network, dependent on degree of modal shift from car. Mitigating facilities would be designed into scheme development to address personal security concerns of many individuals.	<b>Operational</b>	Requires PT patronage levels to at least be sustained in order to be commercially viable and operate successfully over projected life. Should additional buses be required, there will be associated operational costs. Ultimately service level will be dictated by commercial viability. Future implementation of hard-shoulder running on the M80 (understood to be currently considered by TS) could enhance deliverability through providing improved journey times and journey time reliability during periods of high traffic volumes.
<b>Economy</b>	Option would be expected to reduce traffic delays and contribute to economic benefits through improving the efficiency of people and goods flows through the corridor. TEE analysis indicates that the main benefits generated under this option are travel time savings primarily for road users associated with reduced levels of congestion/traffic queuing within the study area due to the transfer of trips to public transport.	<b>Financial</b>	Option would likely be funded through a combination of local authority investment, SPT funding, local bus operator funding and Scottish Government funding.
<b>Integration</b>	Encourages transfer of trips from car to bus. Integrates with residential development at Woodilee and to east of KLR. Promotion of sustainable transport is in line with Government policies relating to transport and beyond.	<b>Public Acceptability</b>	No significant public acceptability issues expected although there may be localised objections depending on site selection. If modal shift was achieved, this Option could help to mitigate rail overcrowding issues, thereby being publically acceptable.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	The proposed site in the vicinity of the KLR is within / immediately adjacent to the south Lenzie Conservation Area and Townscape Area. This is also surrounded by residential areas and a long-distance pathway and Core Path along the Bothlin Burn. The B757 site is also located within close proximity to the south Lenzie Conservation Area and Townscape Area, however is located in an area adjacent to fields and Lenzie Golf Course. Depending on the scale, location and design of Park & Ride at either of these locations there may be a moderate negative impact on landscape and visual amenity due to the development breaking existing landscape. In terms of noise and vibration, it is likely that a greater number of receptors will be impacted from development of a Park & Ride scheme adjacent to the KLR. The significance of effect is dependent on the detailed alignments, elevations, topography and any potential mitigation measures included within detailed design and construction practices, but could be moderate negative. The impact across the other sub-criteria is generally expected to be minor negative / neutral.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

Option 5 Summary Table		East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor					Option title: Bus P&R Adjacent to BRR				
Option description: Development of a bus-based Park & Ride adjacent to the Bishopbriggs Relief Road (BRR), providing express services to Glasgow via the M80.					Capital Costs/grant (2010 Prices) Annual Revenue Support (2010 Prices) Present Value (PV) of Cost to Government			£2,363,000 - £10,084,000 <sup>35</sup>			
Summary of impact on the five STAG criteria	Accessibility and Social Inclusion Environment Integration Safety Economy	Impacts (Monetary and Non-Monetary)						Monetary only (£m)		Monetary impact ratio (if relevant)	
		---	--	-	0	+	++				+++
	Including Wider Economic Benefits						NPV: £28,887,000 – £21,116,000	BCR: 13.2 – 3.1			
							NPV(WEB):	BCR(WEB):			
Assessment against Transport Planning Objectives	TPO Target 1:	---	--	-	0	+	++	+++			
	TPO Target 2:										
	TPO Target 3:										
	TPO Target 4:										
	TPO Target 5:										
	<b>Contribution toward the Government Purpose:</b> A bus-based Park & Ride facility would be expected to encourage modal shift from car to bus for journeys leaving the study area, with resultant positive impacts on journey times and journey time reliability within the study area. However, locally, there may be some negative impacts associated with land-take and the generation of local traffic to access the Park & Ride. Positive economic impacts would be anticipated associated with increasing the accessibility of Westerhill Business Park. Provides an opportunity to lock-in the benefits associated with the development of the BRR. Could open up opportunities to connect the study area with the strategic road network, which in turn would facilitate travelling to and from major areas of employment and a variety of land uses in the wider area including shopping, employment and transport. Could integrate with existing and proposed residential developments in Bishopbriggs.										

<sup>35</sup> Lower PVC reflects assumption that Park & Ride would be served by existing bus services, whereas high PVC reflects the additional operating costs that are assumed with delivery of a Park & Ride served by new bus services.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Bishopbriggs East, Westerhill. No severance issues.	<b>Technical</b>	This proposal is considered to be technically feasible, with no untried technologies. There may be disruption to traffic during construction of the Park & Ride facility.
<b>Safety</b>	Could possibly reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	<b>Operational</b>	Requires PT patronage levels to at least be sustained in order to be commercially viable and operate successfully over projected life. Should additional buses be required, there will be associated operational costs. Ultimately service level will be dictated by commercial viability.
<b>Economy</b>	Option would be expected to improve access to Westerhill Business Park and the major employers in this area would be expected to support further economic development of this area. TEE analysis indicates that the main benefits generated under this option are travel time savings primarily for road users associated with reduced levels of congestion/traffic queuing within the study area due to the transfer of trips to public transport.	<b>Financial</b>	Future implementation of hard-shoulder running on the M80 (understood to be currently considered by TS) could enhance deliverability through providing improved journey times and journey time reliability during periods of high traffic volumes. Option would likely be funded through a combination of local authority investment, SPT funding, local bus operator funding and Scottish Government funding. There could be an opportunity for developer contributions.
<b>Integration</b>	Encourages transfer of trips from car to bus. Integrates with existing/proposed residential development. Provides sustainable access to Westerhill. Promotion of sustainable transport in line with Government policies relating to transport and beyond.	<b>Public Acceptability</b>	No significant public acceptability issues expected. This Option could be a driver of economic development at Westerhill and may attract other businesses into the area, which would gain public support.
<b>Environment</b>	<i><b>This section identifies key impacts and tensions across the sub-criteria</b></i>		
	Minor positive impact on local air quality through the promotion of sustainable modes of transport. Minor negative impact on geology and biodiversity depending on extent of earthworks and land-take. There may be effects on visual amenity however these are dependent on the location and design of the scheme, and given the development of Westerhill Business Park and the BRR to the west of this location, the Park & Ride would be mostly in keeping with the surrounding area, resulting in an overall minor negative impact. This Option is proposed in an area that is predominantly utilised for agricultural purposes, and land is regarded as being of Class 3.2 – capable of supporting 'mixed agriculture'. Therefore, any land-take would result in a minor negative impact on agriculture and soils. In terms of cultural heritage, within the near vicinity of the proposed site is the Category C listed building at Cadder Yard. An impact on this building is unlikely but dependent upon the final location and design of the Option, and an overall minor negative impact may be encountered. The impact across the other sub-criteria is generally expected to be neutral / negligible.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

**Contribution toward the Government Purpose:** This option is designed to improve access to key trip attractors within the study area by public transport, and will benefit the local population in particular with some potential modal shift impacts, albeit this is not expected to be significant. By linking key locations within the study area (particularly around Lenzie and Kirkintilloch), this option has potential to support local development and promote local economic growth and access to residential, employment and retail sites. However, this may be negated if a loop bus service opens up the local economy of Kirkintilloch to more competition through improving access to the rail network and associated wider economic centres. It is anticipated that the small pockets of deprivation in Hillhead and, to a lesser degree, Lennoxton, will seek to benefit from the transport improvements, primarily by virtue of increased accessibility to job and labour market opportunities being created within and outside the study area. Issues relating to commercial viability may affect the ability to successfully operate this option.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases PT network coverage and sustainable access to key services, employment and facilities and provides linkage to rail network. Increases accessibility to development areas e.g. Woodilee. Pockets of deprivation in Kirkintilloch would benefit from increased access to services and employment opportunities. No severance issues.	<b>Technical</b>	This proposal is considered to be technically feasible, with no untried technologies.
<b>Safety</b>	Could reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift. Mitigating facilities would be designed into scheme development to address the personal security concerns of many individuals.	<b>Operational</b>	Requires a minimum level of patronage to at least be sustained in order to be commercially viable and operate successfully over projected life. There will be operational costs associated with buses required for the loop bus. Ultimately service level will be dictated by commercial viability.
<b>Economy</b>	The option could increase the attractiveness of public transport and improve local access to retail and employment opportunities. However, overall impact on economic development is expected to be negligible.	<b>Financial</b>	Option would likely be funded through a combination of funding from local authority, SPT, local bus operator and Scottish Government. There is also potential for developer contributions, and possibly funding from local businesses. There will be operational costs associated with loop bus service.
<b>Integration</b>	Enhances bus – rail integration, linking key land use destinations. Improves accessibility for socially excluded and those without car access. Promotion of sustainable transport in line with Government policies relating to transport and beyond.	<b>Public Acceptability</b>	Support for more local bus services linking key destinations to Lenzie Station. Coupled with existing parking issues, this may achieve modal shift from car which would be acceptable. Concerns expressed regarding commercial viability and funding.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	Changes to service patterns on existing routes are unlikely to have notable impacts across the sub-criteria. Very local measure, therefore unlikely to significantly impact on modal shift and therefore impact on air quality and noise and vibration are also likely to be negligible / neutral.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

Option 7 Summary Table		East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor		Option title: Increased Parking at Lenzie Station						
Option description: Increase parking provision at Lenzie Rail Station. Two sub-options exist: one based on extending the surface car park to the north and the other involving the creation of a new deck over the existing car parks/railway line.			Capital Costs/grant (2010 Prices) Annual Revenue Support (2010 Prices) Present Value (PV) of Cost to Government		£2,702,000					
Summary of impact on the five STAG criteria	Accessibility and Social Inclusion Environment Integration Safety Economy	Impacts (Monetary and Non-Monetary)						Monetary only (£m)	Monetary impact ratio (if relevant)	
		---	--	-	0	+	++			+++
	Including Wider Economic Benefits						NPV: -£2,694,000	BCR: 0.003		
	NPV(WEB):									
	Assessment against Transport Planning Objectives	TPO Target 1:	---	--	-	0	+	++	+++	
		TPO Target 2:								
TPO Target 3:										
TPO Target 4:										
TPO Target 5:										
Contribution toward the Government Purpose: If this option is successful in promoting increased rail travel and a corresponding decrease in private car use, there is the potential for it to support the re-allocation of road space to public transport, which would bring journey time and reliability improvements. However, this is likely to be balanced by an increase in the number of local car trips (i.e. trips to get to the proposed car park). Option is likely to increase the attractiveness of Lenzie station, which could open up opportunities for increased rail travel and support local development of the area, although any wider economic impacts area likely to be minimal. There are no changes to public transport network coverage associated with this option. Significant environmental impacts are associated with the implementation of this option. Increased parking provision at Lenzie Rail Station may generate more local traffic in populated areas, with associated negative impacts on safety. Does not fit well with policies to promote social inclusion, as option does not enable people who live in socially deprived areas (particularly those with no access to a car) access to the public transport network.										

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising benefits for those who choose not to travel by car for their whole journey. Offers no increase in PT network coverage. Increases in traffic on local roads may create severance for pedestrians and cyclists.	<b>Technical</b>	Considered to be technically feasible, with no untried technologies. Possible disruption to traffic during construction of the extended car park facility. Construction of a raised car park adjacent to or over a live railway is technically challenging.
<b>Safety</b>	Could reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift. Rail considered safer than car. Mitigating facilities would be designed into scheme development to address personal security concerns of many individuals.	<b>Operational</b>	Proposal considered operationally feasible. The extended car park area will require general winter maintenance such as snow clearance and gritting, together with ongoing maintenance of items such as lighting, signing and lining. Where appropriate, CCTV will require to be maintained in proper working order.
<b>Economy</b>	Option may increase the attractiveness of Lenzie station for car users, which in turn could increase rail patronage and open up employment and retail opportunities for residents. In TEE terms, this option generally has a negligible impact in terms of generating benefits, with the primary source of benefits delivered by user charges.	<b>Financial</b>	Option would likely be funded through a combination of local authority investment, SPT funding and Scottish Government funding (potentially to include the Scottish Stations Fund). There are no subsidies required to successfully operate this Option.
<b>Integration</b>	Encourages transfer of trips from car to rail for longer journeys but may be negated by increase in local car trips to station. Improves access to land uses in wider area via rail network. Promotion of sustainable transport is in line with Government policies, but impact negated if parking results in increased traffic on local roads. Maximises use of existing infrastructure.	<b>Public Acceptability</b>	Additional parking could generate more traffic on local roads and have a 'honeypot' effect and this would not be publicly acceptable. Potential reduction of recreational green space associated with extending parking at surface level not supported. Strong opposition to decking due to negative visual impact and being adjacent to a Townscape Protection Area.
<b>Environment</b>	<i><b>This section identifies key impacts and tensions across the sub-criteria</b></i>		
	Increased noise and vibration levels are subject to volumes of transport predicted to use the scheme, and its location in respect of noise sensitive receptors, but overall impact is expected to be moderate negative. Developing on top of existing facilities may increase noise levels due to higher elevation. Developing on ground will likely bring areas of noise generation closer to the surrounding noise sensitive receptors. The rail station is a listed building, and lies within the Lenzie and south Lenzie Conservation Area. There are also a number of other listed buildings located within the Conservation Areas. Overall impact on cultural heritage therefore expected to be moderate negative. The station is surrounded by residential areas and the Lenzie Moss LNR and Core Path, and there may be an overall minor negative impact on geology, biodiversity and landscape and visual amenity. Permanent effects to water environment may include introduction of pollutants from parked vehicles via the drainage system incorporated in the car park design, which may impact on the water resources which support the Lenzie Moss LNR. These impacts can be mitigated from the incorporation of appropriate SUDS measures within the drainage design, such as oil interceptors, and overall impact is expected to be minor negative.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		



Option 8 Summary Table		East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor							Option title: New Rail Station at Woodilee		
Option description: Development of a new rail station at Woodilee with Park & Ride provision and sustainable access.		Capital Costs/grant (2010 Prices) Annual Revenue Support (2010 Prices) Present Value (PV) of Cost to Government							£8,810,000 - £6,339,000 <sup>36</sup>		
Summary of impact on the five STAG criteria	Accessibility and Social Inclusion Environment Integration Safety Economy	Impacts (Monetary and Non-Monetary)							Monetary only (£m)	Monetary impact ratio (if relevant)	
		---	--	-	0	+	++	+++			
	Including Wider Economic Benefits							NPV: £17,705,000 – 20,176,000	BCR: 3.0 – 4.2		
NPV(WEB):							BCR(WEB):				
Assessment against Transport Planning Objectives	TPO Target 1:	---	--	-	0	+	++	+++			
	TPO Target 2:										
	TPO Target 3:										
	TPO Target 4:										
	TPO Target 5:										
	Contribution toward the Government Purpose: This option would improve access to the rail network. Promoting modal shift could contribute to local air quality improvements as a result of reduced car emissions, and safety through smoothing traffic flow and transferring trips from road to rail (a safer mode). Will help to support local economic development opportunities on the Kirkintilloch / Lenzie – Bishopbriggs – Glasgow corridor, e.g. Woodilee and Kirkintilloch Masterplan area, through a combination of managed congestion brought about by increased accessibility, and improved journey times, through the transfer of trips from road to rail. In addition, this option would have wider economic impacts through improving public transport and accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail line. Fits well with policies to promote social inclusion, by enabling people living in socially deprived areas (particularly those with no access to a car) access to the public transport network. Due cognisance would require to be given to impact on the wider rail network, specifically the EGIP proposals, to ensure effective integration.										

<sup>36</sup> Lower PVC reflects assumption that Park & Ride would be unmanned, whereas the higher PVC reflects the additional operating costs with operating a manned station.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Woodilee.	<b>Technical</b>	Considered to be technically feasible although constructing a station adjacent to a live railway is challenging. If taken forward, consideration should be given to making the stations easily modifiable for any EGIP Phase 2 requirements.
<b>Safety</b>	Could possibly reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift from private car. Rail is considered a safer mode than car. Mitigating facilities would be designed into scheme development to address the personal security concerns of individuals.	<b>Operational</b>	Resilience on rail network is key risk to successful operation of this Option: additional stopping times associated with new station at Woodilee would impact on resilience of rail network. The level of impact and any associated risk would require to be discussed further with NR and TS should Option be progressed.
<b>Economy</b>	Option would connect a key residential area such as Woodilee with major trip generators, including Glasgow and Edinburgh, opening up employment opportunities in the study area as a result of reduced commuting times. TEE analysis indicates that the major benefits derived with this option is travel time savings for road users, associated with a reduction in congestion on the local road network due to an increase in public transport users linked to a new rail station at Woodilee.	<b>Financial</b>	Likely to be funded through combination of funding from local authority, SPT, Network Rail and Scottish Government. Also potential for developer contributions. SPP14 (Para 277) states "...further technical assessment and design work will be required before any proposed new station can be confirmed as viable."
<b>Integration</b>	Encourages transfer of trips from car to rail. Improves access to land uses in wider area via rail network. Promotion of sustainable transport is in line with Government policies, but impact negated if increased parking results in increased traffic on local roads. Land safeguarded in Local Plan 2.	<b>Public Acceptability</b>	General support. Lenzie residents may welcome additional station at Woodilee to alleviate overspill parking impacts from Lenzie station. Deliverability and capacity constraints associated with implementing station on E-G rail line.
<b>Environment</b>	<b><i>This section identifies key impacts and tensions across the sub-criteria</i></b>		
	Moderate negative impact on noise and vibration given close proximity to Woodilee residential area, and the increase of additional traffic within the area during operation, dependent on anticipated increases of traffic volumes within the area. To accommodate the rail station there will likely be the requirement to remove some trees currently screening the railway track to the south, and there may also be wider impacts on visual amenity depending on the final scale of the scheme. The South Lenzie Conservation Area and Townscape Area and a long-distance pathway and Core Path along the Bothlin Burn are also within close proximity to this proposed location, giving an overall moderate negative impact on landscape and visual amenity, and a minor impact on cultural heritage. Potential increased flood extents and water quality deterioration of the Bothlin Burn from oils and fuels leaking from parked vehicles (minor negative impact); ground contamination / impact on geology (minor negative impact). Removal of green space and proximity to Ancient Woodland may have a minor negative impact on biodiversity. The area south of the rail tracks is utilised for agriculture: there may be a minor negative impact from land take or potential contamination of soils, dependent on final location and scale of the station.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

Option 9 Summary Table		East Dunbartonshire Part 2 Transport Appraisal - Kirkintilloch/Lenzie-Bishopbriggs-Glasgow Corridor						Option title: New Rail Station Westerhill		
Option description: Development of a new rail station at Westerhill with Park & Ride provision and sustainable access.		Capital Costs/grant (2010 Prices) Annual Revenue Support (2010 Prices) Present Value (PV) of Cost to Government						£9,070,000 – £5,802,000 <sup>37</sup>		
Summary of impact on the five STAG criteria	Accessibility and Social Inclusion Environment Integration Safety Economy	Impacts (Monetary and Non-Monetary)							Monetary only (£m)	Monetary impact ratio (if relevant)
		---	--	-	0	+	++	+++		
	Including Wider Economic Benefits							NPV: £26,250,000 - £29,518,000	BCR: 3.9 / 6.1	
NPV(WEB):							BCR(WEB):			
Assessment against Transport Planning Objectives	TPO Target 1: TPO Target 2: TPO Target 3: TPO Target 4: TPO Target 5:	---	--	-	0	+	++	+++		
<b>Contribution toward the Government Purpose:</b> This option would improve access to the rail network. Promoting modal shift could contribute to local air quality improvements as a result of reduced car emissions, and safety through smoothing traffic flow and transferring trips from road to rail (a safer mode). Will help to support local economic development opportunities on the Kirkintilloch / Lenzie – Bishopbriggs – Glasgow corridor, including, for example, Westerhill Business Park, through a combination of managed congestion brought about by increased accessibility, and improved journey times, through the transfer of trips from road to rail. In addition, this option would have wider economic impacts through improving public transport and accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail line. Fits well with policies to promote social inclusion, by enabling the people living in socially deprived areas (particularly those with no access to a car) access to the public transport network. Due cognisance would require to be given to impact on the wider rail network, specifically the EGIP proposals, to ensure effective integration.										

<sup>37</sup> Lower PVC reflects assumption that Park & Ride would be unmanned, whereas higher PVC reflects the additional operating costs with operating a manned station.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
<b>Accessibility &amp; Social Inclusion</b>	Increases accessibility by PT, realising key benefits for those without access to a private car or who choose not to travel by car for their whole journey. Offers increase in PT network coverage. Increases accessibility to development areas e.g. Bishopbriggs East, Westerhill.	<b>Technical</b>	Considered to be technically feasible although constructing a station adjacent to a live railway is challenging. Consideration should be given to making the stations easily modifiable for any EGIP Phase 2 requirements.
<b>Safety</b>	Could possibly reduce number of road casualties by removing cars from road network, but dependent on degree of modal shift from private car. Rail is considered a safer mode than car. Mitigating facilities would be designed into scheme development to address the personal security concerns of individuals.	<b>Operational</b>	Resilience on rail network is key risk to successful operation of this Option: additional stopping times associated with new station at Woodilee would impact on resilience of rail network. The level of impact and any associated risk would require to be discussed further with NR and TS should Option be progressed.
<b>Economy</b>	The option would connect a key employment area such as Westerhill with the rail network, and could have wider economic impacts in the future. Analysis of TEE indicates that the primary source of benefits associated with a new rail station at Westerhill is travel time savings with benefits delivered for both road and public transport users. Road users benefit due to an estimated reduction in local traffic and congestion associated with increased numbers using public transport. Benefits for public transport users are generated through faster travel times associated with the provision of a new rail station in this location.	<b>Financial</b>	Likely to be funded through combination of funding from local authority, SPT, Network Rail and Scottish Government. Also potential for developer contributions. SPP14 (Para 277) states "...further technical assessment and design work will be required before any proposed new station can be confirmed as viable."
<b>Integration</b>	Encourages transfer of trips from car to rail. Improves access to Westerhill Business Park and land uses in wider area via rail network. Promotion of sustainable transport in line with Government policies, but impact negated if results in increased traffic on local roads. Land safeguarded in Local Plan 2.	<b>Public Acceptability</b>	General support. Attractive for established business and increased accessibility may generate economic development, which would be acceptable. Could alleviate parking problems in Bishopbriggs centre, with positive impact on air quality, thus gaining public support. Deliverability and capacity constraints associated with implementing station on E–G rail line.
<b>Environment</b>	<i><b>This section identifies key impacts and tensions across the sub-criteria</b></i> Moderate negative impact on noise and vibration given close proximity to Bishopbriggs East residential area, and the increase of additional traffic within the area during operation, dependent on anticipated increases of traffic volumes within the area. To accommodate the rail station there will likely be a loss of agricultural land, and potentially some woodland areas, with associated impacts on landscape and visual amenity, and agriculture and soils. The railway line is identified as an important ecological corridor by East Dunbartonshire Council and construction in this area may have a negative impact on biodiversity. Potential ground contamination / impact on geology during earthworks. Potential negative impact on Category C listed building at Cadder Yard dependent upon the final location and design of the station.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
<b>TPO 1:</b>	To promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.	<b>TPO 3:</b>	Improve accessibility by sustainable transport modes to key trip attractors within the study area.
<b>TPO 2:</b>	Improve public transport journey times and journey time reliability through the study area.	<b>TPO 4:</b>	Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
<b>TPO 5:</b>	Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.		

## **6 Monitoring and Evaluation**

## 6 Monitoring and Evaluation

### 6.1 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 assess the project performance against established objectives and to provide in-depth diagnosis of successes as well as deficiencies. 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 some time 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 Dunbartonshire Council to meet the requirements of the STAG with respect to evaluation and monitoring. An indicative monitoring process is indicated in Figure 6.1.

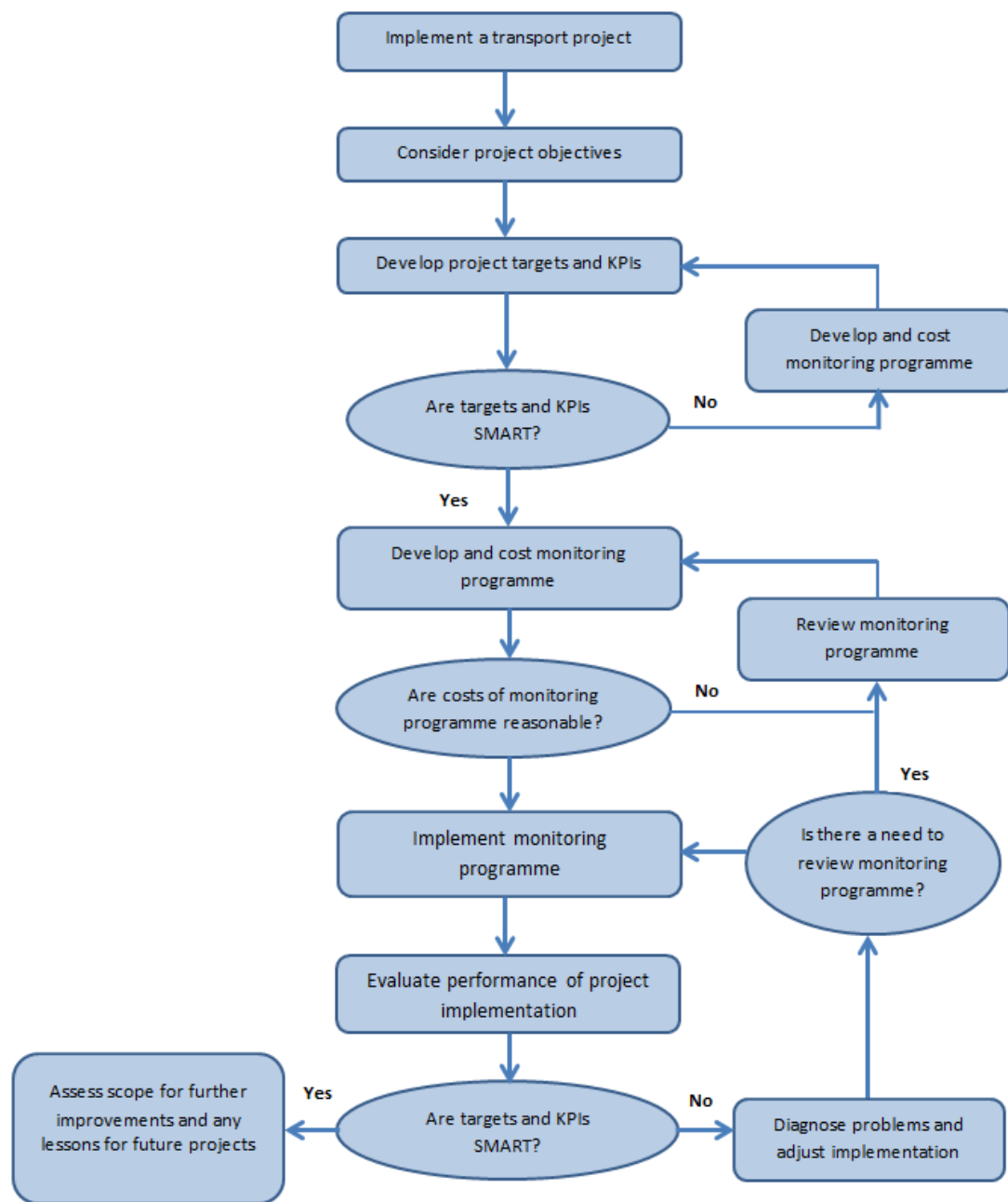


Figure 6.1 – Indicative Monitoring Process

## 6.2 Objectives

### 6.2.1 Introduction

The objectives for the study are described in Chapter Two of this report and further refined within Chapter Five. The specific project objectives have been derived from a range of national 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 area and take on board the aspirations of stakeholders.

### 6.2.2 Strategy Objectives

The specific project objectives developed for the study, and against which the various proposals will be evaluated and monitored, are as follows:

- Promote modal shift to sustainable transport modes for trips to key attractors outside of the study area, particularly commuting journeys.
- Improve public transport journey times and journey time reliability through the study area.
- Improve accessibility by sustainable transport modes to key trip attractors within the study area.
- Deliver a transport network that supports improvements to human health and air quality, while minimising the impact on the environment.
- Provide a sustainable transport network that supports local development, regeneration and contributes to the sustainable economic growth of the study area.

## 6.3 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 Dunbartonshire Council, Transport Scotland, SPT, Network Rail and bus operators, as appropriate, during the period immediately prior to completion / operation of each individual element of the preferred 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 and North Lanarkshire 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 scheme 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.



## 6.4 Project Development, Procurement and Construction

### 6.4.1 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 planning objectives, taking into account any changes in the underlying transport situation.

### 6.4.2 Cost and Revenue and Programme Monitoring

It is recommended that a management team comprising various advisors be appointed to manage the process of monitoring cost and revenue and programme issues throughout the development and construction of the preferred Option(s). The team will thereby evaluate any potential for changes in project costs and associated risks.

## 6.5 Operations

### 6.5.1 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 6.1, below, summarises a possible example which might be employed as the basis for the process evaluation:

**Table 6.1: Evaluation Performance Indicators**

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

<b>Transport</b>	The extent to which model results reflect reality	Traffic diversion Congestion Delays	CSTM12 model and traffic surveys	Comparison between modelled and actual – after implementation and again one year later
<b>Local economy</b>	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 planning objectives discussed in Section 6.2, above, the following performance indicators could be appropriate:

- Traffic congestion:
  - Reduce traffic volume on key routes;
  - Reduce traffic delays; and
  - 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; and
  - Improve access to employment opportunities.

Table 6.2 summarises potential performance indicators and a possible monitoring programme.

**Table 6.2: Potential Performance Indicators and Possible Monitoring Programme**

Objective	Performance indicator	Definition of indicator	Performance target	Source of indicator/target	Monitoring method and frequency
<b>Accessibility</b>	Access to sustainable transport network	Percentage of population within 400 metres walk distance from a public transport stop/service Public 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 user surveys
	Access to employment opportunities	Transport connections to employment and regeneration areas	<ul style="list-style-type: none"> <li>• X% car use for travel to work (and school) from Census data.</li> </ul>	Travel to Work (and School) Data from Census, or local surveys as appropriate.	Review of Census Travel to Work Data, and other local surveys as appropriate.

<b>Traffic Congestion</b>	Traffic volumes - key routes	Average AM/PM, daily, weekly, monthly and annual traffic volumes on key routes Growth in car traffic	Volume of traffic in line with existing and future road hierarchy	Traffic flow / volume surveys	Ongoing review of permanent/ temporary site automatic/manual traffic count programme EDC roads standards manual
	Journey times	Changes in journey times by road-based public transport	Reduction in journey time through study area by 2025	Journey time surveys	Journey time surveys every 2 years
<b>Environmental Impact</b>	Air Quality	Changes in key indicators of air quality	Meet or exceed the air quality management targets adopted by EDC X% by 2025	Air quality monitoring	Ongoing review of EDC air quality monitoring programme
<b>Economic Impact</b>	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 EDC X% by 2025	EDC Development and Regeneration Business and Improvement Plan 2015-18	Quarterly performance indicators as set out within EDC Development and Regeneration Business and Improvement Plans

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.

## 6.6 Summary

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

The following Chapter outlines the key risks and uncertainties relating to the study.

## **7 Risk and Uncertainty**

## 7 Risk and Uncertainty

### 7.1 Introduction

Risk management strategies should be adopted 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.

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.

### 7.2 Optimism Bias

Experience has demonstrated a tendency for insufficient contingency costs or programme time to be made; a phenomenon known as Optimism Bias. The economic analysis in this report has been undertaken using standard optimism bias uplifts (for local authority transport schemes at a ‘Programme Entry’ stage an OB of 44% should be applied, and for rail projects at a pre-feasibility stage without a Quantified Risk Assessment an Optimism Bias of 66% should be applied). Should the preferred Option(s) be progressed towards construction, a plan for the management and mitigation of risk will require to be adopted. This Chapter describes our recommended approach.

### 7.3 Risk Management Process

STAG states that all risks and uncertainties associated with an Option need to be fully identified and accounted for in the appraisal process. As stated in the HM Treasury Green Book (2003)<sup>38</sup>, in appraisals it is always likely there is some difference between what is expected and what actually happens. This is the consequence of biases unwittingly inherent in the appraisal process, and risks and uncertainties that materialise. As a result, it is important to identify and mitigate risks, and make allowances for Optimism Bias.

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.

### 7.4 Risk Identification

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

<sup>38</sup> Green Book, Appraisal and Evaluation in Central Government, HM Treasury (2003) [http://www.hm-treasury.gov.uk/economic\\_data\\_and\\_tools/greenbook/data\\_greenbook\\_index.cfm](http://www.hm-treasury.gov.uk/economic_data_and_tools/greenbook/data_greenbook_index.cfm)

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 forms the basis of the Risk Register, which can then be circulated for further comment.

## 7.5 Risk Register

The Risk Register should be structured to identify:

- A unique identification reference
- 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. An initial draft risk register is set out within Table 7.1.

## 7.6 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:

- Limitations of the CSTM12 modelling - whilst the CSTM12 model was considered to be the most fit for purpose tool available for the purposes of this study, there may be limitations associated with its use, for example there may be new developments which are not included within the model and which may materially impact on the volume of trips. Should a preferred Option(s) be taken forward for further consideration, additional modelling may be required.
- Consent risk - legal and planning issues, specifically where planning approval or powers are required.
- North Lanarkshire Council is considering a Park & Ride facility at the Hornhill Junction within its City Deal bid, and due cognisance would require to be given to this proposal should Option 4 emerge as the preferred scheme.
- Capacity constraints on rail network to accommodate Park & Ride and rail station sites and additional stops. To achieve new rail stations, 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 Edinburgh-Glasgow services). This may involve widening to four tracks, which would result in a significant undertaking.
- Availability of funding - issues relating to the commercial viability and funding of the bus-based Options, in particular the Kirkintilloch loop bus (Option 6), would require to be discussed further with bus operators and SPT. 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."
- Environment – as detailed within Section 5.5, various environmental issues have been identified as part of this study. A separate SEA has also been undertaken.
- Right of Way / Core Path - AECOM has consulted East Dunbartonshire's Core Paths / Right of Way interactive mapping system which has indicated there is right of way situated to the North of the Westerhill Road Bridge (EGM1/109) which may pose a risk in relation to the provision of a new rail station at Westerhill. In addition, there is a Core Path (Strathkelvin Railway Path) situated to west of the Woodilee development site parallel to Initiative road, which may pose a risk in relation to the provision of a new rail station at Woodilee.
- Mining - AECOM has consulted the Coal Authority interactive maps database, which has indicated that the area is classed as a high risk due to mining works. 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.
- Completion of BRR - If roadspace priority is afforded to public transport it is possible that there may be adverse impacts on local traffic movements, particularly through already constrained networks, if Phases 4 and 5 of the BRR are not completed.
- Resilience on rail network – the additional stopping times associated with new rail stations at Westerhill and / or Woodilee would 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 these Options be progressed.
- Public acceptability at future consultations.

## **7.7 Risk Register**

An indicative risk register – as shown in Figure 7.1 – has been prepared to summarise each of the risks identified, and consider the likelihood and impact of their occurrence. In addition each risk has been categorised when they may occur, some risks are associated with the ability to deliver and implement whilst others are associated with the operation of the option post implementation.



**Table 7.1 – Indicative Risk Register**

RISK IDENTIFICATION						
Category	Risk Assessment			Risk Description	Risk Nature	
	Risk Likelihood 1-5	Risk Impact 1-5	Risk Rating		Deliverability	Operation
3rd Parties / Stakeholders	5	5	25	Resilience on rail network – the additional stopping times associated with new rail stations at Westerhill and / or Woodilee would 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 these Options be progressed.		✓
3rd Parties / Stakeholders	5	5	25	Rail Policy - the introduction of two new rail stations on the main Edinburgh - Glasgow rail line may be viewed negatively / not supported by Transport Scotland / Network Rail / Scottish Government / Rail Operators as it may be seen as detrimental to the resilience and capacity on the line. Implementation of this option will need to be supported by these organisations. It is likely that this option will need to go through the GRIP 4 process for rail investment which is a costly exercise which won't guarantee implementation support. A significant level of further expenditure will be required before a determination on the implementability of this option can be made, this may be abortive expenditure.	✓	✓
Funding	4	4	16	Financial Support - Progressing interventions beyond the STAG project will require further funding, either by EDC or their partners. There is a risk the sufficient funds may not be secured, particularly for complex and expensive options.	✓	✓
Land and Compensation	5	4	20	Consent risk - legal and planning issues, specifically where planning approval or powers are required.	✓	
3rd Parties / Stakeholders	5	4	20	Significant objections to proposals by stakeholders/public resulting in delays/challenges resulting in increasing costs.	✓	

Commercial (Economic)	4	5	20	Availability of funding - issues relating to the commercial viability and funding of the bus-based Options, in particular the Kirkintilloch loop bus (Option 6), would require to be discussed further with bus operators and SPT. 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	4	3	12	Capacity constraints on the rail network to accommodate Park & Ride and rail station sites and additional stops. To achieve new rail stations, 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 Edinburgh-Glasgow services). This may involve widening to four tracks (especially for Woodilee), which would result in a significant undertaking.	✓	✓
Asset Management	3	4	12	Completion of BRR - If roadspace priority is afforded to public transport it is possible that there may be adverse impacts on local traffic movements, particularly through already constrained networks, if Phases 4 and 5 of the BRR are not completed.	✓	✓
Design	2	5	10	Mining - AECOM has consulted the Coal Authority interactive maps database, which has indicated that the area is classed as a high risk due to mining works. 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.	✓	
General - modelling, stds, legislation, taxation	3	3	9	Limitations of the CSTM12 modelling - whilst the CSTM12 model was considered to be the most fit for purpose tool available for the purposes of this study, there may be limitations associated with its use, for example there may be new developments which are not included within the model and which may materially impact on the volume of trips. Should a preferred Option be taken forward for further consideration, additional modelling may be required.	✓	
Construction	3	3	9	Traffic management issues - (Problems with construction sequencing)	✓	✓
General - modelling, stds, legislation, taxation	2	4	8	North Lanarkshire Council is considering a Park & Ride facility at the Hornshill Junction within its City Deal bid, and due cognisance would require to be given to this proposal should Option 4 emerge as the preferred scheme.	✓	

Commercial	2	4	8	Procurement - contractual issues affect programme delivery e.g. disputes with Contractors, existing contractual franchises with rail operators.	✓	✓
Land and Compensation	3	2	6	Right of Way / Core Path - AECOM has consulted East Dunbartonshire's Core Paths / Right of Way interactive mapping system which has indicated there is right of way situated to the North of the Westerhill Road Bridge (EGM1/109) which may pose a risk in relation to the provision of a new rail station at Westerhill. In addition, there is a Core Path (Strathkelvin Railway Path) situated to west of the Woodilee development site parallel to Initiative Road, which may pose a risk in relation to the provision of a new rail station at Woodilee.	✓	
3rd Parties / Stakeholders	2	3	6	Difficulties in defining expectations and level of information required from Statutory Consultees impacted by the scheme proposals.	✓	
Construction	2	3	6	Impacts on tourism, local businesses, major events, etc. during construction.	✓	
Construction	3	3	9	Non-delivery of the Do Minimum package may impact on the deliverability and operation of options. In particular A803 QBC, rail station at Westerhill and bus Park & Ride at Westerhill.	✓	✓
Construction	2	3	6	Fibre-optic servicing may need to be moved and replaced to implement an option. This would increase costs significantly.	✓	
Commercial (Economic)	3	3	9	Introduction of A803 QBC may require TROs which may restrict access to local businesses which may impact their revenue	✓	✓
General - modelling, stds, legislation, taxation	3	2	6	The introduction of an option, particularly the A803 QBC, may increase traffic congestion through Bishopbriggs due to the re-allocation of road space to public transport. This may result in traffic rat running through residential roads to minimise delay. This would result in a loss of local amenity and road safety issues, but would be negated by full implementation of the BRR.		✓

## 7.8 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 project development. The following Chapter presents the key recommendations arising from the STAG Part 2 appraisal.

## **8 Conclusions**

## 8 Conclusions

### 8.1 Introduction

This Chapter brings together the findings from the STAG appraisal process. A summary of each of the Options followed by recommended next steps.

### 8.2 Outcomes of the Study

#### 8.2.1 Do Minimum

The Do Minimum comprises all committed schemes within the study area and includes implementation of the BRR (up to and including phase 5); SCOOT; Kirkintilloch Town Centre Regeneration; Parking Strategy and Decriminalised Parking Enforcement; EGIP Phase 1; and the Glasgow City Council City Centre Strategy.

The Do Minimum has provided a base case upon which the “Do Something” Options can be compared.

#### 8.2.2 Option 2 – A803 QBC Package

Development of a QBC package along the A803 performs positively against the transport planning objectives. The Option would seek to improve bus journey times and journey time reliability through the study area and in turn aim to promote modal shift to bus for trips outside of the study area, particularly commuter journeys. If the Option is successful in achieving modal shift, it should support air quality improvements in the air quality management area within Bishopbriggs.

It is considered that this Option may help to support local economic development opportunities through a contribution of managed congestion brought about by increased accessibility and improved journey times particularly along the A803 corridor. This Option may also have wider economic impacts through improving public transport and accessibility to Glasgow. The results of appraisal suggest that this Option would deliver a positive economic impact through improving journey time reliability for users of the A803. Traffic time savings would be generated for public transport users who will benefit from improved bus journey times, and also car users who will experience travel time savings associated with reduced congestion.

In general terms, this Option is unlikely to result in adverse environmental impacts as it involves minimal changes to existing infrastructure. It is expected that this Option would result in a smoother flow of traffic (through modal shift from private car) which would see a reduction in link speeds which should in turn result in a reduction in the number and severity of accidents.

This Option is also expected to have a positive impact on transport integration through improved integration between modes and a reduction in reliance on private car use. This Option also aligns well with policy integration as it would reduce the need to travel through encouraging modal shift and assisting in achieving a healthy, prosperous and inclusive society.

In terms of accessibility and social inclusion, the implementation of this Option would improve bus journey times and journey time reliability for both local trips and also commuter trips to / from Glasgow via the A803, albeit there would be no increase in level of public transport coverage. This Option is expected to have a positive impact in terms of tackling the problem of private car use by encouraging a modal shift towards public transport and 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.

There is a general appetite for this Option amongst bus operators and transport bodies, while broader consultation revealed there would be support for this amongst the travelling public as long as measures did not overly penalise motorists (e.g. only operational at peak times and at targeted pinch points). Concerns have been raised that the provision of priority roadspace to public transport through already constrained networks may have an adverse impact on local traffic movements. However, as shown by previous studies, this is expected to be negated by the full implementation of the BRR, and it is the case that implementation of QBC measures along the route could help to lock in the benefits of freed up capacity on the A803 post completion of the BRR.

Overall, it is considered that this option performs strongly in terms of delivery against the transport planning objectives of the study and it is recommended for further consideration.

### 8.2.3 Option 3 – Kirkintilloch Bus Hub

This Option would generally have a positive impact against the transport planning objectives of this study by improving the integration of bus services, ease of interchange and make travel by bus more attractive. However, the Option is not anticipated to significantly contribute to modal shift.

The implementation of a bus hub in Kirkintilloch may have a marginal impact on the economy of Kirkintilloch through reduced congestion and improved accessibility through the town centre attributable to the rationalisation of bus stops.

The construction of new infrastructure associated with the bus hub may, however, have adverse environmental impacts, specifically Kirkintilloch town centre is located within a Conservation Area and Townscape Protection Area.

It is considered that this Option will have a positive impact on transport integration through improved integration between modes and a reduction in reliance on private car use. This Option is aimed at providing a more attractive bus system within Kirkintilloch, which is likely to attract public transport users to this mode and will support wider regeneration plans for the town. It is further considered that this Option would have a positive impact on policy integration as it would promote sustainability and reduce the need to travel through encouraging modal shift and assisting in achieving a healthy, prosperous and inclusive society.

In terms of accessibility and social inclusion, the development of a bus hub in Kirkintilloch would assist in reducing town centre congestion through the centralisation of bus stop locations, and would improve bus journey times and journey time reliability for local trips, albeit there would be no increase in public transport coverage.

With regards to public acceptability, it was generally considered that simple measures to improve facilities for bus passengers such as improved shelters and facilities, real time information at bus stops and the general creation of a more pleasant waiting environment would add value and would be welcomed by the public.

Overall, it is considered that this option has the potential to deliver local benefits to bus passengers in the area and should be considered as part of future and ongoing masterplanning works for Kirkintilloch town centre.

### 8.2.4 Option 4 – Bus Park & Ride in the Vicinity of the B757 / KLR

Against the transport planning objectives of this study, a bus-based Park & Ride in this location performs positively. The Option would be expected to support improve the attractiveness of public transport and encourage a shift from car to bus for commuter trips into Glasgow from the Kirkintilloch and Lenzie areas.

It is considered that this Option may help to support local economic development opportunities through a contribution of managed congestion brought about by increased accessibility, and improved journey times particularly along the A803 corridor. The provision of a bus-based Park & Ride facility may have wider economic impacts through improving public transport and accessibility to Glasgow. Analysis of transport modelling indicated that the main benefits generated under this option are travel time savings for car users associated with a reduction in congestion.

The construction of this Option is likely to have some negative environmental impacts. Specifically the site is within / immediately adjacent to the south Lenzie Conservation Area and Townscape Area and adjacent to a pocket of Ancient Woodland listed within the Ancient Woodland Inventory (AWI). This is also surrounded by residential areas and a long-distance pathway and Core Path along the Bothlin Burn, and is located within close proximity to the south Lenzie Conservation Area and Townscape Area and the Gadloch water body.

It is expected that this Option would result in a smoother flow of traffic (through modal shift from private car) and would see a reduction in link speeds which should in turn result in a reduction in the number and severity of accidents. Whilst this Option would encourage people to transfer from cars to bus services for journeys to and from Glasgow, this may be negated by an increase in more local car trips to the Park & Ride and this would require to be considered appropriately at the design stage.

The Park & Ride facility would be expected to integrate with residential properties located to the east of the Link Road (Woodilee), where public transport services are currently limited. It is further considered that this Option would have a positive impact on policy integration as it would promote sustainability and reduce the need to travel through encouraging modal shift and assist in achieving a healthy, prosperous and inclusive society.

In terms of accessibility and social inclusion, the implementation of a bus-based Park & Ride facility could increase the attractiveness of bus as a mode of transport for commuting trips to / from Glasgow and would potentially remove pressure from the rail network and assist in alleviating Lenzie Rail Station parking difficulties.

There are no significant public acceptability issues expected in relation to this Option, albeit there may be localised objections depending on site selection. If modal shift was achieved, it was anticipated that this Option would help to mitigate rail overcrowding issues, thereby being publically acceptable. This Option was generally felt to be attractive by bus operators and transport bodies, particularly if a site is identified which could be used by existing bus services without the need for detour. The proposal would require a minimum level of patronage to at least be sustained in order to be commercially viable and operate successfully over its projected life. The benefits of this option would be enhanced by future implementation of hard-shoulder running on the M80 (understood to be under consideration by Transport Scotland) through providing improved bus journey times and journey time reliability during periods of high traffic volumes. This Option would perhaps be less effective should the proposed Park & Ride facilities at Robroyston and the M80 Hornshill Junction (under consideration by North Lanarkshire Council) be implemented in the future. It is noted that the transport modelling exercise undertaken as part of this study has suggested that the benefits of this option would be reduced in a scenario with the Robroyston Park & Ride facility in place. There would likely be compatibility issues with this option and other Park & Ride proposals.

On the whole, this option performs positively in terms of addressing the transport planning objectives of this study and is recommended for further consideration, pending more detailed site specific investigations.

#### 8.2.5 Option 5 - Bus Park & Ride Adjacent to BRR

Similar to Option 4, the implementation of a bus-based Park & Ride in this location performs positively against the transport planning objectives of this study. The Option would be expected to encourage a transfer of trips from car to bus for commuter journeys from the study area into Glasgow, as well as improving sustainable access to Westerhill Business Park owing to the location of the proposed Park & Ride adjacent to the Business Park. By increasing the accessibility of the Business Park, this Option would also promote local economic growth of the area.

It is considered that this Option may help to support local economic development opportunities through a contribution of managed congestion brought about by increased accessibility, and improved journey times particularly along the A803 corridor. In addition, the provision of a bus-based Park & Ride facility may have wider economic impacts through improving public transport and accessibility. Similar to Option 4, analysis of transport modelling indicated that the main benefits generated under this option are travel time savings for car users associated with a reduction in congestion.

The construction of this Option is likely to have negative environmental impacts, specifically the railway line adjacent to the BRR is identified as an important ecological corridor.

It is expected that this Option would result in a smoother flow of traffic (through modal shift from private car) which would see a reduction in link speeds which should in turn result in a reduction in the number and severity of accidents.

It is considered that this Option would have a positive impact on transport integration through improved integration between modes and a reduction in reliance on private car use, however this may be negated by an increase in more local car trips to the Park & Ride facility and this would require to be considered appropriately at the design stage.

The Park & Ride facility is expected to have a positive impact through promoting modal shift for commuting journeys between the study area and Glasgow, and providing access to a variety of land uses in the wider area. It would integrate with existing and proposed residential developments in Bishopbriggs and also offer sustainable access to Westerhill Business Park. It is further considered that this Option would have a positive impact on policy integration as it would promote sustainability and reduce the need to travel through encouraging modal shift and assist in achieving a healthy, prosperous and inclusive society.

In terms of accessibility and social inclusion, this Option could increase the attractiveness of bus as a mode of transport for commuting trips to / from Glasgow and would potentially remove pressure from the rail network and assist in alleviating Lenzie Rail Station parking difficulties.

There are no significant public acceptability issues expected in relation to this Option, albeit there may be localised objections depending on site selection. It is considered that this Option may ease congestion through the A803 as it may attract residents

from more remote communities (i.e. Lennoxton, Torrance, Milton of Campsie) who are travelling into Glasgow. This Option could be a driver of economic development at Westerhill and may attract other businesses into the area, which would gain public support. The transfer of trips from car to bus would help reduce congestion on the A803 which could increase accessibility through Bishopbriggs town centre, reduce parking problems and increase access to locations such as Stobhill Hospital, all of which are publically acceptable. In order to sustain a Park & Ride service in this area, including through the operation of new services or diversion of existing services, there would be a need for a minimum patronage level. Future implementation of hard-shoulder running on the M80 (understood to be under consideration by Transport Scotland) could enhance the attractiveness of this Option through providing improved journey times and journey time reliability during periods of high traffic volumes. It is to be noted however that transport modelling has suggested that the benefits of this option would be significantly reduced in a scenario with the Robroyston Park & Ride facility in place. There would likely be compatibility issues with this option and other Park & Ride proposals.

This option would have a positive impact against the transport planning objectives of the study and is recommended for further consideration, pending more detailed site specific investigations.

#### 8.2.6 Option 6 – Kirkintilloch / Lenzie Loop Bus

Introduction of a loop bus service connecting key locations within the study area would positively contribute towards delivery of the study transport planning objectives. Specifically, this Option may promote a transfer of trips from car to rail for trips outside of the study area by improving the integration between bus and rail (at Lenzie) for those without access to a car. Importantly, the Option would also encourage sustainable travel for trips within the study area through provision of a loop bus service linking key location within Kirkintilloch and Lenzie.

In terms of this Option, it is anticipated that this Option may deliver wider economic impacts through improving public transport access between Lenzie and Kirkintilloch, although this could be negated if its introduction opens up the local economy of Kirkintilloch to more competition through improving access to the rail network and associated wider economic centres.

It is not anticipated that there would be any adverse environmental impacts associated with this option since it would involve minimal changes to existing infrastructure.

In terms of integration criteria, this option performs strongly. A new loop bus service would link Lenzie rail station to a variety of land uses in the local area including shopping, housing, education, employment and transport. Services would also be timetabled to dovetail with rail services at Lenzie Rail Station, thus significantly improving integration between bus and rail modes.

Similarly, with regards to accessibility, the introduction of a loop bus service would increase public transport network coverage and improve access to Lenzie rail station, thereby increasing the number of people able to access local and city centre employment opportunities. Furthermore, the loop bus service would assist in improving access to employment opportunities within Kirkintilloch town centre, both for those who would make the journey entirely by bus and those who would interchange with rail services at Lenzie. Access to other local services would also be improved, which is 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 rail station.

Overall, while the option does perform positively against many of the transport planning objectives, there are concerns about the deliverability of this Option primarily on the grounds of its commercial viability. For this reason, it is recommended that this option is not taken further forward at this stage.

#### 8.2.7 Option 7 – Increased Parking at Lenzie Station

Increasing car parking provision at Lenzie Station has the potential to have both positive and negative impacts against the transport planning objectives of the study. The Option would enable more people to use Lenzie Station and thereby increase sustainable access for commuter journeys outside of the study area. However, the Option would also encourage an increase in local car journeys accessing the station, thereby having a negative impact against the objective of increasing the use of sustainable transport for trips within the study area.



In terms of economic impacts, the Option would increase the attractiveness of Lenzie Station, which could open up opportunities for increased rail travel and support local development of the area, although wider economic impacts area likely to be minimal.

The Option is likely to generate an increase in local car trips (i.e. trips to get to the car park) in the populated area around Lenzie rail station, which could lead to possible safety concerns.

From a transport integration perspective, increased parking at Lenzie Station would encourage modal shift from car to rail thus improving the level of integration between the modes for longer journeys. Enhanced access to the rail network would also have a positive impact on land-use integration through improving access to land uses in the wider area.

In terms of the impact on local accessibility, while the option will enhance access for car users to the rail station, the net impact is likely to be neutral due to the impact of increased levels of traffic on local roads negating any accessibility benefits to pedestrians and cyclists.

Unlike other options which were generally considered favourable during public consultation, clear opposition was shown to this Option by a number of stakeholders. In addition to concerns that the additional parking would generate more traffic on local roads and have a 'honeypot' effect which would not be acceptable, concerns were also expressed on environmental grounds. Specifically, a potential reduction of recreational green space associated with extending Lenzie Station parking at the surface level would not be supported, while there was strong opposition to the decking due to its likely negative visual impact adjacent to a Townscape Protection Area.

On environmental grounds, it is recommended that this Option is not considered further and instead opportunities are examined to improve and promote local access to the station by sustainable transport means (i.e. walking and cycling) as an alternative approach to relieving parking pressure at the station.

#### 8.2.8 Option 8 – New Rail Station at Woodilee

Implementation of a new rail station at Woodilee performs positively against the transport planning objectives of the study. The Option would support improved public transport journey times through the provision of a direct rail service from Woodilee and, in turn, strongly contribute to the objective of promoting modal shift for commuter journeys outside of the study area. As a result, this Option would be expected to make a positive contribution towards supporting local development and economic growth of the study area.

Following on from this, against the STAG economy criteria, the provision of a new rail station is likely to have a positive economic impact through a combination of managed congestion brought about by increased accessibility, and improved journey times, through the transfer of trips from road to rail. As alluded to above, this option would also have wider economic impacts through improving public transport and accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail lines. The results of modelling suggest that the main benefits derived with this Option would be travel time savings for road users, associated with a reduction in congestion on the local road network due to an increase in public transport users linked to a new rail station at Woodilee. However, while this option performs positively in economic terms in the Do Minimum situation, transport modelling suggests that in a scenario with Robroyston Park & Ride in place, the Woodilee station option does not perform favourably and is estimated to generate a negative BCR with generated benefits abstracted by the availability of the proposed Robroyston Park & Ride.

Promoting modal shift could contribute to local air quality improvements as a result of reduced car emissions, and safety through smoothing traffic flow and transferring trips from road to rail (a safer mode).

Levels of accessibility would be improved with a new Woodilee station, which by its nature would increase public transport network coverage. Rail demand would be expected to increase leading to an increase in the number of people able to access local and city centre employment opportunities, given the speed and capacity characteristics of rail versus other modes.

From a transport integration perspective, a new Park & Ride station at Woodilee would encourage a transfer from cars to rail services for journeys to and from Glasgow, although this may be negated by an increase in more local car trips to the Park & Ride / new station facility. Due cognisance would also need to be given to the impact of this Option on the wider rail network,

specifically the EGIP proposals, to ensure effective integration which could be challenging. In terms of land use integration, this Option is expected to have a positive impact through promoting modal shift for commuting journeys between the study area and Glasgow, and providing access to a variety of land uses in the wider area. The Option would also integrate well with, and improve accessibility for residential properties located in the new Woodilee development, where public transport services are currently limited.

Stakeholder consultation generally revealed support for the concept of a new rail station with Park & Ride at Woodilee as this could alleviate overspill car parking impacts at Lenzie rail station, although there could be localised objections to Park & Ride depending on the site selected and the access route to the site, which requires further investigation. Concerns have been raised, however, around the acceptability of this option due to potential capacity constraints on the Edinburgh-Glasgow line, and associated impacts of additional stations on wider network resilience. Equally, concern was also raised during consultation that some rail users may use a station at Woodilee instead of other stations in the area (i.e. Lenzie and Bishopbriggs), simply to access trains before other passengers in order to get a seat, thus heightening problems of overcrowding down the line (albeit the EGIP proposals will increase passenger capacity on the line).

Despite the likely positive impacts of a new station at Woodilee, there are a number of deliverability issues which pose significant question marks over this Options feasibility.

Firstly, although rail operation modelling undertaken as part of this study has suggested that it would be theoretically possible to timetable additional stops on the Edinburgh – Glasgow rail network, there are concerns around potential capacity constraints on the rail network to accommodate additional stops such as at Woodilee. To implement a new station would potentially require increasing the capacity of the track to ensure services do not interrupt Edinburgh-Glasgow services. This may involve widening to four tracks and implementing parallel slow tracks to allow overtaking, which would result in a significant undertaking (with significant additional costs).

Secondly, and linked to the above, is the potential impact that a new station would have on wider network resilience. Again, although the rail operational modelling has suggested that it is theoretically possible to fit new stops on the line, the additional stopping times associated with new rail stations at Woodilee would have a detrimental impact on the resilience and capacity of the main Edinburgh – Glasgow rail line and may be viewed negatively / not supported by the rail industry. The level of impact and any associated risk would require to be discussed further with Network Rail and Transport Scotland should these Options be progressed. It is likely that these Options would need to go through the GRIP 4 process for rail investment which is a costly exercise and would not guarantee implementation support. A significant level of further expenditure will be required before a determination on the implementability of these Options can be made, and this may be abortive expenditure.

Additionally, there are concerns about the provision of access to a new station at Woodilee and if this option is taken forward, further investigation would be required. While access through the Woodilee residential area would be appropriate for pedestrians and cyclists, it would involve private vehicles travelling through residential traffic calmed streets, which would meet resistance from local residents. A route of this nature would also not be visible from the main road (i.e. the KLR) and may therefore be unattractive to potential rail users. Alternatively, access from the KLR or via Calfmuir Road would involve significant construction works including potential bridge widening.

Overall, while this Option performs strongly against the overall transport planning objectives of this study and various STAG criteria, there are significant deliverability issues which would require further investigation prior to taking this Option further forward.

#### 8.2.9 Option 9 – New Rail Station at Westerhill

Option 9 is anticipated to perform slightly more positively than Option 8 in terms of addressing the transport planning objectives of the study. Similar to Option 8, a new Park & Ride rail station at Westerhill would encourage modal shift to rail for commuter journeys outside of the study area, but in addition would be expected to contribute more positively to objectives around increasing accessibility to key trip attractors within the study area and supporting local development and economic growth of the study area by improving access by rail to Westerhill Business Park.

In terms of the STAG economic criteria, a new rail station at Westerhill would deliver positive impacts through improving public transport accessibility to Glasgow, and other key economic centres located on the Edinburgh – Glasgow and Stirling / Alloa – Glasgow rail line. As referred to above, a new station in this location would also connect the key employment area of Westerhill Business Park with the rail network, delivering wider economic impacts. Analysis of TEE indicates that the primary source of benefits associated with a new rail station at Westerhill is travel time savings with benefits delivered for both road and public transport users. Road users benefit due to an estimated reduction in local traffic and congestion associated with increased numbers using public transport. Benefits for public transport users are generated through faster travel times associated with the provision of a new rail station in this location. Similar to Option 8, transport modelling indicates that while this Option performs positively in economic terms in the Do Minimum situation, in a scenario with Robroyston Park & Ride in place, the Option does not perform favourably and is estimated to have a negative BCR with generated benefits abstracted by the availability of the proposed Robroyston Park & Ride.

The environmental appraisal suggested this option could have both positive and negative impacts. In safety terms, the option would be expected to have a minor positive impact in reducing the number of road casualties by removing cars from road network, but this would be dependent on degree of modal shift from private car.

A new rail station in this location would improve accessibility by increasing public transport network coverage. Particular benefits would be experienced by residents in Bishopbriggs East and employees at Westerhill Business Park. Rail demand would be expected to increase leading to an increase in the number of people able to access local and city centre employment opportunities, given the speed and capacity characteristics of rail versus other modes.

From a transport integration perspective, a new Park & Ride station at Westerhill would encourage a transfer of trips from car to rail for journeys to/from Glasgow and also to Westerhill Business Park which is an important employer in its own right. In terms of land use integration, this Option is expected to have a positive impact through promoting modal shift for commuting journeys to and from the study area, and promote the further development of the Business Park. The option would also be integrated with the proposal for the BRR, which would be expected to open up the accessibility of the site to residents across the study area. Similar to Option 8, cognisance would require to be given to the impact of this Option on the wider rail network, specifically the EGIP proposals, to ensure effective integration which could be challenging.

Stakeholder consultation revealed support for a new rail station at Westerhill. The option is considered to be attractive for existing businesses in the area while increased accessibility may generate economic development which would be supported. Consultation also revealed the view that a new station in this location could alleviate parking issues in Bishopbriggs town centre which would also have a positive impact on air quality, thus gaining public support. However, similar to Option 8, concerns have also been raised about the deliverability of the scheme due to potential capacity constraints on the Edinburgh-Glasgow line, and associated impacts of additional stations on wider network resilience.

As discussed under Option 8, while rail operational modelling has suggested that it would be theoretically possible to timetable additional stops on the Edinburgh – Glasgow rail network, there are concerns around potential capacity constraints on the rail network to accommodate additional stops such as at Westerhill and its impact on reducing wider network resilience. The level of impact and any associated risk would require to be discussed further with Network Rail and Transport Scotland should these Options be progressed. It is likely that these Options would need to go through the GRIP 4 process for rail investment which is a costly exercise and would not guarantee implementation support. A significant level of further expenditure will be required before a determination on the implementability of these Options can be made, and this may be abortive expenditure.

Overall, similar to Option 8, while the development of a new Park & Ride rail station at Westerhill performs strongly against the overall transport planning objectives of this study and various STAG criteria, there are significant deliverability issues which would require further investigation prior to taking this Option further forward.

### 8.3 Summary and Recommendations

Results of the transport appraisal indicate that each of the Options have the potential to positively contribute towards the delivery of the transport planning objectives of the study and also perform positively against the majority of the STAG criteria.

Of all the Options assessed the option of increasing parking provision at Lenzie rail station performs least positively given the public concerns around this option, including the potential environmental impacts on the local landscape as well as the potential increase in local car journeys associated with this Option. The Option of delivering a bus hub in Kirkintilloch has the potential to deliver local level benefits but does not significantly contribute towards the wider transport planning objectives of this study, while the Option of improving local accessibility through the provision of a Kirkintilloch/Lenzie loop bus is not considered to be financially viable.

Of the bus-based options (Option 2, 4 and 5), each option is anticipated to support improved bus journey times and in turn increase public transport accessibility and encourage modal shift for commuter journeys. Option 5 would also support modal shift for trips to the study area by improving sustainable access to Westerhill Business Park. The rail-based Park & Ride options (Options 8 and 9) would similarly contribute positively to encouraging modal shift for key trips from the study area, with Option 9 expected to contribute more positively due to the benefits this Option would deliver by increasing the accessibility of Westerhill Business Park and supporting local economic growth.

The results of transport modelling indicate that the bus-based options generate greater positive economic benefit cost ratio than the rail based options, primarily as these options are not as costly as the rail options, while it is also the case that the proposals for new rail stations are associated with significant deliverability issues which would require further discussion with Transport Scotland and Network Rail. The transport modelling also indicated however that the inclusion of a new Park & Ride rail station at Robroyston has a significant detrimental impact on the level of benefits generated by both the bus and rail-based Park & Ride schemes. The exception to the above is the A803 Quality Bus Corridor Package (Option 2) which does not appear to be impacted by the availability of a new Robroyston station and generates positive impacts in a scenario both with and without Robroyston Park & Ride in place.

On the basis of the appraisal, the following recommendations are made:

- Overall, the development of a QBC on the A803 (Option 2) performs strongly against the transport planning objectives of the study, the STAG criteria and is considered to be technically and operationally feasible. Unlike other options, the QBC Option is estimated to deliver benefits under scenarios both with and without the implementation of a new station at Robroyston. By way of next steps, it is recommended that a detailed feasibility study is undertaken to examine the specific QBC measures that could be implemented along the corridor phased with the development of the BRR. This will ensure that the benefits of the BRR are 'locked in' on the A803 and allow partners to put forward the case for investment in bus measures on the A803 as part of future work looking at enhancing the bus quality corridors across Strathclyde.
- The Kirkintilloch Bus Hub (Option 3) does not perform as strongly against the transport planning objectives of this study but does have the potential to deliver local benefits for public transport users in Kirkintilloch. It is therefore recommended that the findings from the review of the Bus Hub are taken on board as part of the future and ongoing masterplanning works for the regeneration of the town centre.
- Both bus-based Park & Ride options (Option 4 and Option 5) would positively address the transport planning objectives of this study. Option 5 in particular has the potential to deliver benefits not only for public transport users travelling into Glasgow, but also for commuters travelling into East Dunbartonshire owing to its vicinity to Westerhill Business Park. If these options are taken forward, it would be recommended that more detailed site specific investigation is undertaken into potential locations for Park & Ride facilities at both locations. For both options, and in particular the Westerhill Option which could require the development of a new service or diversion of existing services, it is to be noted that there would be a need for a minimum level of patronage in order for Park & Ride operations to be sustainable and this would require further examination. These options should also be kept under review pending potential developments in the form of potential new Park & Ride facilities on the M80 Hornhill junction and the Robroyston Park & Ride station, both of which have the potential to impact on the feasibility of the East Dunbartonshire proposals.

- The Kirkintilloch/Lenzie loop bus (Option 6) performs positively against the transport planning objectives, specifically as it promotes integration and would improve accessibility between a number of key locations within the study area, and should encourage interchange opportunities with Lenzie rail station, which could relieve parking pressures at the station. However, there are serious question marks over the commercial viability of this service and it is therefore recommended that this option is not advanced at this stage. As an alternative, community and demand responsive transport can play an important role in improving local accessibility and in the absence of a commercially viable service may be more appropriate to promote for local passengers.
- Given the public concerns and potential environmental impacts around increasing car parking provision at Lenzie rail station (Option 7), it would be recommended that this Option is not considered further and instead opportunities are examined to improve and promote local access to the station by sustainable transport means (i.e. walking and cycling) as an alternative approach to relieving parking pressure at the station.
- Both rail-based Park & Ride options (Option 8 and Option 9) perform strongly against the transport planning objectives of this study and the rail operational review undertaken as part of this study has suggested that both are theoretically feasible. However, significant concerns have been raised about the deliverability and acceptability of additional stops on the Edinburgh–Glasgow rail network in terms of the impact of reduced resilience on the line which would likely face opposition in the context of the wider EGIP scheme. Also, while both options would improve accessibility to the Woodilee and Westerhill sites, the transport modelling exercise undertaken has suggested that benefits of the new stations would be abstracted with a new Robroyston Station in place; a proposal which has been advanced considerably further in rail planning terms. If there is still an aspiration to take forward these Options, it would be recommended that more detailed operational modelling is undertaken to investigate the impacts of the schemes on the wider resilience of the rail network. It would also be recommended that should either (or, indeed both) of the new stations be taken forward, the proposed locations should be reviewed against the infrastructure requirements of EGIP Phase 2.
- Finally, a number of wider schemes outlined within the Council's Local Transport Strategy and proposed by partner organisations have the potential to contribute to the delivery of the study's objectives and improve local travel choice and conditions throughout the study area. While the Options appraised at STAG 2 stage have focused on infrastructure based measures, for example, to be a success and deliver the transport planning objectives of this study, including modal shift, these need to be complemented by local access improvements such as walking and cycling facilities, and wider publicity and awareness campaigns. Wider schemes being considered at the regional level around integrated ticketing and passenger information should also continue to be supported given the contribution these can make in delivering a step change in public transport use.