



PRELIMINARY OPTIONS APPRAISAL



STIRLING PARK AND RIDE STUDY

PRELIMINARY OPTIONS APPRAISAL

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EXECUTIVE SUMMARY

SYSTRA Limited (SYSTRA) was commissioned by regional transport partnership Tactran to consider how best to increase the modal share of public transport for those strategic trips (which are too long to be undertaken by active travel) entering, leaving and passing through the Stirling City Area. Funding was allocated to the study as part of Transport Scotland's Local Rail Development Fund (LRDF).

The work builds on the recommendations of Stirling Council's DPMTAG Transport Appraisal, undertaken to inform Stirling's Local Development Plan (LDP) and Local Transport Strategy (LTS), which concluded that to enable full build out of the Plan, additional interventions would be required over and above what the Council could achieve via local modal shift and local road capacity improvements.

This report presents the findings of the Preliminary Options Appraisal stage of the Stirling Transport Appraisal, and follows the Initial Appraisal: Case for Change stage which was approved in early 2020.

Recommendations

The options identified in the Case for Change have been assessed qualitatively against the study Transport Planning Objectives (TPOs) and STAG Criteria. In addition, the deliverability of the options was considered against Feasibility, Affordability and Public Acceptability.

This qualitative appraisal of the options has resulted in nine options being recommended for further investigation as part of the Detailed Options Appraisal. The options and rationale for progressing is detailed in the following table.

Stirling Park and Ride Study	
Preliminary Options Appraisal	107755
STAG Report	03/02/2021

Summary of Initial Appraisal – Options to be taken Forward¹

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 1: Improve coach connectivity - increase in frequency and destinations	✓	✓ ✓	✓ ✓	-	✓	✓	✓	✓	Mod	Mod	Min	Progressed Contributes to TPOs by improving public transport connectivity between study area and locations outside the area, including locations not served by rail.
Option 6a: New Bus/coach Park and Choose site at Pirnhall/South Stirling	✓	✓ ✓ ✓	✓ ✓	X	✓	✓ ✓	✓ ✓ ✓	✓	Maj	Mod	Min	Progressed As identified in previous STPR and STAG investigations it addresses TPOs by providing local and strategic P&C, reducing the need to drive into Stirling.
Option 7d: Increased parking at Bridge of Allan station	-	✓ ✓	✓ ✓	-	✓	-	✓	-	Mod	Maj	Mod	Progressed Option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently impacted by parking availability

¹ Identification numbers are not continuous as they reflect the original identifications prior to options not being progressed

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
												limitations and reducing traffic going into Stirling.
Option 8a: New rail station between Bridge of Allan, Causewayhead and Cornton (retaining Bridge of Allan station) with park and ride facilities	✓ ✓	✓ ✓	✓ ✓	X	✓ ✓	✓	✓ ✓	✓ ✓	Maj	Maj	Maj	Progressed Option performs well against the TPOs and would increase access for Cornton residents as well as removing car trips from the strategic network.
Option 8b: New rail station at Manor Powis with park and ride facilities	-	✓ ✓	✓	X	✓	✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail.

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 8c: New rail station at Cambus with park and ride facilities	-	✓ ✓	✓	X	✓	✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail.
Option 8d: New rail station at Causewayhead with park and ride facilities	✓	✓ ✓	✓	X	✓	✓ ✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed Option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail from Wallace High and Stirling University.
Option 8e: New rail station south of Stirling with park and ride facilities	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	X	✓	✓ ✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed Significant benefits to all three TPOs by providing a station within walking distance for Cowie or Bannockburn populations whilst also close to A91 eastern peripheral route.

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 8h: Relocated Bridge of Allan station with park and ride facilities	✓✓	✓✓	✓✓	✗	✓	-	✓✓	✓✓	Maj	Maj	Maj	Progressed Relocating Bridge of Allan station makes significant positive impacts on the TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling. Major deliverability considerations have been identified for delivery.



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1. INTRODUCTION

1.1 Background

- 1.1.1 SYSTRA Limited (SYSTRA) was commissioned by regional transport partnership Tactran to consider how best to increase the modal share of public transport for those strategic trips (which are too long to be undertaken by active travel) entering, leaving and passing through the Stirling City Area. Funding was allocated to the study as part of Transport Scotland's Local Rail Development Fund (LRDF).
- 1.1.2 The work builds on the recommendations of Stirling Council's DPMTAG Transport Appraisal, undertaken to inform Stirling's Local Development Plan (LDP) and Local Transport Strategy (LTS), which concluded that to enable full build out of the Plan, additional interventions would be required over and above what the Council could achieve via local modal shift and local road capacity improvements.
- 1.1.3 LRDF funded studies are undertaken in three stages:
- Initial Appraisal: Case for Change;
 - Preliminary Options Appraisal; and
 - Detailed Options Appraisal.
- 1.1.4 This report presents the findings of the Preliminary Options Appraisal Stage of the Stirling Park and Ride Study, and follows the Initial Appraisal: Case for Change stage which was approved by Transport Scotland in early 2020.
- 1.1.5 Figure 1 shows the study area for this appraisal and for the purpose of this study, the area will be referred to as the Stirling City Area.

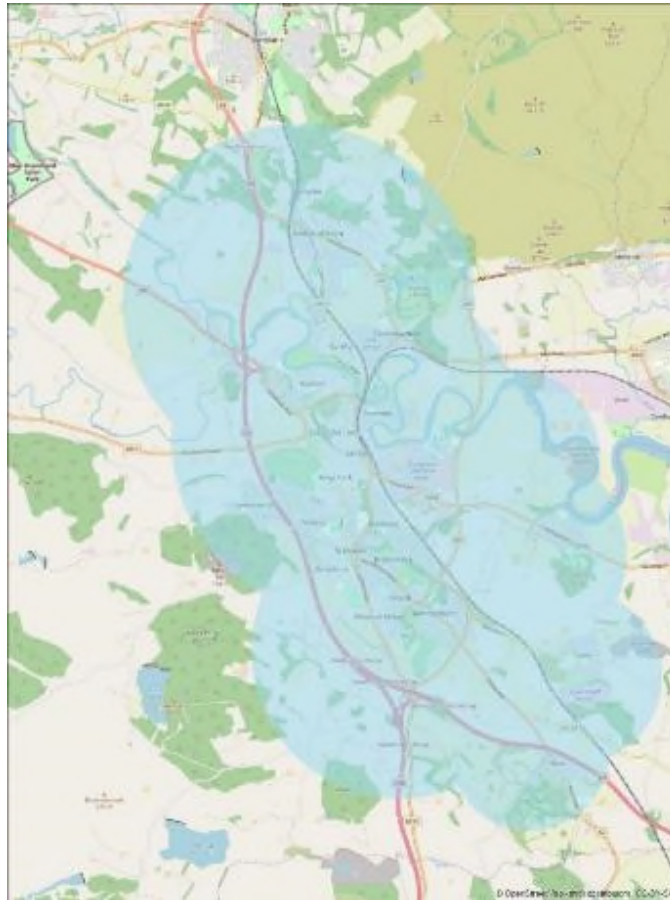


Figure 1. Stirling Study Area (Open Street Map)

1.2 Initial Appraisal: Case for Change

1.2.1 The Case for Change established the baseline for the study by identifying evidenced transport problems and opportunities within the study area which are reflected in the Transport Planning Objectives (TPO). Based on the problems, opportunities, issues and constraints identified through this process, three TPOs were identified:

- TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.
- TPO2: Support Stirling's Local Development Plan (LDP) and the Stirling and Clackmannanshire City Region Deal (CRD) growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.
- TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.

1.2.2 The development of the TPOs took into consideration established policy directives. Following the publication of the National Transport Strategy 2 in early 2020 the TPOs have been reviewed and considered to align with the objectives of NTS2.

- 1.2.3 Following the development of the Transport Planning Objectives, a wide range of options were generated by stakeholders through engagement sessions which could alleviate the identified problems and address the potential opportunities across the study area.
- 1.2.4 Ninety-nine options were generated at this stage, after refining and collating these options an initial, high level sifting determined the suitability for further assessment. This appraisal was a qualitative assessment against the TPOs and determined if the option would have a positive, negative or neutral impact against the TPO.
- 1.2.5 At this stage, some options were identified as *Complementary* options. These options were not considered to significantly impact on the TPOs as a standalone option but as a package they would contribute.
- 1.2.6 Nine *Core* options were identified for initial appraisal and fourteen as *Complementary*. Through the Preliminary Options Appraisal process, this has been expanded out to 35 sub-options to take account of different locations for each option which would warrant individual attention.
- 1.2.7 To maintain the focus on the Core options, the appraisal of the complementary options is not detailed in the main body of the report.
- 1.2.8 Appendix A presents the Appraisal Summary Tables (ASTs) for the Core options. Appendix B presents the ASTs for the Complementary options.



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2. SUMMARY OF OPTIONS

2.1 Overview

2.1.1 The generated options have been developed further and, in a number of cases, have been split into sub-options to reflect the different geographies which would warrant individual appraisal attention.

2.1.2 To focus the appraisal on the Core options (Table 1) that will have greatest impact on the TPOs, the options identified below as Complementary (Table 2) are summarised in Appendix B.

Table 1. Core Options

ID	MODE	OPTION	DESCRIPTION
1	Coach	Improve strategic coach connectivity - increase in frequency and destinations	Increasing the frequency and destinations of coach services to key employment centres and cities including Glasgow, Edinburgh and Falkirk from existing stops in the study area to a wider range of destinations.
2	Light Rail/Tram	Light rail from Pirnhall/Durieshill into Stirling	Light rail from Pirnhall/Durieshill into Stirling.
3	Park and Choose	Improvements to existing bus Park and Choose sites serving Stirling City Area	<p>This option includes a range of improvements to existing bus park and choose sites at Springkerse and Castlevie:</p> <ul style="list-style-type: none"> improved walking and cycling connections/facilities (including Nextbike); a tourism bus into Stirling City Centre and Stirling Castle; review access arrangements to Springkerse P&C; a review of services to improve connections to employment and education destinations and improve frequencies; and EV charging
4	Rail	Improve journey times, frequencies of rail services	Improve journey times and frequencies of rail services to Glasgow and Edinburgh, from and through the study area.

ID	MODE	OPTION	DESCRIPTION
5	Bus-Rail	Improve local bus connections to/from rail stations	Increase the number of bus services connecting communities to rail stations in the study area, including from Plean, Cowie and Fallin.
6a	Park and Ride	New Bus/coach Park and Ride site at Pirnhall/South Stirling	A new Bus/coach Park and Ride site at Pirnhall/South Stirling to provide connections to Stirling and to the Central Belt.
6b	Park and Ride	Bus/coach Park and Ride opportunities at Manor Powis	A new Bus/coach Park and Ride site at Manor Powis to provide connections to Stirling.
7a	Rail	Increased parking at Stirling station	Increased parking at Stirling station
7b	Rail	Increased parking at Larbert station	Increased parking at Larbert station
7c	Rail	Increased parking at Alloa station	Increased parking at Alloa station
7d	Rail	Increased parking at Bridge of Allan station	Increased parking at Bridge of Allan station
7e	Rail	Increased parking at Dunblane	Increased parking at Dunblane
8a	Rail	New rail station between Bridge of Allan, Causewayhead and Cornton (retaining Bridge of Allan station) with park and ride facilities	New rail station between Bridge of Allan, Causewayhead and Cornton (retaining Bridge of Allan station)
8b	Rail	New rail station at Manor Powis with park and ride facilities	New rail station at Manor Powis
8c	Rail	New rail station at Cambus with park and ride facilities	New rail station at Cambus
8d	Rail	New rail station at Causewayhead with park and ride facilities	New rail station at Causewayhead

ID	MODE	OPTION	DESCRIPTION
8e	Rail	New rail station south of Stirling with park and ride facilities	New rail station south of Stirling
8f	Rail	New rail station at Blackford or Greenloaning with park and ride facilities	New rail station at Blackford or Greenloaning
8g	Rail	New rail station and line reopening to Clackmannan	New rail station and line reopening to Clackmannan
8h	Rail	Relocated Bridge of Allan station with park and ride facilities	This option is the relocation of Bridge of Allan station further south to between Cornton No1 vehicular level crossing and Cornton No2 pedestrian level crossing (between B823 and Easter Cornton Road).

Table 2. Complementary Options

ID	MODE	OPTION	DESCRIPTION
1	Bus	Potential for other trip attractors to use (local employer) Prudential bus services (from city centre and around Central Scotland, e.g. Forth Valley College).	Prudential currently operates a bus service from employees with pick up points across Stirling. This option proposes to allow non-employees use the service to increase local accessibility with no additional services.
2	Road	Road improvements: Infrastructure improvements identified as DP4 and DP5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road.	Road improvements: Infrastructure improvements identified as DP4 and 5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road which may support core options. The M9 connectivity is being appraised separately and does not require appraisal here.

ID	MODE	OPTION	DESCRIPTION
3	Taxis	Wheelchair accessible taxis and private hire vehicles.	Increase the availability of wheelchair accessible taxis and private hire vehicles. Negligible
4	Bus	Bus priority/gates on city centre approaches.	Introduce bus priority measures or bus gates on city centre approaches.
5	Bus	Promote investment in new buses.	Promote investment in new buses.
6	Active Travel	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and Park and Ride sites and train stations.	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and train stations. Improved connections from P&R sites to the centre.
7	Active Travel	Widen the bike share scheme in and around the city.	Widen the bike share schemes in and around the city.
8	Integration	Improve bus and cycle integration at bus shelters and on buses by allowing bikes on buses and installing cycle parking at shelters.	Improve bus and cycle integration at bus shelters and on buses by allowing bikes on buses and installing cycle parking at shelters.
9	Integration	Create a multi-modal ticketing system and optimise pricing structure.	Create a multi-modal ticketing system and optimise pricing structure.
10	Integration	Promote activities to encourage more sustainable travel.	Investigate and promote, if applicable. activities to encourage more sustainable travel, for example, travel plans, car-free days and incentives to leave the car at home.
11	Integration	Community transport targeted at interchange opportunities.	Support improvements in the Community Transport offering and target movements to and from interchange opportunities.

ID	MODE	OPTION	DESCRIPTION
12	Parking	Manage parking in the city centre with policy changes.	Manage parking policy in the city centre - this could include a review of parking prices in the city and P&R fares (reduced to encourage P&R use). The Community Parking Management Plan has recently been approved and this option is therefore not to be appraised.
13	Technology	Technological improvements to improve flow of traffic	Technological improvements to improve flow of traffic: <ul style="list-style-type: none"> • Intelligent Transport Systems directing to P&R with spaces • Traffic light prioritisation for public transport • Bus real time information
14	Lift Sharing	Improve lift share offering in the study area by incentivising lift sharing	Improve the lift share offering in the study area by incentivising lift sharing

2.2 Impact of Covid-19 Restrictions

- 2.2.1 The study looks at how to best manage future travel demands associated with growth in the Stirling area, at a time when the country is entering a period when a number of different scenarios could affect future travel demands and how they could be met.
- 2.2.2 The timing of the Preliminary Appraisal means that it is being undertaken during a period of great uncertainty and change in society due to the impacts of Covid-19 which exacerbates this issue.
- 2.2.3 The restrictions put in place by both UK and Scottish governments has impacted on how people, work, study and socialise. This in turn has impacted on how travel is viewed and undertaken.
- 2.2.4 At this stage, the medium to long-term impacts of the virus have not been considered as a factor in appraisal. As the picture becomes clearer, these will be discussed further with key stakeholders at the Detailed Appraisal stage.



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3. METHODOLOGY

3.1 Scottish Transport Appraisal Guidance (STAG)

3.1.1 As required by the conditions of the LRDF, the study has been undertaken in accordance with the Scottish Transport Appraisal Guidance (STAG) process which provides a framework to assess the performance of different transport options to address identified problems and present the results in a consistent manner to inform decision makers. The STAG process comprises four stages as outlined below:

- **Pre-Appraisal (Initial Appraisal: Case for Change):** where the problems, opportunities, issues and constraints are identified and scoped. Study-specific Transport Planning Objectives (TPOs) are then identified and an 'optioneering' and sifting process undertaken to provide a list of possible options to address the problems;
- **Initial Appraisal (Preliminary Options Appraisal):** potential options are appraised against the TPOs, five STAG criteria and factors concerning deliverability, to ensure that they are likely to fulfil the study's requirements;
- **Detailed Appraisal (Detailed Options Appraisal):** involving more detailed consideration of potential options taken forward following the Initial Appraisal, and presenting the outcomes to inform investment decision makers. The Detailed Options Appraisal also includes proposals for monitoring and evaluation; and
- **Post-Appraisal:** key elements of this stage involve the application of the monitoring and evaluation proposals developed as part of the appraisal.

3.1.2 This stage of the study is the **Preliminary Options Appraisal**. This report details the performance of the options in terms of the likely impacts of the options against TPOs (1.2.1), likely impacts of the options against the five STAG criteria (Environment, Safety, Economy, Integration and Accessibility, and Social Inclusion), and feasibility, affordability and likely public acceptability of the options (3.3).

3.1.3 In line with STAG, the preliminary appraisal has been completed on a largely qualitative basis and draws on the quantitative data collected as part of the Case for Change and previous studies where appropriate. The Appraisal Summary Tables (ASTs) that form Appendix A provide further information on the different aspects of the appraisal for the options identified.

3.2 Appraisal of the Options

3.2.1 The performance of an option against each criterion follows the seven-point scale of assessment as recommended in STAG, and has therefore been adopted for this part of the appraisal:

- Major benefit (✓✓✓): these are benefits or positive impacts which, depending on the scale of benefit or severity of impact, the practitioner feels should be a principal consideration when assessing an option's eligibility for funding;
- Moderate benefit (✓✓): the option is anticipated to have only a moderate benefit or positive impact. Moderate benefits and impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together do so;
- Minor benefit (✓): the option is anticipated to have only a small benefit or positive impact. Small benefits or impacts are those which are worth noting, but the practitioner believes are not likely to contribute materially to determining whether an option is funded or otherwise.
- No benefit or impact (-): the option is anticipated to have no or negligible benefit or negative impact.
- Small minor cost or negative impact (✗): the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together could do so.
- Moderate cost or negative impact (✗✗): the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together could do so; and
- Major cost or negative impacts (✗✗✗): these are costs or negative impacts which, depending on the scale of cost or severity of impact, the practitioner should take into consideration when assessing an option's eligibility for funding.

3.3 STAG Criteria

3.3.1 The appraisal of the options against the STAG criteria includes:

- Environment:
 - Noise and vibration;
 - Global air quality - carbon dioxide (CO₂);
 - Local air quality - particulates (PM₁₀) and nitrogen dioxide (NO₂);
 - Water quality, drainage and flood defence;
 - Geology;
 - Biodiversity and habitats;
 - Landscape;
 - Visual amenity;
 - Agriculture and soils;
 - Cultural heritage; and
 - Physical Fitness.

- Safety:
 - Accidents; and
 - Security.
- Economy:
 - Transport Economic Efficiency (TEE); and
 - Wider Economic Impacts.
- Integration:
 - Transport integration;
 - Transport and land-use integration; and
 - Policy integration.
- Accessibility and Social Inclusion:
 - Community Accessibility; and
 - Comparative Accessibility.

3.4 Transport Planning Objectives

3.4.1 The Transport Planning Objectives for this study are as follows:

- TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.
- TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.
- TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.

3.5 Feasibility, Affordability and Public Acceptability

3.5.1 The implementation potential of the options was appraised in terms of feasibility, affordability and public acceptability as follows:

- Feasibility – a preliminary assessment of the feasibility of construction or implementation and operation (if relevant) of an option and the status of its technology (e.g. proven, prototype, in development, etc.) as well as any cost, timescale or deliverability risks associated with the construction or operation of the option, including consideration of the need for any departure from design standards that may be required;
- Affordability – the scale of the financing burden on the promoting authority and other possible funding organisations and the risks associated with these should be considered together with the level of risk associated with an option's ongoing operating or maintenance costs and its likely operating revenues (if applicable); and
- Public Acceptability – the likely public response at this initial appraisal phase.

- 3.5.2 For this appraisal, the criteria have been assessed over three levels: minor, moderate or major considerations. By ‘consideration’ it is meant that there may be potential negative or problematic issues which will require a certain level of investigation.
- 3.5.3 As this analysis highlights ‘potential’ issues, the scorings of ‘major’ in this section of the appraisal have not led to an outright rejection of these options. The scoring has been considered in the overall context of the appraisal and further analysis of these issues will need to be explored if the option is taken forward. Further analysis in the Detailed Appraisal will allow more detailed scoring (i.e. in relation to a seven-point scale for example), however, at present it is felt that doing this would be misrepresentative, creating an unfairly negative score where details of considerations are unconfirmed.

3.6 Governance

- 3.6.1 The governance process for this exercise includes taking Stirling Council’s LDP/LTS Member Officer Working Group (MOWG) through each stage of the process before we seek approval to submit the respective stage of the work from either the Forth Valley Regional Transport Working Group (Case for Change and Preliminary Appraisal), or Stirling Council’s Environment and Housing Committee (Detailed Appraisal). In taking the preliminary appraisal to the MOWG, the elected members expressed a strong preference for social inclusion to be a key determinant in prioritising any option, and requested that this preference be noted in the preliminary appraisal. Specifically, they didn’t want to see an option with less of an impact on reducing social inclusion prioritised over one that had a greater impact on reducing social inclusion.

4. PRELIMINARY OPTIONS APPRAISAL

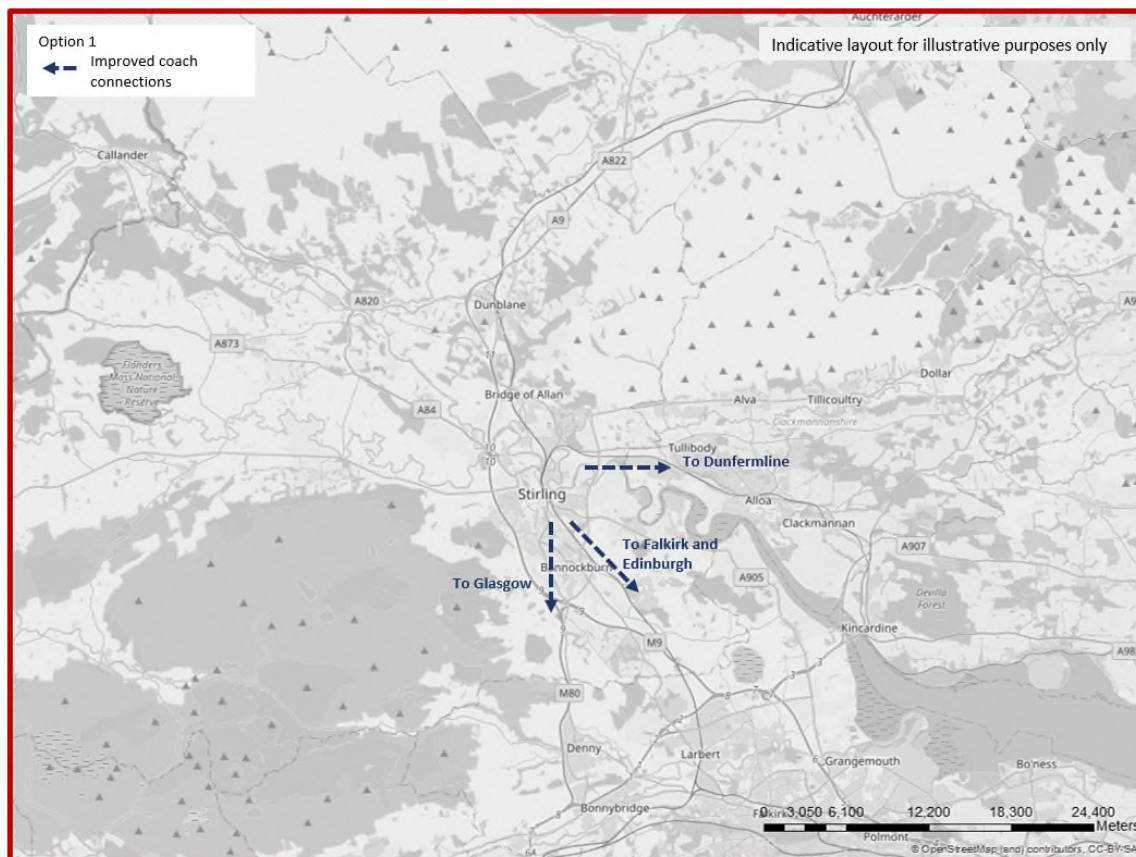
4.1 Overview

- 4.1.1 This chapter summarises the performance of the options against the criteria described in Chapter 0 and the recommendations to further investigate an option in the Detail Appraisal or reject at this stage. This includes the rationale for rejection or selection of an option.
- 4.1.2 The tables presented here are summaries of the Appraisal Summary Tables (ASTs). For complete ASTs, please refer to Appendix A.

Table 3. Option 1 – Improving Strategic Coach Connectivity

OPTION 1 – IMPROVING STRATEGIC COACH CONNECTIVITY TO/FROM THE STUDY AREA

This option would involve increasing the frequency and destinations of coach services to key employment centres and cities including Glasgow, Edinburgh and Falkirk from existing stops in the study area to a wider range of destinations.



Performance Against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	The benefits associated with this option would be dependent on the location of stops for connections to healthcare, employment, education and training for the residents of Plean, Cowie, Fallin, Bannockburn and Cornton. Connections may still be required to access the coach network however it is considered that this option would increase the opportunities, services and locations which could be accessed.
TPO2: Support LDP and CRD growth aspirations by	✓✓	This option would increase the attractiveness of coach travel and provide additional options for strategic travel. This would encourage a shift from private car to public transport.

OPTION 1 – IMPROVING STRATEGIC COACH CONNECTIVITY TO/FROM THE STUDY AREA

reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	This option would increase the frequency and destination of coach trips which improve the competitiveness of coach travel for strategic trips.

Summary of Performance against STAG Criteria

Environment	-	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.
Safety	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network and therefore lower vehicle kilometres. This reduction will be a modal shift from car to coach.
Economy	✓	Increased destinations and frequencies would lead to journey time benefits using direct services to destinations and reduced wait and interchange time. This option would lead to additional operating, maintenance and investment costs and a minor increase in subsidy may be required to increase the service provision, especially in the short term. Following the establishment of the option, however, increased passenger numbers and revenue generated by a more attractive service to the key employment centres are expected. This option is considered to be relatively low cost with relatively low benefits.
Integration	✓	An increased number of services and destinations would allow for more service integration and supports

OPTION 1 – IMPROVING STRATEGIC COACH CONNECTIVITY TO/FROM THE STUDY AREA

		the Local Development Plan by improving services in the vicinity of Plean, Cowie and Fallin which are identified as growth areas. This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.
Accessibility and Social Inclusion	✓	Improvements to frequencies and destinations of coach services would improve public transport coverage across the study area. Although it would not directly improve walking or cycling it would improve access to services and local accessibility. The comparative accessibility benefits associated with this option would be dependent on the location of the stops and the connections. Connections by car may still be required to access the coach network which would not benefit those households with no access to a car, however, it is considered that this improvement would still result in a minor benefit for Accessibility.

Implementability Appraisal

Feasibility	Moderate consideration	Additional stops to an existing long-distance service would have minor impacts on deliverability, however, new destinations and services would require changes to existing bus timetables and additional coach fleets. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available. In particular, the potential requirement to subsidise a national coach network may require investigation. This option may be supported by the priority of Stirling Council to develop a business case for a community-owned public transport company. ²
Affordability	Moderate consideration	The patronage associated with this option is expected to be low to medium at the outset, with comparably low operating revenue. This option, therefore, may be reliant on public sector revenue funding as it may not be commercially viable to offer such a service. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.

² <https://www.stirling.gov.uk/media/5764/5-year-plan-low-2018-feb-9-10am-003.pdf>

OPTION 1 – IMPROVING STRATEGIC COACH CONNECTIVITY TO/FROM THE STUDY AREA

Public Acceptability	Minor consideration	It is anticipated that improving the frequency and destinations of coach services would be well received by the public.
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Select/Reject Rationale

This option contributes positively to all three TPOs by improving coach connectivity and, therefore, connections to major employment centres. This would have a positive impact on improving the competitiveness of public transport and reducing the modal share of cars entering, leaving or passing through the Stirling City Area.

The option is considered a minor positive benefit for all options excluding environment (neutral) and would support integration and accessibility whilst also providing an economic benefit.

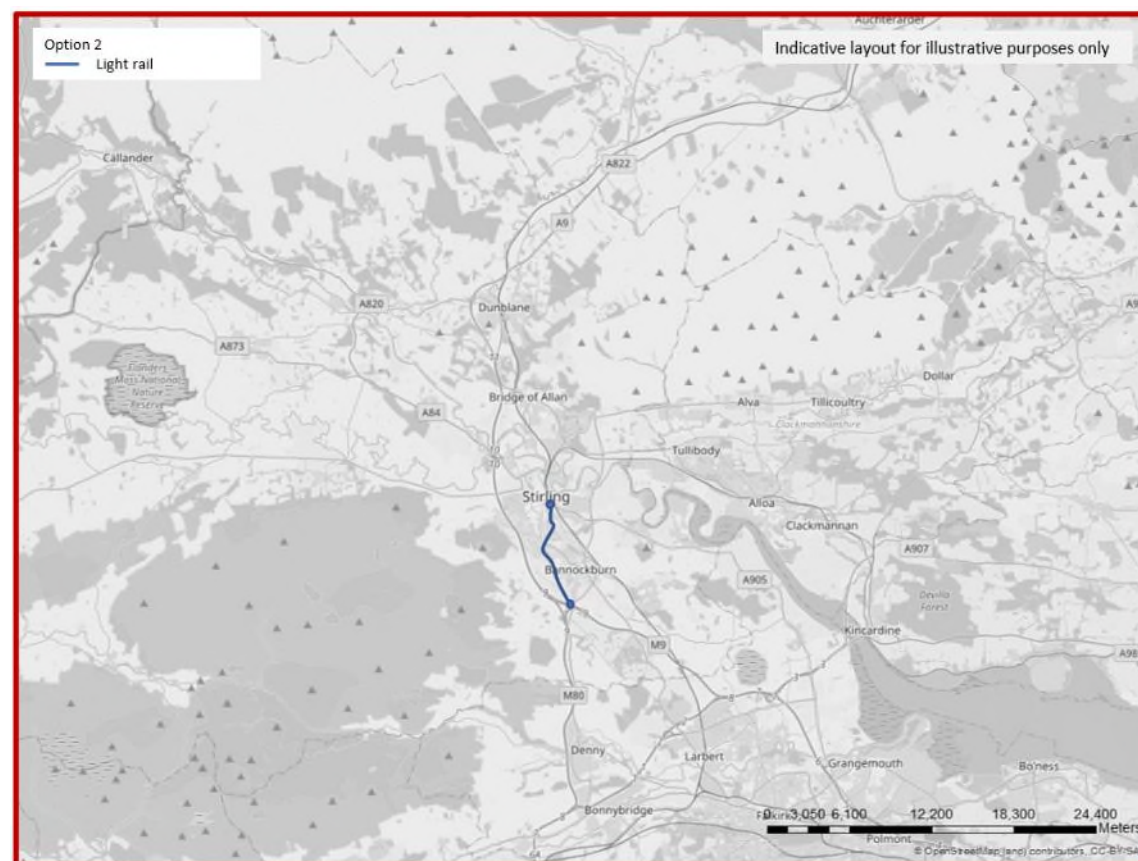
Considerations regarding the deliverability of the option have been considered, in particular, with regard to discussions with operators and potential subsidies which may be required. The option would likely receive support from the public due to the increased connectivity to key employment centres.

Progressed to Detailed Appraisal.

Table 4. Option 2 – Light Rail from Pirnhall/Durieshill into Stirling

OPTION 2 – LIGHT RAIL FROM PIRNHALL/DURIESHILL INTO STIRLING

This option would involve the construction of a Light Rail line from Durieshill/Pirnhall into Stirling with regular services to provide a connection to be used by residents and employees at the planned development at Durieshill, communities in southern Stirling and as a park and ride into Stirling.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	A light rail service from Pirnhall/Durieshill to Stirling would improve access to services for communities along the route, including residents of Bannockburn. This would be a benefit for Bannockburn residents to access Stirling City Centre and the strategic site at Durieshill. The light rail is not considered a moderate benefit as bus services currently serve the route from Bannockburn.
TPO2: Support LDP and CRD growth aspirations by	✓ ✓	This option would improve transport options from Durieshill which is a significant housing and employment site to the south of Stirling with 3,000 homes. This would provide a direct link from the

OPTION 2 – LIGHT RAIL FROM PIRNHALL/DURIESHILL INTO STIRLING

reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		development, supporting the LDP and could reduce the modal share of cars entering the area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would increase the range of public transport from the planned development at Durieshill and on the route to Stirling City Centre, however, this would have only a minor benefit for TPO3 as passengers would be required to interchange at Stirling rail or bus station to access the strategic transport network.

Summary of Performance against STAG Criteria

Environment	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	✓	This option is considered a minor positive benefit to safety resulting from the reduction of private cars on the local road network. This reduction will be a modal shift from car to bus and coach park and ride and reduce vehicle kilometres on the local road network. Security for public transport users would also be improved by this LRT option because it would include passenger waiting facilities built to minimum safety requirements with regards to entrances and exits, lighting and surveillance.
Economy	X	This option would provide a direct connection to Stirling City Centre which would have journey time benefits and modal shift from car to P&R may also reduce car and bus journey times. Capital costs associated with light rail would be major and require full feasibility studies, land costs, junction modelling and engineering. In addition, rolling stock would be required alongside significant operating and maintenance costs. Although the service would generate new revenue through new passengers a high subsidy is expected to be required for this option, especially in the short term to

OPTION 2 – LIGHT RAIL FROM PIRNHALL/DURIESHILL INTO STIRLING

		<p>establish demand as the flow is not considered significant enough to maintain the service.</p> <p>The location of the Park & Ride, close to a large residential and employment development at Durieshill, would provide improved public transport connectivity between Stirling City Centre and the planned housing and employment which would have a positive impact on Wider Economic Impacts. On balance however, the option is considered to have major costs with relatively low benefits and is a minor negative impact.</p>
Integration	✓ ✓	<p>The LRT would provide additional services and destinations which would allow for more service integration and between modes. In addition, park and ride facilities may be available at some stops. The integration of a major residential and employment development at Durieshill into Stirling City Centre would provide sustainable access to employment, education, healthcare and leisure facilities for the Durieshill residents and other nearby communities. The option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice reinforces that this option is moderate benefit for Integration.</p>
Accessibility and Social Inclusion	✓ ✓	<p>This option would improve transport options from Durieshill which is a significant housing and employment site to the south of Stirling with 3,000 homes and along the route to the city centre. This would be a significant improvement to local public transport coverage. The service would also pass through communities identified in the study as being areas with higher levels of deprivation within Stirling, including Bannockburn. This option could therefore help improve connections to local services and opportunities for those without access to a car.</p>
Implementability Appraisal		
Feasibility	Major Consideration	<p>The design and construction complications of light rail lines vary significantly, however, this is expected to be a major consideration with the potential for a slow and unpredictable construction. The delivery and operation of a light rail line would also require the creation of a new body, or changes to existing public transport management in the local authority.</p>
Affordability	Major Consideration	<p>Construction costs of light rail lines vary considerably. Major consideration should be given to the costs and the financial risks associated with the operation of the line. It is anticipated that this option would be reliant on public sector revenue funding as it may not be commercially viable to run the service.</p>

OPTION 2 – LIGHT RAIL FROM PIRNHALL/DURIESHILL INTO STIRLING

		This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.
Public Acceptability	Major Consideration	Public acceptability of this option is a major consideration. The public may have concerns relating to the impact on transport associated with construction and operation of a light rail line through south Stirling and the impact on residents to have the service operating in close proximity to residential homes.

Select/Reject Rationale

This option contributes positively to all three TPOs to varying degrees by providing a connection between a major planned residential and employment developed at Durieshill which would provide sustainable travel opportunities between the site and Stirling. However, there are number of negative impacts on STAG criteria, including Environment for which negative impacts are considered minor to moderate for noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. In addition, the option is considered a negative impact on Economy. Although the service would generate new revenue through new passengers and improved journey times, a high subsidy is expected to be required for this option, especially in the short term to establish demand as the flow is not considered significant enough to maintain the service and costs including investment, operating and maintenance are expected to be high.

In terms of deliverability, construction costs of light rail lines vary considerably, however costs and financial risks are a major consideration, as is land availability and technical deliverability, and they are not outweighed by the benefits.

Given the expenditure required and the public acceptability with the land take (impacting either road space or residential housing) to develop a light rail system from Durieshill and the relatively minor positive impacts this option has been rejected and is not recommended for further appraisal.

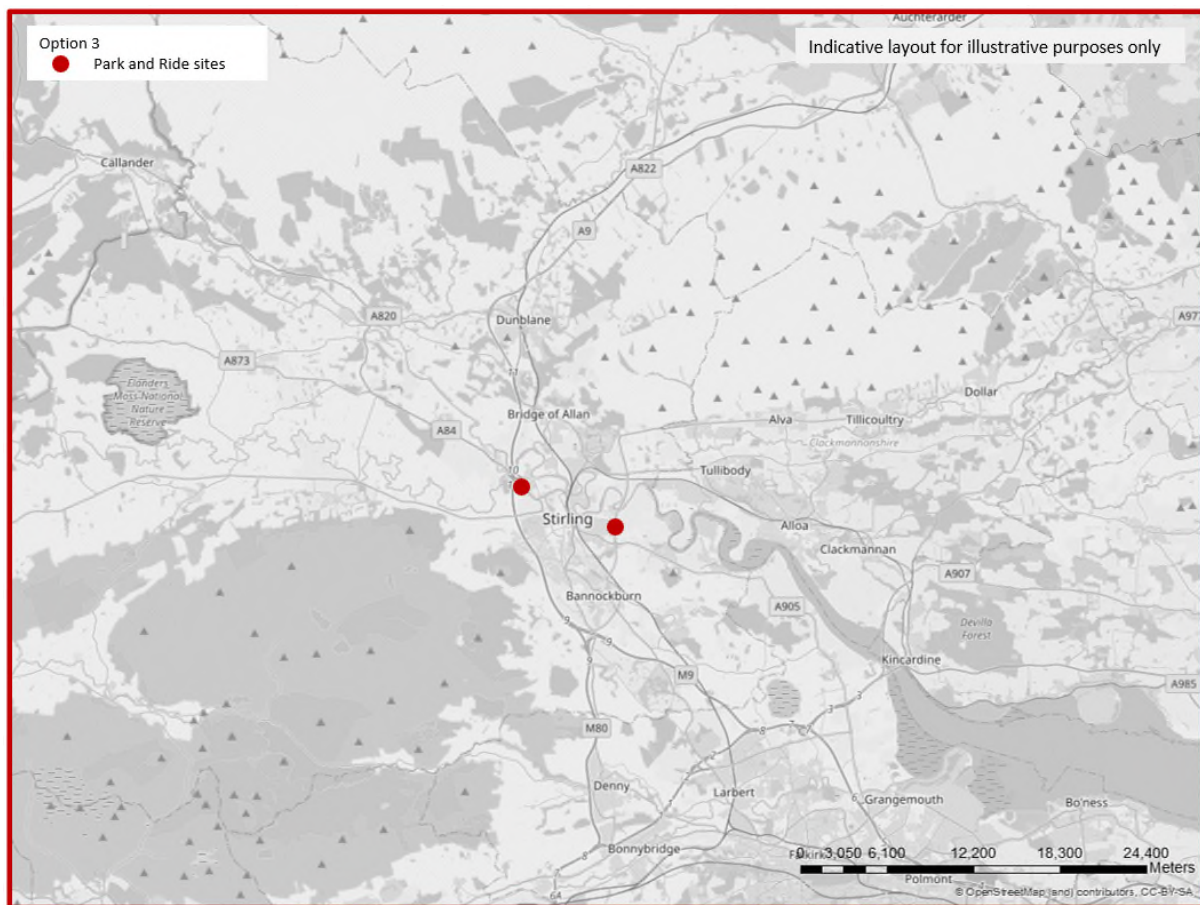
Not progressed to Detailed Appraisal.

Table 5. Option 3 – Improvements to Existing Park & Choose

OPTION 3 – IMPROVEMENTS TO EXISTING PARK AND CHOOSE

This option includes a range of improvements to existing bus park and choose sites at Springkerse and Castlevieu:

- improved walking and cycling connections/facilities (including bike share provision);
- a tourism bus into Stirling City Centre and Stirling Castle;
- review access arrangements to Springkerse P&C;
- a review of services to improve connections to employment and education destinations and improve frequencies; and
- EV charging.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	Services at the existing Park and Ride sites would be reviewed and improved to provide connections to employment and education destinations. This would be a benefit to users of the park and ride site however the benefit is

OPTION 3 – IMPROVEMENTS TO EXISTING PARK AND CHOOSE

		limited as users would still require access to the site by car or local connections.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	Providing an improved park and ride facility would be more attractive to users with reviewed and enhanced services or different parking controls. This could lead to a modal shift from road to bus/coach or green travel.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	-	The review of services is not considered to include access to strategic sites. Therefore, there would be no improvement to strategic connections to improve the competitiveness.

Summary of Performance against STAG Criteria

Environment	✓	Minor local air quality benefits from reduced vehicle movements. No significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.
Safety	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. An improved park and ride facility would provide increased security including surveillance (CCTV) and lighting. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on real and perceived improvements to security.
Economy	✓	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.

OPTION 3 – IMPROVEMENTS TO EXISTING PARK AND CHOOSE

Integration	✓ ✓	Improvements to facilities at the park and ride sites would support transport integration by making a facility geared towards integration more attractive to the general public. This would also align with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.
Accessibility and Social Inclusion	✓	This option would result in a minor public transport coverage improvement through the review of connections and a tourism bus. Improvements to walking and cycling connections would also improve access to services and facilities through active travel modes. Although improvements are focused on improving the facilities and services at the park and ride which is aimed at those with access to a car, it also provides improvements to walking and cycling connections. This may benefit residents within walking/cycling distance of the site with no car access.

Implementability Appraisal

Feasibility	Minor Consideration	This option includes a range of improvements to the existing park and ride sites. These improvements are well established concepts and are not considered risks. The introduction of a tourism bus and a review of existing services would require negotiation and, potentially, reconfiguration of timetables, however this is considered a minor risk as the majority of services currently exist or have in recent years.
Affordability	Minor Consideration	There would be relatively low construction costs to deliver this option. The commercial viability of a bus service is dependent on the demand for the service and although the service improvements and tourism bus would be designed to maximise patronage, subsidies may be required to support the services, especially in the initial stages of delivery.
Public Acceptability	Minor Consideration	This option is expected to be well received by the public.

OPTION 3 – IMPROVEMENTS TO EXISTING PARK AND CHOOSE

Select/Reject Rationale

This option makes a minor positive contribution to two TPOs by providing enhanced and more attractive park and ride facilities to users. However, the impact on modal shift is considered to be minor.

Across the STAG criteria the option is considered a minor positive benefit and would support integration, in particular, through the promotion of park and ride, whilst also providing an economic benefit.

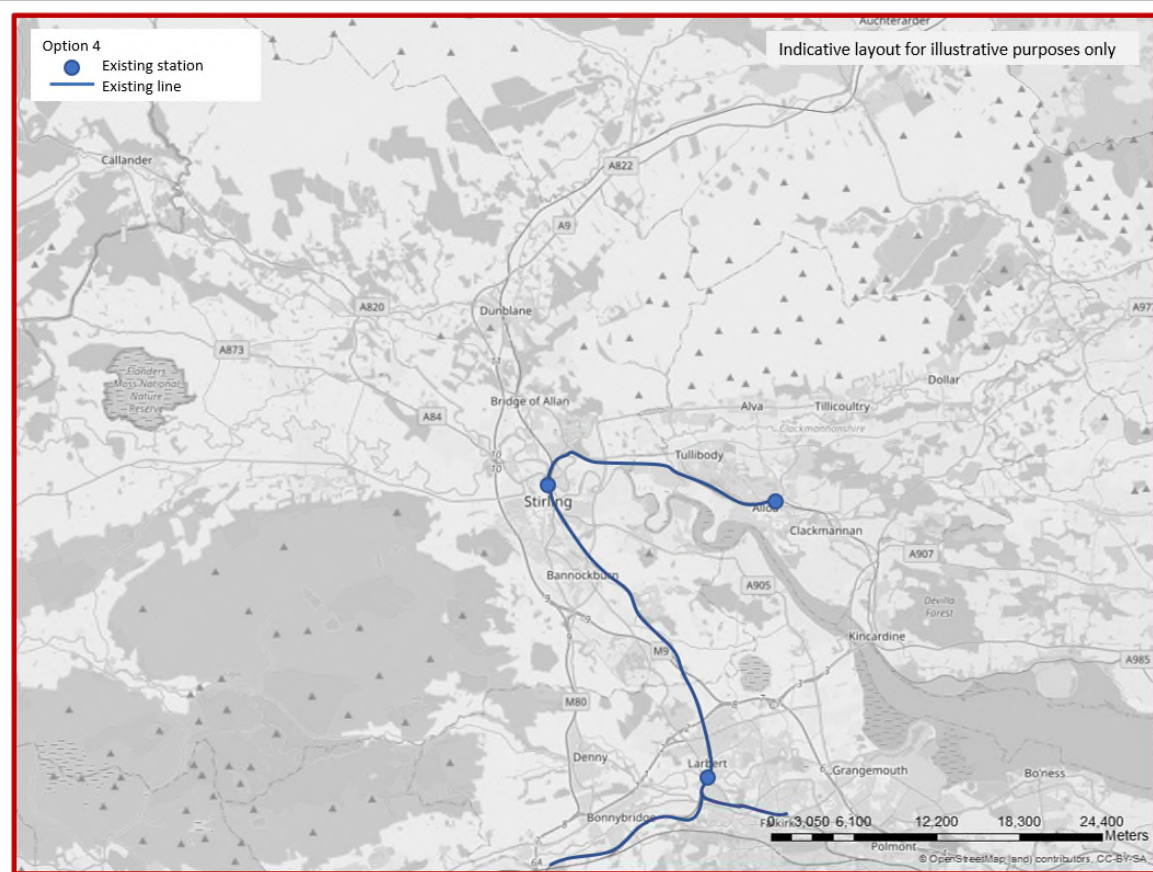
Considerations regarding the deliverability of the option have been considered, in particular, with regard to discussions with operators regarding reviews of existing services and any infrastructure requirements. These considerations are considered minor and the option is therefore recommended for further investigation in the Detailed Appraisal as a Complementary option which would support other Core Options to deliver the TPOs.

Progressed to Detailed Appraisal as a Complementary Option.

Table 6. Option 4 - Improve Journey Times and Frequencies of Rail Services

OPTION 4 – IMPROVE JOURNEY TIMES AND FREQUENCIES OF RAIL SERVICES

Improve journey times and frequencies of rail services to Glasgow and Edinburgh from Alloa and Stirling.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	This option would provide a minor benefit for residents from Plean, Cowie, Fallin, Bannockburn and Cornton once they are on the train as the journeys will be quicker and more frequent. However, the access to the strategic rail network remains unchanged.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	This option would provide a moderate benefit for TPO2 by improving the frequency and journey times of rail journeys into and through Stirling. This would make sustainable travel more attractive and encourage modal shift. This would only be a benefit, with

OPTION 4 – IMPROVE JOURNEY TIMES AND FREQUENCIES OF RAIL SERVICES

		regards to this TPO, for those already with good sustainable access to the rail network.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	This option would provide a moderate benefit for TPO3 by improving the frequency and journey times of rail journeys. This would be particularly attractive for strategic trips and would improve the competitiveness of public transport compared to car for strategic trips.

Select/Reject Rationale

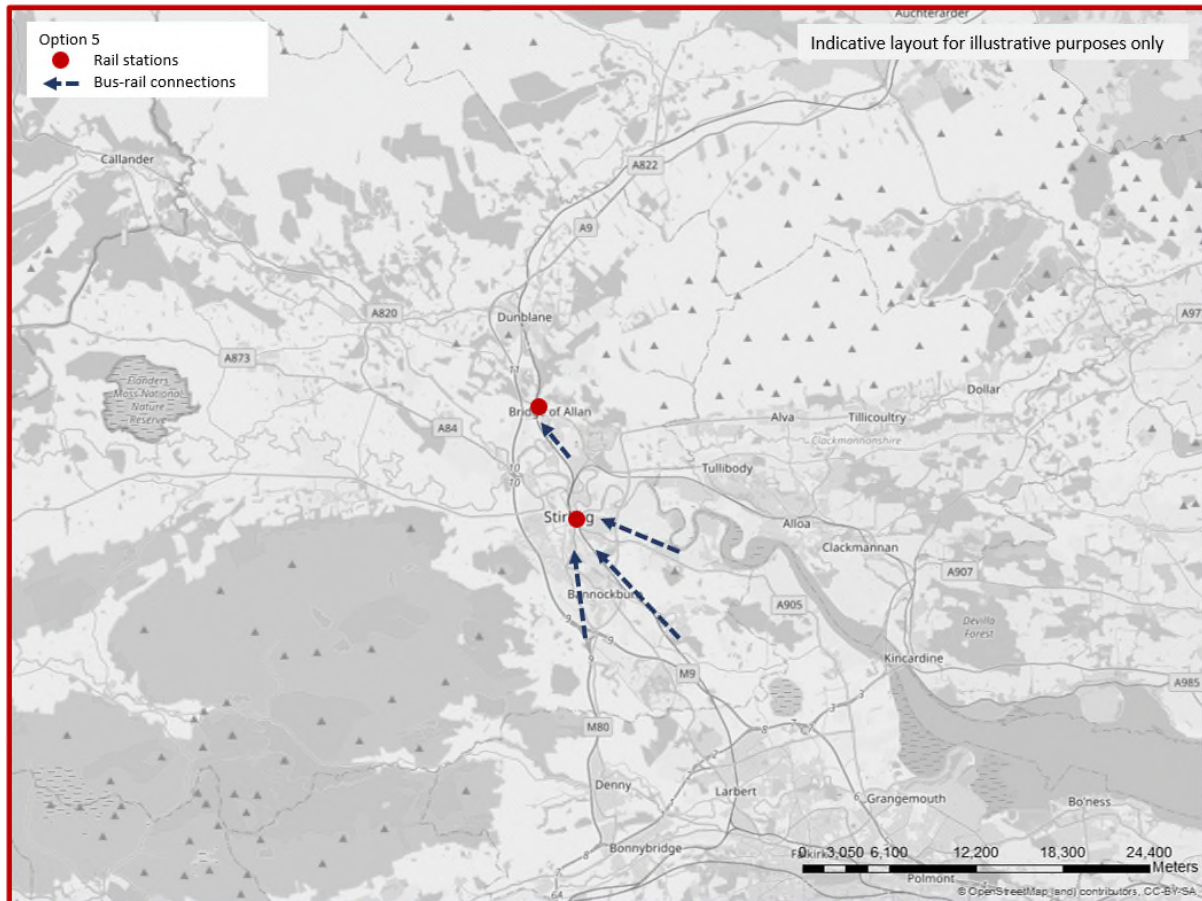
This option positively impacts on the study TPOs by improving the attractiveness of public transport over private car and therefore reducing the car mode share. Following engagement with ScotRail and Network Rail they have highlighted the significant investment requirement to implement Option 5 and therefore it has not been appraised against the STAG Criteria. There are various points of congestion on the rail network in the Edinburgh, Glasgow and Stirling triangle which would impact on the ability to deliver the option and improvements would be part of a wider review of services (currently under review by Network Rail and ScotRail). It is therefore recommended that this option is considered further, but not as part of this study.

Not progressed to the Detailed Appraisal

Table 7. Option 5 – Improve Local Bus Connections to/from Rail Stations

OPTION 5 – IMPROVE LOCAL BUS CONNECTIONS TO/FROM RAIL STATIONS

Increase the number of bus services connecting communities to rail stations in the study area, including from Plean, Cowie and Fallin.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓ ✓	This option would benefit the communities identified in TPO1 by providing a direct connection to rail stations in the study area. This option would provide direct connections not only to the wider rail network and the opportunities which exist in Glasgow and Edinburgh, but also the services and opportunities in close proximity to the stations themselves, including Stirling.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of	✓	This option would provide improved connection to the existing rail network

cars entering, leaving or passing through the Stirling City Area.		and reduce the need to park and ride at stations or destinations in Stirling. This would reduce the mode share for cars entering the Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	By improving direct access to the rail network this option would improve journey times and therefore the competitiveness of public transport compared to car for strategic trips to the Central Belt.

Summary of Performance against STAG Criteria

Environment	✓	With improvements to public transport and encouraging modal shift, this option would result in minor environmental improvements to local air quality, global air quality, water environments, landscape, visual amenity and cultural heritage.
Safety	✓	This option could produce a minor benefit to safety resulting from reduced accident rates associated with the reduction of private cars on the road network. This reduction would be a modal shift from car to bus due to increased access to the rail network.
Economy	✓	An increase in bus-rail connections would lead to journey time benefits by reducing the connection and interchange time to access the rail network. To deliver this improvement there would be increased operating costs for bus vehicles and potentially increased fleet requirements. The option would result in increased access to the rail network and patronage on bus services leading to increased passenger numbers and additional revenue however an increase in subsidy may be required to increase the service provision. With the added benefit of providing direct connections to the rail network for communities not currently connected and allowing improved access to employment and education opportunities, this option would have a minor positive economic impact.
Integration	✓ ✓	This option integrates bus and rail services which will significantly improve integration between the two by ensuring timetables are appropriately matched to minimise interchange between modes. Providing this service would improve access to new and planned developments in the study area which would also have a positive impact on transport and land use integration. Furthermore, the option aligns with transport policy from national to local

		level, particularly in relation to promoting sustainable mode use over private car.
Accessibility and Social Inclusion	✓ ✓	This option would provide improved connection to the existing rail network with direct connections to services. This would improve the public transport coverage, especially for those currently without a connection to the stations. The option would also directly benefit groups identified as socially excluded by providing a direct connection to rail stations in the study area. This option would provide direct connections to the wider rail network for those without access to a car, including communities in Pleun, Cowie and Fallin.

Implementability Appraisal

Feasibility	Moderate Consideration	This option would require changes to existing bus timetables and potentially additions to bus fleets. This would require negotiation with both bus and rail operators to ensure appropriate interchange times and investigations of any potential subsidies available. Processes for responding to rail timetable changes would also have to be agreed.
Affordability	Moderate Consideration	Commercial bus operations require sufficient revenue to support the operational costs of the service. If the patronage levels do not provide sufficient revenues, then they may be reliant on public sector revenue funding. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.
Public Acceptability	Minor Consideration	It is anticipated that improving bus connections to rail stations would be well received by the public.

Select/Reject Rationale

This option would make a positive contribution to each of the study TPOs including providing improved connections to the existing rail network and reduce the need to park and ride at stations and therefore travelling by car into or through the study area. The impact on modal shift, however, is considered to be low. The appraisal against the STAG criteria has identified no negative impacts and shows significant benefits associated with Integration and Accessibility.

In terms of implementability, this option would require changes to existing bus timetables potentially additions to bus fleets. This would require negotiations with both bus and rail operators and may require an ongoing operating subsidy.

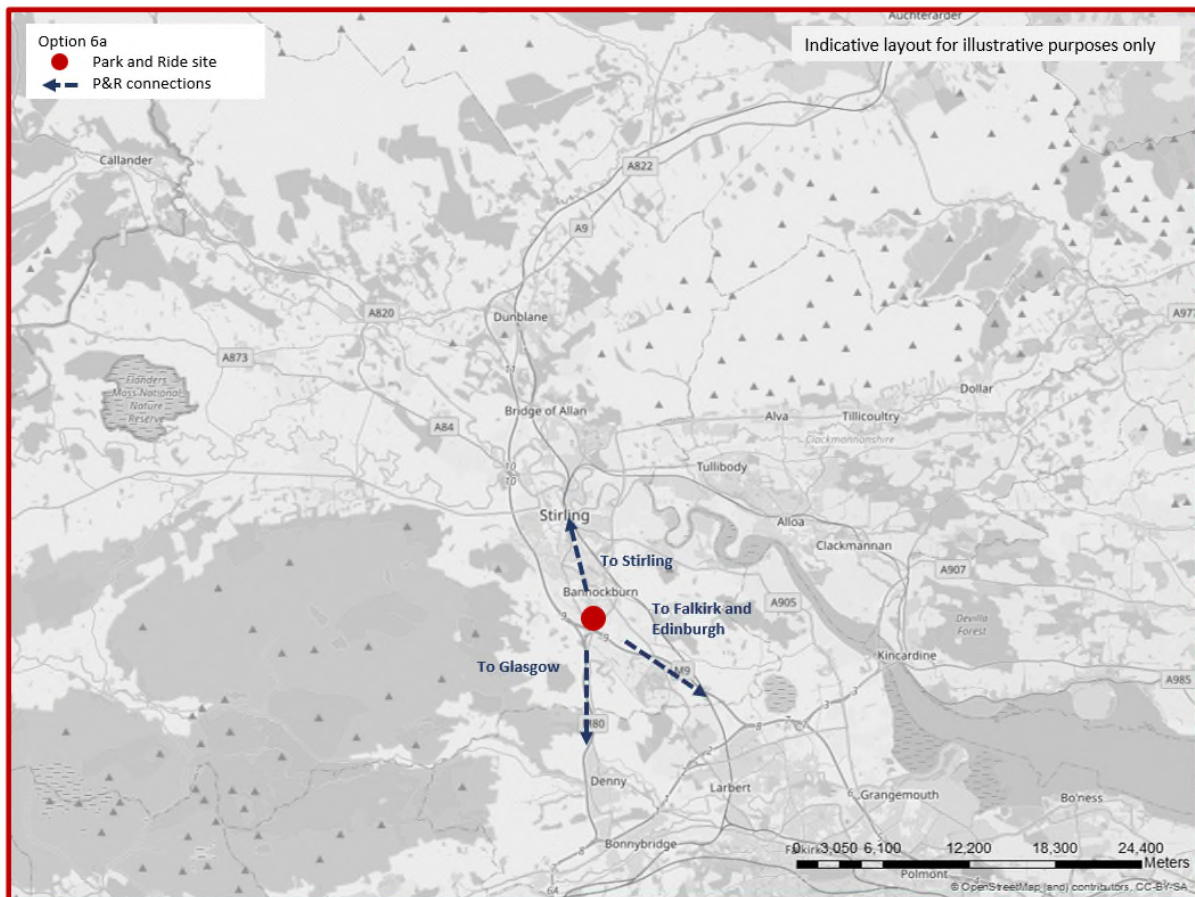
Given the positive performance against the TPOs and STAG criteria and relatively minor implementability considerations this option has been recommended for further appraisal as a Complementary option.

Progressed to Detailed Appraisal as a Complementary Option.

Table 8. Option 6a – New Park & Choose Site at Pirnhall/Durieshill

OPTION 6A – NEW BUS AND COACH PARK AND CHOOSE SITE AT PIRNHALL/SOUTH OF STIRLING

This option would involve the development of new bus and coach-based Park & Choose south of Stirling at the Pirnhall Junction to serve movements travelling into Stirling from Falkirk, Durieshill and other inward travel patterns and strategic links to Glasgow, Edinburgh and other central belt locations.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	The benefits associated with this option would be dependent on the connections to the Pirnhall site from the locations identified in the TPO. Due to the low car ownership in some of the areas the benefits would be limited however, with good local active travel accessibility this option would provide improved accessibility to Stirling and strategic

OPTION 6A – NEW BUS AND COACH PARK AND CHOOSE SITE AT PIRNHALL/SOUTH OF STIRLING

		locations with services and opportunities.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓ ✓	This option would reduce the need to enter Stirling to join the strategic public transport network to travel to the Central Belt or into Stirling. In particular, residents travelling from Falkirk and Edinburgh could use the facility to travel into Stirling and Clackmannanshire and South Stirling residents could use the facility to travel onwards to the Central Belt and reduce the need to travel into Stirling to access the rail network. The location, close to a large growth area south of Stirling would support the LDP and CRD aspirations by improving mode choice for Durieshill residents and employees and may support major events in the area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	This option would increase the range of public transport available for those travelling from Clackmannanshire, Falkirk and South Stirling. The location next to the strategic road network will maximise the competitiveness of journey times on the bus and coach and accessing the P&C site by car.

Summary of Performance against STAG Criteria

Environment	X	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on cultural heritage and biodiversity are anticipated either. Assuming the site is not located within the green belt area and appropriate design and mitigation steps are followed then it is likely that potential impacts on landscape; visual amenity; geology and soils; water quality; drainage or flood defence would be of an acceptable level.
Safety	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the

OPTION 6A – NEW BUS AND COACH PARK AND CHOOSE SITE AT PIRNHALL/SOUTH OF STIRLING

		<p>strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. A new park and choose facility would be built to current safety requirements with regards to entrances and exits, surveillance and lighting. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on security.</p>
Economy	✓ ✓	<p>This option would provide a direct connection to Stirling City Centre which would have journey time benefits. Modal shift from car to P&C may also reduce car and bus journey times.</p> <p>There would be capital costs associated with the P&R which would be moderate and require full feasibility, land costs and junction modelling, in addition additional fleet may be required and there would be increased maintenance and operating costs. These would be offset by increased revenue generated by new park and choose users however a moderate subsidy is expected to be required for this option, especially in the short term to establish demand. The location of the park and choose, close to a large residential and employment development at Durieshill would provide improved public transport connectivity between Stirling City Centre and the planned housing and employment.</p>
Integration	✓ ✓ ✓	<p>This option supports transport integration by providing a site where users can switch from car to public transport or other sustainable modes such as cycling. The facilities would be designed with transport integration at the centre of the proposal. From a land-use perspective this option integrates a major residential and employment development at Durieshill into the local and strategic transport network. This would provide sustainable access to employment, education, healthcare and leisure facilities for the Durieshill residents and other nearby communities.</p>
Accessibility and Social Inclusion	✓	<p>A new park and choose would improve public transport coverage to/from south Stirling. Although it would not directly improve walking or cycling it would improve access to services and local accessibility and may be directly accessible, without the need for a car, by residents of Durieshill and South Stirling Gateway.</p>

OPTION 6A – NEW BUS AND COACH PARK AND CHOOSE SITE AT PIRNHALL/SOUTH OF STIRLING

		Separate schemes will provide an active travel corridor to the site from the city centre and the wider cycling network. The wider population, however, would require a car to access the facilities which limits the benefit for some socially excluded groups.
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Implementability Appraisal

Feasibility	Major Consideration	Note that the specific site location has not been confirmed however a previous study undertaken in 2010 identified the following points for consideration for a P&C site in the vicinity of Durieshill. Currently there are no facilities for pedestrians or cyclists at this location, but these are due to be provided as part of the Durieshill development with other links to the wider walking and cycling network planned. Public utilities plans show the presence of 2 major pipelines running through the site which could be costly or time consuming to work alongside safely. Otherwise, technical risks associated with the construction of a new bus and coach-based park and choose are expected to be a minor consideration with minimal departure from design standards. Of more significant consideration is the requirement to work with bus and coach operators to develop new routes, source additional bus and coach fleet and market the new services. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available. In particular, the potential requirement to subsidise a national coach network may require investigation.
Affordability	Moderate Consideration	Moderate consideration should be given to the costs associated with the construction of the park and choose site. The financial risk associated with park and choose construction is considered to be low. Revenue costs for operating buses would vary depending on the model used however at the initial stages the patronage associated with this option is expected to be low to medium, with comparably low operating revenue. This option, therefore, may be reliant on public sector revenue funding as it may not be commercially viable to offer such a service. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue. As

OPTION 6A – NEW BUS AND COACH PARK AND CHOOSE SITE AT PIRNHALL/SOUTH OF STIRLING

		Stirling has declared a Climate Emergency the preference will be for low emission public service vehicles from this site to the city centre. EV charging will need to be included with future proofing for new technologies.
Public Acceptability	Minor Consideration	It is anticipated that a park and choose site well located for planned development at Durieshill and with good connections to the road network for both drivers and buses/coaches would be well received by the public.

Select/Reject Rationale

This option would make a significant positive contribution to each of the study TPOs including reducing the need to enter Stirling to join the strategic public transport network to travel to the Central Belt or into Stirling. The service provided would be similar to Option 2 (Light Rail) with a direct connection to the city centre in addition to strategic links. In particular, residents travelling from Falkirk and Edinburgh could use the facility to travel into Stirling and Clackmannanshire and South Stirling residents could use the facility to travel onwards to the Central Belt and reduce the need to travel into Stirling to access the rail network. The location, close to a large growth area south of Stirling would support the LDP and CRD aspirations by improving mode choice for Durieshill residents and employees.

The appraisal against the STAG criteria has identified positive impacts for all excluding Environment. Of particular note is the significant benefit associated with Economy and Integration due, in particular due to the proximity of the proposed site to the Durieshill planned developments.

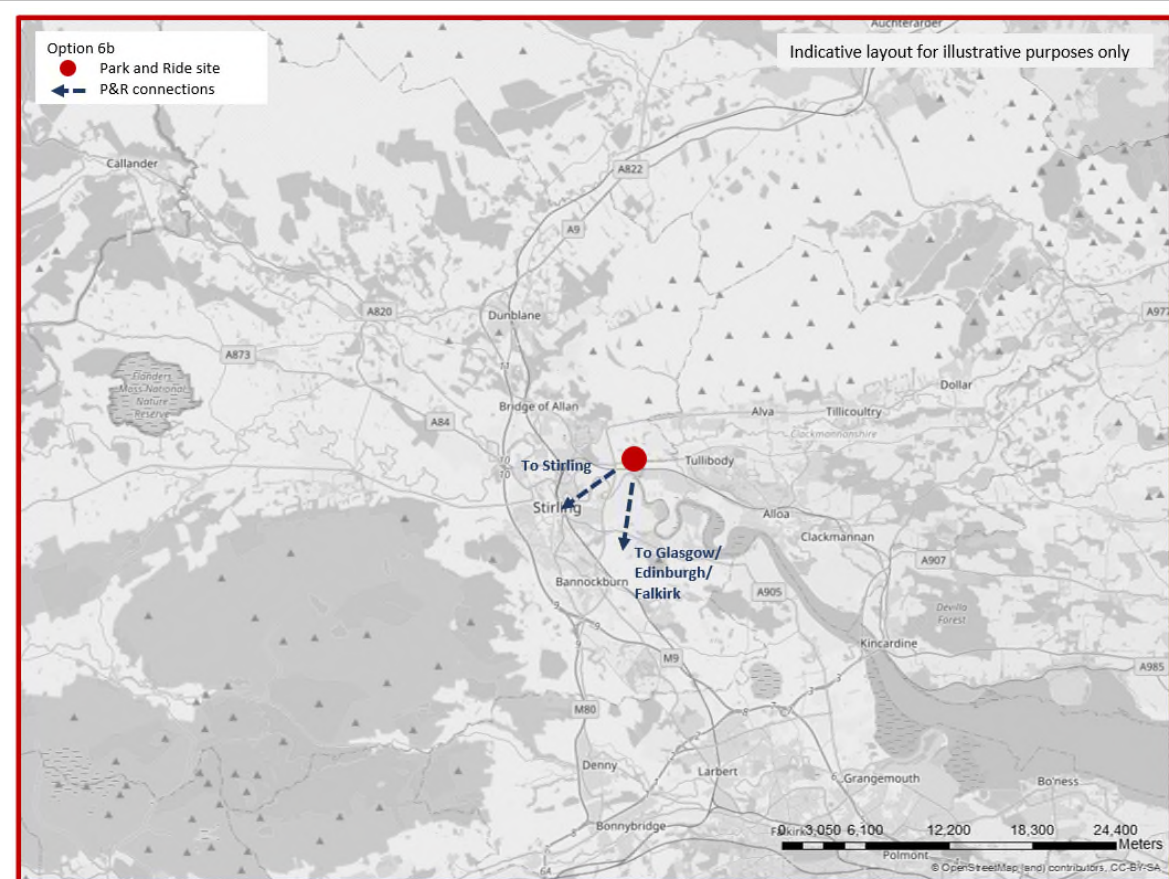
In terms of implementability, previous studies have identified a number of considerations including technical risks associated with pipelines and crossing facilities. These are major considerations which would require further investigation. Given the positive performance against the TPOs and STAG criteria this option has been recommended for further appraisal.

Progressed to Detailed Appraisal.

Table 9. Option 6b – New Park & Choose Site at Manor Powis

OPTION 6B – NEW BUS AND COACH PARK AND CHOOSE SITE AT MANOR POWIS

New bus and coach-based Park & Choose facility at Manor Powis to serve movements travelling into Stirling from Clackmannanshire and Fife and other inward travel patterns.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plein, Cowie, Fallin, Bannockburn and Cornton.	-	This option would not contribute towards TPO1 as the proposed site to the north east of Stirling would not be suitable for residents of Plein, Cowie, Fallin, Bannockburn and Cornton accessing services in Stirling and beyond.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	This option would support TPO2 by providing public transport options to the east of Stirling, and, in particular, provide options for travel from Alloa, supplementing the existing Alloa to Stirling/Glasgow/Edinburgh service. This could support the LDP and CRD growth ambitions by improving mode choice for

OPTION 6B – NEW BUS AND COACH PARK AND CHOOSE SITE AT MANOR POWIS

		those travelling along the A91 and reduce the mode share of car.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	-	This option would increase the range of public transport available for those travelling from Clackmannanshire, however, the location to the north east of Stirling is not likely to support a strategic link to Glasgow, Edinburgh or Falkirk and therefore it will have minimal benefits for TPO3. As part of a wider network of park and choose sites this option could provide a connection, but not as a standalone option.

Summary of Performance against STAG Criteria

Environment	X	No material changes in traffic flows, associated emissions or biodiversity within the study area are expected from this option. implementation would produce minor improvements on global and local air quality. Several impacts ranging from minor to moderate would also be produced during construction on visual amenity, water environments, geology, landscape and cultural heritage. However, assuming appropriate steps are followed with regards to design and mitigation, operation of the option would yield minor positive outcomes for visual amenity, water environments, geology, landscape and cultural heritage
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Safety	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. A new park and choose facility would be built to current safety requirements with regards to entrances and exits, surveillance (CCTV) and lighting.
Economy	✓ ✓	This option would provide a direct connection to Stirling City Centre from Manor Powis, which would benefit Clackmannanshire residents, and would have journey time benefits. The impact on user charges would be dependent on the approach to P&R pricing, including the approach to parking charges to maximise the attractiveness of the site. Investment costs: Capital costs associated with the new P&R would be moderate and may require full feasibility, land costs and junction modelling. Additional fleet and increased operating and maintenance costs may be required to deliver a more comprehensive service which may rely on a subsidy, especially in the short term to establish demand.

		A new park and choose service with links to education and employment centres which would improve employment opportunities in the study area benefiting Wider Economic Impacts. This option is considered to have moderately high costs with moderately high benefits.
Integration	✓ ✓	This option supports transport integration by providing a site where users can switch from car to public transport or other sustainable modes such as cycling. The facilities would be designed with transport integration at the centre of the proposal. In addition, the park and choose site would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa and aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.
Accessibility and Social Inclusion	✓	A new park and choose would improve public transport coverage to/from Clackmannanshire. Although it would not directly improve walking or cycling it would improve access to services and local accessibility. The wider population would require a car to access the facilities which limits the benefit for socially excluded groups.
Implementability Appraisal		
Feasibility	Moderate Consideration	Note that the specific site location has not been confirmed. Technical risks associated with the construction of a new bus and coach-based park and choose are expected to be a minor consideration with minimal departure from design standards. Of more significant consideration is the requirement to work with bus and coach operators to rework new routes, potentially source additional bus and coach fleet and market the new services. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available, if required. Given this would be a relocation of services the feasibility is considered to be a moderate consideration.
Affordability	Moderate Consideration	Moderate consideration should be given to the costs associated with the construction of the park and choose site and the financial risk associated with park and choose construction is considered to be low. As the site is a relocation with pre-existing operating costs the change in the operating costs of the existing facility is expected to be minimal however there may be additional costs associated with reworking the timetables and providing an appropriate service.

Public Acceptability	Moderate Consideration	It is anticipated that a new park and choose site capturing trips from Clackmannanshire would be well received by the public but there may be concerns about the closure of the site at Springkerse.
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Select/Reject Rationale

A park and choose site at Manor Powis has minimal impacts on the Study TPOs. The site would provide public transport options to the east of Stirling, and, in particular, provide options for travel from Alloa and support the LDP and CRD growth ambitions by improving mode choice for those travelling along the A91 this would be offset by those negatively impacted by the relocation. The location to the north east of Stirling is not likely to support a strategic link to Glasgow, Edinburgh or Falkirk and therefore it will have minimal benefits for strategic transport as a standalone option.

Against the STAG Criteria the option is considered a moderate positive impact on Economy and Integration with areas for additional consideration identified in the Environment category.

In terms of deliverability, there are moderate considerations for all aspects including the construction, impact of service rerouting and public acceptability of relocation a site.

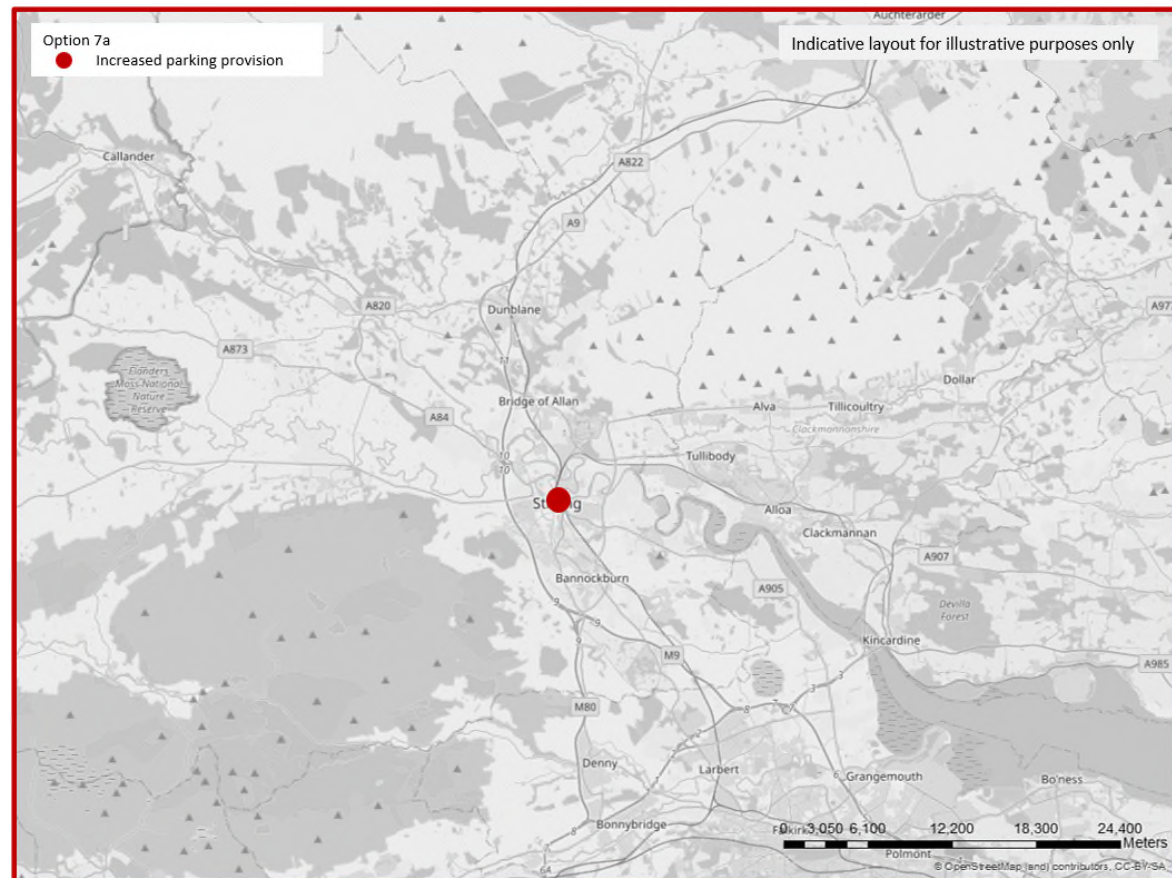
As part of a wider network of park and choose sites this site could be a local Park & Choose into Stirling city, as well as providing a first point of call for a coach service which would then pick up further passengers from a South Stirling option. This would, however, not meet the current TPOs as a standalone option but may do so as part of a package with Core Options. This option has therefore not been selected for appraisal as a standalone option but to be considered as part of package.

Progressed as a Complementary option.

Table 10. Option 7a – Increased Parking Provision at Stirling Rail Station

OPTION 7A – INCREASED PARKING PROVISION AT STIRLING RAIL STATION

This option is increasing the parking provision at Stirling Railway Station.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have a negligible impact on TPO1 as access to Stirling city centre by car would be required to access the strategic rail network and onwards to opportunities and services. Parking at Stirling would provide a direct connection to the Forth Valley Royal Hospital by rail and bus connection from Larbert station however this is still considered negligible.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share	XXX	This option would have a major negative impact on reducing the modal share of cars entering Stirling.

OPTION 7A – INCREASED PARKING PROVISION AT STIRLING RAIL STATION

of cars entering, leaving or passing through the Stirling City Area.		Additional capacity at Stirling station would increase the attractiveness of driving to Stirling station to access the rail network and increase the modal share of cars entering the Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.

Select/Reject Rationale

Increased parking at Stirling station is considered to have a major negative impact on TPO2 because additional capacity would increase the attractiveness of driving to Stirling station to access the rail network and increase the modal share of cars entering the Stirling City Area. expected to increase the modal share of cars entering Stirling.

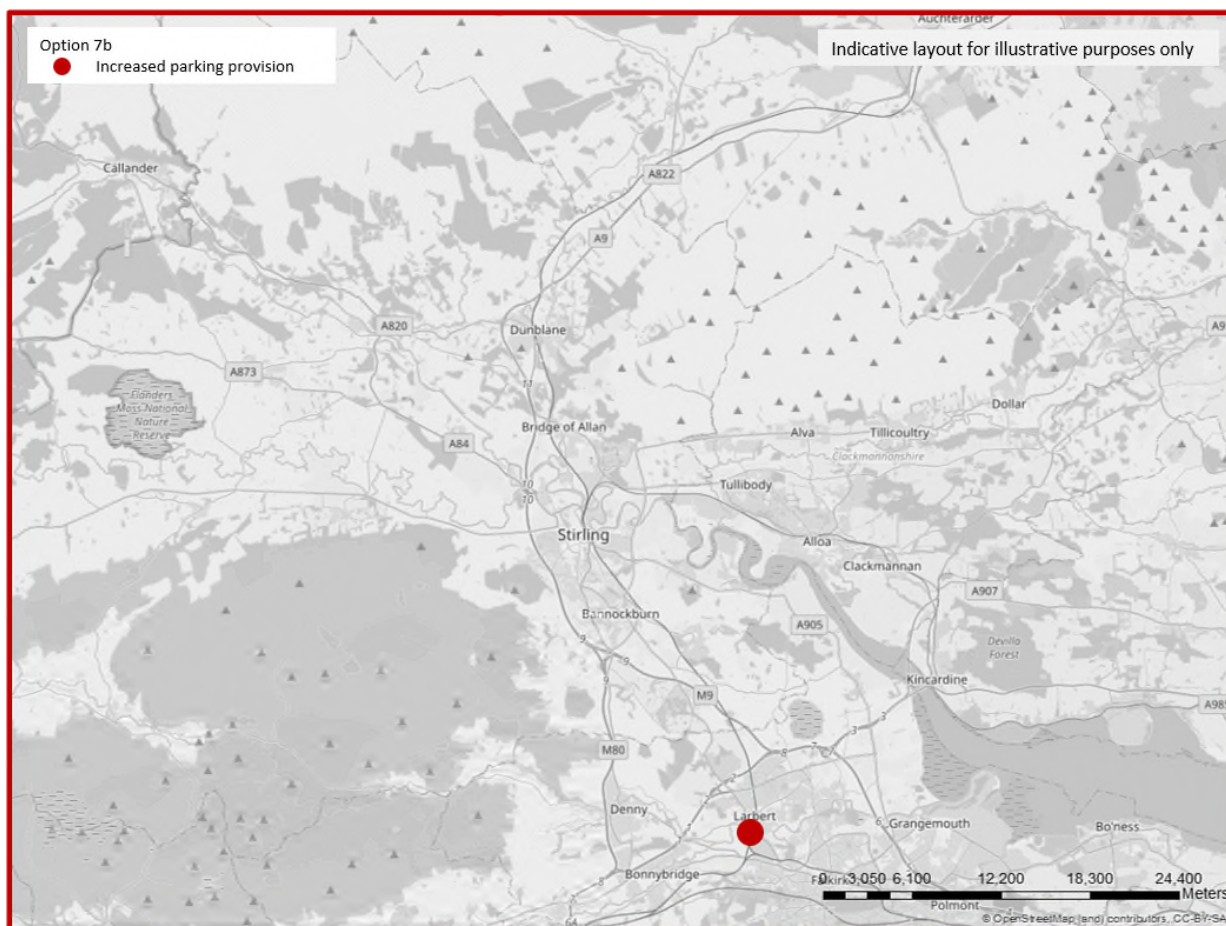
There may be some benefits associated with this option but not which adequately support this study's TPO. This option has therefore not been appraised against the STAG criteria and has not been recommended for further investigation as part of this study.

Not progressed to the Detailed Appraisal.

Table 11. Option 7b – Increased Parking Provision at Larbert Rail Station

OPTION 7B – INCREASED PARKING PROVISION AT LARBERT RAIL STATION

This option is increasing the parking provision at Larbert Rail Station.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have no impact on TPO1 as access to Larbert by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	This option would benefit TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Larbert station. This option would increase availability and reduce

		the number of cars coming into Stirling from the Larbert area or heading further north than Stirling. Larbert station could be used by residents at the Durieshill development travelling to the Central Belt, and possibly even to Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.

Summary of Performance against STAG Criteria

Environment	✗	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology.
Safety	✓ ✓	This option is considered to provide a benefit to safety in a number of ways. Increased parking is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents. On-street parking linked to rail travel occurs at Larbert station, reducing on-street-parking in the vicinity of the station would have a positive impact on accidents. In addition, increased availability of parking at rail stations would give the option to park at the station instead of on-street. The station car parks would meet

		current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security.
Economy	X	This option may result in journey time savings by reducing the time spent finding a space or enabling parking close to the station instead of on-street parking and increased reliability benefits associated with rail. Capital costs associated with the parking would be major and would likely require construction of a multi-storey car park and potentially land costs. Although there would be no direct revenue associated with parking charges the increased attractiveness of rail may increase rail revenue. Due to the significant costs and relatively minor positive impacts this results in a minor negative impact on Economy.
Integration	✓	This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment. Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered a minor benefit, as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car.
Accessibility and Social Inclusion	-	This option increases the attractiveness and ease of use of the rail network, and, in particular, the access to parking spaces for non-commuters arriving later in the day, however, it does not improve public transport coverage. In addition, improved parking is not expected to improve access for the majority of groups identified as socially excluded as access to a car is required.

Implementability Appraisal

Feasibility	Moderate Consideration	Increasing parking capacity at Larbert station would be a major consideration in terms of feasibility. Due to land availability, a multi-storey car park would be required to provide additional capacity. Although the design and construction of a multi-storey car park is expected to be in line with established design standards it will still be a major consideration.
Affordability	Major Consideration	The requirement for a multi-storey car park will significantly increase the capital cost requirement for this option. Parking is currently free at Larbert therefore there will be operating costs which cannot be met by any revenue generated from parking charges.
Public Acceptability	Moderate Consideration	The development of a multi-storey car park is likely to have a number of negative and positive aspects from a public acceptability aspect. For local residents, there may be issues relating to outlooks impacted by the car park and an increased capacity resulting in increased traffic to the station, impacting on local resident movements. Benefits would include improvements to overspill parking currently experienced by local residents in the surrounding streets.

Select/Reject Rationale

This option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently impacted by the perception (real or otherwise) of parking availability limitations at Larbert station. This option would increase availability and reduce the number of cars coming into Stirling from the Larbert area or heading further north than Stirling. Larbert station could be used by residents at the Durieshill development travelling to the Central Belt, and possibly even to Stirling.

The appraisal against STAG criteria has identified minor negative impacts for Economy and Environment and moderate and major deliverability considerations.

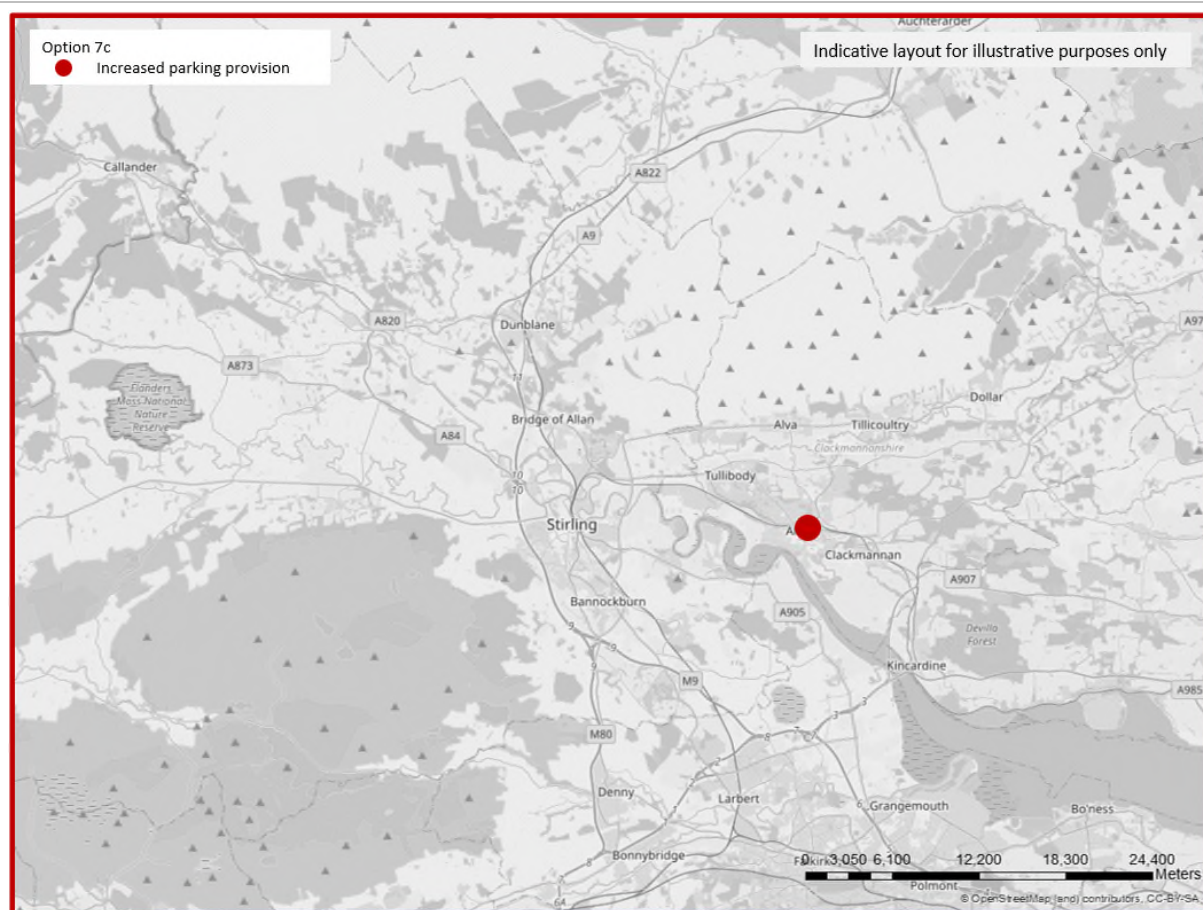
Although the option does impact positively on the study TPOs it does fall outwith the geographical scope of this study and would benefit from consideration as part of a wider parking strategy in the Central Belt. The option is therefore not selected for further investigation as part of this study.

Not Progressed to Detailed Appraisal.

Table 12. Option 7c – Increased Parking Provision at Alloa Rail Station

OPTION 7C – INCREASED PARKING PROVISION AT ALLOA RAIL STATION

This option is increasing the parking provision at Alloa Rail Station.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have no impact on TPO1 as access to Alloa by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	This option would have a benefit for TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Alloa station. This option would increase availability. Alloa station

OPTION 7C – INCREASED PARKING PROVISION AT ALLOA RAIL STATION

		would capture trips coming from Clackmannanshire travelling to the Central Belt and Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	-	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. This would, however, not impact on trips between Stirling and the Central Belt and is therefore neutral for TPO3.

Summary of Performance against STAG Criteria

Environment	X	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology.
Safety	✓	This option is considered to provide a benefit to safety in a number of ways. Increased parking is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents. The station car parks would meet current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security.
Economy	✓	This option may result in journey time savings by reducing the time spent finding a space or enabling

OPTION 7C – INCREASED PARKING PROVISION AT ALLOA RAIL STATION

		<p>parking close to the station instead of on-street parking and increasing the reliability benefits associated with rail. Capital costs would likely be relatively minor with some increased additional service operating and maintenance running costs. Although there would be no direct revenue associated with parking charges the increased attractiveness of rail may increase rail revenue.</p> <p>On balance, this is a minor positive impact on Economy.</p>
Integration	✓	<p>This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment.</p> <p>Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered a minor benefit, on balance, as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car.</p>
Accessibility and Social Inclusion	-	<p>This option increases the attractiveness and ease of use of the rail network, and, in particular, the access to parking spaces for non-commuters arriving later in the day, however, it does not improve public transport coverage. In addition, improved parking is not expected to improve access for the majority of groups identified as socially excluded, as access to a car is required.</p>
Implementability Appraisal		
Feasibility	Moderate Consideration	<p>Alloa station currently has 64 free spaces available to rail users and operated by Clackmannanshire Council. In addition, there are further car parks in close proximity to the station, including King Street car park and Asda car park. To increase the capacity of parking</p>

OPTION 7C – INCREASED PARKING PROVISION AT ALLOA RAIL STATION

		for rail users, negotiations could take place between ScotRail, Clackmannanshire Council, residents and Asda regarding the approach to parking in and around the station to manage capacity and demand.
Affordability	Minor Consideration	This option requires changes to the management of existing sites and therefore construction costs would be minimal. Operating costs would be largely dependent on the agreements made and any revenue provided to Asda in lieu of spaces, if required.
Public Acceptability	Minor Consideration	This option requires management of existing parking availability to suit demand. If the solution proposed ensures sufficient supply is available for all users, then this option would be positively viewed by the public."

Select/Reject Rationale

This option would have a moderate benefit for TPO 2 by increasing the attractiveness of rail which may be currently impacted by the perception (real or otherwise) of parking availability limitations at Alloa station. This option would increase availability and reduce the number of cars coming into Stirling from Clackmannanshire but increase the numbers coming into Alloa.

The appraisal against STAG criteria has identified minor negative impacts for Economy and Environment and moderate and major deliverability considerations.

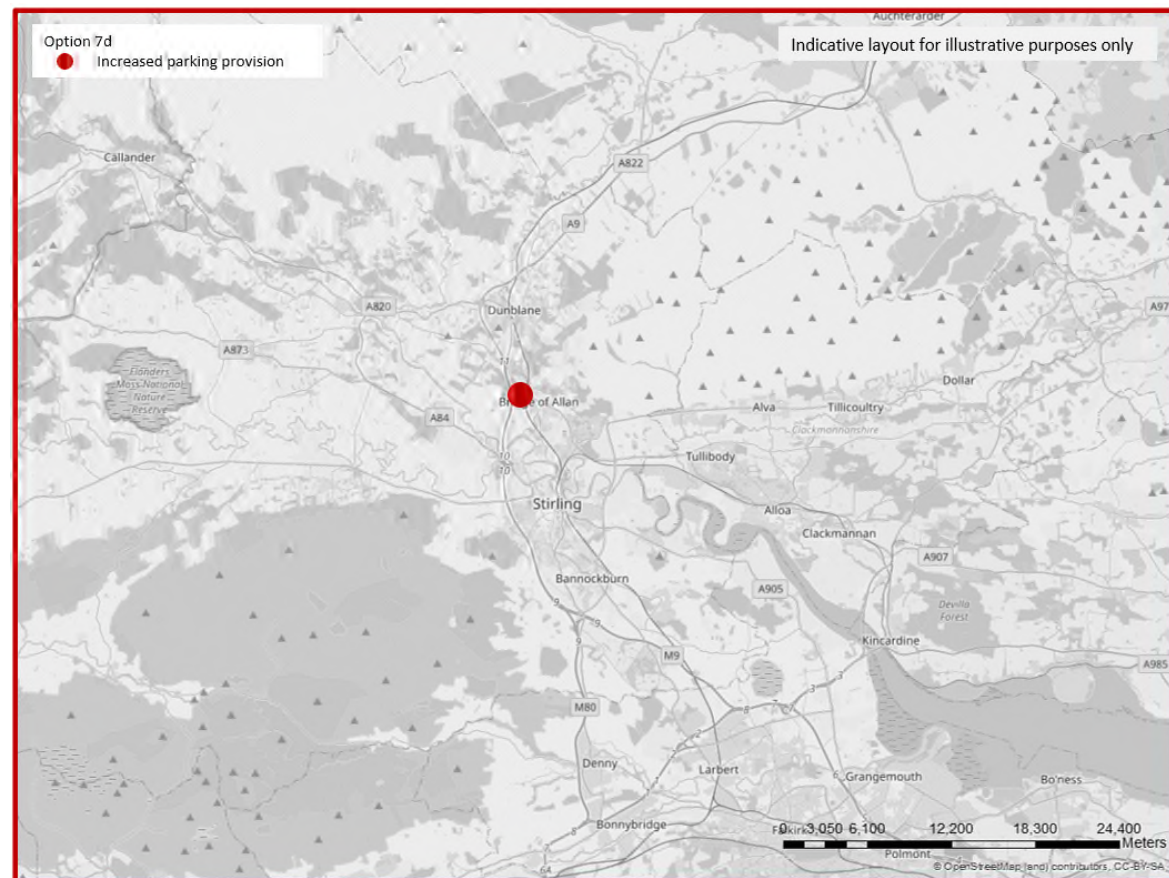
Although the option does impact positively on one of the study TPOs it does fall outwith the geographical scope of this study and would benefit from consideration as part of a wider parking strategy. The option is therefore not selected for further investigation as part of this study.

Not progressed to Detailed Appraisal.

Table 13. Option 7d – Increased Parking Provision at Bridge of Allan Rail Station

OPTION 7D – INCREASED PARKING PROVISION AT BRIDGE OF ALLAN RAIL STATION

This option is increasing the parking provision at Bridge of Allan Rail Station.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have no impact on TPO1 as access to Bridge of Allan by car would be required from Plean, Cowie, Fallin and Bannockburn to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	This option would have a moderate benefit for TPO2 as the attractiveness of rail may currently be impacted by parking availability limitations

		at Bridge of Allan station. This option would increase availability.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. .

Summary of Performance against STAG Criteria

Environment	-	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology, with a risk of moderate adverse effects on landscape and visual amenity.
Safety	✓	This option is considered to provide a benefit to safety in a number of ways. Increased parking is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents. The station car parks would meet current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security. These would be minor positive benefits on safety.

Economy	-	<p>This option may result in journey time savings by reducing the time spent finding a space or enabling parking close to the station instead of on-street parking and increasing the reliability benefits associated with rail. The capital costs associated with this option would be dependent on the variation progressed – (i) multi-storey or (ii) expansion to the south or west of the existing site and the level of groundworks required at these sites. Although there would be no direct revenue associated with parking charges the increased attractiveness of rail may increase rail revenue. The parking costs are considered significant for option with minor positive benefits.</p>
Integration	✓	<p>This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment.</p> <p>Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered a minor benefit, on balance, as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car.</p>
Accessibility and Social Inclusion	-	<p>This option increases the attractiveness and ease of use of the rail network, and, in particular, the access to parking spaces for non-commuters arriving later in the day, however, it does not improve public transport coverage. In addition, improved parking is not expected to improve access for the majority of groups in Stirling identified as socially excluded as access to a car</p>

		is required. This will have a neutral impact on Accessibility.
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Implementability Appraisal

Feasibility	Moderate Consideration	Bridge of Allan currently has 146 spaces available and is regularly reported to be over capacity with overspill onto residential streets. Increasing capacity at Bridge of Allan station would require either a multi storey car park on the existing parking site or expansion of the site to the south or to the west (western side of railway line). The viability of these options would depend on land ownership and the geography of the land including the gradient to the west of the railway line, if considering build to the west.
Affordability	Major Consideration	The capital costs associated with this option would be dependent on the variation progressed - multi-storey or expansion to the south or west of the existing site. Each option represents major affordability considerations as the level of engineering required for both the multi-storey and extension option may be significant. Parking is currently free at Bridge of Allan and although there would be no direct revenue associated with parking charges the increased attractiveness of rail may increase rail revenue.
Public Acceptability	Moderate Consideration	Increased parking capacity at Bridge of Allan is anticipated to be positively received by local residents currently impacted by overspill parking. For local residents, there may also be issues relating to outlooks impacted by the car park, which would be dependent on the option progressed. An increased capacity may also result in increased traffic to the station, impacting on local resident movements.

Select/Reject Rationale

This option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently impacted by parking availability limitations at Bridge of Allan station. This would increase parking availability and reduce the number of cars coming into Stirling from the North which would support the LDP/CRD development by reducing the volume of traffic

into/through Stirling (TPO2) and improve the competitiveness of sustainable modes for strategic trips (TPO3).

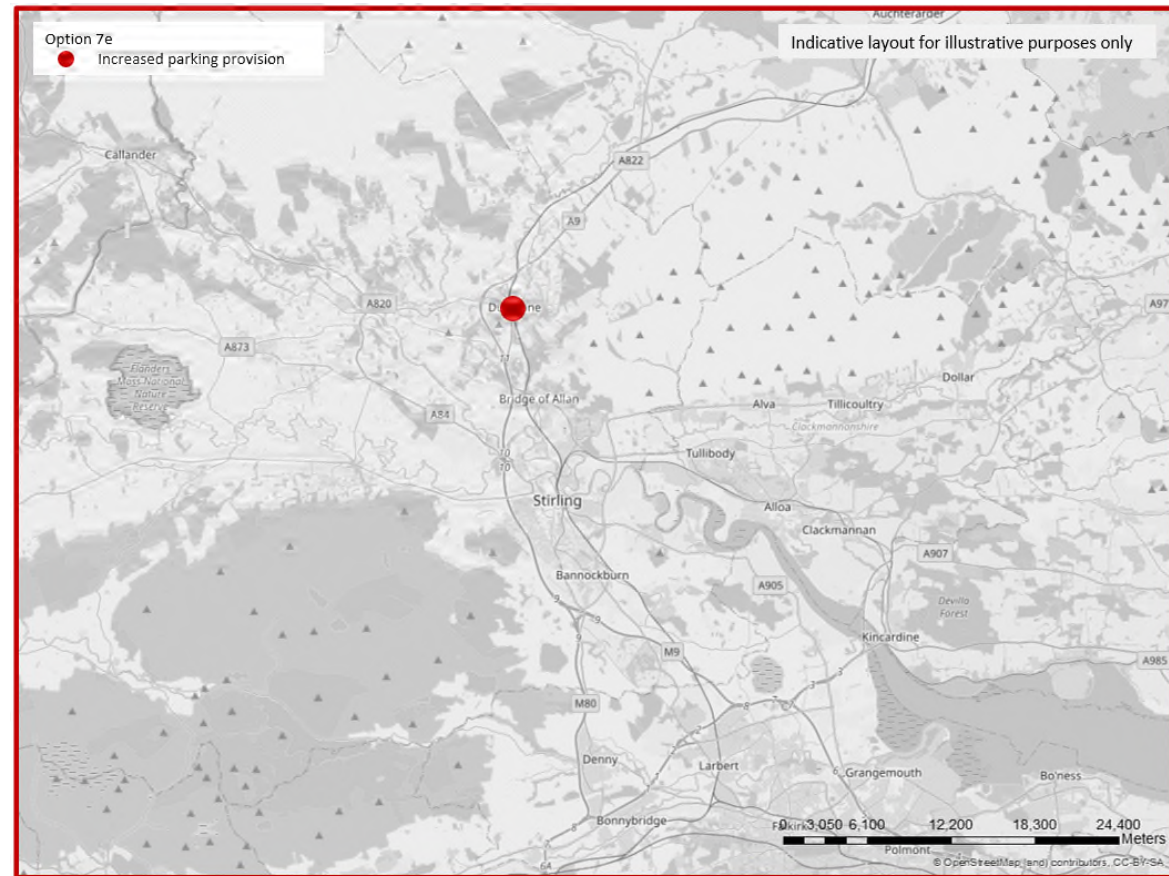
The appraisal against STAG criteria has identified a minor negative impact on Environment, neutral impacts on Economy, Integration and Accessibility and positive impacts on Safety. Although a major consideration with regards to affordability has been identified, and, public acceptability is likely to be impacted by the option progressed, the performance against the study TPOs indicates that this option should be considered further.

Progressed to Detailed Appraisal.

Table 14. Option 7e – Increased Parking Provision at Dunblane Rail Station

OPTION 7E – INCREASED PARKING PROVISION AT DUNBLANE RAIL STATION

This option is increasing the parking provision at Dunblane Rail Station.



Performance against Transport Planning Objectives

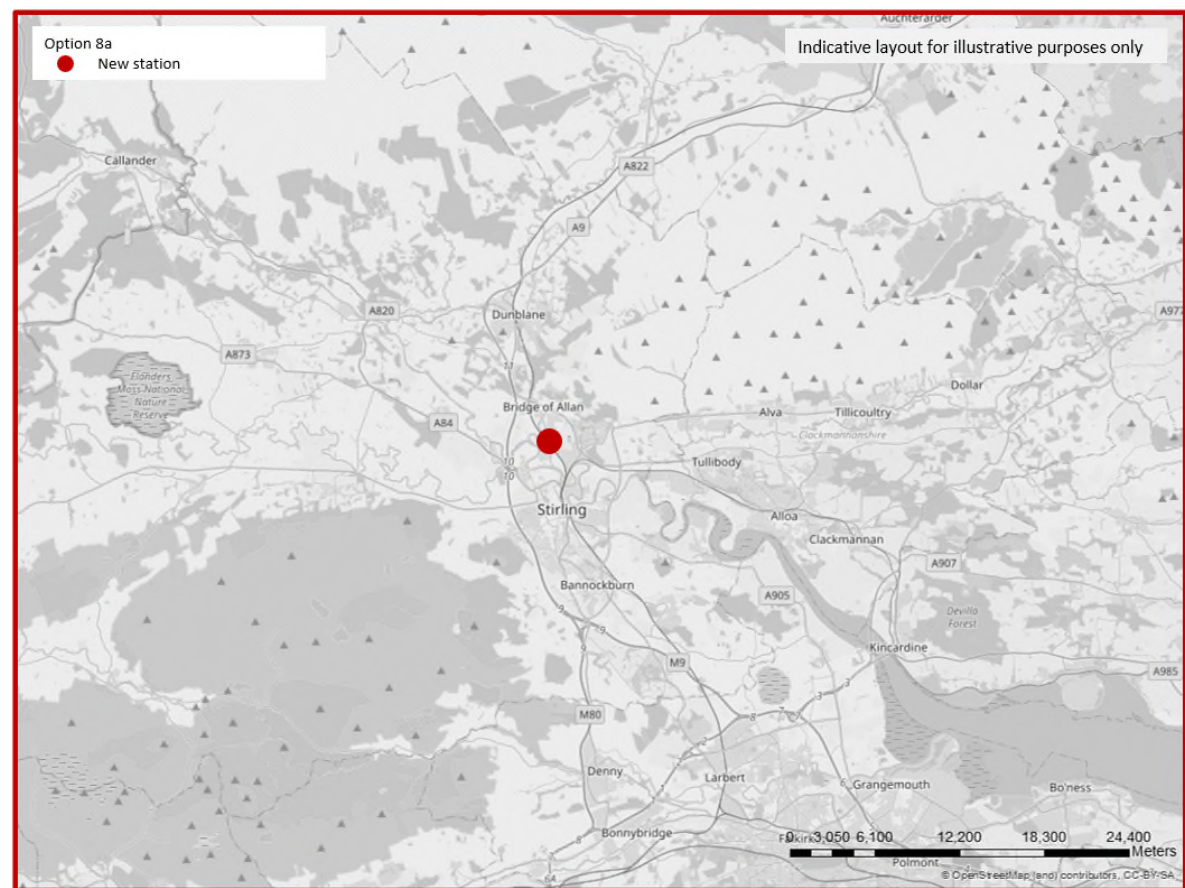
Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have no impact on TPO1 as access to Dunblane by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	This option would have a minor benefit for TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Dunblane station. This option would increase availability and reduce the

		number of cars coming into Stirling from the Dunblane area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.
Select/Reject Rationale		
<p>Increasing parking provision at Dunblane has not been recommended for further investigation as part of this study. There are benefits associated with this option which have a positive impact on the TPOs identified for this study, however, the option is outwith the geographical scope of this study and an ongoing study is considering parking provision in the Dunblane area currently. It is therefore more appropriate for further investigation to take place as part of that study. For that reason, it has not been appraised against STAG criteria.</p> <p>Not progressed to Detailed Appraisal.</p>		

Table 16. Option 8a – New Rail Station between Bridge of Allan, Causewayhead and Cornton

OPTION 8A – NEW RAIL STATION BETWEEN BRIDGE OF ALLAN, CAUSEWAYHEAD AND CORNTON

This option is a new rail station between Bridge of Allan, Causewayhead and Cornton whilst retaining Bridge of Allan station.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓ ✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	Opening a station between Cornton and Bridge of Allan would provide a walk-in catchment from both communities and Causewayhead and reduce the modal share of cars

OPTION 8A – NEW RAIL STATION BETWEEN BRIDGE OF ALLAN, CAUSEWAYHEAD AND CORNTON

		entering, leaving and passing through the Stirling City Area by providing improved access to the rail network for the Cornton community. In particular this is likely to reduce traffic passing through Clock Roundabout which was identified as pinch point as the new station would be more attractive than Stirling for Causewayhead and Cornton and reduce these traffic movements.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	This option would be a moderate benefit for TPO3 as it would provide access to the strategic network for a large walk-in population. This would improve the competitiveness of sustainable modes compared to private car, in particular, for strategic trips to the Central Belt. In addition, plans for the Kildean - Cornton and Cornton to Airthrey Link Roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access to the station from the University, Forth Valley College, Castle Business Park, Kildean Housing and business and West End Raploch Housing which would improve the competitiveness of rail.

Summary of Performance against STAG Criteria

Environment	✗	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely.
Safety	✓ ✓	A new station between Bridge of Allan, Causewayhead and Cornton would have a significant walk in catchment. This could result in modal shift from car to

OPTION 8A – NEW RAIL STATION BETWEEN BRIDGE OF ALLAN, CAUSEWAYHEAD AND CORNTON

		<p>rail leading to reductions in car vehicle kilometres and accidents. The location of the station is, however, in close proximity to a level crossing which would require consideration by Network Rail to identify and mitigate any risks. The station would require a footbridge which would result in the closure of Cornton No.2 which would be positive in terms of reducing the likelihood of pedestrian deaths. A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.</p>
Economy	✓	<p>This option includes a new station close to a level crossing. The station may significantly increase the time the crossing is closed and impact on road journey times on the route. Public transport journey times for those within walking distance of the new station would improve however the additional stop will increase journey times for existing passengers. Appropriate services could be identified to mitigate this increase in journey time for existing passengers.</p> <p>Investment costs associated with this option would be high including land costs, station design, mitigation of barrier crossing risks and costs associated with construction on a live railway line. Providing access to the rail network for communities not currently connected would provide increased access to employment and education opportunities and would, on balance, result in a minor positive impact on Economy.</p>
Integration	✓ ✓	<p>This option would be in walking distance of the Cornton, Causewayhead and south Bridge of Allan community and provide direct access to the rail network.</p> <p>The new station aligns with the plans for the Kildean - Cornton and Cornton to Airthrey Link Roads. Such a link road may require a bridge crossing the rail line. These link roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access between the station and Stirling University, Forth Valley College, Castle Business Park, Kildean Housing and West End Raploch Housing.</p>
Accessibility and Social Inclusion	✓ ✓	<p>A new the station between Cornton and Bridge of Allan would have a significant walk in catchment station and</p>

OPTION 8A – NEW RAIL STATION BETWEEN BRIDGE OF ALLAN, CAUSEWAYHEAD AND CORNTON

		improve the public transport coverage for these communities and Causewayhead. This catchment includes areas with a low SIMD ranking and access to a car.
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Implementability Appraisal

Feasibility	Major Consideration	There are a number of factors to take into consideration for this option regarding feasibility. The proposed site is located close to the Cornton No1 vehicular crossing which will be converted to a full barrier MCB (OD) crossing. This change will lead to protecting signals being installed and the location of the station is likely to be within the scope of these crossings. This will increase the time the barriers are down, and Network Rail have indicated there are safety issues associated with locating a station close to a level crossing which will require mitigation. There are likely to be flooding risks to be mitigated as identified in the environmental appraisal. Construction on a busy, live, electrified line will also be a major consideration. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments. The close proximity of Bridge of Allan station may also mean the station has a limited catchment in terms of new passengers.
Affordability	Major Consideration	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. In addition, the factors introduced above - Cornton No1 vehicular crossing and construction on a live line - will also impact on building a new station. These factors will result in increased costs which will be relatively high.
Public Acceptability	Major Consideration	This option is likely to have a range of views from the public. Although the station would be well positioned for access from Cornton, Causewayhead and residences in south Bridge of Allan the implications of the Cornton No1 crossing may result in lengthy closures to the B823 which will impact on local movements. In addition, existing passengers would experience longer journey times due to the introduction of a new stop.

OPTION 8A – NEW RAIL STATION BETWEEN BRIDGE OF ALLAN, CAUSEWAYHEAD AND CORNTON

Select/Reject Rationale

A new station between Bridge of Allan, Causewayhead and Cornton makes significant positive impacts on the study TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling.

In terms of Integration and Accessibility the new station is considered a positive benefit with considerations to be further investigated identified in the Environment and Economy appraisal. These include the potential negative impacts associated journey time increases for road and rail users and investment costs associated with the new station.

There are significant implementability considerations in addition to those expected as part of a new station and construction. These include the operation of the Cornton No1 level crossing which will require additional safety mitigations and road journey time delays on the B823. An additional station on the corridor, rather than a relocation, would also present further implementability considerations in the form of timetabling and journey time increases to existing passengers which conflicts with Scottish Government policy to reduce Intercity journey times.

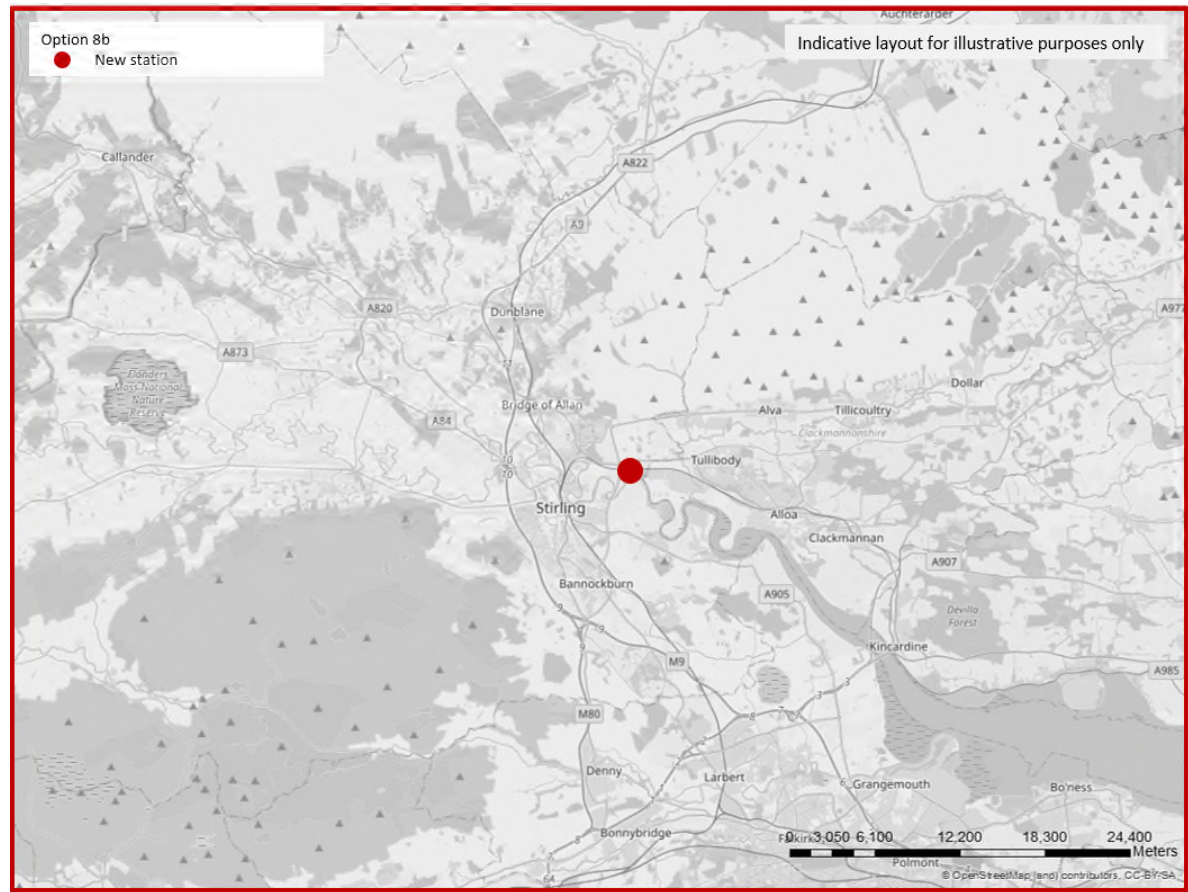
Due to the positive impacts on the TPOs, however, this option has been recommended for further investigation as part of the Detailed Appraisal.

Progressed to Detailed Appraisal.

Table 17. Option 8b – New Rail Station at Manor Powis

OPTION 8B – NEW RAIL STATION AT MANOR POWIS

This option is a new rail station at Manor Powis.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	This option would provide a moderate benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or

		passing through the Stirling City Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would provide a minor benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car and bus trips from Clackmannanshire and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips.

Summary of Performance against STAG Criteria

Environment	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	✓	This option would provide a minor benefit for accidents as the new station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents. A new rail station would be built to current safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	✓	Public transport journey times for those within walking and cycling distance of the new station would improve, as would those using the service as a park and ride, however existing passengers would also be negatively impacted by the additional stop on the route. Investment costs associated with this option would be high including land costs, station design, mitigation of barrier crossing risks and costs associated with construction on a live railway line and operating and maintenance costs would be required for the new station. The station is likely to

		<p>increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area. This could be offset by buses using the station as a formal or informal park and ride site.</p> <p>This option would provide access to the rail network for communities not currently connected and would provide a useful connection to Stirling University and Innovation Park. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts.</p>
Integration	✓ ✓	<p>This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa, however, these locations are already served by Alloa station. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.</p> <p>The option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.</p>
Accessibility and Social Inclusion	✓ ✓	<p>A new station would improve public transport coverage for communities in the vicinity of Manor Powis, in particular, it would be within cycling distance of Tullibody which is identified as an area with below average income employment and health indicators (according to SIMD).</p>
Implementability Appraisal		
Feasibility	Moderate Consideration	<p>Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. There are flooding risks to be mitigated as identified in the environmental appraisal. There is a level crossing within the vicinity which would have a number of safety concerns requiring mitigation. The location is on a live line which will impact on construction and safety, but it</p>

		is not as busy as the Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.
Affordability	Major Consideration	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.
Public Acceptability	Minor Consideration	The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.

Select/Reject Rationale

This option would provide benefits to TPOs 2 and 3 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or passing through the Stirling City Area.

In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers.

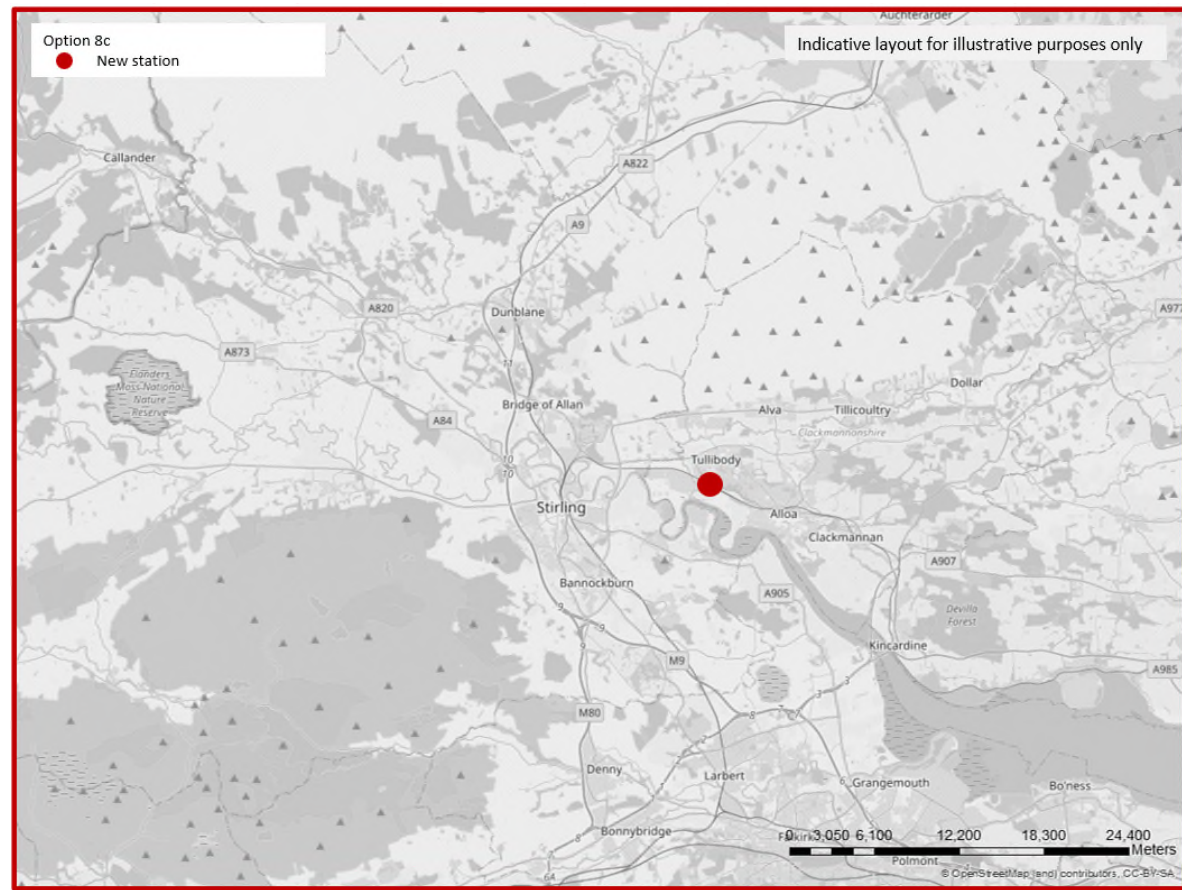
Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.

Progressed to Detailed Appraisal.

Table 18. Option 8c – New Rail Station at Cambus

OPTION 8C – NEW RAIL STATION AT CAMBUS

This option is a new rail station at Cambus.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓✓	This option would provide a benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. The proximity to the existing Alloa station would limit benefits however it is expected that there would be a reduction in the modal share of cars

		entering, leaving or passing through the Stirling City Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would provide a minor benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car trips from Clackmannanshire and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips. As the station would be on the Alloa line, the frequency and destinations would be limited without changing trains at Stirling. The proximity to the existing Alloa station would also limit benefits.

Summary of Performance against STAG Criteria

Environment	✗	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	✓	This option would provide a minor benefit for accidents as the new station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents. A new rail station would be built to current safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	✓	Public transport journey times for those within walking distance of the new station would improve, as would those using the service as a park and ride, however existing passengers would also be negatively impacted by the additional stop on the route. Proximity to Alloa station and a low catchment population may impact on the patronage however a 2007 study into a station at Cambus reported that the patronage could be favourable. Investment costs associated with this

		<p>option would be high including land costs, station design and costs associated with construction on a live railway line and operating and maintenance costs would be required for the new station. The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area. This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts.</p>
Integration	✓ ✓	<p>This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa, however, these locations are already well served by Alloa station. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.</p> <p>The option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.</p>
Accessibility and Social Inclusion	✓ ✓	<p>A new station would improve public transport coverage to/from Cambus, in particular, it would be within walking distance of Tullibody which is identified as an area with below average income employment and health indicators (according to SIMD).</p>

Implementability Appraisal

Feasibility	Moderate Consideration	<p>Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. Also, a 2007 study into a station at Cambus concluded there would be no significant technical considerations. There are flooding risks to be mitigated as identified in the environmental appraisal. There is a level crossing within the vicinity which would have a number of safety concerns requiring mitigation. The location is on a live line which will impact on construction and safety, but it is not as busy as the</p>
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		Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.
Affordability	Major Consideration	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station re-openings would provide a good understanding of the outturn costs of similar projects.
Public Acceptability	Minor Consideration	The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.

Select/Reject Rationale

This option would provide minor benefits to TPOs 2 and 3 as a station to the East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or passing through the Stirling City Area; however, these benefits are anticipated to be minimal.

In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers.

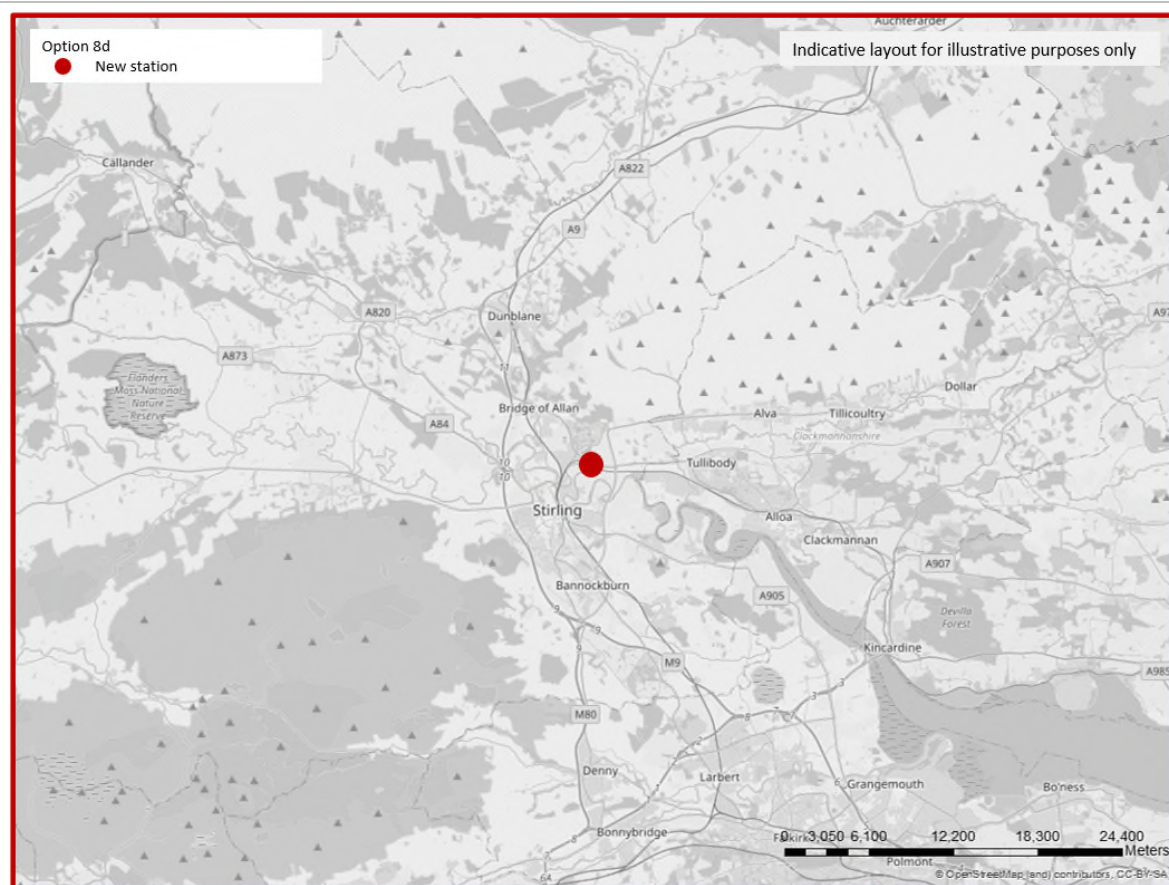
This option has been recommended for further appraisal based on the benefits to TPOs 2 and 3.

Progressed to Detailed Appraisal.

Table 19. Option 8d – New Rail Station at Causewayhead

OPTION 8D – NEW RAIL STATION AT CAUSEWAYHEAD

This option is a new rail station at Causewayhead.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	This option would provide a moderate benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and

OPTION 8D – NEW RAIL STATION AT CAUSEWAYHEAD

		provide the opportunity to travel to Stirling and beyond by rail. The need to access the station via Causewayhead Road would limit some of the benefits, however, it is still anticipated that modal shift would reduce traffic passing through Clocks Roundabout. The station would also be in walking distance of Stirling University (not via the main entrance) and reduce the modal share of cars passing through Stirling to access the University.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓	This option would provide a moderate benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car trips from Clackmannanshire and the University of Stirling and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips. As the station would be on the Alloa line, the frequency and destinations would be limited without changing trains at Stirling.

Summary of Performance against STAG Criteria

Environment	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	✓	This option would provide a minor benefit for accidents as the new station would capture car trips

OPTION 8D – NEW RAIL STATION AT CAUSEWAYHEAD

		<p>from Causewayhead and Clackmannanshire to a lesser extent, provide the opportunity to travel to Stirling and beyond by rail and a connection to Stirling University. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents. A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting. This would be a minor positive impact on Safety.</p>
Economy	✓ ✓	<p>Public transport journey times for those within walking distance of the new station would improve, as would those using the service as a park and ride, however existing passengers would also be negatively impacted by the additional stop on the route. Extra traffic to/from the station/parking may impact negatively on road journey times on Causewayhead Road. Investment costs associated with this option would be high including land costs, station design and costs associated with construction on a live railway line and operating and maintenance costs would be required for the new station. The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area. This could be offset by buses using the station as a formal or P&R</p> <p>This option would provide access to the rail network for communities not currently connected and a link to Stirling University. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts.</p>
Integration	✓ ✓	<p>This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020) and planned expansion at Stirling University as part of the City Region Deal. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.</p>

OPTION 8D – NEW RAIL STATION AT CAUSEWAYHEAD

		The option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.
Accessibility and Social Inclusion	✓ ✓	A new station would improve public transport coverage to/from Causewayhead for those wishing to travel further than the centre of Stirling. The station location would have good walk in residential and education (Stirling University) catchment. This would be a moderate benefit for Accessibility.

Implementability Appraisal

Feasibility	Moderate Consideration	Note that the specific site location has not been confirmed however land is limited and there are flooding risks to be mitigated as identified in the environmental appraisal. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. The location is on a live line which will impact on construction and safety, but it is not as busy as the Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.
Affordability	Major Consideration	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.
Public Acceptability	Minor Consideration	The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers and potentially increased traffic on Causewayhead Road accessing the station.

OPTION 8D – NEW RAIL STATION AT CAUSEWAYHEAD

Select/Reject Rationale

This option would provide benefits to TPOs 2 and 3 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. The need to access the station via Causewayhead Road would limit some of the benefits, however, it is still anticipated that modal shift would reduce traffic passing through Clocks Roundabout. The station would also be in walking distance of Stirling University and reduce the modal share of cars passing through Stirling.

In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers.

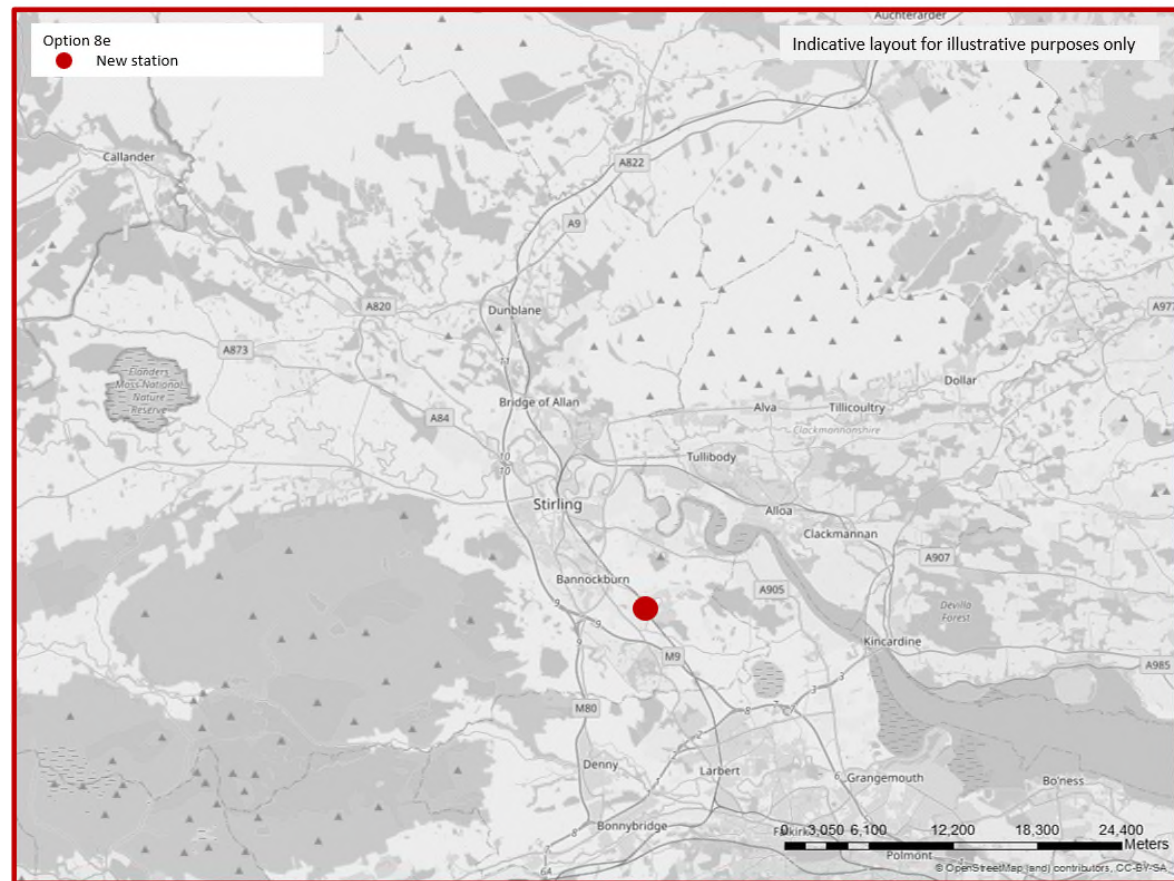
Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.

Progressed to Detailed Appraisal.

Table 20. Option 8e – New Rail Station South of Stirling

OPTION 8E – NEW RAIL STATION SOUTH OF STIRLING

This option is a new rail station South of Stirling.



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓ ✓ ✓	This station would be located on the existing line south of Stirling which, depending on the location, would provide a station within walking and cycling distance for Cowie or Bannockburn populations. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.

OPTION 8E – NEW RAIL STATION SOUTH OF STIRLING

<p>TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.</p>	<p>✓ ✓</p>	<p>This option would provide a moderate benefit for TPO2 as a station to the south of Stirling would capture car trips going into Stirling from Cowie, Pleau, Bannockburn and other A9 traffic. The location may also capture trips from the planned development at Durieshill and provide a more attractive strategic Park and Ride option for Clackmannanshire residents which would further reduce traffic passing through the Stirling area.</p>
<p>TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.</p>	<p>✓ ✓ ✓</p>	<p>This option would capture trips going north to Stirling and trips going south to the Central Belt. There would potentially be abstraction from Bridge of Allan and Stirling station if parking was readily available however if there was appropriate access from the motorway then this is unlikely to increase travel through Stirling. The station would provide access to both Glasgow and Edinburgh to the south and Perth and Alloa to the north.</p>

Summary of Performance against STAG Criteria

<p>Environment</p>	<p>✗</p>	<p>Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.</p>
<p>Safety</p>	<p>✓</p>	<p>This option would provide a minor benefit for accidents as a station to the south of Stirling would</p>

OPTION 8E – NEW RAIL STATION SOUTH OF STIRLING

		capture car trips going into Stirling and potentially also trips from the north. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents. A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	✓ ✓	<p>Public transport journey times for those within walking and cycling distance of the new station would improve, as would those using the service as a park and ride, particularly travelling from the new development at Durieshill, the industrial development proposed at Bandeath and travelling north to Stirling and south to the Central Belt. Existing passengers would be negatively impacted by the additional stop on the route. Investment costs associated with this option would be high including land costs, station design and costs associated with construction on a live railway line and operating and maintenance costs would be required for the new station. The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area. This could be offset by buses using the station as a formal or informal park and ride site.</p> <p>This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education, particularly for Cowie and Bannockburn communities which include socially excluded groups with below average economic activity and could increase the opportunity for more economic activity in the surrounding areas and positive Wider Economic Impacts.</p>
Integration	✓ ✓	<p>This option would capture car trips from Falkirk and communities to the south of Stirling going into Stirling and also trips to the Central Belt, providing direct access to the rail network. This option would be well located for integrating a major residential and employment development at Durieshill and South Stirling Gateway into Stirling City Centre and the Central Belt. This would provide sustainable access to employment, education, healthcare and leisure</p>

OPTION 8E – NEW RAIL STATION SOUTH OF STIRLING

		<p>facilities for the Durieshill residents and other nearby communities. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.</p> <p>The option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.</p>
Accessibility and Social Inclusion	✓ ✓	<p>A new park and ride would improve public transport coverage to/from south Stirling. Although it would not directly improve walking or cycling other schemes for active travel are underway in the area which would support travel to and from a new station, and it would improve access to services and local accessibility.</p> <p>This station would be located within walking and cycling distance for Cowie or Bannockburn populations which are identified as being below average in terms of income and employment.</p>

Implementability Appraisal

Feasibility	Moderate Consideration	<p>Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. The location is on a busy, live, electrified line which will impact on construction and safety. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.</p>
Affordability	Major Consideration	<p>Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.</p>

OPTION 8E – NEW RAIL STATION SOUTH OF STIRLING

Public
Acceptability

Minor
Consideration

The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.

Select/Reject Rationale

This option would provide significant benefits to all three TPOs by providing a station within walking distance for Cowie or Bannockburn populations. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow. In addition, the station would capture car trips going into Stirling from Cowie, Plean, Bannockburn and other A9 traffic. The location may also capture trips from the planned development at Durieshill and provide a more attractive strategic Park and Ride option for Clackmannanshire residents which would further reduce traffic passing through the Stirling area.

In terms of STAG criteria, the new station would contribute positively to Economy, Integration and Accessibility and to Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers.

Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.

Progressed to Detailed Appraisal.

Table 21. Option 8f – New Rail Station at Blackford or Greenloaning

OPTION 8F – NEW RAIL STATION AT BLACKFORD OR GREENLOANING

This option is a new rail station at Blackford or Greenloaning



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	-	Gleneagles and Dunblane currently provide access to the rail network to the north of Stirling and mode choices to limit car travel through the study area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City	-	This option would have a neutral impact on TPO2. Gleneagles and Dunblane

Area and key origins/destinations in the Central Belt.

currently provide access to the rail network to the north of Stirling.

Select/Reject Rationale

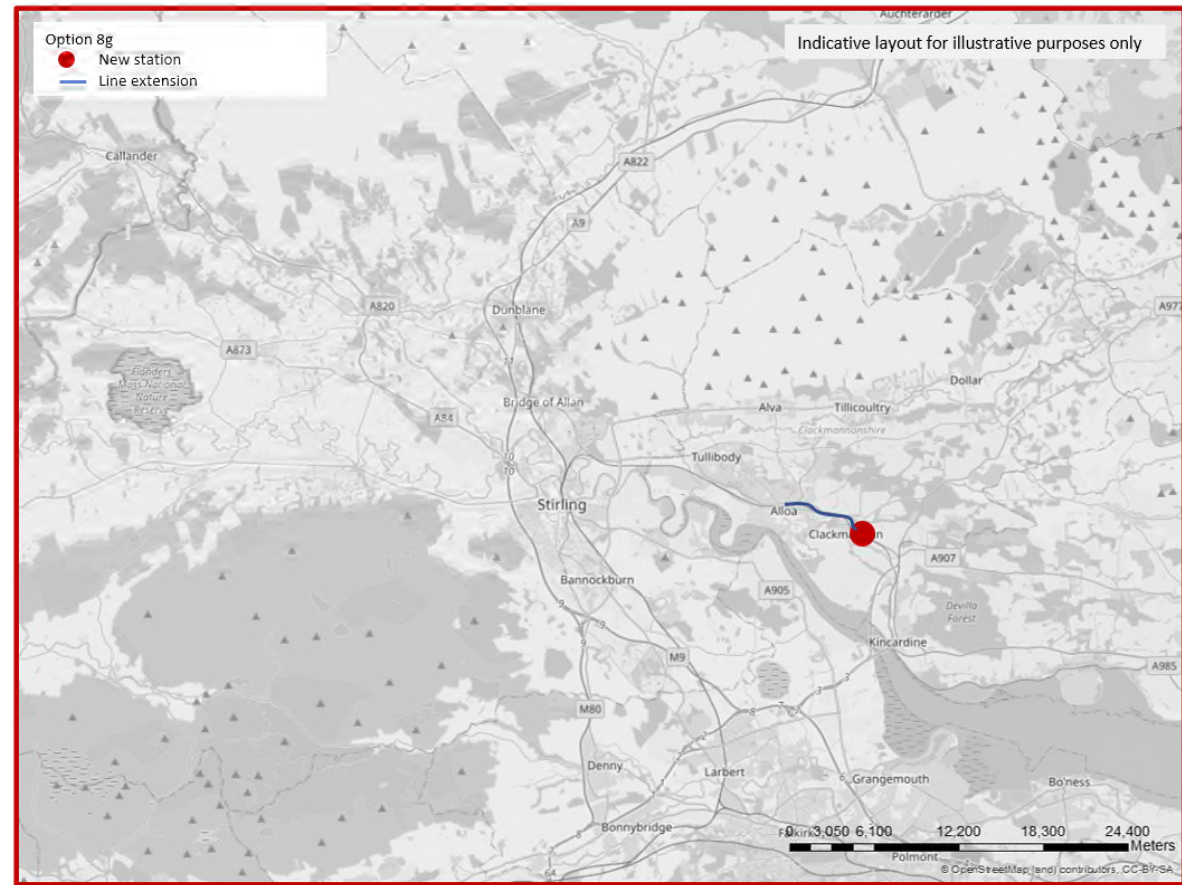
This option is not recommended for further investigation. Although it may improve accessibility for communities north of Dunblane it is not considered to contribute to the study TPOs and is outwith the scope of the study. This option may be considered as part of an alternative study investigating north of Dunblane.

Not progressed to Detailed Appraisal.

Table 22. Option 8g – New Rail Station and Line Reopening to Clackmannan

OPTION 8G – NEW RAIL STATION AND LINE REOPENING TO CLACKMANNAN

This option is a new rail station and line reopening to Clackmannan



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	A new line and station would increase the mode choice for residents in Clackmannan and capture trips going into and passing through Stirling, however, the service is not anticipated to be better than Alloa's and due to the proximity to Alloa the benefit is considered minor.

OPTION 8G – NEW RAIL STATION AND LINE REOPENING TO CLACKMANNAN

TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.

-

A new line and station would improve the competitiveness of public transport over car for Clackmannan residents, however, the service is not anticipated to be better than Alloa's and due to the proximity to Alloa the benefit is considered neutral.

Select/Reject Rationale

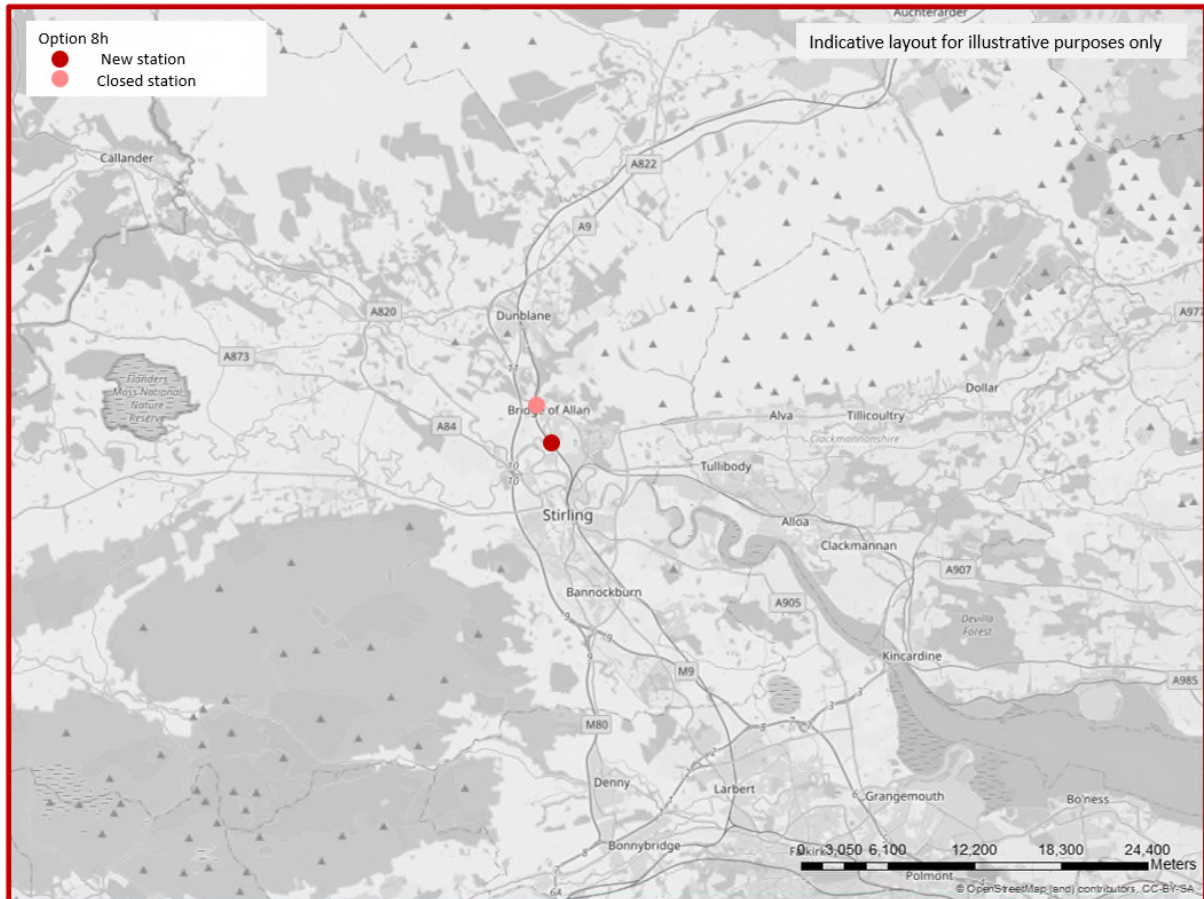
Reopening the line to Clackmannan has not been recommended for further investigation as part of this study. There may be benefits associated with this option however they have minimal positive impacts on the TPOs identified for this study and it is outwith the scope of this study. In addition, reopening the line to Clackmannan has been identified as an option as part of the West of Fife Enhancements study and it is therefore more appropriate for further investigation to take place as part of that study. For that reason, it has not been appraised against STAG criteria.

Not progressed to Detailed Appraisal.

Table 23. Option 8h – Relocation of Bridge of Allan Rail Station

OPTION 8H – RELOCATION OF BRIDGE OF ALLAN STATION

This option is the relocation (closure and reopening) of Bridge of Allan station to a site south of the existing station, between Cornton No1 vehicular level crossing and Cornton No2 footpath level crossing (between B823 and Easter Cornton Road).³



Performance against Transport Planning Objectives

Criteria	Score	Rationale
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓ ✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training

³ There is no reference in the Railways Act (2005) that specifically covers relocation. There has been a historic understanding that closure would not apply if the new facilities overlapped with the old facilities and a view (apparently unrecorded) that moving a station up to 440 yards did not require a closure of the old facility.

OPTION 8H – RELOCATION OF BRIDGE OF ALLAN STATION

		opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓ ✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station. Travel surveys at Bridge of Allan station have shown that 66% of users at Bridge of Allan drive to the station currently, if the new station provides sufficient parking and suitable access the drive-in level is expected to be maintained and supplemented by the additional walk-in catchment.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt.	✓ ✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station and improve the competitiveness of sustainable modes for strategic trips for Cornton residents. Providing sufficient parking at the new station would further increase the competitiveness.

Summary of Performance against STAG Criteria

Environment	X	Further assessment required at the detailed design stage for elements such as landscape, noise, flood risk, ecology etc.
Safety	✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station. This could result in modal shift from car to rail leading to reductions in car vehicle kilometres and accidents. The location of the station is, however, in close proximity to a level crossing which would require consideration by Network Rail to identify and mitigate any risks. The station would require a footbridge which would result in the closure of Cornton No.2 which would be positive in terms of reducing the likelihood of

OPTION 8H – RELOCATION OF BRIDGE OF ALLAN STATION

		pedestrian deaths. A new rail station would be built to current safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	-	This option includes a new station close to a level crossing. The station is likely to significantly increase the time the crossing is closed and impact on road journey times on the route, however, re-routing may result in journey time savings across the network (for example, Clock Roundabout). Public transport journey times for those within walking distance of the new station would improve however those in walking distance of the current location would see an increase. The relocation costs are major with public transport journey time improvements for those within walking distance offsetting the current location due to the greater catchment and road journey times would be negatively impacted by increased closures of the barrier crossings. Providing access to the rail network for communities not currently connected would provide increased access to employment and education opportunities and would, on balance, result in a neutral impact on Economy.
Integration	✓ ✓	This option would be in walking distance of the Cornton and south Bridge of Allan community and provide direct access to the rail network for a greater population, however it would remove the current access at the existing station, albeit a smaller walk in catchment. The new station aligns with the plans for the Kildean - Cornton and Cornton to Airthrey Link Roads. These link roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access to the station from the University, Forth Valley College, Castle Business Park, Kildean Housing and West End Raploch Housing.
Accessibility and Social Inclusion	✓ ✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station and improve the public transport coverage for these communities and Causewayhead. This catchment includes areas with a low SIMD ranking and access to a car.

OPTION 8H – RELOCATION OF BRIDGE OF ALLAN STATION

Implementability Appraisal

Feasibility	Major Consideration	<p>There are a number of factors to take into consideration for this option regarding feasibility. The proposed site is located close to the Cornton No1 crossing which will be converted to a full barrier MCB (OD) crossing. This change will lead to protecting signals being installed and the location of the station is likely to be within the scope of these crossings. This will increase the time the barriers are down and there are also significant safety issues with locating a station close to a level crossing which will have to be considered with Network Rail. There are flooding risks to be mitigated as identified in the environmental appraisal. Construction on a busy, live, electrified line will also be a major consideration.</p> <p>The relocation would also have to adhere to DfT's Guidance Note: Railway Closures, 18 October 2006, which is also approved by Transport Scotland</p>
Affordability	Major Consideration	<p>The factors introduced above - Cornton No1 crossing and construction on a live line - will also impact on the affordability of relocating the station. These factors will result in increased costs which will be relatively high.</p>
Public Acceptability	Major Consideration	<p>This option is likely to have a range of views from the public. Although the station would have an increased walk in catchment for access from Cornton and residences in south Bridge of Allan the station has historically been located to the north of the town and a move will negatively impact existing users who currently access the station by foot or bike. There is likely to be significant support in favour of the station staying at the current location. In contrast, there would likely be strong support for a relocated station close to Cornton and Causewayhead. In addition, the implications of the Cornton No1 crossing may result in lengthy closures to the B823 which will impact on local movements and support of the option.</p> <p>Public acceptability is a major consideration for this option.</p>

Select/Reject Rationale

OPTION 8H – RELOCATION OF BRIDGE OF ALLAN STATION

Relocating Bridge of Allan station makes significant positive impacts on the study TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling.

In terms of Integration and Accessibility the relocation of the station is considered a positive benefit with considerations to be further investigated identified in the Environment and Economy appraisal. These include the potential negative impacts associated with noise and flooding and potential journey time increases for road users and investment costs associated with the relocation.

There are significant implementability considerations in addition to those expected as part of a station relocation and construction. These include the operation of the Cornton No1 level crossing which will require additional safety mitigations and road journey time delays on the B823. Public acceptability is also a major consideration as the station has historically been located to the north of the town and a move will negatively impact existing users who currently access the station by foot or bike. There is likely to be significant support in favour of the station staying at the current location.

Due to the positive impacts on the TPOs, this option has been recommended for further investigation as part of the Detailed Appraisal.

Progressed to Detailed Appraisal.

5. SUMMARY & RECOMMENDATIONS

5.1 Summary

- 5.1.1 The options identified in the Case for Change have been assessed qualitatively against the study TPOs and STAG Criteria. In addition, the deliverability of the options was considered against Feasibility, Affordability and Public Acceptability.

5.2 Recommendations

- 5.2.1 This qualitative appraisal of the options has resulted in nine options being recommended for further investigation as part of the Detailed Options Appraisal.

Table 24. Summary of Initial Appraisal

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 1: Improve coach connectivity - increase in frequency and destinations	✓	✓ ✓	✓ ✓	-	✓	✓	✓	✓	Mod	Mod	Min	Progressed Contributes to TPOs by improving public transport connectivity between study area and locations outside the area, including locations not served by rail
Option 2: Light rail from Pirnhall/Durieshill into Stirling	✓	✓ ✓	✓	X	✓	X	✓ ✓	✓ ✓	Maj	Maj	Maj	Not progressed Contributes to TPOs but there are negative impacts on Environment and Economy and major considerations for Feasibility and Affordability.
Option 3: Improvements to existing bus Park and Choose serving Stirling City Area	✓	✓	-	✓	✓	✓	✓ ✓	✓	Min	Min	Min	Progressed as a complementary option Minor positive contribution to TPOs by providing enhanced and more attractive P&C facilities encouraging and enabling a park and choose into Stirling. .

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 4: Improve journey times, frequencies of rail services	✓	✓ ✓	✓ ✓	Not appraised								Not progressed Significant investment required across the central belt to implement option. Work is currently ongoing by Network Rail and ScotRail. This option requires further consideration but not as part of this study.
Option 5: Improve local bus connections to/from rail stations	✓ ✓	✓	✓	✓	✓	✓	✓ ✓	✓ ✓	Mod	Mod	Min	Progressed as Complementary Option Positive contribution to each of the study TPOs including providing improved connections to the existing rail network and reduced need to P&R at stations. Modal shift not considered significant and would support a core option.
Option 6a: New Bus/coach Park and Choose site at	✓	✓ ✓ ✓	✓ ✓	X	✓	✓ ✓	✓ ✓ ✓	✓	Maj	Mod	Min	Progressed As identified in previous STPR and STAG investigations it addresses TPOs by providing local

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Pirnhall/South Stirling												and strategic P&C, reducing the need to drive into Stirling.
Option 6b: Bus/coach Park and Ride opportunities at Manor Powis	-	✓ ✓	--	X	✓	✓ ✓	✓ ✓	✓	Mod	Mod	Mod	Progressed as Complementary Option Minimal impacts on the TPOs. As part of a wider network of park and ride sites this option could provide improved connections and support the TPOs.
Option 7a: Increased parking at Stirling station	-	XXX	✓	Not appraised								Not Progressed Major negative impact on TPO2 because additional capacity would not reduce traffic in study area, but would increase the demand to drive to Stirling station exacerbating problems in the City. Option not appraised against STAG criteria.

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 7b: Increased parking at Larbert station	-	✓	✓	X	✓✓	X	✓	-	Mod	Maj	Mod	Not Progressed Would support sustainable trips into the central belt, but unlikely to have impact of trips into / out of the study area. Option could benefit from consideration as part of a Falkirk area or wider central Scotland corridor study.
Option 7c: Increased parking at Alloa station	-	✓	-	X	✓	✓	✓	-	Mod	Min	Min	Not Progressed Option would support study TPOs by removing some traffic into and through the study area but would not provide any modal shift from within the study area. Option could benefit from consideration as part of a wider parking strategy
Option 7d: Increased parking at Bridge of Allan station	-	✓✓	✓✓	-	✓	-	✓	-	Mod	Maj	Mod	Progressed Option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
												impacted by parking availability limitations and reducing traffic going into Stirling. -
Option 7e: Increased parking at Dunblane	-	✓	✓	Not appraised								Not Progressed Impacts positively on the study TPOs but falls outwith the geographical scope of the study and would benefit from consideration as part of a wider parking strategy or the ongoing LRDF study in Dunblane.
Option 8a: New rail station between Bridge of Allan, Causewayhead and Cornton (retaining Bridge of Allan station) with park and ride facilities	✓ ✓	✓ ✓	✓ ✓	X	✓ ✓	✓	✓ ✓	✓ ✓	Maj	Maj	Maj	Progressed Option performs well against the TPOs and would increase access for Cornton residents as well as removing car trips from the strategic network.

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
Option 8b: New rail station at Manor Powis with park and ride facilities	-	✓ ✓	✓	X	✓	✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed Option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail.
Option 8c: New rail station at Cambus with park and ride facilities	-	✓ ✓	✓	X	✓	✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed Option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail.
Option 8d: New rail station at Causewayhead with park and ride facilities	✓	✓ ✓	✓	X	✓	✓ ✓	✓ ✓	✓ ✓	Mod	Maj	Min	Progressed Option would provide benefits to TPOs 2 and 3 as the station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail from

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
												Wallace High and Stirling University.
Option 8e: New rail station south of Stirling with park and ride facilities	✓✓✓	✓✓	✓✓✓	X	✓	✓✓	✓✓	✓✓	Mod	Maj	Min	Progressed Significant benefits to all three TPOs by providing a station within walking distance for Cowie or Bannockburn populations whilst also close to A91 eastern peripheral route.
Option 8f: New rail station at Blackford or Greenloaning with park and ride facilities	-	-	-	Not appraised								Not Progressed Does not contribute to the study TPOs and was not appraised against STAG criteria. This option may be considered as part of an alternative study investigating north of Dunblane.
Option 8g: New rail station and line reopening to Clackmannan	-	✓	-	Not appraised								Not Progressed Does not contribute to TPOs and was not appraised against STAG criteria as it would not impact on trips going through Stirling. The

OPTION	TPO1	TPO2	TPO3	ENVIRONMENT	SAFETY	ECONOMY	INTEGRATION	ACCESS	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	PROGRESSED/ NOT PROGRESSED
											line to Clackmannan has been identified as an option in the West of Fife Enhancements study which is a more appropriate forum.	
Option 8h: Relocated Bridge of Allan station with park and ride facilities	✓ ✓	✓ ✓	✓ ✓	X	✓	-	✓ ✓	✓ ✓	Maj	Maj	Maj	Progressed Relocating Bridge of Allan station makes significant positive impacts on the study TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling. Major deliverability considerations have been identified for delivery.

- 5.2.2 In the Case for Change, some options were identified as Complementary. These options were not considered to significantly impact on the TPOs as a standalone option but as a package they would contribute.
- 5.2.3 These complementary options have been appraised and reported in Appendix B and those to be considered in the Detailed Appraisal as part of a package are identified below.

Table 25. Complementary Options

ID	OPTION	DESCRIPTION	PROGRESSED/ NOT PROGRESSED
1	Potential for other trip attractors to use (local employer) Prudential bus services (from city centre and around Central Scotland, e.g. Forth Valley College).	Prudential currently operates a bus service from employees with pick up points across Stirling. This option proposes to allow non-employees to use the service to increase local accessibility with no additional services.	Progressed
2	Road improvements: Infrastructure improvements identified as DP4 and DP5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road.	Road improvements: Infrastructure improvements identified as DP4 and 5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road which may support core options. The M9 connectivity is being appraised separately and does not require appraisal here.	Progressed
3	Wheelchair accessible taxis and private hire vehicles.	Increase the availability of wheelchair accessible taxis and private hire vehicles. Negligible	Progressed
4	Bus priority/gates on city centre approaches.	Introduce bus priority measures or bus gates on city centre approaches.	Progressed
5	Promote investment in new buses.	Promote investment in new buses.	Progressed

ID	OPTION	DESCRIPTION	PROGRESSED/ NOT PROGRESSED
6	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and Park and Ride sites and train stations.	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and train stations. Improved connections from P&R sites to the centre.	Progressed
7	Widen the bike share scheme in and around the city.	Widen the bike share schemes in and around the city.	Progressed
8	Improve bus and cycle integration at bus shelters and on buses by allowing bikes on buses and installing cycle parking at shelters.	Improve bus and cycle integration at bus shelters and on buses by allowing bikes on buses and installing cycle parking at shelters.	Progressed
9	Create a multi-modal ticketing system and optimise pricing structure.	Create a multi-modal ticketing system and optimise pricing structure.	Not progressed
10	Promote activities to encourage more sustainable travel.	Investigate and promote, if applicable. activities to encourage more sustainable travel, for example, travel plans, car-free days and incentives to leave the car at home.	Progressed
11	Community transport targeted at interchange opportunities.	Support improvements in the Community Transport offering and target movements to and from interchange opportunities.	Progressed
12	Manage parking in the city centre with policy changes.	Manage parking policy in the city centre - this could include a review of parking prices in the city and P&R fares (reduced to encourage P&R use). The Community Parking Management Plan has recently been approved and this option is therefore not to be appraised.	Progressed

ID	OPTION	DESCRIPTION	PROGRESSED/ NOT PROGRESSED
13	Technological improvements to improve flow of traffic	<p>Technological improvements to improve flow of traffic:</p> <ul style="list-style-type: none"> • Intelligent Transport Systems directing to P&R with spaces • Traffic light prioritisation for public transport • Bus real time information 	Progressed
14	Improve lift share offering in the study area by incentivising lift sharing	Improve the lift share offering in the study area by incentivising lift sharing	Progressed

Appendix A – Core Options

Table 1. Option 1 - Improve Strategic Coach Connectivity to/from the Study Area

Appraisal Summary Table	
Option number	1
Option name	Improve Strategic Coach Connectivity to/from the Study Area
Option description	Increasing the frequency and destinations of coach services to key employment centres and cities including Glasgow, Edinburgh and Falkirk from existing stops in the study area to a wider range of destinations.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>
Performance against Transport Planning Objectives	

TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	The benefits associated with this option would be dependent on the location of stops for connections to healthcare, employment, education and training for the residents of Plean, Cowie, Fallin, Bannockburn and Cornton. Connections may still be required to access the coach network however it is considered that this option would increase the opportunities, services and locations which could be accessed.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would increase the attractiveness of coach travel and provide additional options for strategic travel. This would encourage a shift from private car to public transport.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓✓	This option would increase the frequency and destination of coach trips which improve the competitiveness of coach travel for strategic trips.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	No material changes in traffic flows on key roads in the study area or beyond are expected from this option as offset by modal shift / increased patronage of bus networks. No significant effects on transport noise or vibration for receptors adjacent to bus routes or facilities are predicted.
	Global Air Quality (CO2)	✓	No material changes in traffic flows or associated emissions on key roads in the study area or beyond are expected from this option as offset by modal shift / increased patronage of bus networks. No significant effects on global (carbon) emissions are predicted.

	Local Air Quality (PM10 and NO2)	✓	Modal shift is a positive change. No significant effects on local air pollutant emissions are predicted on basis that air quality in the Stirling area is good and there are no issues or Air Quality Management Areas currently declared. Fleet is assumed to be modern and will include electric or hybrid buses.
	Water quality, Drainage and Flood defence	-	No significant effects on water quality / drainage or flooding are predicted for this option
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.
	Landscape	-	No significant effects on landscape assets are predicted for this option
	Visual Amenity	-	No significant effects on visual amenity are predicted for this option
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option
	Cultural Heritage	-	No significant effects on cultural heritage interests are predicted for this option
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey
	Summary	-	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.

Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network and therefore lower vehicle kilometres. This reduction will be a modal shift from car to coach.
	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	✓	<p><u>Travel time savings</u>: An increased frequency and number of destinations would lead to journey time benefits using direct services to destinations and reduced wait and interchange time.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: There would be increased operating costs for bus vehicles associated with the increased frequency and destinations.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion as existing or similar vehicles are expected to provide the services.</p> <p><u>Reliability benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Additional fleet may be required.</p> <p><u>Operating and maintenance costs</u>: This option would require additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: Option would result in a more attractive service to the key employment centres leading to increased passenger numbers and additional revenue.</p> <p><u>Grant and subsidy payments</u>: A minor increase in subsidy may be required to increase the service provision, especially in the short term.</p> <p><u>Summary</u>: This option is considered to be relatively low cost with relatively low benefits and is a minor benefit to TEE.</p>
	Wider Economic Benefits	✓	This option includes improvement to the coach network. This would provide improved access to the Central Belt and other employment and education centres which would

			improve employment opportunities in the study area and is therefore a minor benefit to Wider Economic Impacts.
Integration	Transport	✓	An increased number of services and destinations would allow for more service integration, this would be a minor benefit for transport integration.
	Transport/Land Use	✓	This option would have a positive impact on Transport and Land Use Integration as it supports growth in Plean, Cowie and Fallin which are identified in the LDP as growth areas.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	Improvements to frequencies and destinations of coach services would improve public transport coverage across the study area. Although it would not directly improve walking or cycling it would improve access to services and local accessibility.
	Comparative	✓	The benefits associated with this option would be dependent on the location of the stops and the connections. Connections by car may still be required to access the coach network which would not benefit those households with no access to a car, however, it is considered that this improvement would still result in a minor benefit.

Implementability		
Feasibility	Technical	This option has a broad scale of implementation. Additional stops to an existing long-distance service would have minor impacts on deliverability, however, new destinations and services would require changes to existing bus timetables and additional coach fleets. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available. In particular, the potential requirement to subsidise a national coach network may require investigation. On balance, this is a moderate consideration. This option may be supported by the priority of Stirling Council to develop a business case for a community-owned public transport company.
Affordability	Financial	The patronage associated with this option is expected to be low to medium at the outset, with comparably low operating revenue. This option, therefore, may be reliant on public sector revenue funding as it may not be commercially viable to offer such a service. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.
Public Acceptability		It is anticipated that improving the frequency and destinations of coach services would be well received by the public.
Rationale for Selection or Rejection		
<p>This option contributes positively to all three TPOs by improving coach connectivity and, therefore, connections to major employment centres. This would have a positive impact on improving the competitiveness of public transport and reducing the modal share of cars entering, leaving or passing through the Stirling City Area.</p> <p>The option is considered a minor positive benefit for all options excluding environment (neutral) and would support integration and accessibility whilst also providing an economic benefit.</p> <p>Considerations regarding the deliverability of the option have been considered, in particular, with regard to discussions with operators and potential subsidies which may be required. The option would likely receive support from the public due to the increased connectivity to key employment centres.</p> <p>Progressed to Detailed Appraisal</p>		

Table 2. Option 2 - Light Rail from Pirnhall/Durieshill into Stirling

Appraisal Summary Table	
Option number	2
Option name	Light Rail from Pirnhall/Durieshill into Stirling
Option description	This option would involve the construction of a Light Rail line from Durieshill/Pirnhall into Stirling with regular services to provide a connection to be used by residents and employees at the planned development at Durieshill, communities in southern Stirling and as a park and ride into Stirling.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	A light rail service from Pirnhall/Durieshill to Stirling would improve access to services for communities along the route, including residents of Bannockburn. This would be a moderate benefit for Bannockburn residents to access Stirling City Centre and the strategic site at Durieshill. The light rail is not considered a major benefit as bus services currently serve the route from Bannockburn.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would improve transport options from Durieshill which is a significant housing and employment site to the south of Stirling with 3,000 homes. This would provide a direct link from the development, supporting the LDP and could reduce the modal share of cars entering the Stirling City Area. This would be a moderate benefit.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would increase the range of public transport from the planned development at Durieshill and on the route to Stirling City Centre, however, this would have only a minor benefit for TPO3 as passengers would be required to interchange at Stirling rail or bus station to access the strategic transport network.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	The construction and operation of a new light rail facility could lead to changes in noise and vibration levels in the surrounding environment. The scale of potential impacts would depend on the physical location of the station / hub and proximity to sensitive receptors e.g. residential properties. Changes in noise levels could also result from operation of the light rail infrastructure e.g. announcements at stops. The option would change traffic volumes into Stirling via private car and would promote modal shift to Stirling City Centre / Bus and Rail Station and reduce congestion.

Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor benefits to global air quality.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor benefits to local air quality.
	Water quality, Drainage and Flood defence	✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a light rail scheme from Pirnhall/Durieshill into Stirling is unlikely to have significant adverse effects on water quality and drainage. Once proposed route is known review of SEPA's Flood Risk Map should highlight potential medium/high risk of flooding, and detailed assessment carried out if necessary.
	Geology	✗ to ✗✗ and ✓	With adequate mitigation in place it is anticipated that the construction of a light rail scheme between Pirnhall and Stirling would not have significant adverse effects on geology and soils. However, depending on the route of the scheme, the light rail may traverse areas within a coal mining Development High Risk Area or brownfield land. A comprehensive site investigation will be required along the route to inform options and allow detailed design, potentially leading to a requirement for remedial action.
	Biodiversity and Habitats	✗	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	✗ and ✓	Development of a light rail route from the south of Stirling would lead to some minor loss and fragmentation of rural fringe character in the Lowland Hill Fringes LCT, albeit in an area already influenced by the M9, A roads and development typical of the urban/rural fringe, with further development allocated in the LDP. There would also be potential townscape effects within the urban area, depending on the route taken. Localised effects could be largely mitigated by careful routing and design of facilities. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.

	Visual Amenity	X to XX and ✓	There would be relatively few sensitive visual receptors in the rural fringe to the south of Stirling. However, depending on the route adopted there would be potential for effects on a significant number of residential receptors. However, effects are mainly likely to be slight, depending on the route taken. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	X	Land Capability for Agricultural data from the MacAulay Land Use Research Institute confirms that much of the area between Pirnhall and Stirling comprises either urban land, or Class 3.2 agricultural land, which is "land capable of average production though high yields of barley, oats and grass can be obtained". The proposed route of the scheme will determine the loss of any agricultural land however the overall impact is considered to be small.
	Cultural Heritage	XX to X and ✓	There are no scheduled monuments or designed landscapes on likely routes for the proposed light rail. However, it would pass through two battlefield sites in the south and there is the potential to affect the setting of a significant number of listed buildings within the urban area. There is the potential to affect as yet unknown archaeology, depending on the route. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. The provision of P&R options associated with light rail provision will reduce cars in the city centre which may encourage others to walk and cycle more.
	Summary	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.

Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the local road network. This reduction will be a modal shift from car to bus and coach park and ride and reduce vehicle kilometres on the local road network.
	Security	✓	Security for public transport users would likely be improved by this LRT option because it would include passenger waiting facilities built to minimum safety requirements with regards to entrances and exits, lighting and surveillance.
Economy	TEE	XX	<p><u>Travel time savings</u>: This option would provide a direct connection to Stirling City Centre which would have journey time benefits. Modal shift from car to P&R may also reduce car and bus journey times.</p> <p><u>User charges including fares, parking charges and tolls</u>: The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing bus and rail fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: There would be increased operating costs for rolling stock associated with the new service.</p> <p><u>Quality benefits to transport users</u>: Quality benefits could be expected if new, high-quality buses are used to serve the new park and ride.</p> <p><u>Reliability benefits to transport users</u>: Reliability benefits would be dependent on the proportion of track which can be off and on road. It is likely that there would be minor reliability benefits.</p> <p><u>Investment costs</u>: Capital costs associated with light rail would be major and require full feasibility studies, land costs, junction modelling and engineering. Rolling stock would also be required.</p> <p><u>Operating and maintenance costs</u>: This option would require additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: The service would generate new revenue through new passengers.</p> <p><u>Grant and subsidy payments</u>: A high subsidy is expected to be required for this option, especially in the short term to establish demand as the flow is not considered significant enough to maintain the service.</p>

			<u>Summary:</u> This option is considered to have major costs with relatively low benefits due to the flow not being considered high enough to generate a positive benefit cost ratio.
	Wider Economic Benefits	✓✓	The location of the park and ride, close to a large residential and employment development at Durieshill would provide improved public transport connectivity between Stirling City Centre and the planned housing and employment. This would be a moderate benefit.
Integration	Transport	✓✓	The LRT would provide additional services and destinations which would allow for more service integration and between modes, in addition, park and ride facilities may be available at some stops. This would be a moderate benefit for transport integration.
	Transport/Land Use	✓✓	This option integrates a major residential and employment development at Durieshill into Stirling City Centre. This would provide sustainable access to employment, education, healthcare and leisure facilities for the Durieshill residents and other nearby communities. This is a moderate benefit.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓✓	This option would improve transport options from Durieshill which is a significant housing and employment site to the south of Stirling with 3,000 homes and along the route to the city centre. This would be a significant improvement to local public transport coverage.
	Comparative	✓	The Light rail route would pass through communities identified in the study as being areas with higher levels of deprivation within Stirling including Bannockburn. This option could help improve connections to local services and opportunities for those without access to a car.

Implementability		
Feasibility	Technical	The design and construction complications of light rail lines vary significantly, however, this is expected to be a major consideration with the potential for a slow and unpredictable construction. The delivery and operation of a light rail line would also require the creation of a new body, or changes to existing public transport management in the local authority.
Affordability	Financial	Construction costs of light rail lines vary considerably, however major consideration should be given to the costs and the financial risks associated with the operation of the line. It is anticipated that this option would be reliant on public sector revenue funding as it may not be commercially viable to run the service. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.
Public Acceptability		Public acceptability of this option is a major consideration. The public may have concerns relating to the impact on transport associated with construction and operation of a light rail line through south Stirling and the impact on residents to have the service operating in close proximity to residential homes.
Rationale for Selection or Rejection		
<p>This option contributes positively to all three TPOs to varying degrees by providing a connection between a major planned residential and employment developed at Durieshill which would provide sustainable travel opportunities between the site and Stirling. However, there are number of negative impacts on STAG criteria, including Environment for which negative impacts are considered minor to moderate for noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. In addition, the option is considered a negative impact on Economy.</p> <p>Although the service would generate new revenue through new passengers and improved journey times, a high subsidy is expected to be required for this option, especially in the short term to establish demand as the flow is not considered significant enough to maintain the service and costs including investment, operating and maintenance are expected to be high.</p> <p>In terms of deliverability, construction costs of light rail lines vary considerably, however costs and financial risks are a major consideration, as is land availability and technical deliverability, and they are not outweighed by the benefits.</p> <p>Given the expenditure required and the public acceptability with the land take (impacting either road space or residential housing) to develop a light rail system from Durieshill and the relatively minor positive impacts this option has been rejected and is not recommended for further appraisal.</p> <p>Not progressed to Detailed Appraisal</p>		

Table 3. Option 3 - Improvements to Existing Bus Park & Choose

Appraisal Summary Table	
Option number	3
Option name	Improvements to Existing Bus Park and Choose
Option description	<p>This option includes a range of improvements to existing bus park and choose sites at Springkerse and Castlevew:</p> <ul style="list-style-type: none"> • improved walking and cycling connections/facilities (including bike share provision); • a tourism bus into Stirling City Centre and Stirling Castle; • review access arrangements to Springkerse P&C; • a review of services to improve connections to employment and education destinations and improve frequencies; and • EV charging.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	Services at the existing Park and Ride sites would be reviewed and improved to provide connections to employment and education destinations. This would provide be a benefit to users of the park and ride site however the benefit is limited as users would still require access to the site by car or local connections.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Providing an improved park and ride facility would be more attractive to users with reviewed and enhanced services or different parking controls. This could lead to a modal shift from road to bus/coach or green travel.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	The review of services is not considered to include access to strategic sites. Therefore, there would be no improvement to strategic connections to improve the competitiveness.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	Modal shift and reduced private trips would reduce vehicle movements. No significant effects on transport noise or vibration for receptors adjacent to bus routes or facilities are predicted.
Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. No significant effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Locally minor positive benefits. Current fleet is assumed to be modern and will include electric or hybrid buses.

	Water quality, Drainage and Flood defence	-	No significant effects on water quality / drainage or flooding are predicted for this option.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on geology or geological/material resources are predicted for this option.
	Landscape	-	No significant effects on landscape or townscape are predicted for this option
	Visual Amenity	-	No significant effects on visual amenity are predicted for this option
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	-	No significant effects on biodiversity and habitat are predicted for this option
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. The provision of P&R options will reduce cars in the city centre which may encourage others to walk and cycle more. However, facilities for parking is likely to result in car use for some travellers with no net benefit.
	Summary	✓	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.

Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. On balance, this would be a minor benefit. This reduction will be a modal shift from car to park and ride.
	Security	✓	An improved park and ride facility would provide increased security including surveillance (CCTV) and lighting. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on real and perceived improvements to security.
Economy	TEE	✓	<p><u>Travel time savings</u>: This option may result in journey time savings through the review of services to improve connections and also by encouraging modal shift which would reduce car and bus journey times on the road network.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option would create a better environment for waiting with improved facilities which would be a moderate quality benefit.</p> <p><u>Reliability benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Capital costs associated with the improvements would be relatively low including improved walking/cycling infrastructure and EV charging.</p> <p><u>Operating and maintenance costs</u>: This option would require minimal additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: Improvements to the park and ride are anticipated to result in minor increases in passengers and associated revenue.</p> <p><u>Grant and subsidy payments</u>: The ongoing subsidy is not anticipated to increase from the current subsidy required.</p> <p><u>Summary</u>: The P&R site improvements are considered relatively low cost with associated benefits which would mean this option is considered a minor benefit for TEE.</p>

	Wider Economic Benefits	✓	This option includes a review of connections to employment and education destinations. Any improved connections to employment and education destinations would help build a skilled and qualified workforce and improve employment opportunities. This is a minor benefit to Wider Economic Impacts.
Integration	Transport	✓✓	Improvements to facilities at the park and ride sites would support transport integration by making a facility geared towards integration more attractive to the general public. This would be a moderate benefit.
	Transport/Land Use	✓	This option would involve a review of services including connections to employment and education destinations. This may have a small impact on Land-Use Integration by identifying planned employment centres and ensuring appropriate public transport access, with support from developers.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	This option would result in a minor public transport coverage improvement through the review of connections and a tourism bus. Improvements to walking and cycling connections would also improve access to services and facilities through active travel modes.
	Comparative	✓	This option is primarily focused on improving the facilities and services at the park and ride which is aimed at those with access to a car, however, it also provides improvements to walking and cycling connections. This may benefit residents within walking/cycling distance of the site with no car access.

Implementability		
Feasibility	Technical	This option includes a range of improvements to the existing park and choose sites. These improvements are well established concepts and are not considered risks. The introduction of a tourism bus and a review of existing services would require negotiation and, potentially, reconfiguration of timetables, however this is considered a minor risk as the majority of services currently exist or have in recent years.
Affordability	Financial	There would be relatively low construction costs to deliver this option. The commercial viability of a bus service is dependent on the demand for the service and although the service improvements and tourism bus would be designed to maximise patronage, subsidies may be required to support the services, especially in the initial stages of delivery.
Public Acceptability		This option is expected to be well received by the public.
Rationale for Selection or Rejection		
<p>This option makes a minor positive contribution to two TPOs by providing enhanced and more attractive park and choose facilities to users. However, the impact on modal shift is considered to be minor.</p> <p>Across the STAG criteria the option is considered a minor positive benefit and would support integration, in particular, through the promotion of park and choose, whilst also providing an economic benefit.</p> <p>Considerations regarding the deliverability of the option have been considered, in particular, with regard to discussions with operators regarding reviews of existing services and any infrastructure requirements. These considerations are considered minor and the option is therefore recommended for further investigation in the Detailed Appraisal as a Complementary option which would support other Core Options to deliver the TPOs.</p> <p>Progressed to Detailed Appraisal as a Complementary Option</p>		

Table 4. Option 4 – Improve Journey Times and Frequencies of Rail Services

Appraisal Summary Table	
Option number	4
Option name	Improve Journey Times and Frequencies of Rail Services
Option description	Improve journey times and frequencies of rail services to Glasgow and Edinburgh from Alloa and Stirling.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the ‘Eastern Villages’ of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland’s other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓	This option would provide a minor benefit for residents from Plean, Cowie, Fallin, Bannockburn and Cornton once they are on the train as the journeys will be quicker and more frequent. However, the access to the strategic rail network remains unchanged.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓✓	This option would provide a moderate benefit for TPO2 by improving the frequency and journey times of rail journeys into and through Stirling. This would make sustainable travel more attractive and encourage modal shift. This would only be a benefit, with regards to this TPO, for those already with good sustainable access to the rail network.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓✓	This option would provide a moderate benefit for TPO3 by improving the frequency and journey times of rail journeys. This would be particularly attractive for strategic trips and would improve the competitiveness of public transport compared to car for strategic trips.
Rationale for Selection or Rejection		
<p>This option positively impacts on the study TPOs by improving the attractiveness of public transport over private car and therefore reducing the car mode share. Following engagement with ScotRail and Network Rail they have highlighted the significant investment requirement to implement Option 5 and therefore it has not been appraised against the STAG Criteria. There are various points of congestion on the rail network in the Edinburgh, Glasgow and Stirling triangle which would impact on the ability to deliver the option and improvements would be part of a wider review of services (currently under review by Network Rail and ScotRail). It is therefore recommended that this option is considered further, but not as part of this study.</p> <p>Not progressed to the Detailed Appraisal</p>		

Table 5. Option 5 - Improve Local Bus Connections to/from Rail Stations

Appraisal Summary Table	
Option number	5
Option name	Improve Local Bus Connections to/from Rail Stations
Option description	Increase the number of bus services connecting communities to rail stations in the study area, including from Plean, Cowie and Fallin.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓✓	This option would benefit the communities identified in TPO1 by providing a direct connection to rail stations in the study area. This option would provide direct connections not only to the wider rail network and the opportunities which exist in Glasgow and Edinburgh, but also the services and opportunities in close proximity to the stations themselves, including Stirling.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	This option would provide improved connection to the existing rail network and reduce the need to park and ride at stations or destinations in Stirling. This would reduce the mode share for cars entering the Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	By improving direct access to the rail network this option would improve journey times and therefore the competitiveness of public transport compared to car for strategic trips to the Central Belt.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	No material changes in traffic flows on key roads in the study area or beyond are expected from this option. No significant effects on transport noise or vibration for receptors adjacent to bus routes or facilities are predicted.
Environment	Global Air Quality (CO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality

	Local Air Quality (PM10 and NO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on local air quality
	Water quality, Drainage and Flood defence	-	Improved bus services may encourage increased use of services with the potential for minor changes in use of other modes of transport such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.
	Landscape	✓	Assuming this does not entail the construction of significant new structures, there are unlikely to be any adverse effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	Assuming this does not entail the construction of significant new structures, there are unlikely to be any adverse effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	Assuming this does not entail the construction of significant new structures, there are unlikely to be any adverse effects on townscape and listed buildings. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times
	Physical Fitness	✓	A reduction in overall levels of private car journeys on key routes through the city centre by facilitating rail then bus connections with associated onward journeys on foot will increase levels of physical activity.

	Summary	✓	With improvements to public transport and encouraging modal shift, this option would result in minor environmental improvements to local air quality, global air quality, water environments, landscape, visual amenity and cultural heritage.
Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the road network. This reduction will be a modal shift from car to bus due to increased public transport coverage and access to the rail network.
	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services could have a positive impact on real and perceived improvements to security and reduced waiting times and connections to make the journey, however, this is considered to be marginal.
Economy	TEE	✓	<p><u>Travel time savings</u>: An increase in bus-rail connections would lead to journey time benefits by reducing the connection and interchange time to access the rail network.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: There would be increased operating costs for bus vehicles associated with the increased frequency and destinations.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion as existing or similar vehicles are expected to provide the services.</p> <p><u>Reliability benefits to transport users</u>: The reliability of access to the rail network would be improved with this option.</p> <p><u>Investment costs</u>: Additional fleet may be required.</p> <p><u>Operating and maintenance costs</u>: This option would require additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: Option would result in increased access to the rail network and patronage on bus services leading to increased passenger numbers and additional revenue.</p> <p>Grant and subsidy payments: An increase in subsidy may be required to increase the service provision, especially in the short term.</p> <p><u>Summary</u>: This option is considered to be relatively low cost with minor benefits and is a minor benefit to TEE.</p>

	Wider Economic Benefits	✓✓	This option would provide direct connections to the rail network for communities not currently connected. This would allow for improved access to employment and education opportunities, particular for communities currently identified as having lower economic activity. This would have a minor positive impact on Wider Economic Impacts.
Integration	Transport	✓✓	This option integrates bus and rail services which will significantly improve integration between the two by ensuring timetables are appropriately matched to minimise interchange between modes. This is a moderate benefit.
	Transport/Land Use	✓	This option would include providing access to new and planned developments in the study area which would have a positive impact on transport and land use integration.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓✓	This option would provide improved connection to the existing rail network with direct connections to services. This would improve the public transport coverage, especially for those currently without a connection to the stations. This would be a moderate benefit.
	Comparative	✓✓	This option would directly benefit groups identified as socially excluded by providing a direct connection to rail stations in the study area. This option would provide direct connections to the wider rail network for those without access to a car, including communities in Plean, Cowie and Fallin. This would be a moderate benefit.

Implementability		
Feasibility	Technical	This option would require changes to existing bus timetables and potentially additions to bus fleets. This would require negotiation with both bus and rail operators to ensure appropriate interchange times and investigations of any potential subsidies available. Processes for responding to rail timetable changes would also have to be agreed.
Affordability	Financial	Commercial bus operations require sufficient revenue to support the operational costs of the service. If the patronage levels do not provide sufficient revenues, then they may be reliant on public sector revenue funding. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue.
Public Acceptability		It is anticipated that improving bus connections to rail stations would be well received by the public.
Rationale for Selection or Rejection		
<p>This option would make a positive contribution to each of the study TPOs including providing improved connections to the existing rail network and reduce the need to park and ride at stations and therefore travelling by car into or through the study area. The impact on modal shift, however, is considered to be low. The appraisal against the STAG criteria has identified no negative impacts and shows significant benefits associated with Integration and Accessibility. In terms of implementability, this option would require changes to existing bus timetables potentially additions to bus fleets. This would require negotiations with both bus and rail operators and may require an ongoing operating subsidy.</p> <p>Given the positive performance against the TPOs and STAG criteria and relatively minor implementability considerations this option has been recommended for further appraisal as a Complementary option.</p> <p>Progressed to Detailed Appraisal as a Complementary Option</p>		

Table 6. Option 6A - New Park & Choose site at Pirnhall/Durieshill

Appraisal Summary Table	
Option number	6A
Option name	New Park & Choose site at Pirnhall/Durieshill
Option description	This option would involve the development of new bus and coach-based Park and Choose south of Stirling at the Pirnhall Junction to serve movements travelling into Stirling from Falkirk, Durieshill and other inward travel patterns and strategic links to Glasgow, Edinburgh and other central belt locations.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	The benefits associated with this option would be dependent on the connections to the Pirnhall site from the locations identified in the TPO. Due to the low car ownership in some of the areas the benefits would be limited however, with good local active travel accessibility this option would provide improved accessibility to Stirling and strategic locations with services and opportunities.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓✓	This option would reduce the need to enter Stirling to join the strategic public transport network to travel to the Central Belt or into Stirling. In particular, residents travelling from Falkirk and Edinburgh could use the facility to travel into Stirling and Clackmannanshire and South Stirling residents could use the facility to travel onwards to the Central Belt and reduce the need to travel into Stirling to access the rail network. The location, close to a large growth area south of Stirling would support the LDP and CRD aspirations by improving mode choice for Durieshill residents and employees and may support major events in the area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓✓	This option would increase the range of public transport available for those travelling from Clackmannanshire, Falkirk and South Stirling. The location next to the strategic road network will maximise the competitiveness of journey times on the bus and coach and accessing the P&C site by car.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	- but could be ✗ depending on numbers of buses / routes / operational hours	The construction and operation of new park and ride sites could lead to changes in noise and vibration levels in the surrounding environment. The scale of potential impacts would depend on the physical location of the park and ride site and proximity to sensitive receptors e.g. existing residential development. Changes in noise levels

			could also result from increased routeing of buses and coaches along existing routes. The option would change traffic volumes into Stirling via private car and would promote modal shift to bus / coach connection with Stirling City Centre and reduce congestion. It is assumed that buses and coaches would be a modern fleet / may include electric or hybrid vehicles. Further assessment is likely to be required once details are known.
Environment	Global Air Quality (CO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality
	Local Air Quality (PM10 and NO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on local air quality
	Water quality, Drainage and Flood defence	-	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, the proposed P&C is unlikely to have significant adverse effects on water quality and drainage. According to SEPA's Flood Risk Map, a small portion of the site is subject to potential medium/high risk of surface water flooding, and this will require further assessment.
	Geology	✗	With adequate mitigation in place it is anticipated that the construction of a P&C facility at Pirnhall would not have significant adverse effects on geology and soils. However, the site is within a coal mining Development High Risk Area, with several mine entries in the vicinity, and a comprehensive site investigation will be required to inform options and allow detailed design, potentially leading to a requirement for remedial action.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	✗✗ if mitigation measures not adequate and ✓	Development of a P&C facility with extensive hardstanding, shelters and lighting either side of the A83 would lead to some loss and fragmentation of rural fringe character in the Lowland Hill Fringes LCT south of Stirling, albeit in an area already influenced by the M9, A roads and development typical of the urban/rural fringe, with further

			development allocated in the LDP. Assuming the site is not located in a retained area of green belt and that landform and planting are used to screen/ integrate the P&C into the wider landscape, effects can be partially mitigated. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✗ and ✓	There is the potential for the P&C facility to have adverse effects on the visual amenity of a small number local residents in scattered dwellings, hotel guests, road users and golfers. Landscape mitigation measures including landform and planting would further limit the effects. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	✗	Land Capability for Agricultural data from the MacAulay Land Use Research Institute confirms that the area comprises Class 3.2 agricultural land, which is "land capable of average production though high yields of barley, oats and grass can be obtained". The area to the east of Bannockburn House is currently used for agriculture, so development here would lead to loss of this land that could not be mitigated. Given scale of agricultural land in the area and the scale of the development, the overall impact is considered to be small.
	Cultural Heritage	✗ and ✓	There are no nationally or locally designated monuments, buildings or designed landscapes in the Pirnhall/ South Stirling area north of the junction. However, it is located on the overlap between two battlefield sites (Bannockburn and Sauchieburn) and there are a number of records in the area. The proposals therefore have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. The provision of P&C options will reduce cars in the city centre which may encourage others to walk and cycle more. However, facilities for parking would result in car use for some travellers with no net benefit

	Summary	X	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on cultural heritage and biodiversity are anticipated either. Assuming the site is not located within the green belt area and appropriate design and mitigation steps are followed then it is likely that potential impacts on landscape; visual amenity; geology and soils; water quality; drainage or flood defence would be of an acceptable level.
Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. On balance, this would be a minor benefit. This reduction will be a modal shift from car to bus and coach park and ride.
	Security	✓	A new park and ride facility would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV) and lighting. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on real and perceived improvements to security.
Economy	TEE	✓✓	<p><u>Travel time savings:</u> This option would provide a direct connection to Stirling City Centre which would have journey time benefits. Modal shift from car to P&C may also reduce car and bus journey times.</p> <p><u>User charges including fares, parking charges and tolls:</u> The impact of this option on user charges including fares and parking would be dependent on the approach to P&C pricing, including the approach to parking charges to maximise the attractiveness of the site.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> There would be increased operating costs for bus vehicles associated with the new services.</p> <p><u>Quality benefits to transport users:</u> Quality benefits could be expected if new, high-quality buses are used to serve the new park and ride.</p> <p><u>Reliability benefits to transport users:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs:</u> Capital costs associated with the new P&C would be moderate and may require full feasibility, land costs and junction modelling. Additional fleet may be required.</p>

			<p><u>Operating and maintenance costs:</u> This option would require additional service operating and maintenance running costs.</p> <p><u>Revenues:</u> New park and ride would generate additional revenue through new passengers.</p> <p><u>Grant and subsidy payments:</u> A moderate subsidy is expected to be required for this option, especially in the short term to establish demand.</p> <p><u>Summary:</u> This option is considered to have moderately high costs with moderately high benefits.</p>
	Wider Economic Benefits	✓✓	The location of the park and ride, close to a large residential and employment development at Durieshill would provide improved public transport connectivity between Stirling City Centre and the planned housing and employment. This would be a moderate benefit.
Integration	Transport	✓✓✓	This option supports transport integration by providing a site where users can switch from car to public transport or other sustainable modes such as cycling. The facilities would be designed with transport integration at the centre of the proposal. This would be a major benefit for transport integration.
	Transport/Land Use	✓✓✓	This option integrates a major residential and employment development at Durieshill into the local and strategic transport network. This would provide sustainable access to employment, education, healthcare and leisure facilities for the Durieshill residents and other nearby communities. This is a major benefit.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	A new park and choose would improve public transport coverage to/from south Stirling. Although it would not directly improve walking or cycling it would improve access to services and local accessibility and may be directly accessible, without the need for a car, by residents of Durieshill and South Stirling Gateway. Separate schemes will provide an active travel corridor to the site from the city centre and the wider cycling network.

	Comparative	✓	This option would be directly accessible, without the need for a car, by residents of Durieshill and South Stirling Gateway, however, the wider population would require a car to access the facilities which limits the benefit for socially excluded groups.
Implementability			
Feasibility	Technical	Note that the specific site location has not been confirmed however a previous study undertaken in 2010 identified the following points for consideration for a P&C site in the vicinity of Durieshill. Currently there are no facilities for pedestrians or cyclists at this location, but these are due to be provided as part of the Durieshill development with other links to the wider walking and cycling network planned. Public utilities plans show the presence of 2 major pipelines running through the site which could be costly or time consuming to work alongside safely. Otherwise, technical risks associated with the construction of a new bus and coach-based park and ride are expected to be a minor consideration with minimal departure from design standards. Of more significant consideration is the requirement to work with bus and coach operators to develop new routes, source additional bus and coach fleet and market the new services. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available. In particular, the potential requirement to subsidise a national coach network may require investigation.	
Affordability	Financial	Moderate consideration should be given to the costs associated with the construction of the park and choose site. The financial risk associated with park and choose construction is considered to be low. Revenue costs for operating buses would vary depending on the model used however at the initial stages the patronage associated with this option is expected to be low to medium, with comparably low operating revenue. This option, therefore, may be reliant on public sector revenue funding as it may not be commercially viable to offer such a service. This public sector revenue funding may be in the form of an ongoing operating subsidy or a fund to initiate the service prior to developing a customer base and associated operating revenue. As Stirling has declared a Climate Emergency the preference will be for low emission public service vehicles from this site to the city centre. EV charging will need to be included with future proofing for new technologies.	
Public Acceptability		It is anticipated that a park and choose site well located for planned development at Durieshill and with good connections to the road network for both drivers and buses/coaches would be well received by the public.	

Rationale for Selection or Rejection

This option would make a significant positive contribution to each of the study TPOs including reducing the need to enter Stirling to join the strategic public transport network to travel to the Central Belt or into Stirling. The service provided would be similar to Option 2 (Light Rail) with a direct connection to the city centre in addition to strategic links. In particular, residents travelling from Falkirk and Edinburgh could use the facility to travel into Stirling and Clackmannanshire and South Stirling residents could use the facility to travel onwards to the Central Belt and reduce the need to travel into Stirling to access the rail network. The location, close to a large growth area south of Stirling would support the LDP and CRD aspirations by improving mode choice for Durieshill residents and employees.

The appraisal against the STAG criteria has identified positive impacts for all excluding Environment. Of particular note is the significant benefit associated with Economy and Integration due, in particular due to the proximity of the proposed site to the Durieshill planned developments.

In terms of implementability, previous studies have identified a number of considerations including technical risks associated with pipelines and crossing facilities. These are major considerations which would require further investigation. Given the positive performance against the TPOs and STAG criteria this option has been recommended for further appraisal.

Progressed to Detailed Appraisal

Table 7. Option 6B - New Park and Choose site at Manor Powis

Appraisal Summary Table	
Option number	6B
Option name	New Park and Choose site at Manor Powis
Option description	New bus and coach-based Park & Choose facility at Manor Powis to serve movements travelling into Stirling from Clackmannanshire and Fife and other inward travel patterns.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would not contribute towards TPO1 as the proposed site to the north east of Stirling would not be suitable for residents of Plean, Cowie, Fallin, Bannockburn and Cornton accessing services in Stirling and beyond.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would support TPO2 by providing public transport options to the east of Stirling, and, in particular, provide options for travel from Alloa, supplementing the existing Alloa to Stirling/Glasgow/Edinburgh service. This could support the LDP and CRD growth ambitions by improving mode choice for those travelling along the A91 and reduce the mode share of car.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option would increase the range of public transport available for those travelling from Clackmannanshire, however, the location to the north east of Stirling is not likely to support a strategic link to Glasgow, Edinburgh or Falkirk and therefore it will have minimal benefits for TPO3. As part of a wider network of park and ride sites this option could provide a connection, but not as a standalone option.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	The construction and operation of new park and ride sites could lead to changes in noise and vibration levels in the surrounding environment. The scale of potential impacts would depend on the physical location of the park and ride site and proximity to sensitive receptors e.g. residential properties. Changes in noise levels could also result from increased routeing of buses and coaches along existing routes. The option would change traffic volumes into Stirling via private car and would promote modal shift to bus / coach connection with Stirling City Centre and reduce congestion. It is

			assumed that buses and coaches would be a modern fleet / may include electric or hybrid vehicles.
Environment	Global Air Quality (CO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality
	Local Air Quality (PM10 and NO2)	✓	Making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on local air quality
	Water quality, Drainage and Flood defence	✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, the proposed P&C is unlikely to have significant adverse effects on water quality and drainage. However, according to SEPA's Flood Risk Map, the site area is within an area subject to potential medium/high risk of river flooding due to proximity to the Forth. Depending on precise location chosen, further assessment likely to be required.
	Geology	✗ potential for ✗✗ (moderate cost impact). Also, potential for ✓ if contaminated land is remediated.	With adequate mitigation in place it is anticipated that the construction of a P&C facility at Manor Powis would not have significant adverse effects on geology and soils. However, the site is potentially within the area formerly occupied by the former Manor Powis Colliery, and a comprehensive site investigation will be required to inform on ground conditions relating to contamination and mine workings and allow detailed design, potentially leading to a requirement for remedial action.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	✗✗ depending on siting and if mitigation measures not adequate and ✓	Development of a P&C facility with extensive hard standings, shelters and lighting at Manor Powis would lead to some loss and fragmentation of rural fringe character in the Carselands LCT in the Carse of Forth east of Stirling. Depending on the location, the presence of two intersecting roads, a railway line and overbridge with planting could provide an opportunity for landscape integration. Assuming that further landform and planting are used to screen/ integrate the P&C into the wider landscape, effects can be

			partially mitigated. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	XXX if close to houses at Manor Powis and ✓	There is the potential for the P&C facility to have adverse effects on the visual amenity of users of Cycle Route 76 and local residents at Manor Powis. Landscape mitigation measures including landform and planting would limit the effects as well as sensitive lighting. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	X	The site is not within an area classified as agricultural land by the MacAulay Land Use Research Institute. Surrounding land is known to be used for agricultural purposes so impacts are dependent on precise site location.
	Cultural Heritage	X and ✓	There are no nationally or locally designated monuments, buildings, designed landscapes or battlefield site close to Manor Powis. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. The provision of P&C options will reduce cars in the city centre which may encourage others to walk and cycle more. However, facilities for parking would result in car use for some travellers with no net benefit
	Summary	X	No material changes in traffic flows, associated emissions or biodiversity within the study area are expected from this option. Implementation would produce minor improvements on global and local air quality. Several impacts ranging from minor to moderate would also be produced during construction on visual amenity, water environments, geology, landscape and cultural heritage. However, assuming appropriate steps are followed with regards to design and mitigation, operation of the option would yield minor positive outcomes for visual amenity, water environments, geology, landscape and cultural heritage.

Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the strategic road network. Conversely, there is likely to be an increase in local traffic accessing the site. On balance, this would be a minor benefit. This reduction will be a modal shift from car to bus and coach park and ride and reduce vehicle kilometres on the local road network.
	Security	✓	A new park and ride facility would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV) and lighting. Natural surveillance from increased passenger numbers at stops and on services as well as requiring a reduced number of connections to complete a journey could have a positive impact on real and perceived improvements to security.
Economy	TEE	✓✓	<p><u>Travel time savings:</u> This option would provide a direct connection to Stirling City Centre from Manor Powis, which would benefit Clackmannanshire residents, and would have journey time benefits. Modal shift from car to P&C may also reduce car and bus journey times.</p> <p><u>User charges including fares, parking charges and tolls:</u> The impact of this option on user charges including fares and parking would be dependent on the approach to P&C pricing, including the approach to parking charges to maximise the attractiveness of the site.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> There would be increased operating costs for bus vehicles associated with the new services.</p> <p><u>Quality benefits to transport users:</u> Quality benefits could be expected if new, high-quality buses are used to serve the new park and ride.</p> <p><u>Reliability benefits to transport users:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs:</u> Capital costs associated with the new P&C would be moderate and may require full feasibility, land costs and junction modelling. Additional fleet may be required.</p> <p><u>Operating and maintenance costs:</u> This option may require additional service operating and maintenance running costs.</p> <p><u>Revenues:</u> New park and ride would generate additional revenue through new passengers.</p>

			<p>Grant and subsidy payments: A minor subsidy is expected to be required for this option, especially in the short term to establish demand.</p> <p><u>Summary:</u> This option is considered to have moderately high costs with moderately high benefits.</p>
	Wider Economic Benefits	✓	This option includes a new park and ride service with links to education and employment centres which would improve employment opportunities in the study area and is therefore a minor benefit to Wider Economic Impacts.
Integration	Transport	✓✓✓	This option supports transport integration by providing a site where users can switch from car to public transport or other sustainable modes such as cycling. The facilities would be designed with transport integration at the centre of the proposal. This would be a major benefit for transport integration.
	Transport/Land Use	✓	This option would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	A new park and choose would improve public transport coverage to/from Clackmannanshire. Although it would not directly improve walking or cycling it would improve access to services and local accessibility.
	Comparative	-	This option is not considered to benefit comparative accessibility as it is unlikely to provide an improvement to socially excluded groups, including those with no access to a car, as the location of the site would require a car for access.

Implementability		
Feasibility	Technical	Note that the specific site location has not been confirmed. Technical risks associated with the construction of a new bus and coach-based park and choose are expected to be a minor consideration with minimal departure from design standards. Of more significant consideration is the requirement to work with bus and coach operators to rework new routes, potentially source additional bus and coach fleet and market the new services. This would require negotiation with operators regarding the level of service, where routing should be prioritised and investigations of any potential subsidies available, if required. Given this would be a relocation of services the feasibility is considered to be a moderate consideration.
Affordability	Financial	Moderate consideration should be given to the costs associated with the construction of the park and choose site and the financial risk associated with park and choose construction is considered to be low. As the site is a relocation with pre-existing operating costs the change in the operating costs of the existing facility is expected to be minimal however there may be additional costs associated with reworking the timetables and providing an appropriate service.
Public Acceptability		It is anticipated that a new park and choose site capturing trips from Clackmannanshire would be well received by the public but there may be concerns about the closure of the site at Springkerse.

Rationale for Selection or Rejection

A park and choose site at Manor Powis has minimal impacts on the Study TPOs. Although the site would provide public transport options to the east of Stirling, and, in particular, provide options for travel from Alloa, supplementing the existing Alloa to Stirling/Glasgow/Edinburgh service which could support the LDP and CRD growth ambitions by improving mode choice for those travelling along the A91 and reduce the mode share of car this would be offset by those negatively impacted by the relocation. The location to the north east of Stirling is not likely to support a strategic link to Glasgow, Edinburgh or Falkirk and therefore it will have minimal benefits for strategic transport as a standalone option.

Against the STAG Criteria the option is considered a moderate positive impact on Economy and Integration with areas for additional consideration identified in the Environment category.

In terms of deliverability, there are moderate considerations for all aspects including the construction, impact of service rerouting and public acceptability of relocation a site.

As part of a wider network of park and choose sites this option could provide a connection, but not as a standalone option. This option has therefore not been selected for appraisal as a standalone option but to be considered as part of package.

Progressed as a Complementary Option

Table 8. Option 7A - Increased Parking Provision at Stirling Rail Station

Appraisal Summary Table	
Option number	7A
Option name	Increased Parking Provision at Stirling Railway Station
Option description	This option is increasing the parking provision at Stirling Railway Station.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have a negligible impact on TPO1 as access to Stirling city centre by car would be required to access the strategic rail network and onwards to opportunities and services. Parking at Stirling would provide a direct connection to the Forth Valley Royal Hospital by rail and bus connection from Larbert station however this is still considered negligible.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	XXX	This option would have a major negative impact on reducing the modal share of cars entering Stirling. Additional capacity at Stirling station would increase the attractiveness of driving to Stirling station to access the rail network and increase the modal share of cars entering the Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.
Rationale for Selection or Rejection		
<p>Increased parking at Stirling station is considered to have a major negative impact on TPO2 because additional capacity would increase the attractiveness of driving to Stirling station to access the rail network and increase the modal share of cars entering the Stirling City Area. expected to increase the modal share of cars entering Stirling.</p> <p>There may be some benefits associated with this option but not which adequately support this study's TPO. This option has therefore not been appraised against the STAG criteria and has not been recommended for further investigation as part of this study.</p> <p>Not progressed to the Detailed Appraisal.</p>		

Table 9. Option 7B - Increased Parking Provision at Larbert Rail Station

Appraisal Summary Table	
Option number	7B
Option name	Increased Parking Provision at Larbert Railway Station
Option description	This option is increasing the parking provision at Larbert Railway Station.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would have no impact on TPO1 as access to Larbert by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	This option would benefit TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Larbert station. This option would increase availability and reduce the number of cars coming into Stirling from the Larbert area or heading further north than Stirling. Larbert station could be used by residents at the Durieshill development travelling to the Central Belt, and possibly even to Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✗	Short term minor noise impacts during construction would be mitigated by standard measures. Increased traffic volumes to station may have a negligible to minor negative impact on key routes.
Environment	Global Air Quality (CO2)	✓	Increased traffic flows and associated emissions on local key roads in Larbert or beyond are expected from this option (attracting drivers into city centre). Parking may be used by commuters not intending onward travel by rail. However, on balance, making

			sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality.
	Local Air Quality (PM10 and NO2)	X	Increased traffic flows and associated emissions on local key roads in Larbert or beyond are expected from this option (attracting drivers into town centre). Parking may be used by commuters not intending onward travel by rail. This may have a minor negative impact on local air quality.
	Water quality, Drainage and Flood defence	X	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, any increase to car parking facilities is unlikely to have significant adverse effects on water quality and drainage. Further assessment likely to be required as part of options appraisal and design, particularly relating to flood risk.
	Geology	X	With adequate mitigation in place it is anticipated that an increase in car parking facilities would not have significant adverse effects on geology and soils. Site investigation would be required to confirm contamination status of soils.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	X	Effects on landscape/ townscape would depend on what form the increased provision would take (e.g. two or more level structure). The location is urban and with suitable design/mitigation, effects on townscape are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect on townscape at peak traffic times.
	Visual Amenity	X	Effects on visual amenity would depend on what form the increased provision would take (e.g. two or more level structure). The location is urban and with suitable design/mitigation most effects on visual receptors are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect on visual amenity at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.

	Cultural Heritage	- to X	Effects on cultural heritage would depend on the form that increased provision would take. There are no nearby designated cultural heritage assets. Should there be construction works, there is the potential to affect as yet unknown archaeology. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage.
	Physical Fitness	✓ if option results in more walking.	Potential for modal shift with people preferring public transport to private vehicles for longer journeys could result in increased walking at other end of the journey. Parking at the existing station does mean increased car journeys to the station but should be offset by others choosing to arrive by train rather than using car for entire journey.
	Summary	X	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology.
Safety	Accidents	✓✓	This option is considered to provide a benefit to accidents in two ways. Firstly, increased parking is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents. Secondly, on-street parking linked to rail travel occurs at Larbert station, reducing on-street-parking in the vicinity of the station would have a positive impact on accidents.
	Security	✓	Increased availability of parking at rail stations would give the option to park at the station instead of on-street. The station car parks would meet current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security.
Economy	TEE	X	<p><u>Travel time savings</u>: This option may result in journey time savings by reducing the time spent finding a space or enabling parking close to the station instead of on-street parking.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p>

			<p><u>Quality benefits to transport users:</u> This option would create a better parking environment for users.</p> <p><u>Reliability benefits to transport users:</u> Reliability of accessing a parking space to meet rail times would be improved.</p> <p><u>Investment costs:</u> Capital costs associated with the parking would be major and would likely require construction of a multi-storey car park and potentially land costs.</p> <p><u>Operating and maintenance costs:</u> This option would require minimal additional service operating and maintenance running costs.</p> <p><u>Revenues:</u> Larbert does not currently charge parkers, if the policy remains unchanged there would be no revenue generated from parking but potentially an increase in rail fares through new passengers attracted by the parking availability.</p> <p><u>Grant and subsidy payments:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Summary:</u> The parking costs are considered major with minor positive benefits. This results in a minor negative impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to have any direct Wider Economic Impacts.
Integration	Transport	✓	This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment. This would be a minor benefit.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	-	Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered neutral as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car. This would not support established policy directives.

Accessibility	Community	-	This option increases the attractiveness and ease of use of the rail network, and, in particular, the access to parking spaces for non-commuters arriving later in the day, however, it does not improve public transport coverage. This option is considered neutral for community accessibility.
	Comparative	✓	This option is considered to have a slight positive impact on comparative accessibility. Improved parking is not expected to improve access for the majority of groups identified as socially excluded as access to a car is required. However, increased disabled parking may improve accessibility for those with a blue badge.
Implementability			
Feasibility	Technical	Increasing parking capacity at Larbert station would be a major consideration in terms of feasibility. Due to land availability, a multi-storey car park would be required to provide additional capacity. Although the design and construction of a multi-storey car park is expected to be in line with established design standards it will still be a major consideration.	
Affordability	Financial	The requirement for a multi-storey car park will significantly increase the capital cost requirement for this option. Parking is currently free at Larbert therefore there will be operating costs which cannot be met by any revenue generated from parking charges.	
Public Acceptability		The development of a multi-storey car park is likely to have a number of negative and positive aspects from a public acceptability aspect. For local residents, there may be issues relating to outlooks impacted by the car park and an increased capacity resulting in increased traffic to the station, impacting on local resident movements. Benefits would include improvements to overspill parking currently experienced by local residents in the surrounding streets.	

Rationale for Selection or Rejection

This option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently impacted by the perception (real or otherwise) of parking availability limitations at Larbert station. This option would increase availability and reduce the number of cars coming into Stirling from the Larbert area or heading further north than Stirling. Larbert station could be used by residents at the Durieshill development travelling to the Central Belt, and possibly even to Stirling.

The appraisal against STAG criteria has identified minor negative impacts for Economy and Environment and moderate and major deliverability considerations. Although the option does impact positively on the study TPOs it does fall outwith the geographical scope of this study and would benefit from consideration as part of a wider parking strategy in the Central Belt. The option is therefore not selected for further investigation as part of this study.

Not progressed to Detailed Appraisal

Table 10. Option 7C - Increased Parking Provision at Alloa Rail Station

Appraisal Summary Table	
Option number	7C
Option name	Increased Parking Provision at Alloa Rail Station
Option description	Increased parking at Alloa Railway Station
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would have no impact on TPO1 as access to Alloa by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	This option would have a benefit for TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Alloa station. This option would increase availability. Alloa station would capture trips coming from Clackmannanshire travelling to the Central Belt and Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. This would, however, not impact on trips between Stirling and the Central Belt and is therefore neutral for TPO3.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✗	Short term minor noise impacts during construction would be mitigated by standard measures. Increased traffic volumes to station may have a negligible to minor negative impact on key routes.
Environment	Global Air Quality (CO2)	✓	Increased traffic flows and associated emissions on local key roads in Alloa or beyond are expected from this option (attracting drivers into centre). Parking may be used by commuters not intending onward travel by rail. However, on balance, making

			sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality.
	Local Air Quality (PM10 and NO2)	X	Increased traffic flows and associated emissions on local key roads in Alloa or beyond are expected from this option (attracting drivers into town centre). Parking may be used by commuters not intending onward travel by rail. This may have a minor negative impact on local air quality.
	Water quality, Drainage and Flood defence	X	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, any increase to car parking facilities is unlikely to have significant adverse effects on water quality and drainage. Further assessment likely to be required as part of options appraisal and design, particularly relating to flood risk.
	Geology	X	With adequate mitigation in place it is anticipated that an increase in car parking facilities would not have significant adverse effects on geology and soils. Site investigation would be required to confirm contamination status of soils.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	X	Effects on landscape/ townscape would depend on what form the increased provision would take (e.g. two or more level structure). The location is urban and with suitable design/mitigation, effects on townscape are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect on townscape at peak traffic times.
	Visual Amenity	X	Effects on visual amenity would depend on what form the increased provision would take (e.g. two or more level structure). The location is urban and with suitable design/mitigation most effects on visual receptors are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect on visual amenity at peak traffic times.

	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	- to X	Effects on cultural heritage would depend on the form that increased provision would take. There are no adjacent designated cultural heritage assets. Should there be construction works, there is the potential to affect as yet unknown archaeology. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage.
	Physical Fitness	✓ if option results in more walking.	Potential for modal shift with people preferring public transport to private vehicles for longer journeys could result in increased walking at other end of the journey. Parking at the existing station does mean increased car journeys to the station but should be offset by others choosing to arrive by train rather than using car for entire journey.
	Summary	X	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology.
Safety	Accidents	✓	Increased parking availability is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents. Conversely though, it may result in increased car movements in the more urban environment of Alloa town centre. On balance, this is a minor positive impact.
	Security	✓	Increased availability of parking at rail stations would give the option to park at the station instead of on-street. The station car parks would meet current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security.
Economy	TEE	✓	<u>Travel time savings</u> : This option may result in journey time savings by reducing the time spent finding a space or enabling parking close to the station instead of on-street parking. <u>User charges including fares, parking charges and tolls</u> : This option is not likely to impact on this sub-criterion.

			<p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option would create a better parking environment for users.</p> <p>Reliability benefits to transport users: Reliability of accessing a parking space to meet rail times would be improved.</p> <p><u>Investment costs</u>: This option requires changes to the management of existing sites and therefore investment costs would be minimal.</p> <p><u>Operating and maintenance costs</u>: This option would require minimal additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: Alloa does not currently charge parkers, if the policy remains unchanged there would be no revenue generated from parking but potentially an increase in rail fares through new passengers attracted by the parking availability.</p> <p><u>Grant and subsidy payments</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Summary</u>: The parking costs are considered minor with minor benefits. This results in a minor positive impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to have any direct Wider Economic Impacts.
Integration	Transport	✓	This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment. This would be a minor benefit.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration.
	Policy	-	Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered neutral as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel

			Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car. This would not support established policy directives.
Accessibility	Community	-	This option increases the attractiveness and ease of use of the rail network; however, it does not improve public transport coverage. This option is considered neutral for community accessibility.
	Comparative	-	This option is considered to have a negligible impact on comparative accessibility. Improved parking is not expected to improve access for the majority of groups identified as socially excluded as access to a car is required. However, increased disabled parking may improve accessibility for those with a blue badge.
Implementability			
Feasibility	Technical	Alloa station currently has 64 free spaces available to rail users and operated by Clackmannanshire Council. In addition, there are further car parks in close proximity to the station, including King Street car park and Asda car park. To increase the capacity of parking for rail users, negotiations could take place between ScotRail, Clackmannanshire Council, residents and Asda regarding the approach to parking in and around the station to manage capacity and demand.	
Affordability	Financial	This option requires changes to the management of existing sites and therefore construction costs would be minimal. Operating costs would be largely dependent on the agreements made and any revenue provided to Asda in lieu of spaces, if required.	
Public Acceptability		This option requires management of existing parking availability to suit demand. If the solution proposed ensures sufficient supply is available for all users, then this option would be positively viewed by the public.	

Rationale for Selection or Rejection

This option would have a moderate benefit for TPO 2 by increasing the attractiveness of rail which may be currently impacted by the perception (real or otherwise) of parking availability limitations at Alloa station. This option would increase availability and reduce the number of cars coming into Stirling from Clackmannanshire but increase the numbers coming into Alloa.

The appraisal against STAG criteria has identified minor negative impacts for Economy and Environment and moderate and major deliverability considerations. Although the option does impact positively on one of the study TPOs it does fall outwith the geographical scope of this study and would benefit from consideration as part of a wider parking strategy. The option is therefore not selected for further investigation as part of this study.

Not progressed to Detailed Appraisal

Table 11. Option 7D - Increased Parking Provision at Bridge of Allan Rail Station

Appraisal Summary Table	
Option number	7D
Option name	Increased Parking Provision at Bridge of Allan Rail Station
Option description	Increased parking provision at Bridge of Allan Rail Station
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would have no impact on TPO1 as access to Bridge of Allan by car would be required from Plean, Cowie, Fallin and Bannockburn to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would have a moderate benefit for TPO2 as the attractiveness of rail may currently be impacted by parking availability limitations at Bridge of Allan station. This option would increase availability.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. .
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✗	Short term minor noise impacts during construction would be mitigated by standard measures. Increased traffic volumes to station may have a negligible to minor negative impact on key routes.
Environment	Global Air Quality (CO2)	✓	Increased traffic flows and associated emissions on local key roads in Bridge of Allan or beyond are expected from this option. Parking may be used by commuters not intending onward travel by rail. However, on balance, making sustainable transport modes more attractive and increasing the modal share will have a minor beneficial impact on global air quality.

	Local Air Quality (PM10 and NO2)	-	Increased traffic flows and associated emissions on local key roads in Bridge of Allan or beyond are expected from this option (attracting drivers into town centre). Parking may be used by commuters not intending onward travel by rail. This may have a minor negative impact on local air quality.
	Water quality, Drainage and Flood defence	X	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, any increase to car parking facilities is unlikely to have significant adverse effects on water quality and drainage. Further assessment likely to be required as part of options appraisal and design, particularly relating to flood risk.
	Geology	X	With adequate mitigation in place it is anticipated that an increase in car parking facilities would not have significant adverse effects on geology and soils. Site investigation would be required to confirm contamination status of soils.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	X or XX	Effects on landscape/ townscape would depend on what form the increased provision would take (e.g. two or more level structure). The location is suburban/ town edge and could be sensitive. However, with suitable design/mitigation, effects on landscape are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect at peak traffic times.
	Visual Amenity	X or XX	Effects on visual amenity would depend on what form the increased provision would take (e.g. two or more level structure). The location is suburban/ town edge and potentially sensitive with adjacent residential receptors. With suitable design/ mitigation most effects on visual receptors are not anticipated to be significant. A localised increase in vehicular traffic may lead to a small negative effect on visual amenity at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.

	Cultural Heritage	- to X	Effects on cultural heritage would depend on the form that increased provision would take. There is one adjacent designated cultural heritage asset (B listed building). Should there be construction works, there is the potential to affect as yet unknown archaeology. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage.
	Physical Fitness	✓ if option results in more walking.	Potential for modal shift with people preferring public transport to private vehicles for longer journeys could result in increased walking at other end of the journey. Parking at the existing station does mean increased car journeys to the station but should be offset by others choosing to arrive by train rather than using car for entire journey.
	Summary	-	No material changes are anticipated for soils and biodiversity. The environmental impacts of introducing this option are likely to be modest, ranging from minor positive to minor negative overall. Minor benefits are likely for global air quality due to overall modal shift / making rail access easier physical fitness. Whereas, minor adverse impacts could be produced on local air quality, landscape, visual amenity, cultural heritage, noise and vibration, water environment and geology, with a risk of moderate adverse effects on landscape and visual amenity.
Safety	Accidents	✓	Increased parking is expected to result in increased modal shift from car to rail due to parking availability. This would result in reduced vehicle kilometres and road accidents overall through reduced strategic trips however there are likely to be more local trips.
	Security	✓	Increased availability of parking at rail stations would give the option to park at the station instead of on-street. The station car parks would meet current security standards, including surveillance and would be considered more secure than on-street, especially in the peaks when natural surveillance would contribute to security.
Economy	TEE	-	<p><u>Travel time savings</u>: This option may result in journey time savings by reducing the time spent finding a space or enabling parking close to the station instead of on-street parking.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option would create a better parking</p>

			<p>environment for users.</p> <p><u>Reliability benefits to transport users:</u> Reliability of accessing a parking space to meet rail times would be improved.</p> <p><u>Investment costs:</u> . The capital costs associated with this option would be dependent on the variation progressed – (i) multi-storey or (ii) expansion to the south or west of the existing site and the level of groundworks required at these sites. The requirement for a multi-storey car park would significantly increase the capital cost requirement for this option.</p> <p><u>Operating and maintenance costs:</u> This option would require minimal additional service operating and maintenance running costs.</p> <p><u>Revenues:</u> Bridge of Allan does not currently charge parkers, if the policy remains unchanged there would be no revenue generated from parking but potentially an increase in rail fares through new passengers attracted by the parking availability.</p> <p><u>Grant and subsidy payments:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Summary:</u> The parking costs are considered significant with minor positive benefits. This results in a neutral impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to have any direct Wider Economic Impacts.
Integration	Transport	✓	This option would provide improved ease of access from car to rail and make rail travel more attractive to those with access to a car and outwith the walk-in catchment. This would be a minor benefit.
	Transport/Land Use	-	The impact on land use would be dependent on the location for the increased parking. If site expansion was required, it would impact on the identified Green Belt which would be a negative impact on Land-Use Integration. Until an option is identified this is considered neutral.

	Policy	-	Transport policy from national to local level promotes sustainable mode use over private car by improving mode choice as reinforced by the National Transport Strategy Sustainable Travel Hierarchy. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment. This option promotes sustainable mode use over private car by making rail travel more accessible. However, this is considered neutral as improving access by sustainable modes is highlighted as the key aim of the Sustainable Travel Hierarchy and the availability of parking may encourage some people currently accessing the station by active means to switch to car. This would not support established policy directives.
Accessibility	Community	-	This option increases the attractiveness and ease of use of the rail network; however, it does not improve public transport coverage. This option is considered neutral for community accessibility.
	Comparative	-	This option is considered to have a negligible impact on comparative accessibility. Improved parking is not expected to improve access for the majority of groups identified as socially excluded as access to a car is required. However, increased disabled parking may improve accessibility for those with a blue badge.
Implementability			
Feasibility	Technical	Bridge of Allan currently has 146 spaces available and is regularly reported to be over capacity with overspill onto residential streets. Increasing capacity at Bridge of Allan station would require either a multi storey car park on the existing parking site or expansion of the site to the south or to the west (western side of railway line). The viability of these options would depend on land ownership and the geography of the land including the gradient to the west of the railway line, if considering build to the west. This is considered to be a moderate consideration.	
Affordability	Financial	The capital costs associated with this option would be dependent on the variation progressed - multi-storey or expansion to the south or west of the existing site. Each option represents major affordability considerations as the level of engineering required for both the multi-storey and extension option may be significant. Parking is currently free at Bridge of Allan and although there would be no direct revenue associated with parking charges the increased attractiveness of rail may increase rail revenue.	

Public Acceptability	Increased parking capacity at Bridge of Allan is anticipated to be positively received by local residents currently impacted by overspill parking. For local residents, there may also be issues relating to outlooks impacted by the car park, which would be dependent on the option progressed. An increased capacity may also result in increased traffic to the station, impacting on local resident movements.
Rationale for Selection or Rejection	
<p>This option would have a moderate benefit for TPOs 2 and 3 by increasing the attractiveness of rail which may be currently impacted by parking availability limitations at Bridge of Allan station. This would increase parking availability and reduce the number of cars coming into Stirling from the North which would support the LDP/CRD development by reducing the volume of traffic into/through Stirling (TPO2) and improve the competitiveness of sustainable modes for strategic trips (TPO3).</p> <p>The appraisal against STAG criteria has identified a minor negative impact on Environment, neutral impacts on Economy, Integration and Accessibility and positive impacts on Safety.</p> <p>Although a major consideration with regards to affordability has been identified, and, public acceptability is likely to be impacted by the option progressed, the performance against the study TPOs indicates that this option should be considered further.</p> <p>Progressed to Detailed Appraisal</p>	

Table 12. Option 7E - Increased Parking Provision at Dunblane Rail Station

Appraisal Summary Table	
Option number	7E
Option name	Increased Parking Provision at Dunblane Rail Station
Option description	Increased parking provision at Dunblane Rail Station
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have no impact on TPO1 as access to Dunblane by car would be required to access the strategic rail network and onwards to employment, training, education and healthcare.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	This option would have a minor benefit for TPO2 as the attractiveness of rail may currently be impacted by the perception (real or otherwise) of parking availability limitations at Dunblane station. This option would increase availability and reduce the number of cars coming into Stirling from the Dunblane area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓	This option would require private car to access the strategic rail network but in turn would increase the competitiveness of sustainable modes for strategic trips by reducing the time taken to find parking spaces and anxiety about space availability influencing decisions to complete the whole journey by car. Conversely, increased parking availability may encourage a mode shift from active travel to the station to car travel if spaces are more readily available. On balance, this option would have a minor benefit.
Rationale for Selection or Rejection		
<p>Increasing parking provision at Dunblane has not been recommended for further investigation as part of this study. There are benefits associated with this option which have a positive impact on the TPOs identified for this study, however, the option is outwith the geographical scope of this study and an ongoing study is considering parking provision in the Dunblane area currently. It is therefore more appropriate for further investigation to take place as part of that study. For that reason, it has not been appraised against STAG criteria.</p> <p>Not Progressed to Detailed Appraisal</p>		

Table 13. Option 8A - New Rail Station at Cornton (retain Bridge of Allan)

Appraisal Summary Table	
Option number	8A
Option name	New Rail Station at Cornton (retain Bridge of Allan)
Option description	New rail station at Cornton (retain Bridge of Allan)
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	✓✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓✓	Opening a station between Cornton and Bridge of Allan would provide a walk-in catchment from both communities and Causewayhead and reduce the modal share of cars entering, leaving and passing through the Stirling City Area by providing improved access to the rail network for the Cornton community. In particular, this is likely to reduce traffic passing through Clock Roundabout which was identified as pinch point as the new station would be more attractive than Stirling for Causewayhead and Cornton and reduce these traffic movements.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓✓	This option would be a moderate benefit for TPO3 as it would provide access to the strategic network for a large walk-in population. This would improve the competitiveness of sustainable modes compared to private car, in particular, for strategic trips to the Central Belt. In addition, plans for the Kildean - Cornton and Cornton to Airthrey Link Roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access to the station from the University, Forth Valley College, Castle Business Park, Kildean Housing and business and West End Raploch Housing which would improve the competitiveness of rail.

Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	Potentially XX which will need further assessment and mitigation.	The construction and operation of a new station could lead to changes in noise and vibration levels. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.
Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on local air pollutant emissions are predicted.
	Water quality, Drainage and Flood defence	X	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a new station at Cornton is unlikely to have significant adverse effects on water quality and drainage. According to SEPA's Flood Risk Map, parts of the area are subject to potential low/medium risk of river flooding, and this will require further assessment.
	Geology	X	With adequate mitigation in place it is anticipated that the construction of a new station at Cornton would not have significant adverse effects on geology and soils. The site is not within a coal mining Development High Risk Area, although a comprehensive site investigation will be required to assess geotechnical and geo-environmental conditions, inform options and allow detailed design.
	Biodiversity and Habitats	X	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	XX and ✓	Development of a new station south of Bridge of Allan with platforms, hard standings, bridge, shelters, parking and lighting would lead to some loss and fragmentation of rural fringe character in the Carselands LCT in the Carse of Forth. It would be located in

			the green belt between Stirling and Bridge of Allan, close to the Cornton Vale HMP complex and have the potential to affect the visual separation and settings of the two settlements. The precise location and design of the station, together with mitigation planting to screen/ integrate it into the wider landscape could partially mitigate landscape effects. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	X to XX and ✓	There is the potential for the proposed station to have adverse effects on the visual amenity of local residents on the southern edge of Bridge of Allan and the northern edge of Cornton, Stirling. Mitigation measures including the location and design of facilities and screen planting would help to limit the potential for significant effects. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	X	Land Capability for Agricultural data from the MacAulay Land Use Research Institute confirms that the area comprises Class 3.2 agricultural land, which is "land capable of average production though high yields of barley, oats and grass can be obtained". The area is currently understood to be used for agriculture, so development here would lead to loss of this land that could not be mitigated. Given scale of agricultural land in the area and the scale of the development, the overall impact is considered to be small.
	Cultural Heritage	X and ✓	The proposed location for the relocated station has no national or local cultural heritage designations, although lies immediately north of the northern edge of the Bannockburn battlefield site. There is the potential to affect as yet unknown archaeology. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. However, facilities for parking is likely to result in car use for some travellers with no net benefit.

	Summary	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	Accidents	✓✓	A new station at Cornton would have a good walk-in catchment which could result in modal shift from car to rail leading to reductions in car vehicle kilometres and accidents. The location of the station in proximity to a level crossing would require consideration by Network Rail to identify and mitigate any risks. The station would require a footbridge which would result in the closure of Cornton No.2 which would be positive in terms of reducing the likelihood of pedestrian deaths.
	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	TEE	-	<p><u>Travel time savings:</u> This option includes a new station close to a level crossing. The station is likely to significantly increase the time the crossing is closed and impact on road journey times on the route. Public transport journey times for those within walking distance of the new station would improve. Existing passengers would also be negatively impacted by the additional stop on the busy route.</p> <p><u>User charges including fares, parking charges and tolls:</u> The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing rail fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users:</u> A new station would include new station facilities which would be a quality benefit, as well as improved modal choice for those within the walk-in catchment of the new station.</p> <p><u>Reliability benefits to transport users:</u> Direct access to the rail network would remove reliability concerns linked to bus-rail connections</p>

			<p><u>Investment costs:</u> Investment costs associated with this option would be high including land costs, station design, mitigation of barrier crossing risks and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs:</u> Operating and maintenance costs would be required for the new station.</p> <p><u>Revenues:</u> The high walk-in catchment is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area.</p> <p><u>Grant and subsidy payments:</u> This option is likely to impact on the current franchise agreement and require additional subsidy.</p> <p><u>Summary:</u> The station costs are major with public transport journey time improvements for those within walking distance. Road journey times would be negatively impacted by increased closures of the barrier crossings, as would journey times for existing passengers and on busy route section. This results in a minor negative impact on TEE.</p>
	Wider Economic Benefits	✓✓	<p>This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas, including Cornton and positive Wider Economic Impacts. In addition, if the planned Cornton-Airthrey link road was built then the station would provide direct access to the University and Innovation Park.</p>
Integration	Transport	✓	<p>This option would be in walking distance of the Cornton, south Bridge of Allan and Causewayhead community and provide direct access to the rail network. Parking availability at the new station would allow for integration for both car and active mode users. This would be a minor benefit.</p>
	Transport/Land Use	✓✓	<p>The new station aligns with the plans for the Kildean - Cornton and Cornton to Airthrey Link Roads. These link roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access to the station from the University, Forth Valley College, Castle Business Park, Kildean Housing and West End Raploch Housing. This would be a positive impact on Transport and Land Use Integration.</p>

	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities (in particular, those with the lowest SIMD rank), inclusiveness and provides benefits for health and the environment. It does however, impact on the Scottish Government policy to reduce intercity journey times. On balance, this is a minor benefit.
Accessibility	Community	✓✓	A new station at Cornton would have a good walk in catchment from south Bridge of Allan, Causewayhead and the Cornton community. This would improve the public transport coverage for these communities. This is considered a moderate benefit.
	Comparative	✓✓	A new station to between Cornton and Bridge of Allan would have a high walk in catchment from south Bridge of Allan, Causewayhead and Cornton and would improve the public transport coverage for Cornton in particular which was identified as an area with a low SIMD ranking and access to car.
Implementability			
Feasibility	Technical		There are a number of factors to take into consideration for this option regarding feasibility. The proposed site is located close to the Cornton No1 vehicular crossing which will be converted to a full barrier MCB (OD) crossing. This change will lead to protecting signals being installed and the location of the station is likely to be within the scope of these crossings. This will increase the time the barriers are down, and Network Rail have indicated there are safety issues associated with locating a station close to a level crossing which will require mitigation. There are likely to be flooding risks to be mitigated as identified in the environmental appraisal. Construction on a busy, live, electrified line will also be a major consideration. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments. The close proximity of Bridge of Allan station may also mean the station has a limited catchment in terms of new passengers.
Affordability	Financial		Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. In addition, the factors introduced above - Cornton No1 vehicular crossing and construction on a live line - will also impact on building a new station. These factors will result in increased costs which will be relatively high.

Public Acceptability	This option is likely to have a range of views from the public. Although the station would be well positioned for access from Cornton, Causewayhead and residences in south Bridge of Allan the implications of the Cornton No1 crossing may result in lengthy closures to the B823 which will impact on local movements. In addition, existing passengers would experience longer journey times due to the introduction of a new stop.
Rationale for Selection or Rejection	
<p>A new station between Bridge of Allan, Causewayhead and Cornton makes significant positive impacts on the study TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling.</p> <p>In terms of Integration and Accessibility the new station is considered a positive benefit with considerations to be further investigated identified in the Environment and Economy appraisal. These include the potential negative impacts associated journey time increases for road and rail users and investment costs associated with the new station.</p> <p>There are significant implementability considerations in addition to those expected as part of a new station and construction. These include the operation of the Cornton No1 level crossing which will require additional safety mitigations and road journey time delays on the B823. An additional station on the corridor, rather than a relocation, would also present further implementability considerations in the form of timetabling and journey time increases to existing passengers which conflicts with Scottish Government policy to reduce Intercity journey times.</p> <p>Due to the positive impacts on the TPOs, however, this option has been recommended for further investigation as part of the Detailed Appraisal.</p> <p>Progressed to Detailed Appraisal</p>	

Table 14. Option 8B - New Rail Station at Manor Powis

Appraisal Summary Table	
Option number	8B
Option name	New Rail Station at Manor Powis
Option description	New rail station at Manor Powis
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would provide a moderate benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or passing through the Stirling City Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would provide a minor benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car and bus trips from Clackmannanshire and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	Potentially XX which will need further assessment and mitigation.	The construction and operation of a new station could lead to changes in noise and vibration levels. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.

Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on local air pollutant emissions are predicted.
	Water quality, Drainage and Flood defence	✗ potential for ✗✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a new station at Manor Powis is unlikely to have significant adverse effects on water quality and drainage. However, according to SEPA's Flood Risk Map, the site area is within an area subject to potential medium/high risk of river flooding due to proximity to the Forth. Depending on precise location chosen, further assessment likely to be required.
	Geology	✗ potential for ✗✗ (moderate cost impact). Also, potential for ✓ if contaminated land is remediated.	With adequate mitigation in place it is anticipated that the construction of a new station at Manor Powis would not have significant adverse effects on geology and soils. However, the site is potentially within the area formerly occupied by the former Manor Powis Colliery, and a comprehensive site investigation will be required to inform on ground conditions relating to contamination and mine workings and allow detailed design, potentially leading to a requirement for remedial action.
	Biodiversity and Habitats	✗	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	✗ potentially ✗✗ depending on siting and if mitigation measures not adequate and ✓	Development of a station with platforms, bridge, shelters, car parking and lighting at Manor Powis would lead to some loss and fragmentation of rural fringe character in the Carselands LCT in the Carse of Forth east of Stirling. Depending on the location, the presence of two intersecting roads, a railway line and overbridge with planting could provide an opportunity for landscape integration. Assuming that further landform and planting are used to screen/ integrate the station into the wider landscape, effects can be partially mitigated. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✗ potentially ✗✗ if sited near houses and if	Depending on the location, there is the potential for the station to have adverse effects on the visual amenity of users of Cycle Route 76 and local residents at Manor Powis

		mitigation measures not adequate and ✓	(although likely to be further removed than P&R). Landscape mitigation measures including landform and planting would limit the effects. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	✗	The site is not within an area classified as agricultural land by the MacAulay Land Use Research Institute. Surrounding land is known to be used for agricultural purposes so impacts are dependent on precise site location.
	Cultural Heritage	✗ and ✓	There are no nationally or locally designated monuments, buildings, designed landscapes or battlefield site close to Manor Powis. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey.
	Summary	✗	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	Accidents	✓	This option would provide a minor benefit for accidents as the new station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents.

	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	TEE	✓	<p><u>Travel time savings</u>: Public transport journey times for those within walking distance of the new station would improve, as would those using the service as a park and ride. Existing passengers would also be negatively impacted by the additional stop on the route.</p> <p><u>User charges including fares, parking charges and tolls</u>: The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing rail fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: A new station would include new station facilities which would be a quality benefit, as well as improved modal choice for those within the catchment of the new station.</p> <p><u>Reliability benefits to transport users</u>: Direct access to the rail network would remove reliability concerns linked to bus-rail connections.</p> <p><u>Investment costs</u>: Investment costs associated with this option would be high including land costs, station design, mitigation of barrier crossing risks and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs</u>: Operating and maintenance costs would be required for the new station.</p> <p><u>Revenues</u>: The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area. This could be offset by buses using the station as a formal or informal park and ride site.</p> <p><u>Grant and subsidy payments</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Summary</u>: The station costs are major with public transport journey time improvements for those within the catchment area, however patronage is anticipated</p>

			to be relatively low due to catchment population. Journey times for existing passengers would increase. This results in a minor positive impact on TEE.
	Wider Economic Benefits	✓✓	This option would provide access to the rail network for communities not currently connected and would provide a useful connection to Stirling University and Innovation Park. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts.
Integration	Transport	✓✓	This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would be a moderate benefit.
	Transport/Land Use	✓✓	This option would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	A new station would improve public transport coverage to/from Manor Powis. The benefit would be minor as there is minimal walk in catchment for the station location.
	Comparative	✓✓	A new station would improve public transport coverage to/from Manor Powis, in particular, it would be within cycling distance of Tullibody which is identified as an area with below average income employment and health indicators (according to SIMD).

Implementability		
Feasibility	Technical	Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. There are flooding risks to be mitigated as identified in the environmental appraisal. There is a level crossing within the vicinity which would have a number of safety concerns requiring mitigation. The location is on a live line which will impact on construction and safety, but it is not as busy as the Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.
Affordability	Financial	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.
Public Acceptability		The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.
Rationale for Selection or Rejection		
<p>This option would provide benefits to TPOs 2 and 3 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or passing through the Stirling City Area. In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers. Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.</p>		
Progressed to Detailed Appraisal		

Table 15. Option 8C - New Rail Station at Cambus

Appraisal Summary Table	
Option number	8C
Option name	New Rail Station at Cambus
Option description	New rail station at Cambus
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would provide a benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. The proximity to the existing Alloa station would limit benefits however it is expected that there would be a reduction in the modal share of cars entering, leaving or passing through the Stirling City Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would provide a minor benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car trips from Clackmannanshire and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips. As the station would be on the Alloa line, the frequency and destinations would be limited without changing trains at Stirling. The proximity to the existing Alloa station would also limit benefits.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	Potentially XX which will need further assessment and mitigation.	The construction and operation of a new station could lead to changes in noise and vibration levels. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.
Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on global (carbon) emissions are predicted.

	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on local air pollutant emissions are predicted.
	Water quality, Drainage and Flood defence	✗ potential for ✗✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a new station at Cambus is unlikely to have significant adverse effects on water quality and drainage. However, according to SEPA's Flood Risk Map, the site area is near to an area with potential medium/high risk of river flooding due to proximity to the River Devon. Depending on precise location chosen, further assessment likely to be required.
	Geology	✗ and ✓ if contaminated land is remediated.	With adequate mitigation in place it is anticipated that the construction of a new station at Cambus would not have significant adverse effects on geology and soils. However, the site is potentially within the area formerly occupied by the Cambus Distillery, and a comprehensive site investigation will be required to inform on ground conditions relating to contamination and allow detailed design, potentially leading to a requirement for remedial action. Shallow mine workings are unlikely to be an issue.
	Biodiversity and Habitats	✗	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	- and ✓	The proposed station location is within a built-up area with a significant amount of warehousing. Effects on the landscape are not likely to be significant. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✗ and ✓	Although sited within a built-up area there are residential areas to the east of the level crossing which may be adversely affected by views of the proposed station. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	The site is not within an area classified as agricultural land by the MacAulay Land Use Research Institute.

	Cultural Heritage	✗ and ✓	There are no nationally or locally designated monuments, buildings, designed landscapes or battlefield sites. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. It is assumed there will also be cycle parking at the station to enable longer commutes to the station location.
	Summary	✗	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	Accidents	✓	This option would provide a minor benefit for accidents as the new station would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents.
	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	TEE	✓	<u>Travel time savings</u> : Public transport journey times for those within walking distance of the new station would improve, as would those using the service as a park and ride. Existing passengers would also be negatively impacted by the additional stop on the route. <u>User charges including fares, parking charges and tolls</u> : The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing rail fares for similar journeys to establish a suitable fare to generate

			<p>demand.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users:</u> A new station would include new station facilities which would be a quality benefit, as well as improved modal choice for those within the catchment of the new station.</p> <p><u>Reliability benefits to transport users:</u> Direct access to the rail network would remove reliability concerns linked to bus-rail connections.</p> <p>Investment costs: Investment costs associated with this option would be high including land costs, station design, and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs:</u> Operating and maintenance costs would be required for the new station.</p> <p><u>Revenues:</u> The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area.</p> <p><u>Grant and subsidy payments:</u> This option is likely to impact on the current franchise agreement and require additional subsidy.</p> <p><u>Summary:</u> The station costs are major with public transport journey time improvements for those within the catchment area, however patronage is anticipated to be relatively low due to catchment population and proximity to Alloa station. Journey times for existing passengers would increase. This results in a minor positive impact on TEE.</p>
	Wider Economic Benefits	✓✓	<p>This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education for an area identified as including socially exclude groups with below average economic activity, which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts.</p>
Integration	Transport	✓	<p>This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would be a minor benefit.</p>

	Transport/Land Use	✓	This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa, however, these locations are already well served by Alloa station. In addition, it would support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	A new station would improve public transport coverage to/from Cambus. The benefit would be minor as there is minimal walk in catchment for the station location.
	Comparative	✓✓	A new station would improve public transport coverage to/from Cambus, in particular, it would be within walking distance of Tullibody which is identified as an area with below average income employment and health indicators (according to SIMD).
Implementability			
Feasibility	Technical	Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. Also, a 2007 study into a station at Cambus concluded there would be no significant technical considerations. There are flooding risks to be mitigated as identified in the environmental appraisal. There is a level crossing within the vicinity which would have a number of safety concerns requiring mitigation. The location is on a live line which will impact on construction and safety, but it is not as busy as the Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.	
Affordability	Financial	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station re-openings would provide a good understanding of the outturn costs of similar projects.	

Public Acceptability	The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.
Rationale for Selection or Rejection	
<p>This option would provide minor benefits to TPOs 2 and 3 as a station to the East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. This would reduce the modal share of cars entering, leaving or passing through the Stirling City Area; however, these benefits are anticipated to be minimal.</p> <p>In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers. This option has been recommended for further appraisal based on the benefits to TPOs 2 and 3.</p> <p>Progressed to Detailed Appraisal</p>	

Table 16. Option 8D - New Rail Station at Causewayhead

Appraisal Summary Table	
Option number	8D
Option name	New Rail Station at Causewayhead
Option description	New rail station at Causewayhead
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would provide a moderate benefit for TPO2 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. The need to access the station via Causewayhead Road would limit some of the benefits, however, it is still anticipated that modal shift would reduce traffic passing through Clocks Roundabout. The station would also be in walking distance of Stirling University (not via the main entrance) and reduce the modal share of cars passing through Stirling to access the University.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would provide a moderate benefit for TPO3 as it would be an additional entry point to the strategic rail network, capturing car trips from Clackmannanshire and the University of Stirling and improving public transport journey times. This would improve the competitiveness of rail travel compared to the private car for strategic trips. As the station would be on the Alloa line, the frequency and destinations would be limited without changing trains at Stirling.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	Potentially XX which will need further assessment and mitigation.	The construction and operation of a new station could lead to changes in noise and vibration levels. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.

Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on local air pollutant emissions are predicted.
	Water quality, Drainage and Flood defence	✗ potential for ✗✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a new station at Causewayhead is unlikely to have significant adverse effects on water quality and drainage. However, according to SEPA's Flood Risk Map, the site area is near to an area with potential medium/high risk of river flooding due to proximity to the River Forth. Depending on precise location chosen, further assessment likely to be required.
	Geology	✗ potential for ✗✗ (moderate cost impact). Also, potential for ✓ if contaminated land is remediated.	With adequate mitigation in place it is anticipated that the construction of a new station at Causewayhead would not have significant adverse effects on geology and soils. However, depending on the precise site location, the area formerly occupied by the old Causewayhead Station may require assessment, and a comprehensive site investigation will be required to inform on ground conditions relating to contamination and allow detailed design, potentially leading to a requirement for remedial action. Potential for mine workings will also require assessment.
	Biodiversity and Habitats	✗	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	✗ and ✓	The proposed station would be on the interface between the built-up area and the Carselands LCT of the Carse of Forth. Depending on its precise location it could also be located in the green belt. Landscape effects are not likely to be significant. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✗ to ✗✗ and ✓	The proposed station would have the potential to affect the visual amenity of residential properties on the edge of Stirling, with the number dependent on its precise location. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.

	Agriculture and Soils	-	The site is not within an area classified as agricultural land by the MacAulay Land Use Research Institute, although this will depend on site location, since Class 3.2 land is in the vicinity. Likely candidate sites not currently used for agriculture.
	Cultural Heritage	X to XX and ✓	The proposed station would not be near any national or local designated sites or buildings. However, it would be located within the Stirling Bridge battlefield site. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. It is assumed there will also be cycle parking at the station to enable longer commutes to the station location.
	Summary	X	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	Accidents	✓	This option would provide a minor benefit for accidents as the new station would capture car trips from Causewayhead and Clackmannanshire to a lesser extent, provide the opportunity to travel to Stirling and beyond by rail and a connection to Stirling University. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents.
	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	TEE	✓✓	<u>Travel time savings</u> : Public transport journey times for those within walking distance of the new station would improve, as would those using the service as a park and ride and accessing the university. Existing passengers would also be negatively impacted by the

			<p>additional stop on the route.</p> <p><u>User charges including fares, parking charges and tolls:</u> The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing rail fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users:</u> A new station would include new station facilities which would be a quality benefit, as well as improved modal choice for those within the catchment of the new station.</p> <p><u>Reliability benefits to transport users:</u> Direct access to the rail network would remove reliability concerns linked to bus-rail connections.</p> <p><u>Investment costs:</u> Investment costs associated with this option would be high including land costs, station design and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs:</u> Operating and maintenance costs would be required for the new station.</p> <p><u>Revenues:</u> The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area.</p> <p><u>Grant and subsidy payments:</u> This option is likely to impact on the current franchise agreement and require additional subsidy.</p> <p><u>Summary:</u> The station costs are major with public transport journey time improvements for those within the catchment area and accessing the university. Journey times for existing passengers would increase. This results in a moderate positive impact on TEE.</p>
	Wider Economic Benefits	✓✓	<p>This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas and positive Wider Economic Impacts. In particular, the improved access to Stirling University would have a positive impact on this criterion.</p>

Integration	Transport	✓	This option would capture car trips from Clackmannanshire and provide direct access to the rail network. This would be a minor benefit.
	Transport/Land Use	✓✓	This option would support the employment and residential sites identified in the Clackmannanshire LDP 2015 and Main Issues Report (2020), in particular, at Sauchie and Alloa and planned expansion at Stirling University as part of the City Region Deal.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓✓	A new station would improve public transport coverage to/from Causewayhead. The station location would have good walk in residential and education (Stirling University) catchment. This would be a moderate benefit for community accessibility.
	Comparative	✓	The station location at Causewayhead would provide improved access to the University of Stirling for those without access to a car. The impact is considered minor as access to an origin station would still be required.
Implementability			
Feasibility	Technical	Note that the specific site location has not been confirmed however land is limited and there are flooding risks to be mitigated as identified in the environmental appraisal. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. The location is on a live line which will impact on construction and safety, but it is not as busy as the Stirling to Perth line. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.	
Affordability	Financial	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.	
Public Acceptability		The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers and potentially increased traffic on Causewayhead Road accessing the station.	

Rationale for Selection or Rejection

This option would provide benefits to TPOs 2 and 3 as a station to the North East of Stirling would capture car trips from Clackmannanshire and provide the opportunity to travel to Stirling and beyond by rail. The need to access the station via Causewayhead Road would limit some of the benefits, however, it is still anticipated that modal shift would reduce traffic passing through Clocks Roundabout. The station would also be in walking distance of Stirling University and reduce the modal share of cars passing through Stirling.

In terms of STAG criteria, the new station would contribute positively to Integration and Accessibility and to Economy and Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers. Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.

Progressed to Detailed Appraisal

Table 17. Option 8E - New Rail Station south of Stirling

Appraisal Summary Table	
Option number	8E
Option name	New Rail Station south of Stirling
Option description	New rail station south of Stirling
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓✓✓	This station would be located south of Stirling and would provide a station within walking and cycling distance for Cowie or Bannockburn populations. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would provide a moderate benefit for TPO2 as a station to the south of Stirling would capture car trips going into Stirling from Cowie, Plean, Bannockburn and other A9 traffic. The location may also capture trips from the planned development at Durieshill and provide a more attractive strategic Park and Ride option for Clackmannanshire residents which would further reduce traffic passing through the Stirling area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓✓✓	This option would capture trips going north to Stirling and trips going south to the Central Belt. There would potentially be abstraction from Bridge of Allan and Stirling station if parking was readily available however if there was appropriate access from the motorway then this is unlikely to increase travel through Stirling. The station would provide access to both Glasgow and Edinburgh to the south and Perth and Alloa to the north.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	Potentially XX which will need further assessment and mitigation.	The construction and operation of a new station could lead to changes in noise and vibration levels. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.

Environment	Global Air Quality (CO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	Modal shift and reduced private trips would reduce vehicle movements. Minor effects on local air pollutant emissions are predicted.
	Water quality, Drainage and Flood defence	✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, a new station on the corridor is unlikely to have significant adverse effects on water quality and drainage. However, according to SEPA's Flood Risk Map, to the north of the corridor the area is near to areas with potential medium risk of surface water flooding. Depending on precise location chosen, further assessment likely to be required.
	Geology	✗ to ✗✗ and ✓	With adequate mitigation in place it is anticipated that the construction of a new station to the north of corridor would not have significant adverse effects on geology and soils. However, the site is within a coal mining Development High Risk Area, with several mine entries in the vicinity, and a comprehensive site investigation will be required to inform options and allow detailed design, potentially leading to a requirement for remedial action.
	Biodiversity and Habitats	✗	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	✗ and ✓	The potential sites lie on the interface between built up and rural areas. In either case, assuming careful location and design with landscape mitigations, the effects on the Lowland Hill Fringes LCT or the Carselands LCT are unlikely to be very significant due to the existing backdrop of industry and housing. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✗ to ✗✗ and ✓	A proposed site at Cowie is near one residential property, which already has a backdrop of industry. Sites to the north have greater potential for adverse effects as they lie near cycle route 76 and opposite a row of residential properties looking out over the railway line to the countryside; there is however a significant setback of houses from the railway and assuming careful location and design with landscape mitigation, visual

			effects would not be very significant. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	The north of the corridor is not within an area classified as agricultural land by the MacAulay Land Use Research Institute.
	Cultural Heritage	✗ and ✓	Neither site is located near a nationally or locally designated site or building. However, the north of corridor lies within the Bannockburn battlefield site. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. It is assumed there will also be cycle parking at the station to enable longer commutes to the station location.
	Summary	✗	Minor positive benefits in global and local air quality as a result of modal shift / reduction in traffic into Stirling. However, environmental impacts of introducing this option would produce minor to moderate adverse impacts to noise and vibration, water environments, geology, landscape, visual amenity agricultural soils and cultural heritage are likely. Further environmental assessment and mitigation will be required based on more detailed design.
Safety	Accidents	✓	This option would provide a minor benefit for accidents as a station to the south of Stirling would capture car trips going into Stirling and potentially also trips from the north. This would reduce the modal share of cars and vehicle kilometres which would reduce the level of accidents.
	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.

Economy	TEE	✓✓	<p><u>Travel time savings:</u> Public transport journey times for those within walking and cycling distance of the new station would improve, as would those using the service as a park and ride, particularly travelling from the new development at Durieshill, the industrial development proposed at Bandeath and travelling north to Stirling and south to the Central Belt. Existing passengers would be negatively impacted by the additional stop on the route.</p> <p><u>User charges including fares, parking charges and tolls:</u> The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing rail fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users:</u> A new station would include new station facilities which would be a quality benefit, as well as improved modal choice for those within the catchment of the new station.</p> <p><u>Reliability benefits to transport users:</u> Direct access to the rail network would remove reliability concerns linked to bus-rail connections.</p> <p><u>Investment costs:</u> Investment costs associated with this option would be high including land costs, station design and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs:</u> Operating and maintenance costs would be required for the new station.</p> <p><u>Revenues:</u> The station is likely to increase the patronage on the service and, therefore, revenue, however, there may be a reduction in revenue for bus operators currently serving the area.</p> <p><u>Grant and subsidy payments:</u> This option is likely to impact on the current franchise agreement and require additional subsidy.</p> <p><u>Summary:</u> The station costs are major with public transport journey time improvements for those within the catchment area, including the Durieshill development. Journey times for existing passengers would increase. This results in a moderate positive impact on TEE.</p>
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	Wider Economic Benefits	✓✓	This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education, particularly for Cowie and Bannockburn communities which include socially excluded groups with below average economic activity and could increase the opportunity for more economic activity in the surrounding areas and positive Wider Economic Impacts.
Integration	Transport	✓✓	This option would capture car trips from Falkirk and communities to the south of Stirling going into Stirling and also trips to the Central Belt, providing direct access to the rail network. This would be a moderate benefit.
	Transport/Land Use	✓✓	This option would be well located for integrating a major residential and employment development at Durieshill and South Stirling Gateway into Stirling City Centre and the Central Belt. This would provide sustainable access to employment, education, healthcare and leisure facilities for the Durieshill residents and other nearby communities. In addition, there are allocations in Plean and Fallin. The option would also support Stirling's LDP by reducing the flow of traffic going into and passing through Stirling. This is a moderate benefit.
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	A new park and ride would improve public transport coverage to/from south Stirling. Although it would not directly improve walking or cycling it would improve access to services and local accessibility.
	Comparative	✓✓	This station would be located on the corridor and within walking distance for Cowie or Bannockburn populations which are identified as being below average in terms of income and employment.

Implementability		
Feasibility	Technical	Note that the specific site location has not been confirmed. There could be technical challenges to build a new station on the line, however these will be understood and expected from recent station openings in Scotland. The location is on a busy, live, electrified line which will impact on construction and safety. Engagement with stakeholders and reviews of previous studies have highlighted timetabling constraints on the line which may impact on the capacity to serve a new station and meet existing service commitments, in particular the turnaround time at Alloa.
Affordability	Financial	Costs to be considered include land purchase, signalling, overhead line and track costs, station and platform builds and car park construction and maintenance. Recent station openings would provide a good understanding of the outturn costs of similar projects.
Public Acceptability		The opening of a station is considered to be widely welcomed by the public however there will be journey time implications for existing passengers.
Rationale for Selection or Rejection		
<p>This option would provide significant benefits to all three TPOs by providing a station within walking distance for Cowie or Bannockburn populations. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow. In addition, the station would capture car trips going into Stirling from Cowie, Plean, Bannockburn and other A9 traffic. The location may also capture trips from the planned development at Durieshill and provide a more attractive strategic Park and Ride option for Clackmannanshire residents which would further reduce traffic passing through the Stirling area.</p> <p>In terms of STAG criteria, the new station would contribute positively to Economy, Integration and Accessibility and to Safety to a lesser degree. The deliverability of the station would be a significant consideration with costs associated with land purchase, signalling, station construction to be considered. In addition, there are timetabling constraints to be considered in relation to turnaround time at Alloa and the increase in journey times for existing passengers. Although the appraisal identifies a number of considerations, the positive impacts warrant its recommendation for further investigation.</p> <p>Progressed to Detailed Appraisal</p>		

Table 18. Option 8F - New Rail Station at Blackford or Greenloaning

Appraisal Summary Table	
Option number	8F
Option name	New Rail Station at Blackford or Greenloaning
Option description	New rail station at Blackford or Greenloaning
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	-	Gleneagles and Dunblane currently provide access to the rail network to the north of Stirling and mode choices to limit car travel through the study area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	-	This option would have a neutral impact on TPO2. Gleneagles and Dunblane currently provide access to the rail network to the north of Stirling.
Rationale for Selection or Rejection		
<p>This option is not recommended for further investigation. Although it may improve accessibility for communities north of Dunblane it is not considered to contribute to the study TPOs and is outwith the scope of the study. This option may be considered as part of an alternative study investigating north of Dunblane.</p> <p>Not progressed to Detailed Appraisal</p>		

Table 19. Option 8G - New Rail Station and Line Reopening to Clackmannan

Appraisal Summary Table	
Option number	8G
Option name	New rail station and line reopening to Clackmannan
Option description	New rail station and line reopening to Clackmannan
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would be neutral for TPO1 as it would provide no direct benefit to the communities identified.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓	A new line and station would increase the mode choice for residents in Clackmannan and capture trips going into and passing through Stirling, however, the service is not anticipated to be better than Alloa's and due to the proximity to Alloa the benefit is considered minor.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	-	A new line and station would improve the competitiveness of public transport over car for Clackmannan residents, however, the service is not anticipated to be better than Alloa's and due to the proximity to Alloa the benefit is considered neutral.
Rationale for Selection or Rejection		
<p>Reopening the line to Clackmannan has not been recommended for further investigation as part of this study. There may be benefits associated with this option however they have minimal positive impacts on the TPOs identified for this study and it is outwith the scope of this study. In addition, reopening the line to Clackmannan has been identified as an option as part of the West of Fife Enhancements study and it is therefore more appropriate for further investigation to take place as part of that study. For that reason, it has not been appraised against STAG criteria.</p> <p>Not progressed to Detailed Appraisal</p>		

Table 20. Option 8H - Relocation of Bridge of Allan Station

Appraisal Summary Table	
Option number	8H
Option name	Relocation of Bridge of Allan Station
Option description	This option is the relocation (closure and reopening) of Bridge of Allan station to a site south of the existing station, between Cornton No1 vehicular level crossing and Cornton No2 footpath level crossing (between B823 and Easter Cornton Road).
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's data zones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national data zones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓✓	This option would result in a station within walking distance of the Cornton population. This would provide access to the strategic rail network including links to healthcare, employment, education and training opportunities in Stirling, Edinburgh and Glasgow.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station. Travel surveys at Bridge of Allan station have shown that 66% of users at Bridge of Allan drive to the station currently, if the new station provides sufficient parking and suitable access the drive-in level is expected to be maintained and supplemented by the additional walk-in catchment.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station and improve the competitiveness of sustainable modes for strategic trips for Cornton residents. Providing sufficient parking at the new station would further increase the competitiveness.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✗	The construction and operation of a replacement station at Bridge of Allan (new location) could lead to changes in noise and vibration levels in the surrounding environment e.g. on the southern edge of Bridge of Allan and the northern edge of Cornton, Stirling. It is assumed that a detailed noise impact assessment would be undertaken to address potential for significant impacts from construction and operation of the station and appropriate mitigation including acoustic attenuation would be designed and implemented as part of detailed proposals.

Environment	Global Air Quality (CO2)	✓	No material changes in traffic flows or associated emissions on key roads in the study area or beyond are expected from this option but may increase rail patronage / catchment. No significant effects on global (carbon) emissions are predicted.
	Local Air Quality (PM10 and NO2)	✓	No material changes in traffic flows or associated emissions on key roads in the study area or beyond are expected from this option but may increase rail patronage / catchment. Locally, change in distribution of cars accessing station to park.
	Water quality, Drainage and Flood defence	✗	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, the relocated Bridge of Allan station is unlikely to have significant adverse effects on water quality and drainage. According to SEPA's Flood Risk Map, parts of the area are subject to potential low/medium risk of river flooding, and this will require further assessment.
	Geology	✗	With adequate mitigation in place it is anticipated that the construction of a new station at Bridge of Allan would not have significant adverse effects on geology and soils. The site is not within a coal mining Development High Risk Area, although a comprehensive site investigation will be required to assess geotechnical and geo-environmental conditions, inform options and allow detailed design.
	Biodiversity and Habitats	✗	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation e.g. appropriate surveys to inform the proposals.
	Landscape	✗✗ and ✓	Development of a new station south of Bridge of Allan with platforms, hard standings, bridge, shelters, parking and lighting would lead to some loss and fragmentation of rural fringe character in the Carselands LCT in the Carse of Forth. It would be located in the green belt between Stirling and Bridge of Allan, close to the Cornton Vale HMP complex and have the potential to affect the visual separation and settings of the two settlements. The precise location and design of the station, together with mitigation planting to screen/ integrate it into the wider landscape could partially mitigate landscape effects. The closure and redevelopment of the former station site is unlikely to have significant landscape effects as it is located on the edge of a built-up area and

			not in the green belt. An overall reduction in vehicular traffic may lead to a small positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	XX, reducing to X (slight visual effects) assuming adequate mitigation and ✓	There is the potential for the proposed station to have adverse effects on the visual amenity of local residents on the southern edge of Bridge of Allan and the northern edge of Cornton, Stirling. Mitigation measures including the location and design of facilities and screen planting would help to limit the potential for significant effects. The closure and redevelopment of the former station site may lead to some slight visual effects on nearby residential properties. An overall reduction in vehicular traffic may lead to a small positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	X and ✓	Land Capability for Agricultural data from the MacAulay Land Use Research Institute confirms that the area comprises Class 3.2 agricultural land, which is "land capable of average production though high yields of barley, oats and grass can be obtained". The area is currently understood to be used for agriculture, so development here would lead to loss of this land that could not be mitigated. Given scale of agricultural land in the area and the scale of the development, the overall impact is considered to be small.
	Cultural Heritage	X and ✓	The existing station site and proposed location for the relocated station have no national or local cultural heritage designations, although the latter lies immediately north of the northern edge of the Bannockburn battlefield site. There is the potential to affect as yet unknown archaeology. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a small positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	-, potentially ✓ if option results in more walking or cycling.	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. However, facilities for parking is likely to result in car use for some travellers with no net benefit.
	Summary	X	Further assessment required at the detailed design stage for elements such as landscape, noise, flood risk, ecology etc.

Safety	Accidents	✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station. This could result in modal shift from car to rail leading to reductions in car vehicle kilometres and accidents. The location of the station in close proximity to a level crossing which would require consideration by Network Rail to identify and mitigate any risks. The station would require a footbridge which would result in the closure of Cornton No.2 which would be positive in terms of reducing the likelihood of pedestrian deaths.
	Security	✓	A new rail station would be built to minimum safety requirements with regards to entrances and exits, surveillance (CCTV and on platform call and information services) and lighting.
Economy	TEE	✗	<p><u>Travel time savings</u>: This option includes a new station close to a level crossing. The station is likely to significantly increase the time the crossing is closed and impact on road journey times on the route, however re-routing may result in journey time savings across the network (for example, Clock Roundabout). Public transport journey times for those within walking distance of the new station would improve however those in walking distance of the current location would see an increase.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: A relocated station would include new station facilities which would be a minor quality benefit.</p> <p><u>Reliability benefits to transport users</u>: This option is likely to have a moderate negative impact on car journey times due to extended closures of the barrier crossing.</p> <p><u>Investment costs</u>: Investment costs associated with this option would be high including land costs, station design, mitigation of barrier crossing risks and costs associated with construction on a live railway line.</p> <p><u>Operating and maintenance costs</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Revenues</u>: The increased walk-in catchment is likely to increase the patronage on the</p>

			<p>service and, therefore, revenue.</p> <p><u>Grant and subsidy payments:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Summary:</u> The relocation costs are major with public transport journey time improvements for those within walking distance offsetting the current location due to the greater catchment. Road journey times would be negatively impacted by increased closures of the barrier crossings. This results in a minor negative impact on TEE.</p>
	Wider Economic Benefits	✓✓	<p>This option would provide access to the rail network for communities not currently connected. This would provide access to employment and education which could increase the opportunity for increased economic activity in the surrounding areas, including Cornton and positive Wider Economic Impacts.</p>
Integration	Transport	✓	<p>This option would be in walking distance of the Cornton and south Bridge of Allan community and provide direct access to the rail network for a greater population, however it would remove the current access at the existing station, albeit a smaller walk in catchment. This would, on balance, be a minor positive impact.</p>
	Transport/Land Use	✓✓	<p>The new station aligns with the plans for the Kildean - Cornton and Cornton to Airthrey Link Roads. These link roads would provide access to the station from Clackmannanshire and the M9 as a park and ride facility. The link roads will also provide access to the station from the University, Forth Valley College, Castle Business Park, Kildean Housing and West End Raploch Housing. This would be a positive impact on Transport and Land Use Integration.</p>
	Policy	✓✓	<p>This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.</p>
Accessibility	Community	✓✓	<p>Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station and improve the public transport coverage for these communities and Causewayhead. This is considered a moderate benefit.</p>

	Comparative	✓✓	Relocating the station to between Cornton and Bridge of Allan would increase the walk-in catchment of the station and improve the public transport coverage for Cornton and Causewayhead in particular, which was identified as an area with a low SIMD ranking and access to car.
Implementability			
Feasibility	Technical	There are a number of factors to take into consideration for this option regarding feasibility. The proposed site is located close to the Cornton No1 crossing which will be converted to a full barrier MCB (OD) crossing. This change will lead to protecting signals being installed and the location of the station is likely to be within the scope of these crossings. This will increase the time the barriers are down and there are also significant safety issues with locating a station close to a level crossing which will have to be considered with Network Rail. There are flooding risks to be mitigated as identified in the environmental appraisal. Construction on a busy, live, electrified line will also be a major consideration. The relocation would also have to adhere to DfT's Guidance Note: Railway Closures, 18 October 2006, which is also approved by Transport Scotland	
Affordability	Financial	The factors introduced above - Cornton No1 crossing and construction on a live line - will also impact on the affordability of relocating the station. These factors will result in increased costs which will be relatively high.	
Public Acceptability		This option is likely to have a range of views from the public. Although the station would have an increased walk in catchment for access from Cornton and residences in south Bridge of Allan the station has historically been located to the north of the town and a move will negatively impact existing users who currently access the station by foot or bike. There is likely to be significant support in favour of the station staying at the current location. In contrast, there would likely be strong support for a relocated station close to Cornton and Causewayhead. In addition, the implications of the Cornton No1 crossing may result in lengthy closures to the B823 which will impact on local movements and support of the option.	

Rationale for Selection or Rejection

Relocating Bridge of Allan station makes significant positive impacts on the study TPOs including improved transport opportunities for Cornton residents and reducing the car mode share travelling into Stirling.

In terms of Integration and Accessibility the relocation of the station is considered a positive benefit with considerations to be further investigated identified in the Environment and Economy appraisal. These include the potential negative impacts associated with noise and flooding and potential journey time increases for road users and investment costs associated with the relocation.

There are significant implementability considerations in addition to those expected as part of a station relocation and construction. These include the operation of the Cornton No1 level crossing which will require additional safety mitigations and road journey time delays on the B823. Public acceptability is also a major consideration as the station has historically been located to the north of the town and a move will negatively impact existing users who currently access the station by foot or bike. There is likely to be significant support in favour of the station staying at the current location.

Due to the positive impacts on the TPOs, this option has been recommended for further investigation as part of the Detailed Appraisal.

Progressed to Detailed Appraisal

Appendix B – Complementary Options

Table 1. Option 1 - Potential for Other Trip Attractors to use Employer Bus Services

Appraisal Summary Table	
Option number	1 - Complementary
Option name	Potential for other trip attractors to use employer bus services (for example, Prudential employee services from the city centre and around central Scotland)
Option description	Potential for other trip attractors to use employer bus services (for example, Prudential employee services from the city centre and around central Scotland). This option proposes to allow non-employees to use the service to increase local accessibility with no additional services.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	The benefits of this option would be largely dependent on the routes currently served by employer and the operating hours. This option is considered to provide a minor benefit for TPO1 as the routing and timing may not be suitable for healthcare, employments, education and training, in particular, routing to Forth Valley College (Stirling Campus).
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	This option would be largely dependent on the routes currently served by employer services and the operating hours. This option is considered to provide a minor benefit for TPO2 as it may provide some additional routes and reduce the mode share of cars entering Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option would improve some accessibility at a local level but is unlikely to impact on strategic trips. This option is not consider to impact on TPO3
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	Modal shift and reduced private trips would reduce vehicle movements. No significant effects on transport noise or vibration for receptors adjacent to bus routes or facilities are predicted.
	Global Air Quality (CO2)	-	Modal shift and reduced private trips would reduce vehicle movements. No significant effects on global (carbon) emissions are predicted.

	Local Air Quality (PM10 and NO2)	-	Modal shift and reduced private trips would reduce vehicle movements. No significant effects on local air pollutant emissions are predicted. Current fleet is assumed to be modern and will include electric or hybrid buses.
	Water quality, Drainage and Flood defence	-	No significant effects on water quality / drainage or flooding are predicted for this option.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	There are no physical changes associated with this option and therefore no impacts on biodiversity and habitats
	Landscape	-	No significant effects on landscape or townscape are predicted for this option
	Visual Amenity	-	No significant effects on visual amenity are predicted for this option
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	-	No significant effects on cultural heritage are predicted for this option
	Physical Fitness	-, potentially ✓ if option results in more walking	Potential for modal shift with people preferring public transport to private vehicles would result in increased walking at either end of the journey. The provision of a 'shuttle' service may reduce cars travelling through and within the city centre which may encourage others to walk and cycle more.
	Summary	-	No material changes in traffic flows or associated emissions on key roads within the study area are expected from this option. Similarly, no significant effects on water quality, drainage and flood defence; geology; biodiversity and habitats; visual amenity; or cultural heritage are expected from this option taking account of assumed design and mitigation.
Safety	Accidents	-	This is a small scale option which may improve transport access for some in the study area but is not expected to generate significant modal shift from private car. Therefore, there is likely to be a negligible impact on accidents connected to reduced vehicle kilometres.

	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services and reduced waiting at stops could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	✓	<p><u>Travel time savings</u>: This option would provide a direct connection to a range of destinations, including employment centres which would have journey time benefits.</p> <p><u>User charges including fares, parking charges and tolls</u>: The impact of this option on user charges would depend on the fare for the service which would be considered in relation to existing bus fares for similar journeys to establish a suitable fare to generate demand.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment costs would be minimal and related to the installation of ticketing machines.</p> <p><u>Operating and maintenance costs</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Revenues</u>: The service would generate new revenue through new passengers.</p> <p><u>Grant and subsidy payments</u>: No or minimal subsidies would be required for this option as the services are currently operating without subsidy.</p> <p><u>Summary</u>: This option is considered to have minimal costs and low benefits.</p>
	Wider Economic Benefits	-	This option is considered to provide increased access to employment and education sites across the Stirling area, including Forth Valley College, which would improve employment opportunities however the benefits are likely to be limited and therefore it is considered negligible for Wider Economic Impacts.
Integration	Transport	✓	An increased number of services and destinations would allow for more service integration, this would be a minor benefit for transport integration.

	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	The benefits of this option would be largely dependent on the routes currently served by employer services and the operating hours. This option is considered to provide a minor benefit for community accessibility as the increased public transport coverage is not anticipated to be significant.
	Comparative	✓	The benefits of this option would be largely dependent on the routes currently served by employer services and the operating hours and may positively impact on areas identified in the study as having higher levels of deprivation or access to cars.
Implementability			
Feasibility	Technical	This option would require negotiation with employers to discuss the possibility of opening this option to non-employees. To deliver the service, ticket machines, would need to be installed on employee buses, this is a minor consideration. Other approaches to payment could be considered in the short term to test the option as a trial.	
Affordability	Financial	The services are currently operating with only minor timetabling required and no additional fleet capacity. Affordability is therefore of minor consideration as the requirement for ongoing funding support is not anticipated.	
Public Acceptability		This option is considered to be well received by the public, however, the option will benefit a limited proportion of the population and may not fulfil aspirations for meeting the TPOs in the area.	

Rationale for Selection or Rejection

This option would contribute to TPOs 1 and 2 however the impact is likely to be minor with an improvement to a small component of the population. Minor considerations should be given to the implementability of the options and it is therefore recommended to be considered as a complementary option delivered alongside standalone options.

Progressed as a Complementary Option

Table 2. Option 2 – DPMTAG DP4 & DP5 Infrastructure Improvements

Appraisal Summary Table	
Option number	2 - Complementary
Option name	Road improvements: Infrastructure improvements identified as DP4 and 5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road.
Option description	Road improvements: Infrastructure improvements identified as DP4 and DP5 in Stirling Council's DPMTAG study including connectivity to and from the M9 (Craigforth & A811), localised widening and/or junction improvements on the A91 and Kildean to Cornton and Cornton to Airthrey link road.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	The improvements identified would minimise the impact of road journey time increases across the city associated with planned developments. Of particular relevance, the A91 improvements enable bus access across the A91 for residents of Plean, Cowie and Fallin; Kildean-Cornton and Cornton-Airthrey links will provide Cornton residents with significantly enhanced access to employment (Castle Business Park, Kildean, Stirling University Innovation Park) and further/higher education (Forth Valley College and Stirling University) as well as reducing congestion at Clock roundabout on the Stirling to University/Clackmannanshire bus route. This would be minor benefit for TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		-	The road improvement measures would be proposed as part of an overall package to reduce mode share of cars passing through the study area. Standalone, this option would not reduce mode share of cars.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	The road improvements identified in this option would keep traffic moving, but would also remove congestion pinch points that prevent the bus from being competitive with the private car (e.g. crossing A91; at Clock Roundabout). The improvements are therefore required to maintain the status quo between car and bus and would not give a competitive advantage to the bus unless accompanied by bus priority measures.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	- but could be ✗ depending on numbers of vehicles / routes.	The construction and operation of road improvements would likely increase traffic volumes but may reduce congestion and options for new bus routes.
	Global Air Quality (CO2)	✗	The construction and operation of road improvements would likely increase traffic volumes so a minor adverse impact on global air quality.

	Local Air Quality (PM10 and NO2)	X	The construction and operation of road improvements would likely increase traffic volumes so a minor adverse impact on local air quality.
	Water quality, Drainage and Flood defence	X to XX	With appropriate design and associated mitigation/ compliance with SEPA and Scottish Water guidance and authorisations, road improvements are unlikely to have significant adverse effects on water quality and drainage, although increased traffic could result in contamination loading on surface water runoff resulting in negative effects on nearby surface waters. Further assessment likely to be required as part of detailed design, particularly relating to flood risk.
	Geology	X	With adequate mitigation in place it is anticipated that road improvements would not have significant adverse effects on geology and soils. Site investigation would be required to confirm contamination status of soils and inform detailed geotechnical design.
	Biodiversity and Habitats	X	There would be a level of habitat loss as a result of any new infrastructure. It is assumed that appropriate surveys for habitats and protected species would be undertaken as part of detailed route design and recommended mitigation integrated into the designs such that potential impacts would be reduced to an acceptable level.
	Landscape	XX to X assuming effects of expanded infrastructure are adequately mitigated	The proposed widening of carriageways and junction improvements would lead to localised adverse landscape effects in the Lowland Hill Fringes, Carselands and Lowland Valley Fringes LCTs: through loss of mature roadside vegetation, earthworks, increased scale of road and structures, signage and lighting. Impacts on the Keir junction would affect the Keir Local Landscape Area (LLA). Assuming mitigation through design of earthworks and planting the effects could be reduced to some extent. Should the improvements lead to an increase in traffic entering the city, this could lead to adverse effects on townscape within the urban area.
	Visual Amenity	XX to X assuming effects of expanded infrastructure are adequately mitigated	The changes resulting from the proposed widening of carriageways and junction improvements would lead to localised adverse effects on the visual amenity of road users and a minor number of residential receptors close to the junctions. Assuming mitigation through design of earthworks and planting the effects could be reduced to some extent. Should the improvements lead to an increase in traffic entering the city, this could lead to adverse effects on visual amenity within the urban area.

	Agriculture and Soils	X	Loss of agricultural land could result from widening of carriageways or junction improvements. Impacts are likely to be fairly minor and predominantly on Class 3.2 agricultural land, "land capable of average production though high yields of barley, oats and grass can be obtained".
	Cultural Heritage	XXX to X assuming effects of expanded infrastructure are adequately mitigated	There are national and local designations including a designed landscape, A listed buildings, a conservation area and two battlefield sites (Bannockburn and Sauchieburn) near one or more of the proposed junction improvements and there are a number of records across the areas. The proposals therefore have the potential to significantly adversely affect the fabric and/or setting of these designations as well as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design it may be possible to significantly reduce effects on cultural heritage. Should the improvements lead to an increase in traffic entering the city, this could lead to adverse effects on townscape and the setting of designated sites and buildings within the urban area.
	Physical Fitness	X	The construction and operation of road improvements would likely increase traffic volumes and does not encourage active travel even if road with do allow for cycle lanes
	Summary	X X	The introduction of road improvements including localised road widening would increase traffic volumes with corresponding impacts to noise and air quality. Minor to moderate adverse impacts on water environments, geology and soils, biodiversity landscape, visual amenity, and agriculture. This option could have a major negative impact on cultural heritage depending on route option. Detailed assessment required.
Safety	Accidents	-	This option would improve traffic flows at points across the network, including crossing the A91 and at Clock Roundabout. This may result in increased vehicle kilometres and increased road accidents however this is likely to be offset by improved safety design of the proposed junctions. On balance, this option is neutral for accidents.
	Security	-	There are not anticipated to be any improvements to security associated with this option.
Economy	TEE	✓	<u>Travel time savings</u> : The improvements identified would minimise the impact of road journey time increases across the city associated with planned developments and would have considerable benefits for journey times

			<p><u>User charges including fares, parking charges and tolls:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users:</u> This option is not likely to impact on this sub-criterion.</p> <p>Reliability benefits to transport users: The improvements identified would minimise the impact of road journey time increases across the city associated with planned developments which would improve reliability for road users (car and bus).</p> <p><u>Investment costs:</u> Investment costs will be high, however they could be implemented incrementally.</p> <p><u>Operating and maintenance costs:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Revenues:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Grant and subsidy payments:</u> This option is not likely to impact on this sub-criterion.</p> <p><u>Summary:</u> This option is considered to have high costs but significant journey time benefits and is a minor positive impact on TEE.</p>
	Wider Economic Benefits	✓	This option would improve traffic flows at points across the network, including crossing the A91 and at Clock Roundabout. This improvement in journey time reliability will have a positive impact on Wider Economic Impacts.
Integration	Transport	✓	Improved bus journey time reliability may improve transport integration between bus and rail, this will be a minor benefit. If packaged with other proposals, including a station at Cornton, the transport integration would be improved further, as a standalone option it is considered a minor positive impact.
	Transport/Land Use	-	This option includes mitigations in response to planned developments as identified in the DPMTAG. This represents a moderate benefit for Transport and Land Use Integration.
	Policy	-	This option includes mitigations in response to planned developments as identified in the DPMTAG, however the improvement may also contribute to increased traffic flow on the road network which would conflict with establish policy directives.

Accessibility	Community	-	This option would reduce journey times and improve journey time reliability across a number of routes into the city, however, there would be no planned improvements to public transport coverage, therefore, this will have no impact on community accessibility.
	Comparative	✓	This option would see some improvements for groups identified as socially excluded. Of particular relevance, the A91 improvements enable bus access across the A91 for residents of Plean, Cowie and Fallin, Kildean-Cornton and Cornton-Airthrey links will provide Cornton residents with significantly enhanced access to employment (Castle Business Park, Kildean, Stirling University Innovation Park) and further/higher education (Forth Valley College and Stirling University) as well as reducing congestion at Clock roundabout on the vital Stirling to University/Clackmannanshire bus route. This would be a minor benefit for comparative accessibility.
Implementability			
Feasibility	Technical	According to the DPMSTAG which considered these options they are considered feasible both in terms of implementation and construction. The upgrades to M9 Junction 9 Pirnhall would be implemented as the various streams of the Durieshill and South Stirling Gateway projects are taken forward. Transport Scotland has already identified the need to upgrade M9 Junction 11 Keir Roundabout with a grade-separated solution, and Stirling Council has carried out a number of high-level feasibility assessments of potential improvements to M9 Junction 10 Craigforth. None of the three proposals pose any major civil engineering challenges. It is recognised that their construction would result in periods of disruption. Feasibility is therefore a moderate consideration.	
Affordability	Financial	The interventions are considered to be of medium to high cost, and this represents the main risk to delivery. The cost will have to be met through a range of sources, between Transport Scotland, Stirling Council, developer contributions. This option is therefore a moderate consideration for Affordability.	
Public Acceptability		The options offer opportunities to alleviate existing traffic congestion at the key trunk road junctions and mitigate against potential further congestion generated by the development of the LDP sites. The improvements will also offer increased connectivity with some of the rural communities. The junction improvements seek to create additional road capacity that might generate some local opposition and could be challenged in a public arena. Consequently, this option is a moderate consideration for Public Acceptability.	

Rationale for Selection or Rejection

This option is considered complementary as it does not meet the study TPOs as a standalone option but considered as part of a package may considerably improve the benefits of a core option. This option is therefore recommended to be considered as part of a package in the Detailed Appraisal with consideration given to how different components may impact positively and negatively on other options. For example, the Kildean to Cornton and Cornton to Airthrey link road may improve the access and public transport integration of a new station at Cornton.

Progress as Complementary Option

Table 3. Option 3 – Wheelchair Accessible Taxis and Private Hire Vehicles

Appraisal Summary Table	
Option number	3 - Complementary
Option name	Wheelchair accessible taxis and private hire vehicles
Option description	Increase the availability of wheelchair accessible taxis and private hire vehicles
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	This option would improve access for residents requiring disabled access taxis from the areas identified and would be a minor benefit.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		-	This option would improve access for residents requiring disabled access taxis to transport interchanges. The impact this is likely to have on the modal share of cars entering, leaving or passing through the Stirling City Area is expected to be minimal.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option would improve access for residents requiring disabled access taxis to transport interchanges which would give increased access to the strategic rail and coach network. This would improve the competitiveness of public transport for these journeys, however, the impact is considered to be minimal.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	No significant effects on noise / vibration are predicted for this option.
	Global Air Quality (CO2)	-	No significant effects on global air quality are predicted for this option.
	Local Air Quality (PM10 and NO2)	-	No significant effects on local air quality are predicted for this option.

	Water quality, Drainage and Flood defence	-	No significant effects on water quality / drainage or flooding are predicted for this option.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity and habitats are predicted for this option.
	Landscape	-	No significant effects on landscape are predicted for this option
	Visual Amenity	-	No significant effects on visual amenity are predicted for this option
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	-	No significant effects on cultural heritage are predicted for this option
	Physical Fitness	✓	Enabling access and increasing mobility has an overall minor positive benefit in terms of physical fitness
	Summary	-	No environmental impacts associated with this option.
Safety	Accidents	-	The impact this option is likely to have on modal shift and therefore change in vehicle kilometres and accident rates is minimal.
	Security	✓	The availability of disabled access taxis will increase the number of transport options available for those with additional accessibility needs. Taxis provide a safe and secure transport option.
Economy	TEE	-	<u>Travel time savings:</u> This option would provide a direct connection to interchanges for those requiring disabled access, this would be a journey time benefit. <u>User charges including fares, parking charges and tolls:</u> This option is not likely to

			<p>impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment costs would be minimal and related to purchasing taxis.</p> <p><u>Operating and maintenance costs</u>: Operating and maintenance costs would be the responsibility of the taxi drivers.</p> <p><u>Revenues</u>: The service would generate new revenue through new passengers on taxis.</p> <p><u>Grant and subsidy payments</u>: No ongoing subsidies would be required for this option however grants to purchase vehicles may be required.</p> <p><u>Summary</u>: This option is considered to have minimal costs and low benefits with minimal impact on economy.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts.
Integration	Transport	✓✓	The availability of disabled access taxis will increase the number of transport options available for those with additional accessibility needs and allow for interchanges to the bus and rail network. This is a moderate benefit for transport integration.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	✓✓	This option would improve access for residents requiring disabled access taxis to transport interchanges which would give increased access to the strategic rail and

		coach network for those groups currently excluded from public transport. This would be a moderate benefit.
Implementability		
Feasibility	Technical	Discussions with taxi operators will be required. This will include investigations into funding availability, identifying appropriate operators/drivers and suitable booking mechanisms for the taxis. Given the small scale of the scheme these are considered minor considerations.
Affordability	Financial	This option would require some initial capital funding to purchase the vehicles, however this is a small-scale scheme and costs would be relatively low. Operating costs would be covered by the individual drivers therefore there is no expectation of ongoing costs to support this option.
Public Acceptability		This option is expected to be widely welcomed by the public.
Rationale for Selection or Rejection		
<p>This option has minimal impact on the study TPOs however it does contribute to the STAG criteria. Given the benefits associated with Integration and Accessibility this option is recommended for further consideration as part of a package.</p> <p>Progressed as a Complementary Option</p>		

Table 4. Option 4 - Bus Priority/Gates on City Centre Approaches

Appraisal Summary Table	
Option number	4 - Complementary
Option name	Bus Priority/Gates on City Centre Approaches
Option description	Introduce bus priority measures or bus gates on city centre approaches
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	This option would improve journey time and reliability of bus travel in the study area, including for some of the areas identified in TPO1. This journey time improvement may impact on the distance which can be covered in a reasonable time to access services and therefore improve opportunities. This is a minor benefit for TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	This option would improve journey time and the reliability of bus travel in the study area. The improved journey times and reliability would encourage a shift from car to bus for some trips entering the Stirling City Area. This would be a moderate benefit.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	This option would improve journey time and the reliability of bus travel in the study area. In particular, this option would improve journey times accessing Stirling train station and improve the competitiveness of public transport compared to private car for strategic trips. This would be a minor benefit.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	No significant effects on transport noise or vibration for receptors adjacent to bus routes or facilities are predicted.
	Global Air Quality (CO2)	-	No significant effects on global (carbon) emissions are predicted. Promoting modal shift.
	Local Air Quality (PM10 and NO2)	✓	Modal shift is a positive change. Minor positive effects on local air pollutant emissions Bus fleet is assumed to be modern and will include electric or hybrid buses.

	Water quality, Drainage and Flood defence	✓	Improved bus priorities may encourage increased use of services with the potential for minor changes in use of other modes such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity and soils are predicted for this option.
	Landscape	✓	Assuming this does not entail the construction of significant new signs and structures, there are unlikely to be any adverse effects on townscape. An overall reduction in city centre vehicular traffic may lead to a minor positive effect on townscape at peak traffic times
	Visual Amenity	✓	Assuming this does not entail the construction of significant new signs and structures, there are unlikely to be any adverse effects on visual amenity. An overall reduction in city centre vehicular traffic may lead to a minor positive effect on visual amenity at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	Assuming this does not entail the construction of significant new signs and structures, there are unlikely to be any adverse effects on townscape and listed buildings. An overall reduction in city centre traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings at peak traffic times
	Physical Fitness	✓	A reduction in overall levels of private car journeys on key routes through the city centre may encourage greater bus patronage with associated onward journeys on foot but may also encourage greater walking and cycling in the city centre.
	Summary	✓	Minor environmental benefits to local air quality, water environments, visual amenity and cultural heritage.

Safety	Accidents	✓	This option could produce a minor benefit to accident rates, resulting from the reduction of private cars on the road network. This reduction will be a modal shift from car to bus due to improved journey time reliability.
	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services (due to improved journey time reliability) could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	✓	<p><u>Travel time savings</u>: This option would improve journey time reliability and bus speeds which would be a journey time benefit for bus passengers. Depending on the measures taken there may be a negative impact on car journey times on the route.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option would improve journey time reliability for bus passengers but may impact negatively on car journey time reliability.</p> <p><u>Investment costs</u>: Investment costs would be relatively low and relate to road space reallocation, signage and monitoring/enforcement equipment.</p> <p><u>Operating and maintenance costs</u>: Operating and maintenance costs would be the relatively low and relate to monitoring and enforcement.</p> <p><u>Revenues</u>: Journey time and reliability improvements may result in increases in bus patronage and therefore ticket revenue.</p> <p><u>Grant and subsidy payments</u>: This option is not likely to impact on this sub-criterion.</p> <p><u>Summary</u>: This option is considered to have low costs and moderate benefits.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts

Integration	Transport	✓	Improved journey time reliability will improve transport integration between bus and rail, this will be a minor benefit.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	Although this option would improve journey times and reliability which would make bus travel more accessible, public transport coverage would not be improved by this option.
	Comparative	-	Although this option would improve journey times and reliability which would make bus travel more accessible, public transport coverage and access for socially excluded groups would not be improved by this option.
Implementability			
Feasibility	Technical	The feasibility of this option would be dependent on the bus priority routes proposed. Road space availability on many routes to Stirling city centre is limited which would impact on the design and also the existing traffic flow on those routes. Managing existing vehicle movements and space availability will be a moderate consideration.	
Affordability	Financial	This option would require relatively low capital expenditure with minimal operating costs associated with enforcement and maintenance. Affordability is therefore a minor consideration.	
Public Acceptability		Due to limited road space availability on approaches to the city centre and the potential impact on other road users this option is anticipated to have a range of responses from the public and is therefore considered a moderate consideration.	

Rationale for Selection or Rejection

This option is considered to impact positively on the study TPOs to varying degrees and is therefore recommended for further consideration in the Detailed Appraisal. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.

Progressed as a Complementary Option

Table 5. Option 5 - Promote Investment in New Buses

Appraisal Summary Table	
Option number	5 - Complementary
Option name	Promote Investment in New Buses
Option description	Promote investment in new buses
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	Improved investment in buses would make public transport more attractive to users but would not improve access to services. This option would have a neutral impact on TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Improved investment in buses would make public transport more attractive to users and may encourage car users to switch from car travel to public transport for trips entering, leaving or passing through the Stirling City Area.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option would make buses more attractive but would not make the journeys more competitive compared to car. This option would have no impact on TPO3.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Modern vehicles, particularly those which are electric or hybrid are quieter than older models and use technology such as stop/start which reduces noise and vibration, particularly in built up areas.
	Global Air Quality (CO2)	✓	Modern vehicles produce no (electric) or less emissions (e.g. latest EURO engines or hybrid) and so will be a minor positive effect overall on global air quality
	Local Air Quality (PM10 and NO2)	✓	Modern vehicles produce no (electric) or less emissions (e.g. latest EURO engines or hybrid) and so will be a minor positive effect overall on local air quality

	Water quality, Drainage and Flood defence	✓	Improved bus services may encourage increased use of services with the potential for minor changes in use of other modes of transport such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity or habitats are predicted for this option.
	Landscape	✓	An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There are unlikely to be any adverse effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	A reduction in overall levels of private car journeys on key routes through the city centre through high quality bus service patronage plus associated onward journeys on foot will increase levels of physical activity.
	Summary	✓	Minor positive impacts are anticipated for noise, global air quality, local air quality, water environments, landscape, visual amenity and cultural heritage. No material changes are expected in relation to biodiversity or agriculture.
Safety	Accidents	-	The impact this option is likely to have on modal shift and therefore change in vehicle kilometres and accident rates is minimal.

	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services improved facilities on the buses could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	✓	<p><u>Travel time savings</u>: This option is not expected to impact on this sub-criterion.</p> <p>User charges including fares, parking charges and tolls: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: Potentially reduced operating costs associated with fuel efficient vehicles.</p> <p><u>Quality benefits to transport users</u>: High quality, new vehicles would provide a moderate benefit to users.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investments in new fleet would be required.</p> <p><u>Operating and maintenance costs</u>: Operating and maintenance costs may be reduced by the new, more efficient fleet.</p> <p><u>Revenues</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: Option would result in reduced operating and maintenance costs. This would be a minor benefit for TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	-	This option is not anticipated to impact on Transport Integration.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice.

			This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	Although this option would make bus travel more accessible by improving the attractiveness of bus travel, public transport coverage would not be improved by this option and it is therefore considered neutral.
	Comparative	-	Buses designed to carry over 22 passengers on local and scheduled routes must comply with the Public Service Vehicles Accessibility Regulations (PSVAR), and coaches must comply from 1st January 2020. This option would therefore not make any changes likely to improve access for socially excluded groups as the services should already be compliant with regards to accessibility.
Implementability			
Feasibility	Technical		Discussions with bus operators will be required. This will include investigations into funding availability and identifying suitable options for routes. This is considered a moderate consideration.
Affordability	Financial		This option would require some initial capital funding to purchase the vehicles, however this is a small-scale scheme with operating costs covered by the operators. There is no expectation of ongoing costs to support this option.
Public Acceptability			This option is expected to be widely welcomed by the public.
Rationale for Selection or Rejection			
<p>This option has minimal impact on the study TPOs however it does contribute to the STAG criteria. Given the minor benefits associated with Integration and Accessibility this option is recommended for further consideration as part of a package.</p> <p>Progressed as a Complementary Option</p>			

Table 6. Option 6 - Segregated, Designated Walking and Cycling Routes

Appraisal Summary Table	
Option number	6 - Complementary
Option name	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and Park and Choose sites and rail stations.
Option description	Segregated, designated walking and cycling routes to key destinations such as the City Centre, University and Park and Choose sites and rail stations.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	This option would provide segregated, designated walking and cycling routes to key destinations including to employment and education opportunities. This would provide a minor benefit for TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Segregated walking and cycling routes would be utilised to travel to and from Park and Ride sites and reducing the modal share of cars entering, leaving or passing through the Stirling City Area. This is considered to be a minor benefit for TPO2.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	Segregated walking and cycling routes would be utilised to travel to and from train stations which would give access to the strategic rail network. This would make sustainable modes more attractive and potentially more competitive. This is considered to have a minor benefit for TPO3.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Improved cycling and walking routes may encourage increased use of services with the potential for minor changes in use of other modes of transport such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option. Dependent on site locations, currently unknown.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.
	Landscape	✗ and ✓	Assuming careful design and use of materials and signage the effects on landscape and townscape are unlikely to be significantly adverse and may be positive. An overall reduction in vehicular traffic may lead to a minor positive effect in townscape urban areas at peak traffic times.
	Visual Amenity	✗ and ✓	Assuming careful design and use of materials and signage the effects on visual amenity are unlikely to be significantly adverse and may be positive. An overall reduction in vehicular traffic may lead to a minor positive effect in visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option. Dependent on site locations, currently unknown.
	Cultural Heritage	✗ and ✓	Assuming careful design and use of materials and signage the effects on townscape and the setting of designated sites and buildings are unlikely to be significantly adverse and may be positive. The proposals have the potential to affect as yet unknown archaeology, depending on location. Assuming suitable mitigation through site investigation, location and design there are unlikely to be significant effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.

	Physical Fitness	✓	Measures which support existing and promote wider access to walking and cycling routes will increase levels of overall physical fitness through modal shift choice
	Summary	✓	Further environmental assessment and mitigation will be required based on more detailed design. Assumes appropriate mitigation for physical impacts as a result of changes to implemented segregated routes.
Safety	Accidents	✓✓	This option would provide segregated, designated walking and cycling routes to key destinations including to employment and education opportunities. This would encourage a modal shift from car to walking and cycling which would reduce the number of vehicle accidents and would also reduce car and pedestrian/cyclist interaction which would also contribute to reduced accidents. Appropriate design should be adopted to reduce any accidents associated with pedestrian and cyclist interaction.
	Security	-	Depending on the route, segregation may result in a reduction in natural surveillance (as the location may be away from busy roads and residential areas) and therefore a real or perceived sense of reduced security, however, an increased feeling in safety may lead to increased numbers using the route to counter this. On balance, this is considered neutral.
Economy	TEE	✓	<p><u>Travel time savings</u>: Depending on the new routes and how direct they are to key destinations then journey times may be improved. A reallocation of road space may result in increased road journey times.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: Segregated, high quality routes would be a moderate quality benefit.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment in land, design and construction costs required.</p> <p><u>Operating and maintenance costs</u>: Maintenance costs associated with ensuring the routes remain safe and maintained.</p>

			<p><u>Revenues</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in low benefits but would have relatively low costs. This would be a minor positive impact on TEE.</p>
	Wider Economic Benefits	✓	This option would improve connections to the city centre, train stations, employment centres and educational facilities which would improve employment opportunities within the area resulting in a positive impact on Wider Economic Impacts.
Integration	Transport	✓	This option would promote integration between walking/cycling and public transport services by improving connections to Park and Ride and train stations. This would be a minor benefit to Transport Integration.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓✓	Improved walking and cycling facilities would be a moderate benefit to community accessibility as it would directly impact on local accessibility. Improved connections to the city centre, train stations and educational facilities would provide improved local accessibility to key services.
	Comparative	✓	Segregated cycle and walking routes may improve the perception of safety for more vulnerable groups and therefore improve access for some socially excluded groups. This is considered a minor benefit.

Implementability		
Feasibility	Technical	The delivery of the option will be largely dependent on the routing and scale of the routes however it is not envisaged there would be any technical obstacles to this option. Although there may be challenges associated with land availability, ownership and maintenance. Operationally, this option may impact the network efficiency and operation of junctions where conflicts between different modes occur.
Affordability	Financial	For short distance connections, the costs associated with this option would be relatively low however ongoing maintenance would be required to ensure the facilities are safe and attractive to users.
Public Acceptability		Generally, this option will be supported by the general public however there may be areas where road space or parking is impacted by cycle routes which may lead to a negative response.
Rationale for Selection or Rejection		
<p>This option is considered to impact positively on the study TPOs to varying degrees and is therefore recommended for further consideration in the Detailed Appraisal. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.</p> <p>Progressed as a Complementary Option</p>		

Table 7. Option 7 - Widen the Bike Share Scheme Cordon out of the City

Appraisal Summary Table	
Option number	7 - Complementary
Option name	Widen the Bike Share Scheme Cordon out of the City
Option description	Widen the bike share scheme cordon out of the city
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	Depending on the locations of the bikeshare sites, this option could impact positively on TPO1 by providing access to bikes to travel to healthcare, education, employment and training opportunities. To maximise the benefit of this option it could be combined with improved infrastructure.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	A wider bikeshare Corden could encourage the use of bike hire to/from park and choose sites. This could reduce the modal share of cars entering, leaving or passing through the Stirling City Area. This is considered to be a minor benefit for TPO2.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	A wider bikeshare cordon could be utilised to travel to and from train stations which would give access to the strategic rail network. This would make sustainable modes more attractive and potentially more competitive. This is considered to be a minor impact for TPO3.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Improved cycling and walking routes may encourage increased use of services with the potential for minor changes in use of other modes of transport such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	Improved public transport facilities have potential for minor changes to local habitats from construction and permanent development works which it is assumed would be mitigated during planning and construction phases. No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.
	Landscape	✓	There are unlikely to be any adverse effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There are unlikely to be any adverse effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There are unlikely to be any adverse effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Measures which support existing and promote wider access to bikes and cycling routes will increase levels of overall physical fitness through modal shift choice
	Summary	✓	Further environmental assessment and mitigation will be required based on more detailed design. Assumes appropriate mitigation for physical impacts from additional bikeshare terminals.
Safety	Accidents	-	As a standalone option this is unlikely to provide a benefit for accidents and would require packaging with improved infrastructure to encourage modal shift and safer cycling/walking.

	Security	✓	Increased bicycle use will lead to improved natural surveillance on cycle routes which may have a marginal improvements for security.
Economy	TEE	✓✓	<p><u>Travel time savings</u>: This option would increase the mode choice and journey times would be reduced by those who do not currently have access to bikes.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: Car sharing may result in reduced reliability of transport options as the car sharing is not dependent on fixed times/routes.</p> <p><u>Investment costs</u>: Investment in marketing may be required to promote car sharing.</p> <p><u>Operating and maintenance costs</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Revenues</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in moderate benefits with minimal costs. This would be a moderate positive impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	✓	Widening the bikeshare network would promote integration between cycling and public transport services by improving connections to Park and Ride and train stations from outlying communities/employers. This would be a minor benefit to Transport Integration.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration

	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓	As a standalone option this is unlikely to provide a benefit for community accessibility and would require packaging with improved infrastructure to improve local accessibility. As a standalone option this is considered a minor benefit.
	Comparative	✓	Widening the bikeshare corridor would improve access to bikes for those in socially excluded groups with no access to a bike. This would be a minor benefit for comparative accessibility.
Implementability			
Feasibility	Technical		This option would require discussions with bikeshare operators to discuss potential locations for widening the network. Locations would be reviewed based on potential demand for the service. Widening the network also increases the potential requirement to move bikes between stations to balance supply and demand.
Affordability	Financial		Affordability will be dependent on the number of additional stations and also the demand at each additional station to generate revenue. This is a minor consideration.
Public Acceptability			Generally, this option is expected to be well received by the general public.
Rationale for Selection or Rejection			
<p>This option is considered to impact positively on the study TPOs is therefore recommended for further consideration in the Detailed Appraisal. The option would, however, benefit from packaging with further options to maximise the effectiveness (for example, improved cycling infrastructure) and it is therefore recommended as a complementary option which may support Core options in a package.</p> <p>Progressed as a Complementary Option</p>			

Table 8. Option 8 - Improve Bus and Cycle Integration

Appraisal Summary Table	
Option number	8 - Complementary
Option name	Improve Bus and Cycle Integration
Option description	Improve bus and cycle integration at bus shelters and on buses by allowing bikes on buses and installing cycle parking at shelters
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Culterhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Culterhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		-	This option would improve integration between bus and cycling by providing cycle parking at bus shelters and allowing bicycles on buses. This option is not expected to impact on TPO1 as it does not improve the access for residents from the identified communities.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	This option is expected to have a minor impact on TPO2 by providing the opportunity to integrate bike and bus travel which may make sustainable travel more attractive for trips into Stirling.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	This option is expected to have a minor impact on TPO3 by providing the opportunity to integrate bike and bus travel which may make trips to access the strategic rail network more competitive.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	-	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	-	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Improved cycling and bus integration may encourage increased use of services with the potential for minor changes in use of other modes of transport such as private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity or habitats are predicted for this option.
	Landscape	✓	There are unlikely to be any adverse effects on landscape or townscape, assuming careful location and design of facilities. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There are unlikely to be any adverse effects on visual amenity, assuming careful location and design of facilities. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There are unlikely to be any adverse effects on cultural heritage, assuming careful location and design of facilities. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Measures which support and promote cycle use and integration with other travel options for longer journey will increase levels of overall physical fitness through modal shift choice
	Summary	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality / water quality and landscape and visual impacts.
Safety	Accidents	-	The impact this option is likely to have on modal shift and therefore change in vehicle kilometres and accident rates is minimal.
	Security	-	This option is not anticipated to impact on security.

Economy	TEE	✓	<p><u>Travel time savings</u>: Improved integration between bus and cycling would improve journey times by allowing for bikes to be used at both ends of a journey and time saved securing a bike at bus stops.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment in vehicles shelters would be required.</p> <p><u>Operating and maintenance costs</u>: Maintenance costs associated with cycle parking would be required.</p> <p><u>Revenues</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in low benefits but would have relatively low costs. This would be a minor positive impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	✓	This option would promote integration between bus and cycle use by improving facilities for interchanging between the modes. This would be a minor benefit.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.

Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	-	This option will have no impact on comparative accessibility.
Implementability			
Feasibility	Technical	Discussions with bus operators will be required. This will include investigations into funding availability and identifying suitable routes to trial the scheme. This is considered a moderate consideration.	
Affordability	Financial	This option would require some initial capital funding to purchase the vehicles and install bike parking, however this is a small-scale scheme with operating costs covered by the operators. There is no expectation of ongoing costs to support the buses however maintenance of the parking would be required.	
Public Acceptability		This option is expected to be widely welcomed by the public if there is no impact on bus operations and availability on buses for wheelchairs, prams and passengers.	
Rationale for Selection or Rejection			
This option is considered to impact positively on the TPO2 is therefore recommended for further consideration in the Detailed Appraisal. The option would, however, benefit from packaging with further options to maximise the effectiveness (for example, improved cycling infrastructure) and it is therefore recommended as a complementary option which may support Core options in a package.			
Progressed as a Complementary Option			

Table 9. Option 9 - Create a Multi-Modal Ticketing System and Optimise Pricing Structure

Appraisal Summary Table	
Option number	9 - Complementary
Option name	Create a Multi-Modal Ticketing System and Optimise Pricing Structure
Option description	Create a multi-modal ticketing system and optimise pricing structure
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	This option includes creating a multi-modal ticketing system and optimising the pricing structure. This would improve access to the transport network, and therefore access to healthcare, employment, education and training for residents of the identified communities. This would be a minor positive impact.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Creating a multi-modal ticketing system which is more affordable will make it more attractive in terms of cost and also ease-of-use. This is anticipated to encourage a modal shift from car to sustainable modes and a minor positive impact on TPO2.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	Creating a multi-modal ticketing system which is more affordable will make it more competitive in terms of cost compared to the private car. The multi-modal component would also ensure it is usable for both the bus (to access the rail station) and rail (to access the Central Belt). This would be a minor positive impact on TPO3.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	-	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Improved ticketing and pricing structures may result in the potential for reduction in use of other modes of transport such as individual private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	There would be no effects on biodiversity and habitats.
	Landscape	✓	There would be no effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There would be no effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There would be no effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Measures which support and promote integration with a range of travel options will increase levels of overall physical fitness through modal shift choice / walking or cycling at either ends of a journey
	Summary	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality / water quality and landscape and visual impacts.
Safety	Accidents	✓	Creating a multi-modal ticketing system which is more affordable will make it more attractive in terms of cost and also ease-of-use. This is anticipated to encourage a modal shift from car to sustainable modes, reduced vehicle kilometres and therefore accidents.

	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers at stops and on services could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	X	<p><u>Travel time savings</u>: Small journey time reductions due to reduced time spent purchasing tickets.</p> <p><u>User charges including fares, parking charges and tolls</u>: Benefit for user charges associated with optimising the pricing structure.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Ticket machines in vehicles should be compatible with multi-modal ticketing systems however investment may be required in a back office system.</p> <p><u>Operating and maintenance costs</u>: Ongoing maintenance and operating costs of the back office would be required.</p> <p><u>Revenues</u>: An integrated ticketing system would likely increase patronage on bus and rail networks, however, this may be offset by any reductions in ticket prices associated with optimising the pricing structure.</p> <p><u>Grant and subsidy payments</u>: The impact on this criterion would be dependent on the back-office system, ownership for operating the system and any subsidies to support optimising the pricing structure. This is likely to be a moderate negative impact.</p> <p><u>Summary</u>: This option would result in low benefits with significant costs associated with subsidies, this would be a minor negative impact.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	✓✓✓	The purpose of a multi-modal ticketing system is to promote integration between modes. This option would streamline the ticketing system for those wishing to travel on more than one mode and would be a major benefit to transport integration.

	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	✓	Optimising the pricing structure, and therefore potentially reducing the cost may have a minor benefit on those with reduced income levels. This would provide improved access to the public transport network and be a minor benefit.
Implementability			
Feasibility	Technical	This option would involve existing technologies readily available or already installed on all buses and rail stations. Negotiations with and agreements between operators would be required to ensure buy in the scheme and agree shared revenue and data (if appropriate). Bus operations in Stirling are commercial and fares are not regulated. Reductions in bus fares would require negotiations with bus operators and a financial impact on the operators. Rail fares are currently regulated by the existing franchise agreement however there has been no recent review of the existing fares these regulations rely upon. The review of wider rail fares would require a national approach and is outwith the scope of this study.	
Affordability	Financial	This option would require regular maintenance and management of a back office. A wide marketing campaign would also be required to maximise the effectiveness of the project.	
Public Acceptability		Generally, this option is expected to be well received by the general public.	

Rationale for Selection or Rejection

This option is being progressed at a Scottish level by Transport Scotland. This option would contribute to the TPOs but its delivery is not appropriate for this study scope.

Not Progressed to Detailed Appraisal

Table 10. Option 10 - Promote Activities to Encourage More Sustainable Travel

Appraisal Summary Table	
Option number	10 - Complementary
Option name	Promote Activities to Encourage More Sustainable Travel
Option description	Investigate and promote, if applicable. activities to encourage more sustainable travel, for example, travel plans, car-free days and incentives to leave the car at home.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Culterhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Culterhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓	Promoting activities to encourage more sustainable travel, and, in particular, travel plans for education and healthcare facilities are expected to improve access for the communities identified. This would be a minor positive benefit for TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Promotion of sustainable travel and associated incentives to leave the car at home would result in increased numbers trialling active and public transport which may result in longer-term modal shift. This would be a minor positive benefit for TPO2.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	Low Emission Zones may result in increased costs associated with private car use. This would improve the competitiveness of sustainable modes compared to the private car.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	-	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Sustainable travel incentives may result in the potential for reduction in use of other modes of transport such as individual private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	There would be no effects on biodiversity and habitats.
	Landscape	✓	There would be no effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There would be no effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There would be no effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Measures which support existing and promote wider access to walking and cycling routes and travel choices e.g. rail and bus will increase levels of overall physical fitness through modal shift choice
	Summary	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality / water quality and landscape and visual impacts.
Safety	Accidents	✓	Promotion of sustainable travel and associated incentives to leave the car at home would result in increased numbers trialling active and public transport which may result in longer-term modal shift. This is anticipated to encourage a modal shift from car to sustainable modes, reduced vehicle kilometres and therefore accidents.

	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers on public transport services could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	✓✓	<p><u>Travel time savings</u>: Uptake of the promotions may result in shifts to sustainable modes, a reduction of vehicle traffic and subsequent reduction in car journey times.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment costs will be dependent on the scale of the intervention, from low level costs associated with promoting car free days through to the major consideration of LEZs and WPLs.</p> <p><u>Operating and maintenance costs</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Revenues</u>: Encouraging more sustainable travel may result in increased bus and rail use and associated increases in revenue.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in moderate benefits with low costs to implement and promote. This would be a moderate positive benefit for TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	✓	Initiatives identified as part of this option may include journeys which require interchanging between modes, such as park and ride, and would have a minor benefit on transport integration.

	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	-	This option may improve information provision to some of the socially excluded groups, however this impact is expected to be negligible.
Implementability			
Feasibility	Technical	The deliverability of these options will vary from low level interventions required to incentivise car-free days in the city and travel plans for large employers through to the delivery of Low Emission Zones which will require legal enforcement for delivery.	
Affordability	Financial	As above, the affordability will be dependent on the scale of the intervention, from low level costs associated with promoting car free days through to the major consideration of LEZs.	
Public Acceptability		As above, public acceptability will also be influenced by the scale of intervention, in particular, changes which impact on travelling into the town centre by private car is likely to have an element of negative public response.	
Rationale for Selection or Rejection			
This option is considered to impact positively on the study TPOs and is therefore recommended for further consideration in the Detailed Appraisal. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.			
Progressed as a Complementary Option			

Table 11. Option 11 - Community Transport Improvements Targeted at Interchange Opportunities

Appraisal Summary Table	
Option number	11 - Complementary
Option name	Community Transport Improvements Targeted at Interchange Opportunities
Option description	Support improvements in the Community Transport offering and target movements to and from interchange opportunities
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Culterhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Culterhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓✓	Improvements to community transport offerings in the study area could be used in place of fixed route services and provide access to healthcare, employment, education and training for residents.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓	Although improved community transport availability and access will provide an alternative mode choice which may results in a reduction in the modal share of cars entering, leaving or passing through the Stirling City Area the target market is expected to be limited and therefore the benefits are also expected to be limited. Minor positive benefit.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		-	Although improved community transport availability and access will improve the competitiveness of sustainable modes, especially in areas where fixed route services are limited, the target market is expected to be limited and therefore the benefits are also expected to be minimal.
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Community transport initiatives may result in the potential for reduction in use of other modes of transport such as individual private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity are predicted for this option.
	Landscape	✓	There would be no effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There would be no effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There would be no effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Greater vehicle sharing / shuttle services to key locations etc should reduce overall numbers of private cars within the study area which may encourage others to walk and cycle more.
	Summary	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality / water quality and landscape and visual impacts.
Safety	Accidents	-	The impact this option is likely to have on modal shift and therefore change in vehicle kilometres and accident rates is minimal.
	Security	✓	This option would improve transport access for communities, including those without direct or regular access to interchanges. This would reduce the interchange and wait time at stops and reduce perceived and real security concerns.

Economy	TEE	-	<p><u>Travel time savings</u>: Connections to interchanges using community transport would lead to journey time benefits by reducing the connection and interchange time to access the bus and rail network.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: There would be increased operating costs for community transport vehicles associated with the increased offering.</p> <p><u>Quality benefits to transport users</u>: This option is not likely to impact on this sub-criterion as existing or similar vehicles are expected to provide the services.</p> <p><u>Reliability benefits to transport users</u>: The reliability of access to the bus and rail network would be improved with this option.</p> <p><u>Investment costs</u>: Additional fleet may be required.</p> <p><u>Operating and maintenance costs</u>: This option would require additional service operating and maintenance running costs.</p> <p><u>Revenues</u>: Option would result in increased access to the bus and rail network and patronage on bus services leading to increased passenger numbers and additional revenue.</p> <p><u>Grant and subsidy payments</u>: An increase in subsidy may be required to increase the service provision.</p> <p><u>Summary</u>: This option is considered to be a minor cost with minor benefits, resulting in a neutral TEE.</p>
	Wider Economic Benefits	✓	<p>This option would provide direct connections to the rail network for communities not currently connected. This would allow for improved access to employment and education opportunities, particular for communities currently identified as having lower economic activity. This would have a minor positive impact on Wider Economic Impacts.</p>
Integration	Transport	✓✓	<p>This option integrates community transport and interchanges which will significantly improve integration between modes by ensuring interchanges are accessible. This is a moderate benefit.</p>
	Transport/Land Use	-	<p>This option would have a neutral impact on Transport and Land Use Integration</p>

	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	✓✓	This option would provide improved public transport coverage for those communities served by the improved Community Transport offerings. This connection to interchanges would provide connections to services and would be a moderate benefit.
	Comparative	✓✓	This option would provide access to transport interchanges to communities with no current access which would include socially excluded and vulnerable groups, including the elderly. This would provide a link to the strategic transport network and be a moderate benefit.
Implementability			
Feasibility	Technical	Demand Responsive Travel is currently available in rural Stirling. The service is funded by Stirling Council and delivered by a number of local taxi operators and Dial-a-journey. The service covers a wider area of Rural Stirling, including the Carron Valley, however it is not available within the study area. This option would require a commitment and resources from Stirling Council and partnerships with operators to widen the geographical scope of DRT delivery and could be considered to support existing fixed route services.	
Affordability	Financial	Using the existing management system, this option will require relatively low capital expenditure and low operating costs.	
Public Acceptability		Generally, this option is expected to be well received by the general public.	

Rationale for Selection or Rejection

This option is considered to impact positively on the study TPOs and is therefore recommended for further consideration in the Detailed Appraisal. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.

Progressed as a Complementary Option

Table 12. Option 12 - Manage Parking in the City Centre with Policy Changes

Appraisal Summary Table	
Option number	12 - Complementary
Option name	Manage Parking in the City Centre with Policy Changes
Option description	Manage parking policy in the city centre - this could include a review of parking prices in the city and P&C fares. The Community Parking Management Plan has recently been approved and this option is therefore not to be appraised.
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Culterhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Culterhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives		
TPOs	Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have a neutral impact on TPO1
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓✓✓	Increased parking charges in central Stirling would have a major positive impact on TPO2. The increased cost of parking would reduce the attractiveness of private car travel going into Stirling and encourage a modal shift from car to public transport or car sharing.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓✓	Increased parking charges in central Stirling would have a moderate positive impact on TPO3. The increased cost of parking would make sustainable modes more competitive compared to car, however, this TPO focuses on strategic travel to the Central Belt, therefore, this option will have a more limited impact on TPO3 only capturing trips coming into Stirling.
Rationale for Selection or Rejection		
<p>This option makes a significant contribution to two of the study TPOs, however, the Community Parking Management Plan has recently been approved and this option is therefore not recommended for further investigation as it is being addressed elsewhere.</p> <p>Not Progressed to Detailed Appraisal</p>		

Table 13. Option 13 - Technological Improvements to Improve Flow of Traffic

Appraisal Summary Table	
Option number	13 - Complementary
Option name	Technological Improvements to Improve Flow of Traffic
Option description	<p>Technological improvements to improve flow of traffic:</p> <ul style="list-style-type: none"> • Intelligent Transport Systems directing to P&R with spaces • Traffic light prioritisation for public transport • Bus real time information
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs	Scoring	Rationale for scoring	
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.	-	This option would have a neutral impact on TPO1	
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.	✓✓	The technological improvements identified would improve the journey times and reliability of bus services. Intelligent signposting to P&C sites with spaces would also reduce any anxiety associated with getting a space. These interventions would encourage modal shift to sustainable modes and reduce car travel into, out of and passing through Stirling City.	
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt	✓	The technological improvements identified would improve the journey times and reliability of bus services. This would improve the competitiveness of sustainable modes compared to private car travel. This would be a minor positive benefit.	
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to a reduction in congestion and overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	✓	Measures which lead to a reduction in congestion and overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to a reduction in congestion and overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Technological improvements may encourage use of P&R and bus services in preference to other modes of transport such as individual private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity are predicted for this option.
	Landscape	✓	There would be no effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There would be no effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect in visual amenity of urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There would be no effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Measures which lead to an overall reduction in vehicular traffic are likely to encourage more people to walk and cycle if they feel safer through related technological changes which support modal shift and active travel.
	Summary	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality / water quality and landscape and visual impacts.
Safety	Accidents	-	The technological improvements identified would improve the journey times and reliability of bus services. Intelligent signposting to P&C sites with spaces would also reduce any anxiety associated with getting a space. These interventions would encourage modal shift to sustainable modes, vehicle kilometres and therefore accidents.

	Security	-	There are not anticipated to be any significant improvements to security associated with this option. Natural surveillance from increased passenger numbers on public transport services could have a positive impact on real and perceived improvements to security, however, this is considered to be marginal.
Economy	TEE	-	<p><u>Travel time savings</u>: Traffic light prioritisation and ITS directing car drivers to appropriate parking facilities would reduce journey times.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: Traffic light prioritisation would improve journey time reliability for buses.</p> <p><u>Investment costs</u>: The affordability of the scheme will be largely dependent on the options and scale taken forward. These are moderate impacts however the technological improvements could deliver results at a lower cost than infrastructure improvements.</p> <p><u>Operating and maintenance costs</u>: This option would require moderate ongoing operating and maintenance costs of equipment installed.</p> <p><u>Revenues</u>: Encouraging more sustainable travel may result in limited increases in bus and rail use and associated increases in revenue.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in minor benefits with, potentially, relatively high costs to implement and maintain. This would be a neutral impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	✓	Improved journey time reliability will improve transport integration between bus and rail, this will be a minor benefit. The ITS system also promotes integration by promoting the P&R site availability.

	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration
	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	-	This option would have no impact on comparative accessibility.
Implementability			
Feasibility	Technical	It is not envisaged that there would be any technical obstacles to this option as it utilises existing technologies which have been successfully implemented in other areas.	
Affordability	Financial	The affordability of the scheme will be largely dependent on the options and scale taken forward. These are moderate considerations however the technological improvements could deliver results at a lower cost than infrastructure improvements.	
Public Acceptability		Although there are expected to be minor private car journey time increases the options are expected to be well received by the general public.	
Rationale for Selection or Rejection			
This option is considered to impact positively on the study TPOs and is therefore recommended for further consideration in the Detailed Appraisal. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.			
Progressed as a Complementary Option			

Table 14. Option 14 - Improve Lift Share Offering in the Study Area

Appraisal Summary Table	
Option number	14 - Complementary
Option name	Improve Lift Share Offering in the Study Area by Incentivising Lift Sharing
Option description	Improve the lift share offering in the study area by incentivising lift sharing
Background Information	
Geographic Context	<p>The Stirling City Area is located in the heart of Scotland with a population of approximately 55,000 (2018). The area comprises Stirling City, Bridge of Allan, Bannockburn and the 'Eastern Villages' of Plean, Cowie and Fallin.</p> <p>Stirling currently benefits from stations on the rail network and regular, direct connections to Scotland's other cities. The bus station is also served by strategic coach connections. Access to these strategic transport connections is has been identified as an issue for some of the population in the study area.</p> <p>Stirling City area is forecast to grow with an ambitious Local Development Plan leading to increased growth in population and jobs in the area above the Scottish average. The major development sites are largely around the western, southern and eastern edges of the city including Strategic Development Sites at South Stirling Gateway (800 homes) and Durieshill (2,500 homes) plus employment land.</p>

Social Context	<p>The scale of the study area masks some of the differences in the demographic make-up of the population. In many indicators, the average for Stirling is on par for the Scottish average, however, there are discrepancies across the geographical area including that 20% of the study area's datazones are considered to be within Scotland's most deprived (using the overall index of deprivation). These factors include access to services, education and employment. Some of these areas (Cowie and areas in Bannockburn, Cornton and Cultenhove) are also within the lowest 40% of national datazones in terms of access to facilities.</p> <p>Car availability also highlights that there are pockets of low ownership across the study area and concentrated in the city centre and Raploch area of the city where no access to car is at 56% and 54% respectively.</p> <p>The study area includes Stirling city centre and associated employment opportunities including Stirling University, Forth Valley College, urban small & medium-sized enterprises (SMEs) along with the tourist industry of Stirling City.</p> <p>There are a number of food, technology and finance businesses in the study area with major employers including Prudential, Capita, Graham's Family Dairies and the Scottish Environment Protection Agency and approximately 33,000 employees in the study area.</p>
Economic Context	<p>Stirling is a major tourism destination in Scotland with attractions including Stirling Castle, The National Wallace Monument and the Bannockburn Centre. In 2014, there were 4 million visitors to the Stirling area.</p> <p>Stirling is also home to the University of Stirling which has 14,000 students and 1,500 staff with plans to grow. Growth plans include the development of a new sports complex on campus reinforcing Stirling University's role as Scotland's University for Sporting Excellence and City Regional Deal funding for two research hubs at the University; £17 million for a new Aquaculture Hub and £5 million for an International Environment Centre (across sites in Alloa and at the university). Forth Valley College, Stirling Campus is located on Drip Road, close to Craigforth and is attended by approximately 800 full time students, 100 employees and includes two evenings of classes a week in addition to term time day classes.</p> <p>The proportion of unemployed persons in the Stirling City Area is 5%, which is in line with the Scottish average. Higher levels of unemployment are found in the Raploch area, Cornton, Cultenhove, Plean and Fallin which overlaps with the below average access to car/van. Similarly, areas of Tullibody and Alloa also show a high level of unemployment overlapping with below average access to car/van.</p>

Performance against Transport Planning Objectives			
TPOs		Scoring	Rationale for scoring
TPO1: Improve transport access to healthcare, employment, education and training for residents of Plean, Cowie, Fallin, Bannockburn and Cornton.		✓✓	The communities identified in TPO1 have below average car ownership. This option would provide access to lift sharing for those who do not currently have access to cars. In particular, this option is considered to be of greater benefit for regular journeys and may improve access to employment and education opportunities. This is considered a moderate benefit for TPO1.
TPO2: Support LDP and CRD growth aspirations by reducing the modal share of cars entering, leaving or passing through the Stirling City Area.		✓✓	Currently 70% of trips to work in the study area are car/van drivers and 6% are passengers. This is a significant target market for lift sharing and encouraging car drivers to consider the move could result in a significant reduction in cars entering the Stirling City Area. This represents a moderate benefit for TPO2.
TPO3: Improve the competitiveness of sustainable modes compared to the private car for strategic trips between Stirling City Area and key origins/destinations in the Central Belt		✓	Benefits of lift sharing include reduced fuel costs and parking fees. These savings contribute towards making lift sharing more competitive compared to private car use and a minor benefit for TPO3
Performance against STAG criteria			
Criterion	Sub-criterion	Sub-criterion score	Rationale for scoring
Environment	Noise and Vibration	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of noise and vibration levels along key routes
	Global Air Quality (CO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of global air quality.
	Local Air Quality (PM10 and NO2)	✓	Measures which lead to an overall reduction in vehicular traffic may lead to a minor positive effect in terms of local air quality along key routes

	Water quality, Drainage and Flood defence	✓	Improved lift sharing offering may encourage increased use of services with the potential for reduction in use of other modes of transport such as individual private cars, with the potential for very minor improvement of runoff quality from roads and urban areas.
	Geology	-	No significant effects on geology or geological/material resources are predicted for this option.
	Biodiversity and Habitats	-	No significant effects on biodiversity or habitats are predicted for this option.
	Landscape	✓	There would be no effects on landscape or townscape. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape in urban areas at peak traffic times.
	Visual Amenity	✓	There would be no effects on visual amenity. An overall reduction in vehicular traffic may lead to a minor positive effect on visual amenity in urban areas at peak traffic times.
	Agriculture and Soils	-	No significant effects on agriculture and soils are predicted for this option.
	Cultural Heritage	✓	There would be no effects on cultural heritage. An overall reduction in vehicular traffic may lead to a minor positive effect on townscape and the setting of designated sites and buildings in urban areas at peak traffic times.
	Physical Fitness	✓	Greater lift sharing activity should reduce overall numbers of private cars within the study area which may encourage others to walk and cycle more.
	Summary	✓	Minor positive impacts are anticipated for noise, global air quality, local air quality, water environments, landscape, visual amenity and cultural heritage. No material changes are expected in relation to biodiversity, geology or agriculture.
Safety	Accidents	Negligible	Currently 70% of trips to work in the study area are car/van drivers and 6% are passengers. Improving the lift sharing offering and encouraging car drivers to consider the move could result in a significant reduction in cars entering the Stirling City Area. This would result in reduced vehicle kilometres and therefore accidents.

	Security	X	Lift sharing sites are aware of concerns regarding car sharing and provide advice on approaches to take to minimise risk. This advice includes not sharing personal details until the relationship is established and making use of secure messaging. Following the recommended guidance should minimise any risks but there is likely to still be a level of perceived risk.
Economy	TEE	✓	<p><u>Travel time savings</u>: Journey times would be reduced by those who do not currently have access to a car.</p> <p><u>User charges including fares, parking charges and tolls</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Vehicle operating cost changes for road vehicles</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Quality benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Reliability benefits to transport users</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Investment costs</u>: Investment in lift share back office systems.</p> <p><u>Operating and maintenance costs</u>: There would be maintenance and operating costs for maintaining the lift share service and web back office.</p> <p><u>Revenues</u>: No impact.</p> <p><u>Grant and subsidy payments</u>: This option is not expected to impact on this sub-criterion.</p> <p><u>Summary</u>: This option would result in low benefits but would have relatively low costs. This would be a minor positive impact on TEE.</p>
	Wider Economic Benefits	-	This option is not considered to impact on Wider Economic Impacts
Integration	Transport	-	This option is not anticipated to impact on Transport Integration.
	Transport/Land Use	-	This option would have a neutral impact on Transport and Land Use Integration

	Policy	✓✓	This option aligns with transport policy from national to local level, particularly in relation to promoting sustainable mode use over private car by improving mode choice. This supports sustainable travel choice over the private car, improving access to opportunities, inclusiveness and provides benefits for health and the environment.
Accessibility	Community	-	This option would have no impact on community accessibility.
	Comparative	✓✓	The study area includes area identified as having below average access to cars. This option would provide access to lift sharing for those who do not currently have access to cars and a wider geographical coverage than that currently provided by public transport. This is considered a moderate benefit.
Implementability			
Feasibility	Technical	This option would require further promotion of the Enterprise Car Club operational in Stirling and the LiftShare scheme. This could include additional social media promotion of the initiatives and potentially incentives to trial the services.	
Affordability	Financial	Costs associated with this option would be minimal and include promotional costs including the costs of incentives and trials.	
Public Acceptability		Generally, this option is expected to be well received by the general public.	
Rationale for Selection or Rejection			
This option makes a positive contribution to TPOs by providing access to lift sharing which would improve access for communities with low car ownership. Longer term, the provision of alternatives to private car ownership can help to unseat embedded car use, encouraging the use of a wider range of sustainable modes. However, the scale of modal shift and impact associated with this option is considered to be relatively low and it is therefore recommended as a complementary option which may support Core options in a package.			
Progressed as a Complementary Option			

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Abidjan, Douala, Johannesburg, Kinshasa, Libreville, Nairobi

Latin America:

Lima, Mexico, Rio de Janeiro, Santiago, São Paulo

North America:

Little Falls, Los Angeles, Montreal, New-York, Philadelphia,
Washington

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