

# Midlothian Orbital Bus STAG

Case for Change and Preliminary Options Appraisal  
Executive Summary

Midlothian Council

March 2023

# 1. Introduction

## Overview

AECOM has been commissioned by Midlothian Council, in partnership with the regional transport partnership for South East Scotland, SEStran, to conduct a study based on Scottish Transport Appraisal Guidance (STAG) for four bus corridors within Midlothian. The principal objective of the study – which is being funded through Transport Scotland's Bus Partnership Fund (BPF) – is to develop and appraise options to enhance bus priority on each of the corridors to reduce bus journey times and improve bus journey time variability for trips within Midlothian and to neighbouring local authorities. Options should also address the decline in bus patronage and consider integration with other sustainable modes.

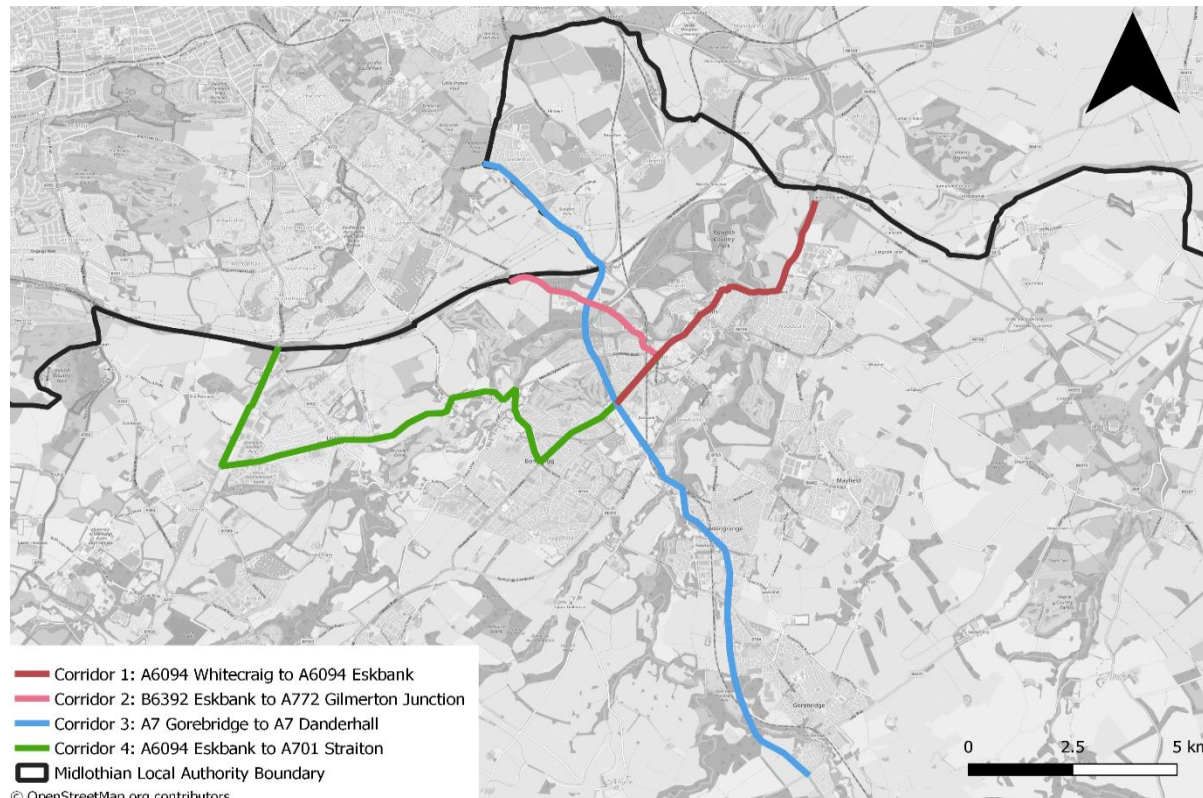
This study has built on the existing body of work contained in the funding application submitted by the Midlothian Bus Alliance (MBA) to the BPF in 2021. The application set out an initial list of problems and opportunities that impact buses across Midlothian and potential options to address these problems. This evidence base has been reviewed and updated as part of this study.

This Note provides an Executive Summary covering off the outcomes from the Case for Change and Preliminary Options Appraisal stages of the STAG process.

## Study Area

The study area encompasses the four key bus corridors in Midlothian shown in **Figure 1** and listed below:

- Corridor 1: A6094 Whitecraig to A6094 Eskbank
- Corridor 2: B6392 Eskbank to A772 Gilmerton Junction
- Corridor 3: A7 Gorebridge to A7 Danderhall
- Corridor 4: A6094 Eskbank to A701 Straiton



**Figure 1: Study Area**

The corridors traverse many of Midlothian's largest settlements, including Loanhead, Lasswade, Bonnyrigg, Eskbank, Dalkeith, Newtongrange and Gorebridge. The routes operate through a number of key junctions, including Eskbank Road Roundabout, Sheriffhall Roundabout, Eskbank Toll and Gilmerton Road Roundabout.

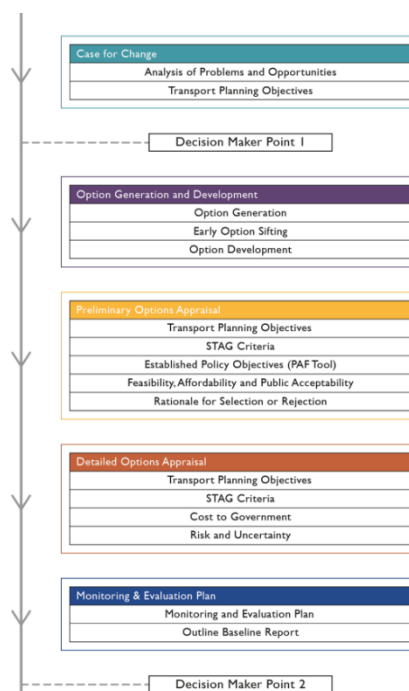
## Scottish Transport Appraisal Guidance

The study has been undertaken following STAG, which represents best practice guidance for transport appraisals and is required whenever Scottish Government funding, support or approval is needed to change the transport system. A summary of the STAG process is shown in **Figure 2**.

The Case for Change stage focuses on an analysis of problems of opportunities drawing on policy review, data analysis of traffic, transport and socio-economic data, and issues identified through stakeholder and public engagement. Drawing on the identified problems and opportunities, Transport Planning Objectives (TPOs) are then developed to set the outcomes that the study should seek to deliver, and in turn guide the development and assessment of options.

The Preliminary Options Appraisal stage has focused on the generation and appraisal of options. A list of options has been generated at this stage, and these were then cleaned and sifted. For the purpose of this study, individual options have been grouped to form four option packages (one per corridor). It is these option packages which have been appraised against the TPOs, STAG Criteria (Environment; Climate Change; Health Safety and Wellbeing; Economy; Equality and Accessibility) and Deliverability Criteria (Feasibility, Public Acceptability and Affordability of options).

As set out, this Note summarises the outcomes from the Case for Change and Preliminary Options Appraisal stages. Future work will involve a more detailed assessment of the option packages.



**Figure 1: STAG Process**

## 2. Problems & Opportunities

### Context

To inform the identification of problems and opportunities a review has been undertaken of the policy, geographic, socio-economic and transport contexts within which the study is set. Of particular importance is that Midlothian is projected to have the highest percentage change in population size out of all the 32 council areas in Scotland (between 2018 to 2028)<sup>1</sup>. Mode of travel to work across the local authority area is also car-dominated, with 63.5% of trips made by car, which is slightly higher than the Scotland average of 62.4%<sup>2</sup>.

Bus services in Midlothian form part of the wider Edinburgh City Region network with the area served by several bus operators, with Lothian Buses / East Coast Buses providing the highest number of services followed by Borders Buses. The majority of services and nearly all routes run to and from various parts of Edinburgh, including the city centre. These services also fulfil important local travel requirements within Midlothian, particularly for east-west movements between Dalkeith and the employment and commercial centres around Straiton. A small number of services are also provided by Lothian Community Transport.

Bus priority infrastructure on the four corridors is limited. Two of the corridors (Corridors 1 and 2) have no bus priority infrastructure in place, whilst there is a small amount of infrastructure on the other two corridors, as below:

- A7 northbound bus lane between north of Newton Church Road junction and The Wisp (Danderhall)
- Short bus lane on southbound approach to A701 / Straiton Park junction
- A701 bus lanes southbound and northbound between A701 / Straiton Park junction and A701 / Pentland Road junction
- Short bus lane on northbound approach to A701 / Pentland Road junction

The quality of infrastructure differs, with site visits identifying that many of the road markings for bus lanes were faded, potentially making it difficult for road users to identify where they are in operation.

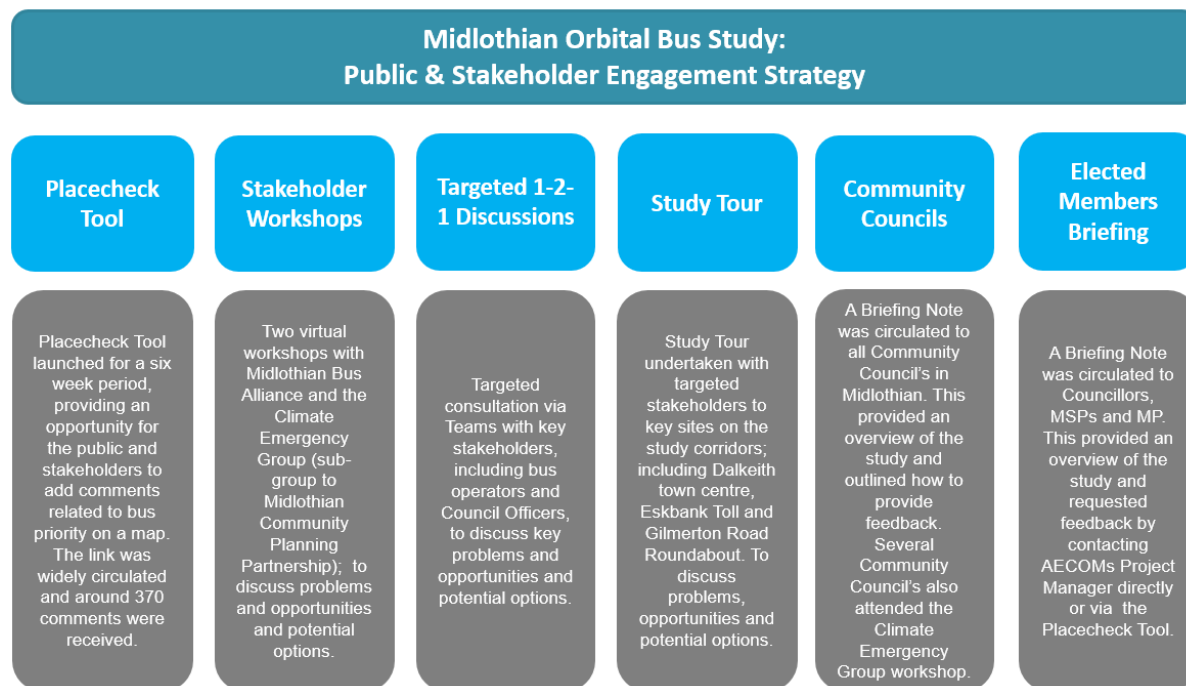
<sup>1</sup> National Records of Scotland, Profile of Midlothian 2021

<sup>2</sup> 2011 Scottish Government Census, <https://www.scotlandscensus.gov.uk>

There are a number of transport projects either proposed or committed in Midlothian which may impact the corridors considered in this study, including A7 Urbanisation Scheme, A701 Relief Road, Sheriffhall Roundabout Grade Separation and Dalkeith Town Centre Regeneration.

## Initial Public & Stakeholder Engagement

To support the identification of problems and opportunities on the study corridors, an extensive engagement exercise has been undertaken at Case for Change stage with the public and stakeholders in Midlothian, as summarised in the diagram below.



**Figure 3: Summary of Public & Stakeholder Engagement**

Further engagement will be undertaken to obtain feedback on options, including through stakeholder workshops, targeted discussions and a public drop in session.

## Problems and Opportunities

STAG<sup>3</sup> states that location-specific problems or opportunities should be the rationale for any appraisal. Following a review of public and stakeholder feedback and findings from analysis of 2022 data (which built on the original BPF application in 2021), the following problems and opportunities related to bus priority measures have been identified in the study area.

### Problems:

#### **Bus congestion (all Corridors)**

- Bus congestion has been identified as a problem on sections of all four corridors through analysis of bus journey time data. Analysis included consideration of where median speeds relative to the speed limit are particularly low, which is an indicator of congestion. Congestion can lead to longer journey times for buses and can also result in journey time variability issues. Areas highlighted through analysis include Eskbank Road Roundabout, Dalkeith town centre, Bonnyrigg Toll and A701 at Straiton.

#### **Right turn movements causing bus congestion (Corridor 1)**

- This problem relates to buses turning right from A6094 onto Buccleuch Street in Dalkeith town centre. Anecdotal evidence suggested constrained turning movements here, with right-turn movements leading to queues forming as vehicles are unable to pass by a stationary bus when travelling straight ahead in the nearside lane. Analysis of data found that the right turn movement from the A6094 onto Buccleuch Street can experience journey time variability. A swept path analysis has also been undertaken for the right turn

<sup>3</sup> Scottish Transport Appraisal Guidance Managers Guide, <https://www.transport.gov.scot/media/50895/scottish-transport-appraisal-guidance-managers-guide.pdf>

movement onto Buccleuch Street and this demonstrates that a bus is able to turn right whilst a bus in the left lane can go straight ahead.

### ***Uncontrolled on-street parking causing longer bus journey times (Corridors 1 and 4)***

- Uncontrolled on-street parking has been identified on sections of A6094 Bonnyrigg Road in Eskbank (on Corridor 1) and Lothian Street in Bonnyrigg and The Loan in Loanhead (on Corridor 4). This leads to buses frequently having to stop when there is oncoming traffic before overtaking stationary vehicles on sections of these roads, thus leading to increased journey times and journey time variability issues. Data analysis also shows sections of these roads record lower median speeds relative to the speed limit, including on the south side of the northern section of Bonnyrigg Road; on Lothian Road; and The Loan, particularly between George Avenue and McNeill Avenue.

### ***Constrained movements at Eskbank Toll (Corridor 1)***

- Queues occurring on approach to the Eskbank Toll roundabout have been highlighted as a problem on the corridor by stakeholders and the public. The constrained geometry of the six-arm roundabout can be difficult for large vehicles such as buses to manoeuvre as they typically require a larger portion of roundabout to be clear and a larger gap in traffic before manoeuvring. The dominant flow of traffic is on the A6094, which can make it particularly difficult for buses exiting from one of the other arms to enter the roundabout, leading to longer journey times.

### ***Rapid growth and development in Midlothian adding pressure to the transport network (all Corridors)***

- Midlothian is forecast to be the fastest growing local authority in all of Scotland in terms of population growth (13.8% increase between 2018 and 2028) as a result of new development, particularly large-scale residential development, including on or close to the four corridors. This will add additional pressures onto the road network, potentially leading to longer journey times for all vehicles, including buses, in the future.

### ***High proportion of travel to work by car and risk of Transport Poverty (all Corridors)***

- A slightly higher than average proportion of people in Midlothian travel to their place of work by car compared to the Scotland wide average (over 63% compared to just over 62% across Scotland)<sup>4</sup>. This contributes to a high number of vehicles on the road, leading to longer journey times for all vehicles, including buses. Even in areas such as Dalkeith where the proportion of people travelling to work by car is slightly lower than the Scotland average, this still constitutes the highest proportion by far of any single mode.
- Transport Poverty<sup>5</sup> is also an issue identified in Midlothian which can impact people's ability to travel around and access key services; high and medium levels of transport poverty have been identified across most areas of Midlothian. The tool defines transport poverty by car availability, household income and access to services by public transport.

### ***Bus access to A7 from Stobhill Road causing longer bus journey times (Corridor 3)***

- Bus services can experience queuing when turning right from Stobhill Road onto the A7, thus increasing journey times. This junction is not signalised and difficulties can arise as a result of the dominant flow of traffic on the A7, which is an important corridor linking the Scottish Borders and Midlothian to Edinburgh.

### **Opportunities:**

- **Improve east-west connectivity** by public transport and encourage development of new bus services.
- **Increase public transport accessibility** through improved punctuality and reduced journey time variability of bus services in Midlothian. A possible way of increasing public transport accessibility and achieving modal shift is through Park & Ride sites. A 2020 SEStran study<sup>6</sup> identified a number of locations for potential future bus Park & Ride sites on or close to the study corridors, including at Millerhill, Shawfair and Lothianburn. Linked to improving accessibility of bus services are opportunities to **install additional bus stops**, for example on the A7 and B6392 / A772 Gilmerton Road corridors as developments are built.
- **Contribute to National Transport Strategy objectives:** The National Transport Strategy<sup>7</sup> (NTS2) sets out the Scottish Government's vision for transport over the next twenty years, which is supported by four priorities to Reduce inequalities, Take climate action, Help deliver inclusive economic growth and Improve

<sup>4</sup> 2011 Scottish Government Census, <https://www.scotlandscensus.gov.uk>

<sup>5</sup> Transport Poverty in Scotland, Sustrans, [https://www.sustrans.org.uk/media/2880/transport\\_poverty\\_in\\_scotland\\_2016.pdf](https://www.sustrans.org.uk/media/2880/transport_poverty_in_scotland_2016.pdf)

<sup>6</sup> SEStran (2020) Regional Park & Ride Strategic Study <https://sestran.gov.uk/wp-content/uploads/2020/05/SEStran-Park-and-Ride-Strategic-Study-Final-Report.pdf>

<sup>7</sup> Transport Scotland (2020) National Transport Strategy <https://www.transport.gov.scot/media/47052/national-transport-strategy.pdf>

our health and wellbeing. The Bus Partnership Fund provides an opportunity to contribute towards achieving these priorities in Midlothian.

- **Greater partnership working** between bus operators and local authorities to the benefit of bus passengers and residents in Midlothian. The Midlothian Bus Alliance has already been developed to guide this study and provides a collaborative forum to discuss potential options.
- **Encourage greater modal shift:** Whilst there are challenges associated with developments leading to additional pressures on the transport network, they also pose an opportunity to make buses an attractive mode of travel for existing and potential new users and thus encourage modal shift from private vehicles to bus.
- **Bus Priority Technology:** Technology is available which permits buses which are behind schedule to be given priority at signals, thus providing an opportunity for these services to better adhere to the timetable and operate with reduced journey time variability.
- **Match in Kind:** Through the Bus Partnership Fund there is an expectation to leverage other bus service improvements as part of the wider partnership offer. Match in kind proposals will be developed at a later stage in the process and will be developed through dialogue with partners, including local authorities, SEStran and bus operators.

Opportunities associated with proposed or committed schemes / projects, including A701 Relief Road, A7 Urbanisation Scheme, Sheriffhall Grade Separation and Dalkeith town centre regeneration are important considerations, to ensure any bus priority measures either form part of or are complementary to ongoing transport schemes.

- **A701 Relief Road:** Part of the rationale for the new road is to relieve pressure from the existing A701 corridor and thus support road space reallocation, either for bus priority or active travel. Any potential bus priority measures on the existing A701 have taken cognisance of the Relief Road and the opportunities this provides in terms of potential traffic reduction on the corridor.
- **A7 Urbanisation Scheme** proposes to implement segregated shared use walking and cycling facilities along the A7 between Gilmerton Road Roundabout in the north and Newtongrange in the south. Designs are being developed. The focus of the Scheme is on active travel and potential options considered as part of this STAG must take cognisance of the active travel proposals.
- **Sheriffhall Grade Separation:** The current road configuration at Sheriffhall Roundabout is a known area of congestion and there are proposals to upgrade the roundabout to be grade separated, thus separating strategic traffic on the A720 and local traffic on the A7 and A6106. No specific bus priority measures are proposed as part of the upgrade but there remains opportunities to lock in the benefits of the grade separation and to make bus travel along the A7 corridor a more attractive mode.
- **Dalkeith town centre regeneration:** Midlothian Council is updating the regeneration masterplan for Dalkeith, informed by a new vision for the town centre. Overarching ideas include a regenerated town centre which is: safe and attractive; a green sustainable place; a place that is a business / commercial destination; and a place that people want to live in. Ideas also include pedestrianisation of part of the town centre. There are opportunities associated with the plans for bus travel in the town.

## Constraints

STAG states that Constraints should be captured; these are summarised below in terms of environmental, physical and technological constraints.

- Bus operators can have different systems for tracking vehicles; as a result, there are challenges identifying optimum traffic light priority measures.
- Residential properties and other buildings line certain sections of the study corridors, thus potentially restricting the level of bus priority in these areas.
- Carriageway space is limited on some sections of corridor, constraining potential measures.
- Some proposed transport schemes, which could have a major impact on bus operations in the study area, are not yet fully committed, constraining potential interventions.
- There are environmental constraints adjacent to / in close proximity to the corridors, including: Conservation Areas, Gardens and designed landscapes and Scheduled monuments.

Other constraints include those associated with the statutory powers of an authority to achieve change, the funding levels that can realistically be obtained, Scottish or UK legislation and Scottish or UK fiscal policy.

### 3. Transport Planning Objectives

The development of TPOs is an important element of the STAG process and they should be evidence led and informed by identified problems and opportunities. In preparing the TPOs, these have also been developed with ‘SMART’ principles in mind. A SMART Objective is:

- **Specific** – it says in precise terms what is sought;
- **Measurable** – there exists means to establish to stakeholders’ satisfaction whether or not the objective has been achieved;
- **Attainable** – there is general agreement that the objectives set can be reached;
- **Relevant** – the objective is a sensible indicator or proxy for the change which is sought; and
- **Timed** – the objective is associated with an agreed future point by which it will have been met.

The TPOs presented below will be developed further as the STAG process progresses. As agreed with Transport Scotland, placeholders have been included in the TPOs at this stage which will be populated following further analysis of the data and discussion with stakeholders at future stages of the STAG process.

- **TPO1: Reduce bus journey times in the AM and PM peaks by X% on the Midlothian study corridors between X and Y [insert years].**
- **TPO2: Increase bus patronage on services operating on the Midlothian study corridors by an average of X% between X and Y [insert years].**

These TPOs have informed the generation and appraisal of options at the Preliminary Options Appraisal stage.

### 4. Preliminary Options Appraisal

#### Summary of Approach

The Preliminary Options Appraisal stage presents a qualitative appraisal of the options being considered, with the adjacent figure summarising the approach to option generation, cleaning, sifting, packaging and appraisal.

Options were sifted against several criteria, including how they performed against TPOs and Deliverability Criteria. Rationale for sifted out options includes where they: were either “out of scope” and not eligible for BPF funding; they performed poorly against the sifting criteria; they were associated with feasibility challenges; or they were considered to have little to no impact on reducing bus congestion.

In line with a proportionate approach, options which performed positively against sifting criteria were retained and form part of an Option Package. Four option packages have been developed, one for each of the four study corridors, as below:

- **Option Package 1:** Measures to improve bus priority on Corridor 1 A6094 Whitecraig to A6094 Eskbank, including Road Space Reallocation, Redesign of Bus Stops, ITS and Signing & Lining.
- **Option Package 2:** Measures to improve bus priority on Corridor 2 B6392 Eskbank to A772 Gilmerton, including New Infrastructure, Signing and Lining and Redesign of Bus Stops.
- **Option Package 3:** Measures to improve bus priority on Corridor 3 A7 Gorebridge to A7 Danderhall, including New Infrastructure, ITS, Signing & Lining and Redesign of Bus Stops.

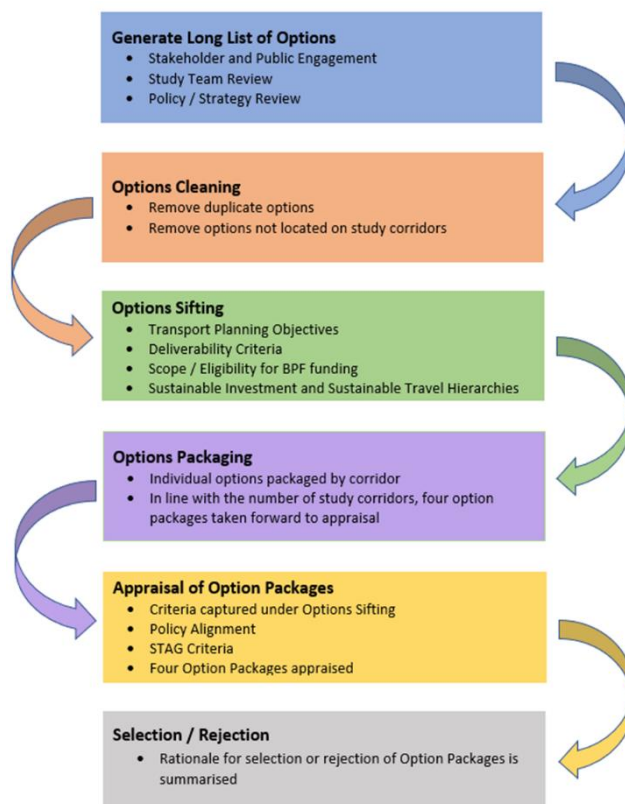


Figure 4: Option Development & Appraisal Approach

- **Option Package 4:** Measures to improve bus priority on Corridor 4 A6094 Eskbank to A701 Straiton, including New Infrastructure, Road Space Reallocation, Redesign of Bus Stops, ITS and Signing & Lining.

Each option package contains a range of individual options, hereafter referred to as option measures, which are outlined below.

It is noted that in addition to those options that have been 'sifted in' for further appraisal, other options have been identified for consideration as complementary measures (these do not however directly form part of an Option Package). Complementary measures include options such as enforcing parking restrictions and bus lanes, supporting EV charging facilities and improving access to bus stops. There is potential for some of these complementary measures to be identified and funded as 'match in kind' measures.

## Appraisal of Option Packages

Following the initial sift of options, the four option packages were appraised against STAG criteria (Environment, Climate Change, Health, Safety & Wellbeing, Economy and Equality & Accessibility), also taking into consideration how options score against TPOs, deliverability criteria, their scope / eligibility for BPF funding and their position in the Sustainable Travel and Investment Hierarchies.

The option measures considered under each of the four option packages are presented by type, as captured in the table.

There are two options which are applicable to all corridors:

- Redesign of bus stops to remove laybys, where appropriate
- Implementation of Urban Traffic Control system in Midlothian (not applicable to Corridor 2)

## Appraisal Findings

Overall, each of the four option packages performed positively against the appraisal criteria and are recommended to be taken forward for more detailed appraisal at the Detailed Options Appraisal Stage. This will include further analytical work and a more quantitative assessment of options in terms of their performance against the appraisal criteria.

### Option Package 1: Measures to improve bus priority on Corridor 1 A6094 Whitecraig to A6094 Eskbank, including Road Space Reallocation, Redesign of Bus Stops, ITS and Signing & Lining

Measure	Location	Option Type
Link three existing traffic signals in Dalkeith town centre, including Traffic Light Priority for buses	High Street and Edinburgh Road, South Street and Buccleuch Street junctions	ITS
Adoption of a right turn filter lane with advanced green time at traffic signal for buses	A6094 / Buccleuch Street Junction	ITS
Signal controlled pedestrian crossings on Newbattle Road and Melville Road approaches to the roundabout; potential to link to buses via Traffic Light Priority on the A6094 bus corridor	Eskbank Toll	ITS
Signalisation of four arms of Eskbank Road Roundabout; including Traffic Light Priority for buses	A6094/A7 Eskbank Road Roundabout	ITS
Bus gate on A6094 in Dalkeith town centre; shared space with pedestrians and cyclists	A6904 Dalkeith town centre	Road Space Reallocation



Bus gate at Buccleuch Street	A6094 Dalkeith High Street at Buccleuch Street	Road Space Reallocation
Signing and lining work on carriageway to formalise the currently uncontrolled on-street residential parking	Bonnyrigg Road (Eskbank Toll to Westfield Park)	Signing and Lining

**Option Package 2: Measures to improve bus priority on Corridor 2 B6392 Eskbank to A772 Gilmerton, including New Infrastructure, Signing and Lining and Redesign of Bus Stops**

Measure	Location	Option Type
Provision of a bus lane on the A772 westbound approach to the A720	A772/A720 Gilmerton Junction	New Infrastructure
Provision of eastbound bus lane before and after Dobbie's Roundabout	Dobbie's roundabout	New Infrastructure
Provision of a westbound bus lane on approach to Gilmerton Road Roundabout	B6392 westbound approach to Gilmerton Road roundabout	New Infrastructure
Bus lanes operational 7am to 7pm, as a minimum	Potential bus lanes	Signing and Lining

**Option Package 3: Measures to improve bus priority on Corridor 3 A7 Gorebridge to A7 Danderhall, including New Infrastructure, ITS, Signing & Lining and Redesign of Bus Stops**

Measure	Location	Option Type
Implementation of a mini roundabout at existing T-junction	A7 / Stobhill Road	New Infrastructure
Provision of a bus lane on the northbound approach to Melville Dykes Roundabout	A7 Melville Dykes Road Roundabout (A7 Northbound approach)	New Infrastructure
Provision of a bus lane on A7 northbound approach to Gilmerton Road Roundabout	A7/B6392 Gilmerton Road Roundabout (A7 NB approach)	New Infrastructure
Provision of a short left turn bus lane on A7 northbound approach to the roundabout	A7/B6392 Gilmerton Road Roundabout	New Infrastructure
New traffic signals, including provision of Traffic Light Priority for buses	A7 / Stobhill Road	ITS
Signalisation of four arms of Eskbank Road Roundabout; including Traffic Light Priority for buses	A6094/A7 Eskbank Road Roundabout	ITS
Bus lanes operational 7am to 7pm, as a minimum	Existing and potential bus lanes	Signing and Lining

**Option Package 4: Measures to improve bus priority on Corridor 4 A6094 Eskbank to A701 Straiton, including New Infrastructure, Road Space Reallocation, Redesign of Bus Stops, ITS and Signing & Lining**

Measure	Location	Option Type
Provision of a section of bus lane between the existing bus stop and on approach to the junction	A768 Lasswade Road / Wadingburn Road	New Infrastructure
Provision of bus lane northbound and southbound between the Straiton Park & Ride entrance and the A720 (New Lane)	A701 between Park & Ride and A720	New Infrastructure
Provision of northbound bus lane south of Straiton Park and Ride Junction, to connect existing bus lane to the south with the proposed bus lane to the north (New Lane)	A701 south of Park & Ride (northbound)	New Infrastructure
Provide priority to buses through introduction of Traffic Light Priority at existing Lasswade Road / Wadingburn Road signals	A768 Lasswade Road / Wadingburn Road	ITS
Provide priority to buses through introduction of Traffic Light Priority at existing A701 / Straiton Park & Ride signals; linking with signals at A701 / Straiton Park Way junction	A701 / Straiton P&R	ITS
Provide priority to buses through introduction of Traffic Light Priority at existing A701 / Straiton Park Way signals; linking with signals at A701 / Straiton Park & Ride junction	A701 / Straiton Park Way	ITS
Signalisation of four arms of Eskbank Road Roundabout; including Traffic Light Priority for buses	A6094/A7 Eskbank Road Roundabout	ITS
Provision of bus lane northbound and southbound between the Straiton Park & Ride entrance and the A720 (Road Space Reallocation)	A701 south of Park & Ride (northbound)	Road Space Reallocation
Provision of northbound bus lane south of Straiton Park and Ride Junction, to connect existing bus lane to the south with the proposed bus lane to the north (Road Space Reallocation)	A701 between Park & Ride and A720	Road Space Reallocation
Signing and lining work on carriageway to formalise the currently uncontrolled on-street residential parking	The Loan	Signing and Lining
Signing and lining work on carriageway to formalise the currently uncontrolled on-street residential parking	The Loan (between McNeill Avenue and George Avenue)	Signing and Lining
Signing and lining work on carriageway to formalise the currently uncontrolled on-street residential parking	A6094 Bonnyrigg Lothian Street	Signing and Lining
Bus lanes operational 7am to 7pm, as a minimum	Existing and proposed bus lanes	Signing and Lining

## 5. Next Steps

In line with STAG, the next stage of work will involve a Detailed Appraisal of the shortlisted options i.e. the four option packages identified through this study. This will involve further development of options including high level design work to enable cost estimates to be prepared, as well as further assessment of option deliverability, risks and impacts to inform the detailed assessment. At the Detailed Appraisal stage, the option packages will be appraised against SMARTened TPOs, STAG Criteria, Deliverability Criteria, and Costs to Government.

There will also be further engagement to obtain feedback from the public and stakeholders. Engagement will involve stakeholder workshops and a public drop in session close to one of the study corridors.