A944/A9119 Transport Corridor Study – STAG-Based Appraisal

Executive Summary

On behalf of

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1 Introduction

1.1 Overview

1.1.1 Stantec was appointed by Aberdeen City Council, Aberdeenshire Council and Nestrans, the Regional Transport Partnership for North-East Scotland, to undertake a Scottish Transport Appraisal Guidance (STAG) based study to identify and appraise options for improving transport connections (particularly active travel and public transport connections) between Westhill and Aberdeen City Centre. The study is focused on the key western approaches to the city, the A944 and A9119 (formerly B9119) corridors, and other roads used by public transport services serving the west of the city, reflecting the status of these corridors within the North East Scotland Roads Hierarchy.

1.1.2 The study considers the western approach corridors in a holistic manner, looking at both eastbound and westbound movements recognising development aspirations and pressures in both Aberdeen and Aberdeenshire.

1.1.3 This study is independent of the Westhill to Kingswells Cycle Connectivity study undertaken simultaneously by AECOM, although options identified by that study are integrated within any options further developed as part of this study.

1.2 Approach to the Study

1.2.1 This study does not require a traditional four-stage STAG Appraisal, but rather a focussed and proportionate appraisal underpinned by STAG principles to guide the development of business cases for emerging interventions. As such our approach to the study consists of two amin deliverables:

(i) An ***Initial Appraisal***: Case for Change, outlining the need for intervention, and

(ii) A 'hybrid' ***Preliminary Appraisal***, support by Appraisal Summary Tables (ASTs).

1.2.2 The findings from this high-level appraisal contribute to developing a costed and prioritised programme of effective, feasible and deliverable interventions, for business case consideration and detailed design.

1.2.3 This note provides an executive summary of the two main report deliverables and the work undertaken to date.

2 Initial Appraisal: Case for Change

2.1 Overview

2.1.1 The ***Initial Appraisal: Case for Change*** is a crucial stage in the STAG process, as it provides the evidence base for the transport problems and opportunities that the study should seek to address and forms the basis for objective setting and subsequent option development.

2.1.2 The Case for Change for this study is heavily influenced by the recently published National Transport Strategy 2 (NTS2) which at its core establishes a refreshed approach to assessing the transport network in Scotland and viewing transport as a means by which to reduce social inequalities. A key premise of the NTS2 is that the transport investment decisions should align with the:

- **Sustainable Travel Hierarchy** to ensure projects which support green and inclusive travel are appropriately prioritised; and the
- **Sustainable Investment Hierarchy**, which focuses on promoting behavioural change and making best use of existing assets before investment in new infrastructure.

2.1.3 Options developed in this study will align with these two hierarchies but will be packaged and subject to detailed design and business case development, to select a preferred option package. This study is the equivalent to the Strategic Business Case (SBC) and will provide the information required to develop a business case for any preferred option package

2.1.4 The study area extends from the A944/Westhill Drive roundabout in Westhill eastwards along the A944, beneath the Aberdeen Western Peripheral Route (AWPR) and onwards to Switchback Roundabout. From Switchback roundabout it continues east along both the A944 and A9119 corridors as follows:

- The A944 section crosses the A92 North Anderson Drive and travels past the Aberdeen Royal Infirmary to Mounthooly Roundabout, from which point the study corridor extends south along the A956 Castle Street.
- The A9119 section travels south east along Skene Road, across the A92 and onwards to the Queens Cross Roundabout. From Queen's Cross, the corridor extends east along Albyn Place to join Union Street as far as its junction with Castle Street.

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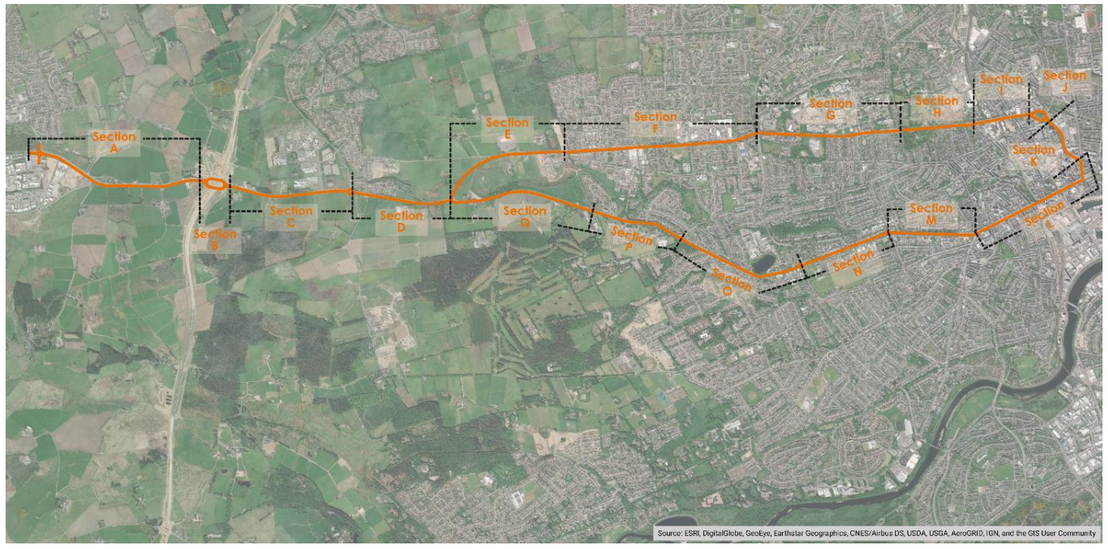
2.1.5 For the purpose of analysis and to help focus interventions, the study corridor was split into 17 sections which were considered similar in nature and bounded by natural breaks such as major junctions.



2.1.6 Both the A944 and A9119 have been assigned as **Priority** route corridors, within the recently revised Roads Hierarchy and, therefore, it is also important to take cognisance of the role of these corridors and to make sure any options identified as part of this study are not detrimental to the ability of the corridors to facilitate their role in the Roads Hierarchy and to avoid diverting traffic onto inappropriate routes.

2.2 Transport Problems and Opportunities

2.2.1 To identify problems and opportunities with the transport network from both the supply-side and from the point of view of a user, two approaches to sourcing the problems and opportunities were adopted:

- site visit and audit; and
- desktop review of ongoing and completed key studies within the area.

Site Visit and Audit

2.2.2 A two-day site visit was undertaken in early February 2020. The corridors were traversed by both bike and by car to identify mode specific problems and opportunities with the supply-side of the transport system, with observations recorded in mode specific *pro formas*, developed combing metrics and indicators from best practice guidance, to assess the network and level of service per mode.

2.2.3 Points to note from the audits include:

- 8 of the 17 sections of the corridor passed the Walking and Wheeling Audit
- 4 of the 17 sections of the corridor passed the Cycling Audit
- 4 of the 17 sections of the corridor passed the Bus Audit.

2.2.4 These audits identified a significant number of problems across the network including inconsistent and incoherent cycling infrastructure, poor surface conditions for pedestrians and cyclists, vehicles parking in advisory cycle lanes & bus lanes and all-round poor level of service for sustainable transport users.

Desktop Review of Key Studies

2.2.5 From our initial review of the documentation, we uncovered **76** problems, **26** issues, **15** constraints and **16** opportunities considered across the range of studies. Many of these observations were consistent or similar in nature so we undertook a process of rationalisation, sifting each of the categories down to a more manageable list.

2.2.6 The resulting list of identified **13 problem themes** from the document review and associated problems is as follows:

- Problem 1: Inconsistent pedestrian infrastructure
- Problem 2: Cycle route infrastructure is disjointed
- Problem 3: Cycle infrastructure is inconsistent in form and quality
- Problem 4: Travel by public bus is not seen as an attractive option
- Problem 5: Bus priority infrastructure is sporadic, and buses are caught in traffic congestion
- Problem 6: Bus stop design and placement
- Problem 7: Kingswells Park and Ride infrastructure is underutilised
- Problem 8: Car travel is perceived as being cheaper than travel by public transport
- Problem 9: Bus network and service frequency are threatened by high car mode share
- Problem 10: Vehicular traffic dominates the city centre
- Problem 11: Poor driver behaviour and misuse of active/bus travel infrastructure
- Problem 12: Significant traffic delays are seen during peak periods
- Problem 13: Extensive development is planned to the western end of the corridor

2.2.7 **12 opportunities** were also identified at this stage and these consist of:

- Opportunity 1: Existing active travel promotional schemes
- Opportunity 2: Policy supports active travel improvements along the A944 and B9119
- Opportunity 3: Existing active travel and bus priority infrastructure on the corridors
- Opportunity 4: Aberdeen has an existing Smart Ticketing System
- Opportunity 5: The Transport (Scotland) Act provides Local Authorities with new powers, including enforcement of pavement parking and bus franchising
- Opportunity 6: National Transport Strategy 2 requires investment is in line with the Sustainable Transport Hierarchy
- Opportunity 7: Availability of External Funding Sources
- Opportunity 8: Kingswells Park and Ride has significant spare capacity
- Opportunity 9: Business Improvement Districts Scheme
- Opportunity 10: Improvements to active travel and reduce congestion already planned
- Opportunity 11: Trip generators and attractors are present along the length of the corridor
- Opportunity 12: New developments may support delivery of transport improvements

2.2.8 There was a high level of consistency between the problems and opportunities identified during the site audit and the review of the previous studies and documents. As such, it was considered that the lists were both appropriate and proportionate and taken forward to stakeholder consultation.

2.3 Case for Change Consultation

2.3.1 The originally planned approach to engagement comprised: (i) stakeholder engagement which would have likely taken the form of a half-day workshop event at a location on the corridor and (ii) views of the public which would have been derived from previous consultation undertaken as part of overlapping studies, to be followed up at the conclusion of the Case for Change with a public drop-in event for feedback on the study outcomes.

2.3.2 Due to the Covid19 Pandemic, however, it was necessary to adapt this approach following the lockdown introduced in mid-March and subsequent social/physical distancing policy. To this end, interactive stakeholder briefing notes were developed. These notes provided a summary of the purpose of the study and key headline statistics uncovered as part of the data analysis and site visits, partly informed by stakeholder and public engagement from previous studies. The note then set out the identified problems and opportunities, as outlined above, before asking the stakeholders a series of questions to capture their views. Four versions of the note were produced for the different stakeholders' groups identified through discussions with the client group as follows:

- General stakeholders;
- Emergency services;
- Community Councils and Elected Members; and
- Public transport operators.

2.3.3 Overall, there was a strong level of validation of the identified problems and opportunities from the stakeholders who responded and thus both sets of lists were taken forward for consideration as part of the objective setting and option generation stages.

2.4 Evidencing the Transport Problems

2.4.1 For each problem theme identified previously, the implied transport problem was then derived from subsequent data analysis and evidence gathering, and this is the problem that objectives and subsequent option generation will address.

2.4.2 As such the resulting process identified the following transport problems from the evidence and analysis of data:

Transport Problem Theme	The Transport Problem
Problem Theme 1: Inconsistent Pedestrian Infrastructure	In some places, facilities for pedestrians make getting around frustrating and inconvenient.
Problem Theme 2: Disjointed Cycle Route Provision	Journeys by bike on designated routes are fragmented and inconvenient.
Problem Theme 3: Inconsistent Cycle routes and infrastructure	In some places facilities for cyclists make getting around frustrating and inconvenient.
Problem Theme 4: Low uptake of Public Transport	Bus Services in the corridors are perceived to be of poor quality.
Problem Theme 5: Lack of Bus Priority Infrastructure	Bus journey times can be long and unreliable.
Problem Theme 6: Issues with Planning / Provision of Bus Stop Infrastructure	Bus operations are hampered by the location of bus stops and facilities at some bus stops are poor.
Problem Theme 7: Kingswells Park and Ride is underutilised	Established park and ride assets are perceived to unattractive and inconvenient.

Problem Theme 8: Car travel is perceived as being cheaper than public transport	Public transport is viewed as too expensive by some.
Problem Theme 9: Extent of bus network threatened by high car mode share	The bus network in the corridors omits areas leading to connectivity gaps.
Problem Theme 10: City Centre is car dominated	The city centre network prioritises vehicular traffic over all other modes.
Problem Theme 11: Poor Driver Behaviour	Intimidation of non-motorised road users.
Problem Theme 12: Traffic Delays	Vehicle based journey times are extended during peak periods in the A944 and A9119 corridors
Problem Theme 13: Land use development	Future growth along the corridors may exacerbate existing problems

2.5 Transport Opportunities

2.5.1 Opportunities with the transport network identified through the study prior to the consultation remained unadjusted for the remainder of the study and thus were simply carried forward through the appraisal.

2.6 Setting Transport Planning Objectives

2.6.1 TPOs were produced for each of the **13** transport problems identified above, with the objectives effectively becoming the inverse of the problems. There was a degree of overlap amongst several of the TPOs, which resulted in several of these TPOs becoming amalgamated. As prescribed by STAG, objective setting is an iterative process and should be refined as the study progresses and they become 'SMART-ened'. Following this guidance, the TPOs were refined and developed to produce a set of **eight** TPOs, each of which was developed with the ability to make them SMART as the study progresses.

2.6.2 The TPOs for this study are as follows:

- **TPO1**: Improve the quality of the pedestrian experience for all, and address the barriers which affect some groups moving around as a pedestrian
- **TPO2**: Improve cycle routes to ensure they are sufficiently direct and connected, while improving journey quality, times, and safety for cyclists in the corridor
- **TPO3**: Rebalance the city centre environment in favour of more sustainable modes
- **TPO4**: Reduce journey times by bus and improve service punctuality
- **TPO5**: Improve the quality of bus services and bus stop infrastructure in the corridor, enhancing the experience for current bus users and attracting new passengers
- **TPO6**: Address the cost of public transport and reduce gaps in bus connectivity along the corridor
- **TPO7**: Provide improved integration between sustainable travel modes
- **TPO8**: Increase the mode share for sustainable travel modes along the A944 and A9119 transport corridors

2.7 Option Generation

2.7.1 The initial long list of options was derived through: (i) options identified through previous and ongoing studies; (ii) options identified via the stakeholder consultation process; and (iii) those identified via internal team optioneering workshops.

2.7.2 An unconstrained initial long list of options was generated against each of the identified transport problems and associated TPO to complete the appraisal framework logic.

2.8 Option Sifting

2.8.1 The convention within STAG is that all options should be retained until unequivocal evidence is provided that the option will not deliver against the TPOs and STAG criteria, thus not addressing the root causes behind the transport problems. At the Case for Change stage, it is recommended that during the sifting stage, any options that will not deliver the intended outcomes of the study should be eliminated from further consideration. Furthermore, those options which may be more appropriately implemented as part of a wider study, should also be routed away at this stage of the appraisal process.

2.8.2 Following this guidance, several options were sifted from the appraisal process, as they: (i) involved wider options that are beyond the scope of this study, (ii) options that are already being delivered via another mechanism, and (iii) involved policy and legislative change.

2.9 Option Development

2.9.1 This task develops the remaining options prior to the *Preliminary Appraisal* stage. This ensures that the options for appraisal are broadly feasible, defined such that they can be appraised independently of other options, and are sufficiently developed for meaningful appraisal. As such, the options that were identified to progress to the *Preliminary Appraisal* are:

Active Travel Options

- **ACTO1**: Programme of pavement maintenance and decluttering.
- **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit.
- **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors
- **ACTO4**: Identify and formalise a city centre cycle network
- **ACTO5a**: Provision of a segregated 2-way cycle lane from PrimeFour to Aberdeen City Centre along the A944 connecting into AECOM study options
- **ACTO5b**: Provision of a segregated 2-way cycle lane from PrimeFour to ARI along the A944 connecting into AECOM study options
- **ACTO6**: Provision of a segregated 2-way cycle lane from Union Street / Holburn junction to PrimeFour via A9119
- **ACTO7**: Replace and extend all existing advisory cycle routes to provide a connected network.
- **ACTO8**: Create cycle route on Old Lang Stracht.
- **ACTO9**: Provide advance stop lines or cycle by-passes at all signalised junctions.

Public Transport Options

- **PTO1**: Reconfigure roundabout junctions to signalised junctions, complete with bus and cycle pre-signals
- **PTO2**: Bus Rapid Transit on the A944 Westhill – Aberdeen City Centre, via Kingswells Park and Ride.
- **PTO3**: Continuous Bus Lane from Westhill to Aberdeen via A944.
- **PTO4**: Continuous Bus Lane from Westhill to Aberdeen City Centre via A9119.
- **PTO5**: Changes to bus lane operational hours and enforcement.
- **PTO6**: Bus Stop upgrade programme and stop rationalisation.
- **PTO7**: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors.
- **PTO8**: Reallocate all lay-by bus stops to on-street bus stops.
- **PTO9a**: Make Castle Street to Union terrace, bus, cycle and walk only.

- **PTO9b**: Make Castle Street to Holburn Street Junction, bus, cycle and walk only.
- **PTO10**: Rebrand of Kingswells Park and Ride.
- **PTO11**: Advanced VMS on AWPR.
- **PTO12**: Establish a Bus Service Improvement Programme (BSIP).
- **PTO13**: Develop Sustainable Transport Hubs.
- **PTO14**: North West Street to Castle Street Right Turn – Bus Only.

General Transport Options

- **GTO1**: Reclaiming Streets Programme.
- **GTO2**: Improve Wayfinding and Signage.

3 Preliminary Appraisal

3.1 Overview

3.1.1 The 'hybrid' preliminary Appraisal, consisting of elements from both the traditional STAG Part 1 and Part 2 appraisal, commences from where the *Initial Appraisal: Case for Change* concludes.

3.1.2 The Preliminary Appraisal considers:

- Further development and refinement of the options from the *Case for Change*;
- 'SMART-ening' of the Transport Planning Objectives and their associated level of ambition;
- Assessment of the options against the TPOs to identify the anticipated level of impact and subsequent scope for sifting or packaging of options to provide the greatest benefit;
- Appraisal of options against the five STAG criteria, comprising of Environment, Safety, Economy, Integration and Accessibility & Social Inclusion; and
- High-level appraisal of the options against the deliverability criteria including; Cost to Government, Feasibility, Affordability and Public Acceptability.

3.1.3 The findings from this high-level appraisal contribute to developing a costed and prioritised programme of effective, feasible and deliverable interventions, for business case consideration and detailed design.

3.2 Option Development

3.2.1 The initial stage of the Preliminary Appraisal focuses on further development and refinement of the identified options from the ***Initial Appraisal: Case for Change***. Each option is considered individually and the narrative behind each developed. In a slight departure from normal STAG guidance at this stage, additional high-level information with regards to feasibility, costs and indicative delivery timeframes have also been indicated, steps, which are not normally considered in more detail until the **Detailed Appraisal** stage. Costs have been considered within three bandings**; Low - <£5m, Medium - £5m to £10m** and **High >£10m**, while timeframes are defined as **short-term (0-2 years)**, **medium-term (2-5 years)** and **long-term (more than 5 years)**.

3.3 Option Cost and Timescale Summary

3.3.1 The table below provides a key summarising the cost and timescale indications described in the Option Development stage within the report.

Options	Cost	Timescale
ACTO1: Programme of pavement maintenance and decluttering.	LOW	SHORT
ACTO2: Review of pedestrian desire lines and installation of pedestrian friendly crossing	LOW	SHORT
ACTO3: Development of Green Corridors within the city centre and between development	LOW	SHORT
ACTO4: Identify and formalise a city centre cycle network	LOW	SHORT
ACTO5a: Provision of a segregated 2-way cycle lane from PrimeFour to Aberdeen City	HIGH	LONG
ACTO5b: Provision of a segregated 2-way cycle lane from PrimeFour to ARI along the	MEDIUM	LONG
ACTO6: Provision of a segregated 2-way cycle lane from Union Street / Holburn junction to	HIGH	LONG
ACTO7a: Replace and extend all existing advisory cycle routes to provide a connected	LOW	SHORT
ACTO7b: Replace and extend all existing advisory cycle routes with mandatory lanes to	LOW	SHORT
ACTO7c: Replace and extend all existing advisory cycle routes with mandatory lanes and	LOW	SHORT
ACTO8: Create cycle route on Old Lang Stracht.	LOW	SHORT
ACTO9: Provide advance stop lines or cycle by-passes at all signalised junctions.	LOW	MEDIUM
PTO1: Reconfigure roundabout junctions to signalised junctions, complete with bus and	MEDIUM	MEDIUM
PTO2: Bus Rapid Transit on the A944 Westhill – Aberdeen City Centre, via Kingswells	HIGH	LONG
PTO3: Continuous Bus Lane from Westhill to Aberdeen via A944.	MEDIUM	MEDIUM
PTO4: Continuous Bus Lane from Westhill to Aberdeen City Centre via A9119.	MEDIUM	MEDIUM
PTO5: Changes to bus lane operational hours and enforcement.	LOW	SHORT
PTO6: Bus Stop upgrade programme and stop rationalisation.	LOW	SHORT
PTO7: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors.	LOW	SHORT
PTO8: Reallocate all lay-by bus stops to on-street bus stops.	LOW	SHORT
PTO9a: Make Castle Street to Union terrace, bus, cycle and walk only.	LOW	MEDIUM
PTO9b: Make Castle Street to Holburn Street Junction, bus, cycle and walk only.	LOW	MEDIUM
PTO10: Rebrand of Kingswells Park and Ride.	LOW	SHORT
PTO11: Advanced VMS on AWPR.	LOW	SHORT
PTO12: Establish a Bus Service Improvement Programme (BSIP).	LOW	SHORT
PTO13: Develop Sustainable Transport Hubs.	LOW	SHORT
PTO14: North West Street to Castle Street Right Turn – Bus Only	LOW	SHORT
GTO1: Reclaiming Streets Programme.	LOW	SHORT
GTO2: Improve Wayfinding and Signage	LOW	SHORT

3.4 Packaging of Options

3.4.1 Having refined the narrative around the options that have progressed from the ***Initial Appraisal: Case for Change***, it is apparent that each can deliver a positive impact against the previously defined study TPOs. Although all the options can improve travel by sustainable transport, it is unlikely that they will be able to deliver a **significant step change** if delivered in isolation, which is a key requirement of this study's purpose.

3.4.2 In completing the narrative behind the options, it became obvious that many of the options provide synergies, and on occasion, overlap with other individual options, and indeed some options would only witness sufficient benefits through subsequent delivery of other complementary options.

3.4.3 As such, during this option development phase, it was decided that in order to best deliver this required step change in sustainable transport mode share, it would be beneficial to consolidate options into deliverable packages based on similar levels of required infrastructure works and level of investment, thus removing standalone options that deliver little through tweaking around the edges of the network, while identifying those that will deliver and facilitate wider societal benefits - reflective of the ambition behind this study and NTS2.

3.4.4 To this end, the emphasis of the appraisal focuses on the performance of these packages as opposed to addressing each individual option. The packages that have been developed consist of four hierarchical levels, each a reflection on the level of ambition that can be achieved through related investment and infrastructure works:

- **Low Delivery Package** – which requires the minimum level of works and investment and represents the minimum acceptable level of option delivery

- **Medium Delivery Package** – which requires a higher level of works and investment and will provide more options beyond the minimum in line with existing levels of work
- **High Delivery Package** – this involves a high level of infrastructure works alongside a significant investment in this infrastructure and other policy / regulatory changes to facilitate the delivery of these options
- **Gold Delivery Package** – this package represents the highest level of infrastructure works in line with best practice guidance and will require substantial financial investment to support the delivery of this package of options.

3.5 The Packages

3.5.1 The following section outlines the options which have been included within each of the defined packages described above. These form the constituent elements of each of these packages as each is appraised further. As described above, many of the options have synergies, overlap or are hierarchical versions of an option. As such, as the packages are developed from the minimum package to the gold package, not all options will be considered within each package as some replace others and others are already accounted for within another option, so these packages are **additive not cumulative**, as you progress through the hierarchy.

3.5.2 Additionally, at this stage it is worth taking cognisance of the fact that some options may not be feasible along the full length of the corridor or indeed in addition to a further option within the same package due to some of the physical carriageway constraints described previously. As such, variations of options may need to be considered in terms of deliverability, i.e. some sections may have the ability to deliver options of the Gold package, whereas in areas of constraint, it may be necessary to reduce the ambition to an option from the medium or high delivery packages. The induced risk from this approach is that levels of safety and coherence for users between standards may reduce the attractiveness of the options. Furthermore, it is also worth noting that circumstances may also arise where trade-offs will exist between modes (bus or cycle in particular) where carriageway constraints limit the ability to deliver options for each on certain sections. In which case, as the appraisal proceeds, it may become evident that one corridor is preferred for greater focus on one mode over the other and vice versa on the other corridor. These issues will be considered at a high-level within this appraisal, with further detailed analysis undertaken through business case development to determine the most appropriate design solution.

3.6 Low Delivery Package

3.6.1 The low delivery package consists of the following options:

- **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit
- **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors
- **ACTO4**: Identify and formalise a city centre cycle network
- **ACTO7a**: Replace and extend all existing advisory cycle routes to provide a connected network
- **ACTO8**: Create cycle route on Old Lang Stracht.
- **PTO5**: Changes to bus lane operational hours and enforcement
- **PTO10**: Rebrand of Kingswells Park and Ride
- **PTO11**: Advanced VMS on AWPR
- **PTO14**: North West Street to Castle Street Right Turn – Bus Only
- **GTO2**: Improve Wayfinding and Signage

3.7 Medium Delivery Packages

3.7.1 The medium delivery package consists of the following options:

- **ACTO1**: Programme of pavement maintenance and decluttering
- **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit
- **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors
- **ACTO4**: Identify and formalise a city centre cycle network
- **ACTO7b/c**: Replace and extend all existing advisory cycle routes to provide a connected network, with the option of including light segregation
- **ACTO8**: Create cycle route on Old Lang Stracht
- **ACTO9**: Provide advance stop lines or cycle by-passes at all signalised junctions
- **PTO5**: Changes to bus lane operational hours and enforcement
- **PTO6**: Bus Stop upgrade programme and stop rationalisation
- **PTO7**: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors
- **PTO8**: Reallocate all lay-by bus stops to on-street bus stops.
- **PTO9a**: Make Castle Street to Union terrace, bus, cycle and walk only
- **PTO10**: Rebrand of Kingswells Park and Ride
- **PTO11**: Advanced VMS on AWPR
- **PTO12**: Establish a Bus Service Improvement Programme (BSIP)
- **PTO13**: Develop Sustainable Transport Hubs
- **GTO2**: Improve Wayfinding and Signage

3.8 High Delivery Package

3.8.1 The high delivery package consists of the following options:

- **ACTO1**: Programme of pavement maintenance and decluttering
- **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit
- **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors
- **ACTO4**: Identify and formalise a city centre cycle network
- **ACTO5b**: Provision of a segregated 2-way cycle lane from PrimeFour to ARI along the A944 connecting into AECOM study options
- **ACTO8**: Create cycle route on Old Lang Stracht
- **ACTO9**: Provide advance stop lines or cycle by-passes at all signalised junctions
- **PTO3**: Continuous Bus Lane from Westhill to Aberdeen via A944
- **PTO4**: Continuous Bus Lane from Westhill to Aberdeen City Centre via A9119
- **PTO5**: Changes to bus lane operational hours and enforcement
- **PTO6**: Bus Stop upgrade programme and stop rationalisation
- **PTO7**: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors
- **PTO8**: Reallocate all lay-by bus stops to on-street bus stops.
- **PTO9b**: Make Castle Street to Holburn Street Junction, bus, cycle and walk only
- **PTO10**: Rebrand of Kingswells Park and Ride
- **PTO11**: Advanced VMS on AWPR
- **PTO12**: Establish a Bus Service Improvement Programme (BSIP)
- **PTO13**: Develop Sustainable Transport Hubs
- **GTO1**: Reclaiming Streets Programme

- **GTO2**: Improve Wayfinding and Signage

3.9 Gold Delivery Package

3.9.1 The gold delivery package consists of the following options:

- **ACTO1**: Programme of pavement maintenance and decluttering
- **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit
- **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors
- **ACTO4**: Identify and formalise a city centre cycle network
- **ACTO5a**: Provision of a segregated 2-way cycle lane from PrimeFour to Aberdeen City Centre along the A944 connecting into AECOM study options
- **ACTO6**: Provision of a segregated 2-way cycle lane from Union Street / Holburn junction to PrimeFour via A9119
- **ACTO8**: Create cycle route on Old Lang Stracht
- **ACTO9**: Provide advance stop lines or cycle by-passes at all signalised junctions
- **PTO1**: Reconfigure roundabout junctions to signalised junctions, complete with bus and cycle pre-signals
- **PTO2**: Bus Rapid Transit on the A944 Westhill – Aberdeen City Centre, via Kingswells Park and Ride
- **PTO4**: Continuous Bus Lane from Westhill to Aberdeen City Centre via A9119
- **PTO5**: Changes to bus lane operational hours and enforcement
- **PTO6**: Bus Stop upgrade programme and stop rationalisation
- **PTO7**: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors
- **PTO8**: Reallocate all lay-by bus stops to on-street bus stops.
- **PTO9b**: Make Castle Street to Holburn Street Junction, bus, cycle and walk only
- **PTO10**: Rebrand of Kingswells Park and Ride
- **PTO11**: Advanced VMS on AWPR
- **PTO12**: Establish a Bus Service Improvement Programme (BSIP)
- **PTO13**: Develop Sustainable Transport Hubs
- **GTO1**: Reclaiming Streets Programme
- **GTO2**: Improve Wayfinding and Signage

3.10 Package Summary

3.10.1 The impacts and benefits of delivering each and the inferred cost and works required, will be calculated cumulatively to provide an overall high-level package delivery feasibility. It should be recognised that the full delivery of each package may be feasible from an engineering perspective, but financial feasibility is bounded by budget constraints. As such, it is noted at this early stage, that it is likely that the final delivery packages highlighted within the Prioritisation and Delivery programme will be representative of a *selection of options from the various packages to provide final deliverable interventions*.

3.11 Study TPOs vs RTS2040 TPOs

3.11.1 The table below highlights the correlation between the TPOs set in this study and those from the emerging RTS 2040.

RTS 2040 Principles	TPO1	TPO2	TPO3	TPO4	TPO5	TPO6	TPO7	TPO8
Significantly reduced carbon emissions from transport to support net-zero nationally by 2045	✓	✓	✓		✓		✓	✓
No exceedances of World Health Organisation (WHO) safe levels of emissions from transport					✓			
A 50:50 mode share split between car driver and sustainable modes	✓	✓	✓	✓	✓	✓	✓	✓
Improved journey efficiencies				✓	✓			
Zero fatalities on the road network	✓	✓	✓					
Accessibility for all					✓	✓	✓	✓

3.11.2 As is evident in the table above there is a strong correlation and synergy between this studies TPOs and those developed through the RTS2040. We are confident, therefore, that there is no need to revisit or change the TPOs for this study and instead should progress to establishing how these objectives could become SMART.

3.12 SMART-ening of Study TPOs

3.12.1 In accordance with STAG guidance, study TPOs should become SMART as the study progresses so that they are:

Specific: It will say in precise terms what is sought

Measurable: There will exist means to establish to stakeholders' satisfaction whether or not the objective has been achieved

Attainable: There is general agreement that the objective set can be reached

Relevant: The objective is a sensible indicator or proxy for the change which is sought

Timed: The objective will be associated with an agreed point by which it will have been met

3.12.2 This study seeks to generate a significant step change in increasing the balance between sustainable transport modes and private car. Based on this premise and the objectives and principles established as part of the RTS2040, it is important that this level of ambition is reflected within this study's' TPOs.

3.12.3 Through consideration of the above elements, the table below establishes the position of the TPOs and the individual elements of the SMART process. With the RTS having a horizon year of 2040, it would be beneficial to set and raise the ambition of these objectives to be achieved in advance of this horizon period. Achieving these ambitious targets can be explored by incrementally adjusting the objectives within four evaluation periods of five years. Adopting this methodology, the TPOs can continually be revisited, evaluated and success monitored as options come online. For example, long-term targets for each of the TPOs can be proportioned into these four evaluation periods, thus by 2025 if these targets have been met, then more ambitious targets can be set for the next period of 2030 and so forth. If they have not been met, then any options delivered within this period would be evaluated to determine any limitations to achieving the target or other options can be brought forward in their planned delivery to assist. This will also provide sufficient time for options delivered during this time period to become fully operation and bedded into the network.

3.13 Appraisal Packages against TPOs

3.13.1 At this stage, an initial appraisal of the identified packages has been undertaken against the TPOs. The 7-point STAG scoring criteria has been used to inform this initial assessment, as highlighted below.

✓✓✓ - Major beneficial impacts

✓✓ - Moderate beneficial impacts

✓ - Minor beneficial impacts

○ – Neutral / No impact

× - Minor detrimental impacts

×× - Moderate detrimental impacts

××× - Major detrimental impacts

Package	TPO1: Improve the quality of the pedestrian experience for all, and address the barriers which affect some groups moving around as a pedestrian	TPO2: Improve cycle routes to ensure they are sufficiently direct and connected, while improving journey quality, times, and safety for cyclists in the corridor	TPO3: Rebalance the city centre environment in favour of more sustainable modes	TPO4: Reduce journey times by bus and improve service punctuality	TPO5: Improve the quality of bus services and bus stop infrastructure in the corridor, enhancing the experience for current bus users and attracting new passengers	TPO6: Address the cost of public transport and reduce gaps in bus connectivity along the corridor	TPO7: Provide improved integration between sustainable travel modes	TPO8: Increase the mode share for sustainable travel modes along the A944 and A9119 transport corridors
Low	✓	✓	✓	✓	○	○	✓	✓
Medium	✓✓	✓✓	✓✓	✓	✓	✓	✓	✓
High	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Gold	✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓

3.13.2 As expected, the packages which contain the highest level of investment deliver the largest benefits. However, this must be set against their deliverability, cost realism and timing. For example, you will be able to deliver against the TPOs for the low delivery package long before achieving the benefits for the gold package.

3.14 Option Appraisal

3.14.1 This section of the report establishes the appraisal of each of the four identified delivery packages. This is achieved through a two-stage process:

A Logic Map, setting out:

- The underlying transport problems – derived from the Initial Appraisal: Case for Change
- The transport related outcomes of delivery package implementation
- The wider societal impacts of delivery package implementation
- TPOS, the package contributes towards
- Which of the RTS2040 targets the delivery package helps towards

Developing a proportionate Appraisal Table covering the appraisal criteria:

- STAG Criteria – Environment, Safety, Economy, Integration and Accessibility and Social Inclusion
- Established Policy Directives
- Feasibility and Cost to Government / Affordability (using three band ranges for cumulative costs; Low <£10m, Medium £10m - £20m, High >£20m)
- Public Acceptability

3.14.2 The information contained within the Appraisal Tables has been developed through consideration of the Logic Mapping exercise and through consideration of:

- Existing studies – drawing on appraisals undertaken to date
- Benchmarking & case studies
- Professional knowledge and experience

3.15 Low Delivery Package

3.15.1 The low delivery package represents those options which require the minimum amount of infrastructure works and financial investment required to implement the options constituent within. In terms of each mode, the options would provide:

Walking

3.15.2 Improvements to city centre crossing locations, including altering wait times to rebalance in favour of pedestrians where appropriate. There would also include the provision of additional crossing points on the A944 which are controlled to provide easier access across a busy dual carriageway to align with desire lines. The beginning of the implementation of green corridors would start with this package with streets interacting with Union Street becoming incorporated in the City Centre Masterplan providing safe and attractive connections between city centre locations that are car free. Wayfinding and signage would be implemented to provide routing along quieter trafficked routes, including the employment of a coloured coded signing strategy.

Cycling

3.15.3 As part of this package, an initial development of an agreed city centre cycle network would be created. This will highlight those routes which are formally recognised as cycling routes and establish the precedence for implementing cycling infrastructure. This network will also extend out to Westhill and incorporate appropriate linkages into Kingswells, Maidencraig and Countesswells. From this position, extension of advisory cycle lanes can be facilitated with preference for resurfacing these lanes to provide brightly coloured asphalt to draw attention and awareness to the presence of these lanes to drivers. Resurfacing has been selected over painting the lanes, as the resurface is more durable and resilient with a longer lifespan compared to screed which has a lifespan of around 5 years and when it starts to disintegrate can account for uncomfortable riding. A direct route would also be provided along Old Lang

Stracht to provide a link between Kingswells and the A944 Lang Stracht without the need to reroute down and along the A944 dual carriageway and interaction with Switchback Roundabout.

Bus

3.15.4 This package includes two main focuses as part of its delivery (i) make better use of existing infrastructure; and (ii) to increase the utilisation of Kingswells Park and Ride. The minimum level of action for altering the bus network includes increasing the operational hours of the existing bus lanes to increase the potential of reducing congestion induced delays to bus journey times. The addition of banning the right-turn onto Castle Street is based on feedback from bus operators who indicated that this turn is one of the largest contributors to the delay of bus services.

3.15.5 The rebranding and further advertising of Kingswells Park and Ride is aimed at encouraging an uptake in utilisation. Increasing the information available including live parking capacity information and potential travel times by bus on VMS signs on the AWPR on approach to the A944 junction is designed to capture drivers' notice and encourage a change in behaviour at a key decision point in their journey. This will be aided by more reliable running services based on the improved enforcement and operational hours of the existing bus lane network. The second aim of the rebranding is to provide an increase in secure cycle parking and changing facilities to encourage an uptake in Park and Choose, where people can decide to take the bus or cycle from the site in place of undertaking the journey by car. Provision of cycle sheds or increased cycle locations allows users to store their bike at the site overnight instead of travelling with their bike every day on a bike rack on their car.

Delivery Package	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Feasibility	Affordability	Public Acceptability
Low	✓	✓	✓	O	✓	✓✓✓	Low Cost	✓

3.16 Medium Delivery Package

3.16.1 The medium delivery package represents those options which require a level of investment above that of the low delivery package while also increasing the amount of required infrastructure related works. Delivery of this package is likely to have a greater impact on other users of the corridor including car and freight vehicles as works look to rebalance the corridor in favour of sustainable transport modes and prioritise these movements where possible at junctions.

3.16.2 In terms of each mode, the options would provide:

Walking

3.16.3 In addition to the low delivery package, this package would include expanding on the pedestrianisation of Union Street to include Castle Street will make the city centre a more attractive and welcoming destination for pedestrians and cyclists.

3.16.4 The main investment would see a programme of surface maintenance and resurfacing where appropriate. It is understood that as part of the CCMP and associated public realm works, more attractive materials will be used to cover the city centre pedestrian environment such as block work and paving slabs. As such this option would instead look to focus on the pavement provision out with the CCMP coverage area. Both Albyn Place and Queen's Road would have their pavement surfaces upgraded to more durable and resilient asphalt materials replacing the current paving slabs. These current slabs are in various states of disrepair due to the number and frequency of vehicles crossing the pavements to enter and exit premises and parking on pavements. Replacing these surfaces will provide longevity to the pavements and makes them easier to maintain over time. This work will be extended to cover the pedestrian pavements along the A944 Westburn Drive to make access to and from the hospital easier – especially for people that are mobility impaired and to ensure compliance with the Equality Act.

Cycling

3.16.5 In addition to the low delivery package this option develops upon the cycle network and, from this position, a TRO would require to be processed to convert existing advisory cycle lanes into mandatory cycle lanes and extending these lanes further along both the A944 and A9119, with preference for resurfacing them to provide brightly coloured asphalt to draw attention and awareness to the presence of these lanes to drivers. Resurfacing has been selected over refurbishing the lane markings, as the resurface is more durable and resilient with a longer lifespan compared to screed which has a lifespan of around 5 years and when it starts to disintegrate can account for uncomfortable riding. Further protection for cyclists will be provided through the integration of light segregation along the inside edge of the mandatory cycle lane in the form of Orcas, which from trials of light segregation by Glasgow City Council in 2020, proved to be the most durable. These orcas will be placed every 3 metres along the corridor and provide an unobtrusive level of protection for cyclists, whilst also retaining the ability for vehicles to access properties off the corridors.

3.16.6 A direct route would also be provided along Old Lang Stracht to provide a link between Kingswells and the A944 Lang Stracht without the need to reroute down and along the A944 dual carriageway and interaction with Switchback Roundabout. Further journey time benefits for existing cyclists would be generated through the integration of cycle priority infrastructure at junctions including expanding on current ASL provision and where appropriate implementing cycle bypasses (e.g. at roundabouts). Advanced signals for cyclists would also be provided, enabling cyclists to have a head-start ahead of other motorised users.

Bus

3.16.7 This package expands on the low delivery package, increasing the focus to three main target areas (i) make better use of existing infrastructure; (ii) improve the quality of bus stop infrastructure provided; and (iii) to increase the utilisation of Kingswells Park and Ride.

3.16.8 Using the existing bus lanes, operational hours will be expanded to cover the entire operating day, while where appropriate bus priority at signals will be implemented. These options are targeted at reducing the impacts of heavy traffic flow on bus journey time reliability. This will be further supported by infilling those bus stops that are currently laybys to on-street roadside bus stops, to protect the buses' position in traffic and minimising the associated delays of boarding and alighting. The addition of banning the right-turn onto Castle Street is based on feedback from bus operators who indicated this turn as being one of the largest contributors to the delay of bus services.

3.16.9 An agreed standard of bus stops will be designed followed by a programme of upgrading bus stops to a consistent standard. This will include the provision of shelters, flags and poles and bus timetable information. Real Time Passenger Information will be provided at strategic stops that experience the largest levels of demand to keep passengers informed. Emphasis will also be on reducing the disparency between infrastructure provision between eastbound and westbound services to reemphasise the importance of the corridor as a facilitator of two-way demand and the levels of development and trip generation to destinations at Westhill and PrimeFour. Additionally, a BSIP plan and option would be identified with the local authorities working closely with the bus operators to agree a level of service along the corridor and the serving of key communities to ensure an increased level of accessibility to public transport. This BSIP will also agree on the vehicle fleet to provide a mix of cleaner and greener vehicles along the corridor to reduce the impact of emissions and local pollutants.

3.16.10 The rebranding and further advertising of Kingswells Park and Ride is aimed at sparking an uptake in utilisation. Increasing the information available including live parking capacity information and potential travel times by bus on VMS signs on the AWPR on approach to the A944 junction is designed to capture drivers notice and encourage a change in behaviour at a key decision point in their journey. This will hopefully be aided by more reliable running services based on the improved enforcement and operational hours of the existing bus lane network. The second aim of the rebranding is to provide an increase in secure cycle parking and changing facilities to encourage an uptake in park and choose, where people can decide to take the bus or cycle from the site in place of undertaking the journey by car. Provision of cycle sheds or increased cycle locations allows users to store their bike at the site overnight instead of travelling with their bike every day on a bike rack on their car. This would assist in this site being

recognised as a multi-modal local interchange whereby all road users could use/benefit from a re-branding.

3.16.11

Delivery Package	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Feasibility	Affordability	Public Acceptability
Medium	✓✓	✓	✓✓	✓✓	✓✓	✓✓	Medium Cost	✓✓

3.17 High Delivery Package

3.17.1 As with the previous package the high delivery package again incrementally increases both the infrastructure works required and the level of investment needed to deliver the package. This package is also the first to identify potential conflicts in infrastructure provision between cycling infrastructure and bus lanes. There are several pinch-points along the corridor which reduces the capability and eventual capacity to deliver both a segregated cycle route and a bus lane along the A944 while ensuring the impacts of such infrastructure does not have a negative impact on other modes. Consideration may have to be given to the creation of a shared segregated bus/cycle lane, reallocating one lane on the duelled sections of the corridor.

3.17.2 In terms of each mode, the options would provide:

Walking

3.17.3 Pedestrian based infrastructure will be delivered as previously described. However, this package would look to expand on the pedestrianisation of Union Street along its entire length coupled with a wider programme of reclaiming the city centre streets. This will see city centre streets rebalanced in favour of sustainable transport modes, providing an environment that encourages walking and cycling and repurposing streets for outdoor events, such as markets, festivals and outdoor seating areas for local restaurants and bars. Albyn Place and sections of Queen's Road would also receive elements of this package to create car free days and a pedestrian and cycle friendly environment for users of the western side of the city centre. This would help in creating a better sense of place and would add destination value to existing central areas.

3.17.4 On-street parking would be removed from Albyn Place and Queen's Road and an alternative solution would need to be sought to relocate large commercial and residential bins present on Union Street, Castle Street and Albyn Place.

Cycling

3.17.5 Again, options for cycling build upon previous options as described via the aforementioned low and medium packages. In keeping with setting the level of investment within each package to differentiate between the level of investment required, there exists a decision over choosing the delivery of either Option 5b or Option 6 as part of this package, rather than both which is considered in the Gold package. For the purposes of this appraisal, Option 5b was considered for delivery within the High delivery package due to the number of trip generators along the A944 Lang Stracht to Westburn Drive. There are significantly higher employment numbers on this corridor, thus why only Option 5b was considered. However, as alluded to previously, there may also exist a trade-off and decision with regards to the deliverability of both Option 5b and bus related options on the same corridor, particularly as there are several carriageway width constraints present. In this case, there is the opportunity to instead define the High Delivery package to focus on bus options along the A944 due to this primarily being the main bus route corridor and Option 6 considered in place of Option 5b, establishing a focus of bus based interventions on the A944 and cycle based interventions on the A9119. These choices can be considered further during any subsequent development of a business case.

3.17.6 Based on the engineering feasibility and works required, the main cycling option considers a segregated cycle lane from the AECOM option at Kingswells to the ARI, before the road narrows to single carriageway. This option reduces the required works to deliver this route, while its feasibility remains. At this point, cyclists would be routed via city centre surface routes to permeate the city to their final destination. A physical concrete buffer between the cycle lane and carriageway may not be feasible along its entire length due to the number of access and egress points and thus the route is envisaged to either contain several sections of raised tables to allow cyclists to cross junctions and retain access for vehicles or a hybrid of continuous concrete buffer interspersed with light segregation in locations where there is increased access points across the cycle route. Cycle bypasses will be provided at bus stops, with these becoming floating bus stops.

Bus

3.17.7 Building on the medium delivery package, the high delivery package introduces end-to-end bus lanes along both the A944 and A9119. This will provide buses with a streamlined route between Westhill and Aberdeen city centre reducing the impacts of other traffic on journey times, allowing for services to become more reliable. As touched on above, potential conflicts for space arise between the delivery of a bus lane alongside a cycle lane while maintaining an appropriate road network and adequate capacity for car users to negate any inappropriate re-routing / displacement issues. Similarly, there are deliverability issues arising around the A9119 especially along sections of Skene Road as indicated in chapter 3. As such, a solution may need to be sought to deliver a lane along this route, which could include having a short section without bus lane provision. Other solutions would require acquiring land on either side of the carriageway, realigning the current carriageway, and narrowing of lanes to accommodate a bus lane.

3.17.8 All other bus-based options will be delivered as described within the medium delivery package.

Delivery Package	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Feasibility	Affordability	Public Acceptability
High	✓✓	✓✓	✓✓	✓✓	✓✓	✗	High Cost	✓✓

3.18 Gold Delivery Package

3.18.1 The gold delivery package represents the maximum required infrastructure works and investment needed to deliver the vast majority of options to significantly change the current sustainable transport system and provide a "gold" level of service representing the very best (best practice / guidance) options across the modes. This package would deliver the full aspirations of Aberdeen City Council, Aberdeenshire Council and Nestrans in terms of delivering the infrastructure required to achieve the maximum modal switch to generate a significant step change. Although the is package represents the very best and thus is expected to deliver positively across all the criteria, it does come with several feasibility issues. Constrained carriageway widths and cost realism are the main issues, resulting in significant carriageway works to accommodate fully segregated bus and cycle provision, or alternatively a need to explore options around integrating both modes into a single piece of infrastructure delivery.

3.18.2 Segregated routes along Queen's Road also raise some issues with the number of access points to properties along this route. This can make it difficult to accommodate a continuous concrete buffer while retaining access to these properties.

3.18.3 In terms of each mode, the options would provide:

Walking

3.18.4 Pedestrian based infrastructure will be delivered as previously described. However, this package would look to expand on the pedestrianisation of Union Street along its entire length coupled with a programme of reclaiming the streets. This will see city centre streets rebalanced in favour of sustainable transport modes, providing an environment that encourages walking and cycling and repurposing streets for outdoor events, such as markets, festivals and outdoor seating areas for local restaurants and bars. Albyn Place

and sections of Queen's Road would also receive elements of this package to create car free days and a pedestrian and cycle friendly environment for users of the western side of the city centre.

3.18.5 On-street parking would be removed from Albyn Place and Queen's Road and an alternative solution would need to be sought to relocate large commercial and residential bins present on Union Street, Castle Street and Albyn Place.

Cycling

3.18.6 This package introduces the concept of delivering fully segregated cycle lanes along both the A944 and A9119, building upon the delivery of other options through each of the previous packages. As discussed within the high delivery package, there are significant issues with delivering a cycle route along the full length of the A944. Option 5b looked at constraining the route to the ARI before routing cyclists through city streets, whereas option 5a as considered in this option would look to explore provision past the ARI and to Mounthooly roundabout. However, what has become apparent is that there is not enough capacity available to deliver both a segregated cycle lane and bus lane along the entire corridor. Thus, a decision would be required to propose which options should proceed past the ARI. From a high-level feasibility view, this may favour cycle provision over bus provision along this section, especially as a number of bus services also divert from the corridor at various points post the ARI.

3.18.7 The A9119 also presents many of the same issues, but mainly the number of entrance and exit points along the corridor and then carriageway width constraints that limit the possibility to have a cycle, bus and other traffic lane. Again, options would need to consider the delivery of a joint segregated lane for bus and cyclists, with cycle bypass provision at bus stops to enable cyclists to continue when buses stop.

3.18.8 The remaining cycling based options will be delivered as described previously.

Bus

3.18.9 The main deliverable as part of the gold delivery package for bus-based options is the introduction of Bus Rapid Transit along the A944 from Westhill to Aberdeen city centre. The routing of the BRT along the A944 was selected due the higher number of trip generators along the corridor, specifically the ARI, which would provide many journey time benefits for commuters and visitors to the hospital and other destinations along the A944 via a local interchange point at the ARI. This option would require the delivery of bus-based infrastructure to provide priority measures including segregated lanes, bus priority signals or bypasses where appropriate and the installation of on street ticket machines and waiting facilities. This option will require significant engineering works to accommodate the delivery of the option along this corridor. Carriageway constraints and the ability to deliver this option and a segregated cycle route are limited. Additional land will need to be acquired at specific sections of the corridor and where this proves too difficult, bus lanes may need to be dropped for short sections, such as the section between Victoria and Westburn Parks.

3.18.10 It is likely that the delivery of this BRT option will have a negative impact on other road users as this service will be provided priority over other motorised users. However, it would be hoped that through the delivery of this option that the use of car along the corridor would reduce in favour of an uptake in both cycling and using public transport.

3.18.11 All other bus-based options will be delivered as described within the high delivery package.

Delivery Package	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Feasibility	Affordability	Public Acceptability
Gold	✓✓✓	✓✓	✓✓	✓✓	✓✓✓	✖	High Cost	✓✓

3.19 Option Appraisal Summary

3.19.1 The table below summarises the STAG related scoring information captured in the appraisal summary tables discussed above.

Delivery Package	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Feasibility	Affordability	Public Acceptability
Low	✓	✓	✓	○	✓	✓✓✓	Low Cost	
Medium	✓✓	✓	✓✓	✓✓	✓✓	✓✓	Medium Cost	
High	✓✓	✓✓	✓✓	✓✓	✓✓	✖	High Cost	
Gold	✓✓✓	✓✓	✓✓	✓✓	✓✓✓	✖	High Cost	

3.19.2 As would be anticipated, the most extensive package in terms of infrastructure works delivers the largest and widest range of benefits but is also the most expensive in terms of cost to government. As is common in STAG studies, there is not yet a clear funding envelope within which to work and thus it is not possible to rule options in or out on the basis of affordability. This will however be a key consideration in progressing towards a preferred option package in the context of a subsequent business case.

3.20 Quantified Risk Assessment

3.20.1 The STAG Guidance requires the development of a Quantified Risk Assessment (QRA), which allows for the quantification and, where practical, valuation of risk factors.

3.20.2 Risks and opportunities are appraised using two criteria:

- **Significance:** What would be the impact and severity if the risk materialised?
- **Likelihood:** How likely is it that the risk will materialise within the period stated?

3.20.3 The risks identified for this study are strategic rather than specific. The table below nonetheless provides an assessment of the wider project risks in terms of their significance, likelihood, potential mitigation measures and residual risk:

Risk	Likelihood	Significance	Risk Score	Mitigation	Residual Likelihood	Residual Significance	Residual Risk Score
The costs of options are higher than that set out in this report. This is likely given the high-level approach to costing and no consideration of land acquisition costs and utilities.	5	4	**20**	Any option or package taken forward as part of this appraisal would be subject to more detailed assessment as part of business case development. This is entirely consistent with STAG appraisals of this nature.	5	2	**10**

Risk	Likelihood	Significance	Risk Score	Mitigation	Residual Likelihood	Residual Significance	Residual Risk Score
There is a low / no uptake in demand for public transport services in response to public perception around physical distancing.	3	4	**12**	As part of making the TPOs SMART, metrics were established for monitoring and evaluating the success of the objective. It recommended the monitoring of patronage figures to determine changes in levels of demand and to adjust targets accordingly.	3	3	**9**
The uptake and continued use of cycling begin to trail off as things return towards "normality" or the potential market is already capped.	3	4	**12**	As part of making the TPOs SMART, metrics were established for monitoring and evaluating the success of the objective. It recommended the monitoring of cycle count data to determine changes in levels of demand and to adjust targets accordingly. Additionally, surveys were also recommended to understand responses to option delivery.	3	3	**9**
There is a change in travel behaviours as an outcome of COVID19 and the flexibility and acceptance of working from home becomes a more permanently accepted practice.	4	5	**20**	In developing the TPOs it was recommended that metrics are reviewed and analysed every five years until the RTS horizon year of 2040, providing four control periods. As part of this review, data analysis and available census data will inform any changes to travel behaviours which affords the opportunity to make refinements to targets and objectives.	3	3	**9**
There is a change in travel demand due to the volatility of the oil and gas sector, one of the main drivers of the Aberdeen City Region economy.	4	4	**16**	In developing the TPOs it was recommended that metrics are reviewed and analysed every five years until the RTS horizon year of 2040, providing four control periods. As part of this review, data analysis and available census data will inform any changes to travel behaviours which affords the opportunity to make refinements to targets and objectives.	3	3	**9**
Future developments on the corridor not being fully up taken in response to economic changes (further dip in the oil sector etc)	3	4	**12**	In developing the TPOs it was recommended that metrics are reviewed and analysed every five years until the RTS horizon year of 2040, providing four control periods. As part of this review, data analysis and available census data will inform any changes to travel behaviours which affords the opportunity to make refinements to targets and objectives.	3	3	**9**

3.21 Uncertainty

3.21.1 The STAG Guidance notes that, no matter how well risks are defined, the future remains uncertain and thus a narrative on key future uncertainties which could impact on the study outcomes is required.

- Coronavirus impacts upon employment levels, demand for public transport and road traffic volumes. It is unclear if conditions will ever return to 'normal' and if so, when. The uncertainties surrounding the long term, structural impacts of the virus are perhaps the greatest 'issue' for the study.
- A significant proportion of jobs in Aberdeen are supported directly or indirectly by the oil industry, and as such employment levels are sensitive to changes in oil prices. A recent study published by Aberdeen University forecasts that oil production activity in the UK Continental Shelf (UKCS) will sharply decrease in medium- and long-term from 2019–2050, resulting in substantial job losses. It is however recognised that there are plans to transform the local economy in response to this.
- Substantial development is planned along the study corridor including residential development at Countesswells, Maidencraig, Kingswells and Friarsfield as well as commercial development at Kingswells Prime 4. Much of the construction is already underway with some traffic impacts on the A944 already being generated, however, there is still uncertainty regarding the cumulative traffic impacts of the these developments on the A944 as they become fully online and also how development appetite will be affected by local economic circumstances.
- The development of the new Aberdeen Football Club Stadium at Kingsford to expand on the recently opened training centre.
- New major junctions are proposed on the A944 to support development at Maidencraig, Kingswells and Countesswells. The exact location and form of these junctions is yet to be confirmed.
- There is a danger of further worsening the divide in Westhill between business park and residential areas by continuing to develop based on the current north-south land use split.
- Additionally, continuing development could result in a deterioration in conditions on the A944 which in turn could threaten the vitality or Westhill and attractiveness of commercial premises in the area.
- New Stagecoach bus timetables were planned to be introduced in April 2020; changes included retiming of services to account for the AWPR, renumbering of the X17 and additional route variations. However, these changes were put on hold as a result of the coronavirus pandemic, and it remains unclear if proposed changes will be reconsidered and/or adjusted.
- First is reviewing its UK bus operations and has sold off individual depots in recent months and is one of the main operators within Aberdeen City Centre.
- There are concerns over the financial viability of some bus services related to their ability to recover from Covid19 and regaining lost patronage.
- Improved cycle connections are proposed between Kingswells Park & Ride and Westhill but not yet committed.

3.22 Prioritisation and Delivery Programme

3.22.1 It is clear from the appraisal undertaken that each of the delivery packages considered has merit in being taken forward for further consideration for detailed design and business case development.

3.22.2 Recognising the fact that the majority of options are both feasible and deliverable from an engineering perspective, they may not be feasible from a financial perspective as these are bounded by budgetary constraints. It may, therefore, be that the final delivery of packages is a spread of options across the four designed delivery packages, almost presenting a menu of options for consideration. The aim, however, is still to create a transformative sustainable transport network along the corridors. This is an issue which would be picked up through iterations of the preferred option in line with the Commercial, Financial and Management Cases of the Outline Business Case.

3.22.3 In considering both what and where to prioritise interventions, the site audit *pro formas* act as a useful indicator. Across the modes, they identify those sections of the corridor that are currently under provisioned for in terms of infrastructure, together with the degree of prioritisation. This analysis provides a clear basis for prioritisation, e.g. by tackling the 'worst' sections first. These then provide us the **'where'**. The **'what'** is prescribed by the sustainable transport hierarchy and positions both walking and cycling as priorities in terms of identifying and implementing interventions.

3.22.4 This stance is further promoted via current network-based conditions. The COVID19 pandemic has led to an increase in active travel users, as people are becoming more aware of health issues and many have concerns with using public transport. Both Aberdeen City and Aberdeenshire have been successful in receiving funding from the *Spaces for People* Fund and have installed temporary measures on key routes to facilitate physical distancing procedures. The success of these temporary measures can be assessed and used as trials for further roll out of future active travel interventions. This will ensure the success of any future active travel-based option through building upon the foundations and initial users on the network. The surge in bike sales is a positive indicator for investment in cycling infrastructure and with additional downturn in bus-based patronage makes this a credible argument in the short term.

3.22.5 Additionally, analysis of bus journey times indicated that although bus journeys are unreliable, they often run ahead of schedule in contrast to historical evidence which indicated long bus journey times due to congestion induced impacts. This would suggest that the AWPR is providing benefits to the road network, freeing up capacity and reducing running times of bus services.

3.22.6 From the evidence obtained through this study from the ***Initial Appraisal Case for Change*** to this ***Preliminary Appraisal***, further detailed analysis is required on the engineering feasibility of providing any of the identified options, especially those involving segregated cycle and bus lanes due to clear and obvious carriageway constraints. The AECOM A944 Cycle Feasibility report indicated that it is feasible to establish a segregated cycle route along the corridor, however, when considered alongside bus-based infrastructure, this feasibility greatly reduces at these constrained points. Whilst the STAG guidance recommends against defining preferred options (this is typically undertaken during the Outline Business Case), we note that the council aspires to improve active and sustainable travel along this corridor in the short-term.

3.22.7 Recognising this and the deliverability of some options over others, there would be merit in working towards the progression of a **hybrid** of the **Medium Delivery Package** supplemented by options **PTO3** and **PTO4** (to provide where possible bus lanes, on both sides of the carriageway, along both corridors) from the High/Gold packages, through the development of an Outline Business Case. This would allow for further option development, greater cost certainty and consideration of funding, procurement, delivery, and management (through the Commercial, Financial and Management cases) ultimately emerging as a preferred package of options. This would be a first step towards creating a consistent coherent network standard along the corridors. Although this recommendation leads towards the medium package, it is worth noting that many of the options within this package are also present within the High and Gold packages, with the main omission being the high-priced ticket items.

3.22.8 In parallel to this however, longer-term option development via business case related works could be undertaken to assess the deliverability and viability of these high priced options from the **high** and **gold** packages within the current and future travel and economic context. In developing and delivering the medium package, a key principle would be to avoid sunk costs and undertake works to protect the deliverability of either the high or gold delivery packages. In fact, this **Medium+ Delivery Package** would provide much of the required infrastructure to facilitate and assist in the delivery of further options from the high and gold packages. This package can therefore be considered as a delivery mechanism for these options in time.

3.22.9 This medium delivery package would achieve benefits for sustainable transport users by segregating buses and cyclists from the main flow of traffic for large parts of the corridors, whist enabling them to maintain their position in traffic at signals. Along wider sections of the corridors, bus lanes would be present alongside cycle lanes, separated by light segregation such as orcas. Where the carriageway widths become constrained, cycle provision will be prioritised over bus lanes in line with the sustainable transport hierarchy, with bus priority infrastructure instead provided via priority signals at junctions where appropriate. The provision of floating bus stops would also enable cyclists to continue without having to stop or manoeuvre around stationary buses, however, there is the potential for conflict between cyclists and bus users accessing the vehicles. The provision of light segregation as opposed to a continuous buffer has been selected so as not to act as a restriction to other users of the network who require access to both residential and commercial properties along both the A944 and A9119. The option therefore provides the foundations to increase future sustainable modes modal share and can provide further evidence for future business case development.

Figure 3-1: Map of Options within Medium+ Delivery Package

3.22.10 The figure above highlights those areas where options could be delivered. Public transport options are highlighted by blue icons, cycle options in white, pedestrian in yellow and sustainable options in green. The purple icons indicate those junctions where both cycle and bus-based priority options will be considered for delivery. Those sections of the corridor, where constraints are less of a barrier, both cycle and bus lanes would be considered as reflected by solid white and blue lines on the map. Those links indicated by a white dashed line, indicate those sections of the corridor, where the focus would move more towards delivering cycle lanes with light segregation due to the width constraints. Adopting this approach would facilitate the integration of both bus and cycle infrastructure where possible. However, there also exists the option, based on the graphic above, to move away from providing infrastructure for both modes along both corridors and instead focussing more on cycle infrastructure along the A9119 and bus-based infrastructure along the A944. The benefits and costs of each can be more fully considered during the more detailed design work undertaken as part of any business case development.

3.22.11 Combined, this **Medium+ Delivery Package** would cost approximately **£25m** to deliver over a timeframe of approximately **five to six years**. This would provide the opportunity to assess and monitor the success

of the option package in addressing the evidenced problems up to the 2040 horizon period of the RTS, accounting for any COVID-19 related changes in travel behaviour. Within this period any emerging evidence of outcomes and/or impacts of the Medium Delivery Package can be fed back into the development of the business cases to support either **the high or gold packages**. This would afford the opportunity to bring forward or delay option implementation or identification of the need to increase the level of ambition and move to a high or gold delivery package, building upon the infrastructure already in place as part of the medium+ delivery package.

3.22.12 The options within this package have been re-ordered to reflect the prioritisation that should be given to implementing each of the options within the package, also considering the required construction and infrastructure works to deliver each, taking cognisance of the interdependencies between them. This would include the requirement to undertake further detailed assessment to ascertain the deliverability aspects from an engineering perspective of the bus lanes on sections of the corridor where carriageway widths are highly constrained.

3.23 Option Delivery Prioritisation

■ **ACTO4**: Identify and formalise a city centre cycle network ■ **PTO5**: Changes to bus lane operational hours and enforcement ■ **PTO13**: Develop Sustainable Transport Hubs ■ **ACTO8**: Create cycle route on Old Lang Stracht	This initial set of options establishes a series of quick win projects. Identifying and formalising a cycle network is key before any work commences to ensure the correct and appropriate routes are identified and connections assessed. Bus lane operating hours will produce small gains across the day, while additional provision of cycle parking at Kingswells and Union Square will assist in the development and refinement of the sustainable transport hubs. The cycle route along Old Lang Stracht will support the option identified by AECOM and provide direct links between Kingswells and A944 Lang Stracht and routing to A9119. **Timescale year 1-2.**
■ **ACTO2**: Review of pedestrian desire lines and installation of pedestrian friendly crossing facilities to suit ■ **ACTO1**: Programme of pavement maintenance and decluttering ■ **GTO2**: Improve Wayfinding and Signage ■ **PTO10**: Rebrand of Kingswells Park and Ride ■ **PTO11**: Advanced VMS on AWPR ■ **PTO12**: Establish a Bus Service Improvement Programme (BSIP) covering the A944 and A9119 corridors	These options provide a mix of quick wins and those which will take some time and complement the delivery of future options. The BSIP is crucial to the delivery of the investment required to deliver the infrastructure changes. Therefore, establishing this ahead of time then helps design and confirm the delivery of bus shelters and bus lanes, and subsequent cycle lanes. **Timescale year 2-4**.
■ **PTO8**: Reallocate all lay-by bus stops to on-street bus stops. ■ **PTO6**: Bus Stop upgrade programme and stop rationalisation ■ **PTO3**: Continuous Bus Lane from Westhill to Aberdeen via A944	These remaining options will be delivered once the first two phases are complete. Bus and cycling infrastructure will be delivered in conjunction to maximise efficiencies in the works and to reduce costs.
■ **PTO4**: Continuous Bus Lane from Westhill to Aberdeen City Centre via A9119 ■ **ACTO7c**: Replace and extend all existing advisory cycle routes with mandatory cycle lanes to provide a connected network, with the option of including light segregation ■ **PTO7**: Bus Prioritisation / Pre-Signals at all signalised junctions on the corridors ■ **ACTO9**: Provide advance stop lines or cycle by-passes at all signalised junctions ■ **ACTO3**: Development of Green Corridors within the city centre and between development sites on the corridors ■ **PTO9a**: Make Castle Street to Union terrace, bus, cycle and walk only	Development of green corridors and pedestrianisation of Castle Street will be programmed to coincide with the CCMP. **Timescale year 5+**.