Appendix 1 - Aberdeen Cross City Connections STAG Part 2 Report – Executive Summary

Aberdeen Cross City Transport Connections

Description:	**Aberdeen Cross City Transport Connections Study STAG Part 2 Report Executive Summary**
Produced by:	**Peter Brett Associates (PBA)**
Date:	**24 May 2019**
Project Manager:	**Emily Seaman**
Project Director:	**Scott Leitham**
Report Authors:	**Emily Seaman** **Rachel Thomas** **Alec Knox**
Report Reviewers:	**Scott Leitham**

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Study Background

Aberdeen City Council (ACC) along with Aberdeenshire Council (AC), Nestrans and Transport Scotland have commissioned Peter Brett Associates (PBA) to undertake a Scottish Transport Appraisal Guidance (STAG) Part 2 Appraisal of sustainable transport connections between a number of development sites in Aberdeen and Aberdeenshire.

The study follows on from the study's STAG Pre-Appraisal and Part 1 Appraisal work which PBA undertook as part of a wider consultant team.

The purpose of the study is to **examine transport connections between new areas of development on the periphery of Aberdeen, and in areas of Aberdeenshire close to the Aberdeen City boundary with the aim of providing viable, attractive and direct linkages, as an alternative to the private car**.

While the study is focussed on connecting major planned developments, it has also considered interchange points linking radial and orbital routes, the potential creation of interchange 'hubs' and transport integration between bus, rail and active travel modes including Park & Ride (P&R) sites (being rebranded Aberdeen wide as Park & Choose sites), as well as linking the planned development sites to existing key employment centres. In essence, the aim is **to maximise the sustainable transport based accessibility associated with the developments**.

Pre-Appraisal Summary

A Pre-Appraisal report was produced in August 2016.

The report covered:

Problems, Opportunities, Issues, & Constraints – which were informed through a baselining and engagement exercise reported in the study's Baseline Report *(Aberdeen Cross City Transport Connections Baseline Report, SIAS, PBA and EE, January 2016)*.

Objective Setting

Option Development & Sifting

Conclusions and Next Steps

A summary of the key outcomes of the Pre-Appraisal work is provided below. Full details of all the Pre-Appraisal work undertaken can be found in the study's Pre-Appraisal Report *(Aberdeen Cross City Transport Connections Pre-Appraisal Report – Final, SIAS, Peter Brett Associates and Energised Environments, August 2016)*.

Problems, Opportunities, Issues & Constraints

This study is considering a future position when the development sites are built out. At present, the development sites under consideration are predominantly greenfield sites which are either yet to be developed or are at a very early stage of development. Hence the problems and opportunities identified relate to potential future **problems** (that could arise if the sites are built out with no provision for sustainable transport access made) and the opportunity to mitigate against these future problems. The future problems could include: additional road congestion, environmental impacts and an increased safety risk for all road users - if a heavy reliance on the private car prevails; community severance; and reduced access to employment, services, and retail and leisure facilities. There is a clear **opportunity** to provide sustainable transport accessibility to create modal shift away from the car and reduce the impact of the identified problems.

A range of existing underlying **issues** with the wider transport network were identified and considered during option development, including: the Aberdeen Western Peripheral Route (AWPR) which will lead to changes in travel patterns in and around the city with enhanced orbital journey times offered by the route; the potentially low commercial appetite of bus operators to run orbital services given the existing low demand; the likely rural nature of some of the active travel routes on the periphery of the city (potentially with lighting and surfacing issues); and current high private car use which may require a culture change to enable the success of new sustainable transport provision (although this may be positively influenced through the implementation of the Aberdeen City Centre Masterplan).

Key **constraints** identified included: the routes of the River Dee and River Don making the development of non-circuitous routes challenging unless major infrastructure is provided; the topography and steep gradients within certain areas which may make active travel an unattractive option; the alignment of the development sites between the A96(T) and the A93 – notably the sites at Greenferns, Countesswells, Maidencraig and Oldfold Farm, which makes it difficult to provide a single non-circuitous orbital connection between the sites; t**he rural nature of many of the sites south of Dyce,** particularly the Countesswells and Chapelton of Elsick sites meaning a lack of existing infrastructure and a need for new infrastructure (and hence high cost) to provide connections; and t**he competition between bus and rail travel modes**, particularly between Chapelton of Elsick and Dyce.

Objective Setting

Taking cognisance of the policy context and the key problems identified during the study, eight Transport Planning Objectives (TPOs) were set and agreed with the Client Group and are detailed in **Error! Reference source not found.**.

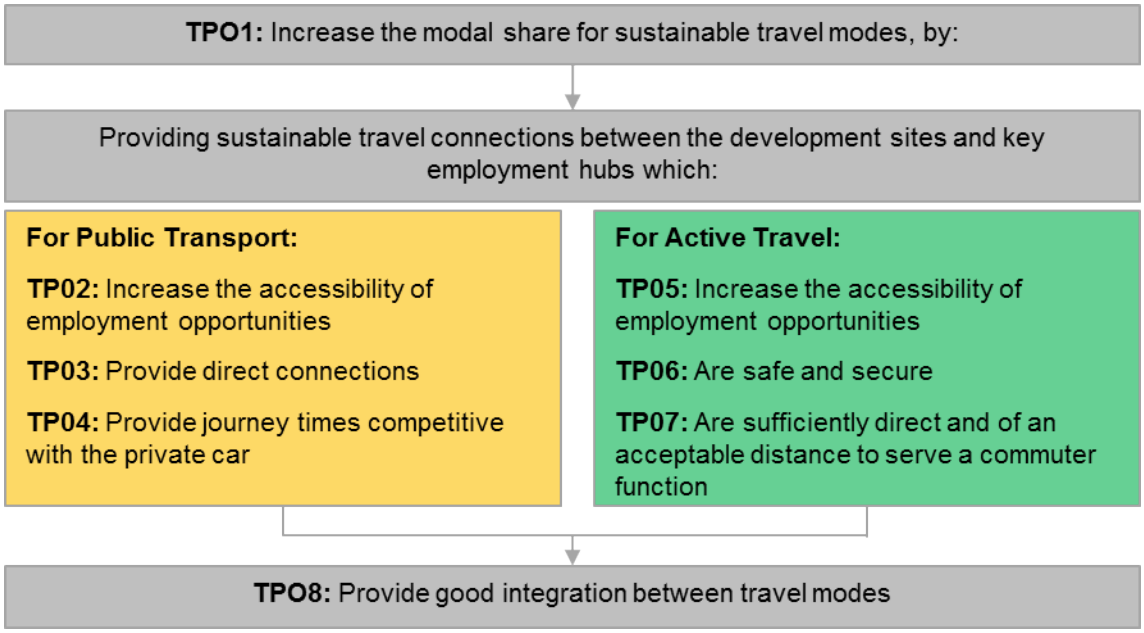

Figure Error! No text of specified style in document.:1: Transport Planning Objectives

Option Development

Options were generated through a number of steps including:

Establishing the existing and future public transport and active travel networks

Establishing the key interchange points: identified as: Dyce Rail Station, A96(T) Park & Ride (under construction); Kingswells Park & Ride; Portlethen Park & Ride site (not yet developed but with planning approval granted) and Portlethen Railway Station;

Establishing existing and future employment hubs: identified as Aberdeen City Centre; Bridge of Don (north Aberdeen); Dyce (north-west of Aberdeen); Westhill (west of Aberdeen); Altens/Tullos/Cove Bay (south Aberdeen); and Badentoy (Portlethen); and

Stakeholder Engagement with: both Aberdeen City Council and Aberdeenshire Council public transport and active travel officers; bus operators; Scottish Enterprise; Opportunity North East (One); Aberdeen & Grampian Chamber of Commerce; the Federation of Small Businesses; Energetica; and a full range of active travel groups in the area.

Public transport options were developed in terms of a broad hierarchy of increasing complexity and cost for a northern section (Blackdog – Dyce) and a southern section (Dyce - Loirston / Chapelton of Elsick), with further consideration given to more minor changes to existing public transport services.

Active travel options were considered between adjacent pairs of sites and with cycle commuting as a focus given the distances involved. As there are already a large number of existing active travel routes (including off-road Core Paths, dual use facilities and on-road cycle provision) which connect to the development sites, rather than developing entirely new routes between pairs of sites, the active travel links developed were largely concerned with filling in 'missing links' in existing routes so as to provide a continuous connection; and / or upgrading an existing route to a level considered suitable for commuters (i.e. providing appropriate surfacing / lighting etc.).

A process of option sifting was undertaken to remove any options not felt to meet the Transport Planning Objectives or which were felt to be highly unfeasible.

Options for Appraisal

Work undertaken to develop both public transport and active travel options generated 22 public transport options and 38 active travel options.

During the Part 1 Appraisal for both the public transport and active travel options, minor alterations were required to a number of the public transport and active travel routes as, during the more detailed consideration of the routes, feasibility issues and/or improved routeing possibilities were identified. Therefore, the options presented in the Pre-Appraisal Report (*Aberdeen Cross City Transport Connections Pre-Appraisal Report – Final*, SIAS, Peter Brett Associates and Energised Environments, August 2016) and final options appraised at Part 1 as presented in the Part 1 Report (*Aberdeen Cross City Transport Connections - STAG Part 1 Report - Final - Revised*, SIAS, Peter Brett Associates and Energised Environments, March 2017) do not exactly match.

The final options which were appraised at STAG Part 1 can be found in the Part 1 Report.

Part 1 Appraisal Summary

The Part 1 Appraisal is an initial appraisal of the options generated during Pre-Appraisal. It involved:

Background information relating to the geographical, economic and social context of the study area;

A qualitative appraisal of the options against the study Transport Planning Objectives (TPOs);

A qualitative appraisal of the options against the STAG Criteria of Environment, Economy, Safety, Accessibility & Social Inclusion, and Integration;

Appraisal of the fit of the options with established policy directives;

Assessment of the Feasibility, Affordability, and Public Acceptability of options;

Participation and Consultation;

Completion of Appraisal Summary Tables for all options; and

Discussion on the potential packaging of options and next steps.

At this phase in the study, an indicative assessment of the scope and scale of the benefits and impacts associated with each option were considered. This allowed for a focus of appropriate effort and

resources towards options which merit detailed quantitative appraisal at the Part 2 Appraisal stage, and eliminates options which are unlikely to meet the Transport Planning Objectives, alleviate problems, or realise opportunities identified during Pre-Appraisal.

However, given the number of options recommended for further appraisal at STAG Part 1, and a need to effectively appraise these options, discussion was undertaken with the Client Group on the most robust way forward to allow for workable analysis. Two options were discussed:

A further round of option sifting to reduce the number of options by combining northern and southern strategic options into full orbital routes; and

Undertaking a focused 'hierarchical appraisal' that appraised the options using the key criteria most likely to quickly eliminate options – rather than undertaking the full Part 1 appraisal (against the TPOs, STAG criteria, and affordability, public acceptability and feasibility criteria) for all options.

Combining the northern and southern strategic options into full orbital routes at this stage was not deemed desirable as it would require assumptions to be made as to the most appropriate options to combine – and may end up with, for example:

A poorly performing southern option combined with a well performing northern option – which together could potentially combine to create an option which would be rejected despite the northern section performing well (which would have been clear if they had been appraised separately); and

Northern and southern option combinations which do not combine to form the most optimal orbital route(s).

Through discussion it was therefore agreed that a *focused appraisal* at Part 1 was more appropriate. The key criteria against which options were considered initially were agreed as:

For the **public transport** options:

- **Accessibility:** and the development of **Accessibility & Connectivity indicators** for the options to show accessibility improvements and the development of Hansen indicators to show changes in access to employment; and
- **Affordability**: including consideration of up front capital construction costs; costs of vehicle acquisition, etc.; ongoing annual operating and maintenance costs; and farebox revenue.

For the **active travel** options:

- A focus on the key **Transport Planning Objectives:** covering modal shift (TPO1), **safety** (TPO6), and **directness** (TPO7); and
- **Affordability**: considering the capital cost of all elements of each option including surfacing, crossings, signage etc.

To support the analysis a long term future picture of jobs and people was developed. This takes account of: trends in reducing household sizes, jobs 'skimming' from city centre and other employment hubs, population totals (as stated in the Aberdeen and Aberdeenshire Strategic Development Plan).

A high level appraisal against the full Part 1 criteria (TPOs, STAG Criteria (Environment, Safety, Economy, Integration, Accessibility, and Social Inclusion), Established Policy Directives, Feasibility, Affordability, and Public Acceptability was then undertaken with a subsequent option selection or rejection process.

The public transport options which are considered worthy of further appraisal at STAG Part 2 were then further developed including consideration of:

Combining the selected options appropriately;

The further work required to explore the options south of the Countesswells site, given: the issues identified with regards to the commercially viability of services due to the more geographically dispersed development sites in the south and the associated user demand issues; and the feasibility constraints in relation to an appropriate route through the Bieldside area because of the existing topography and narrow road widths, and the potential high cost to provide an alternative route.

A re-numbering process was undertaken to provide a final succinct consolidated list the public transport options recommended for further appraisal at STAG Part 2. These final options can be found in the STAG Part 1 Report.

For all public transport options, note that bus is assumed as the operating travel mode, with high quality modern buses assumed to be utilised with the ability to carry cycles. It is also assumed that all interchange points have suitable cycle parking/storage available.

The appraisal of the active travel options and network highlighted the greater benefits of connections in the north of the study area between Blackdog and Dyce, which would connect the large planned residential area of Grandhome, and additionally those at Stoneywood and Blackdog, with the key employment centres at Dyce and Murcar. In particular, the building of a bridge over the River Don between Grandhome and Stoneywood has the capacity to provide a direct route between the sites, significantly reducing active travel journey time and encouraging sustainable travel.

It was further recommended that additional work could be undertaken to develop the active travel network around Kingswells.

The public transport options will all require a level of subsidy to operate until the development sites are built out such that a critical level of demand is generated for commercial viability. Unlike this, the active travel options, if implemented, could provide some 'quick wins' in providing improved accessibility without any need for on-going subsidy.

The key recommendation from the Part 1 appraisal was that while it was acknowledged that public transport options in both the north and south of the study area had merit for further appraisal, the options in the north all utilise a new bridge over the River Don (similar to the key active travel connection recommended between Grandhome and Stoneywood which could be incorporated in any bridge design). The development of this key piece of infrastructure would provide benefits for active travel accessibility in the shorter term and enable the operation of successful public transport services in the medium to longer term. The bridge connection is therefore highlighted as the key element to be considered as the study progresses. Engagement with the developers of the Grandhome and Stoneywood sites, the relevant landowners, and businesses located to the west of the River Don (where the new bridge would be required to 'land') would be worthwhile at an early stage in order to enable buy in to the concept. Detailed assessment of the flood risk in this area is also required.

Part 2 Appraisal Summary

PBA were commissioned in September 2017 to undertake a STAG Part 2 Appraisal of the options developed at STAG Part 1.

Options for Appraisal

Prior to the Part 2 Appraisal, the options recommended for further appraisal at STAG Part 1 were revisited and reconsidered in light of any changes in policy, development site masterplans, infrastructure changes, and overall housing and employment growth projections. The feasibility of the options was also considered in greater detail at this stage especially in light of the active travel options, in order to rule out any options and remove undue appraisal off unrealistic or infeasible connections.

The final options considered at the Part 2 Appraisal Stage are shown in **Figure 1:2**, **Figure 1:3**, and **Figure 1:4** with:

Public Transport Options (9 in total): shown in **Figure 1:2** and Figure 1:3. In the figures the dotted lines within the development sites indicate that the route would go through the development site but no

specific route has been identified as this would be dependent on the final layout of the sites as they develop. For these options, in many instances it is assumed that a parallel active travel route would be provided as part of the option.

Active Travel Options (21 in total): shown in **Figure 1:4**, with the active travel routes between all sites – formed in some instances as an option on its own, or an option in combination with existing routes of suitable quality. It is assumed that the active travel routes developed would form a network of routes connecting up the sites and 'branded' as the 'orbital active travel network' or similar to identify it and promote its use.

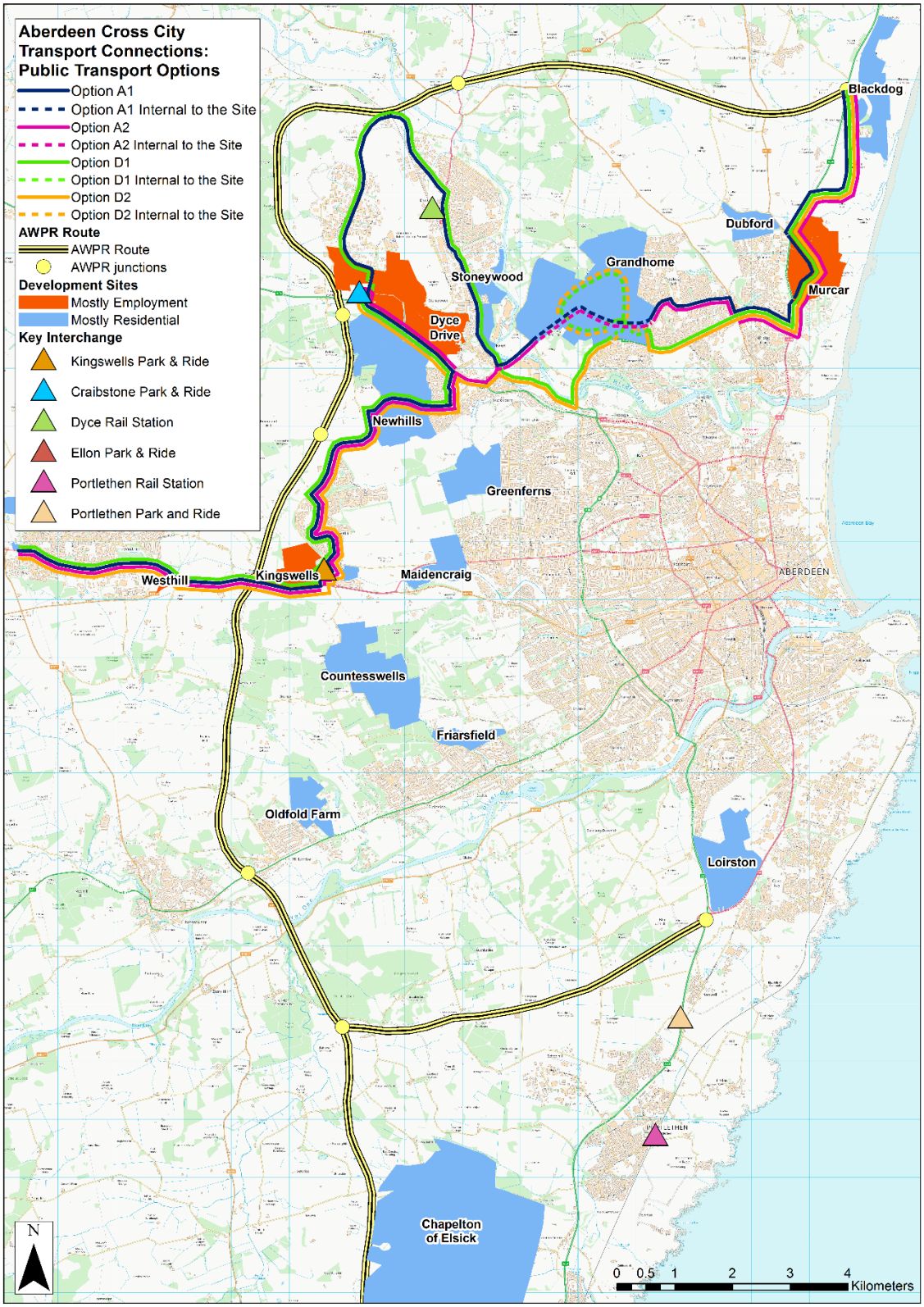

Figure Error! No text of specified style in document.:2: Public Transport Options - (Options A1, A2, D1 and D2)

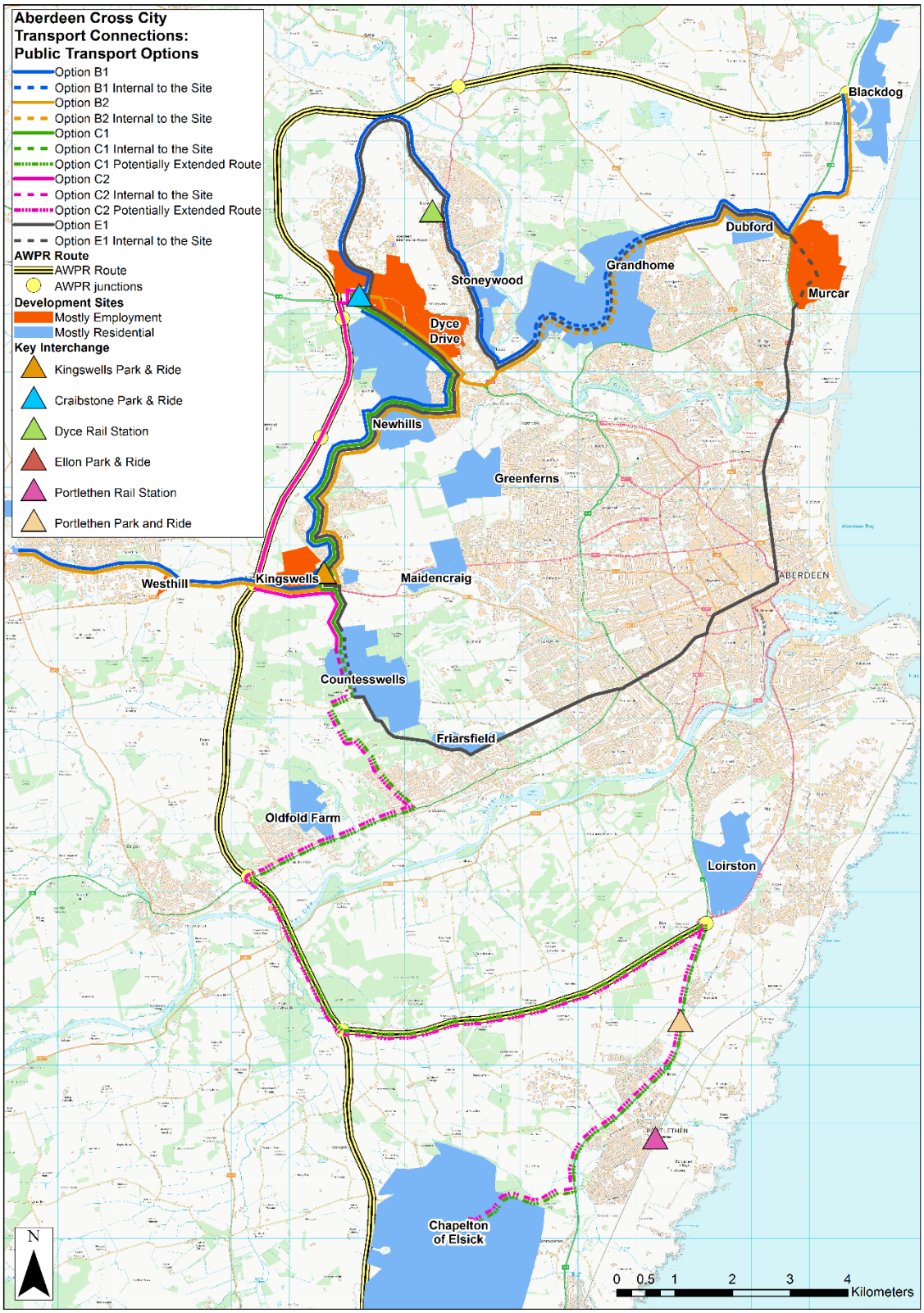

Figure Error! No text of specified style in document.:3: Public Transport Options - (Options B1, B2, C1, C2 and E1)

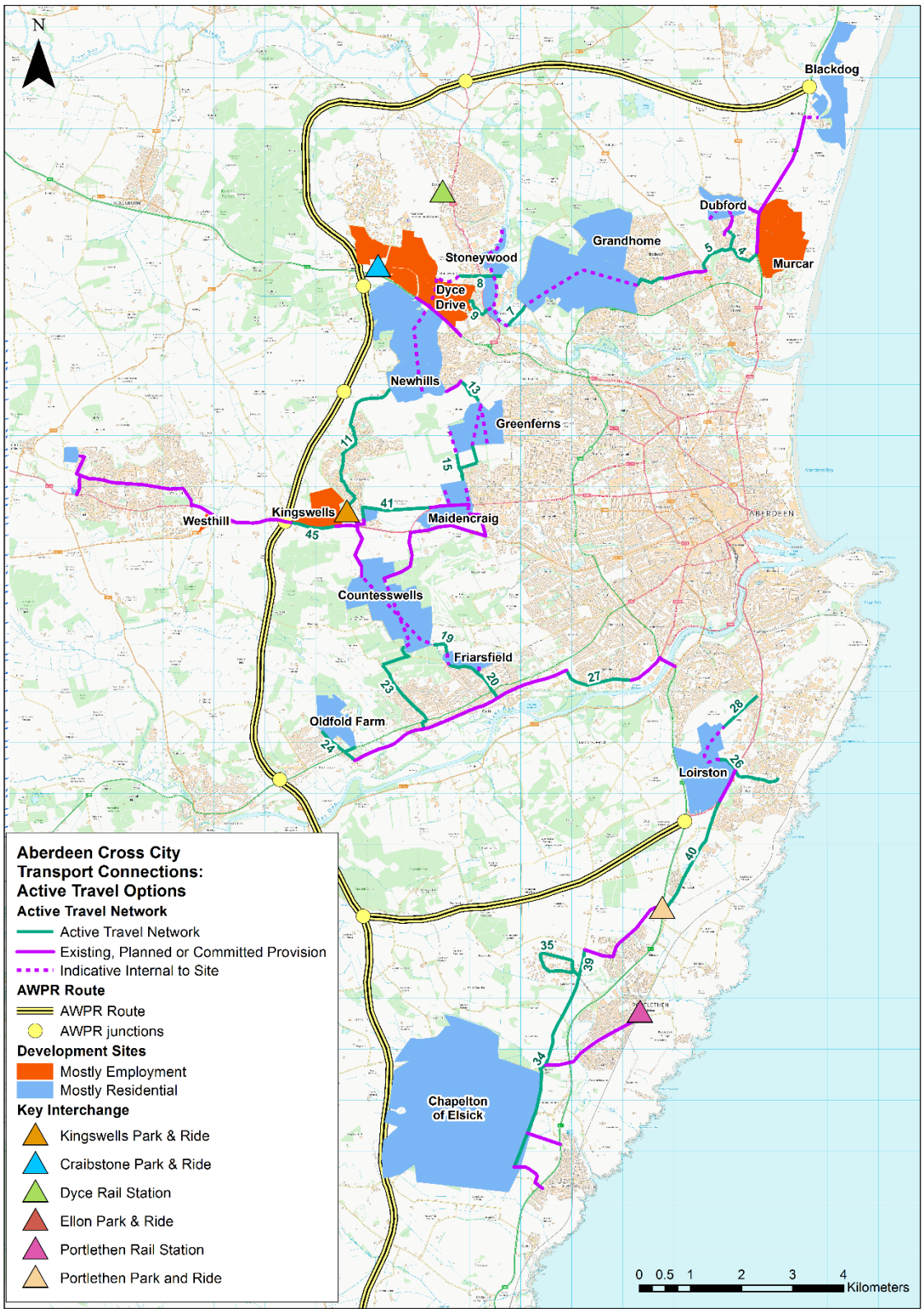

Figure Error! No text of specified style in document.:4: Active Travel Options

Part 2 Appraisal Methodology

The STAG Part 2 Appraisal phase is a more detailed appraisal of the options taken forward from Part 1. It includes a detailed appraisal of option performance against the:

TPOs;

STAG criteria;

Cost to Government; and

Risk and Uncertainty.

The options, where appropriate, were scored using the STAG seven-point scale ranging from 3 (Major Negative Impact) to +3 (Major Positive Benefit). To allow for clarity for decision makers when considering the benefits and impacts of options compared to one another, the scoring of options has been undertaken relatively between public transport options and between the active travel options such that the options with the greatest benefits have been awarded the highest scores, and conversely the options with the greatest negative impacts have been awarded the lowest scores.

To inform the Public Acceptability criteria, a public consultation was undertaken towards the end of the Part 2 Appraisal stage. Given the wide geographical area encompassed by the study, the engagement took the form of an online questionnaire and supporting Engagement Pack, both of which were publicised by the Council through the Council's communications team.

Full details of the appraisal undertaken, the individual scores awarded to each criteria for each public transport option and for the active travel network, as well as full details of the consultation undertaken and the analysis of outcomes, can be found in the Part 2 Appraisal Report and its associated Appendices, *Aberdeen Cross City Transport Connections - STAG Part 2 Report – Final, (PBA 2019).*

Summary of Selection / Rejection

Table 1:1 shows the full scoring awarded to each criteria for each public transport option and **Table 1:2** presents the rationale for each public transport option's selection or rejection.

Table 1:3 provides a summary of the appraisal scoring for all the active travel options as well as whether the option was recommended for selection or rejection.

Table Error! No text of specified style in document.:1: Public Transport Options – Appraisal Summary Scores

	Transport Planning Objectives					STAG Criteria					Risk Rating			
	TPO1	TPO2	TPO3	TPO4	TPO8									
Option	Increase the modal share for sustainable travel	Increase the public transport accessibility of employment opportunities	Provide direct public transport connections	Reduce the public transport to car journey time differential	Provide good integration between travel modes	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Public Acceptability	Cost to Government	Risk and Uncertainty	Select or Reject?
A1	2	3	2	2	3	-1	1	-2	3	3	Low	High	Medium	Reject
A2	2	2	2	2	2	-1	1	-2	2	2	Low	Medium	Medium	Reject
B1	2	3	3	3	3	-1	1	-2	3	2	Medium	Medium	High	Reject
B2	2	2	3	3	2	-1	1	-2	2	1	Low	Medium	High	Reject
C1	1	2	2	2	3	1	1	1	3	2	Low	Medium	Low	Select
C2	1	1	3	2	3	1	1	1	3	1	Medium	Medium	Low	Select
D1	1	3	1	1	3	0	0	-3	3	3	Low	High	Low	Reject
D2	1	2	1	1	2	0	0	-3	2	2	Low	Medium	Low	Reject
E1	3	3	2	3	3	0	2	1	3	3	Low	High	Medium	Select

Table Error! No text of specified style in document.:2: Public Transport Options – Appraisal Summary Scores

ID	Select or Reject	Rationale for Selection or Rejection
A1	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. There is also significant risk surrounding the construction and financial costs associated with the required bridge infrastructure which offsets any journey time benefits realised.
A2	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. There is also significant risk surrounding the construction and financial costs associated with the required bridge infrastructure which offsets any journey time benefits realised.
B1	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. There is also significant risk surrounding the construction and financial costs associated with the required bridge infrastructure and public transport only link between Dubford and Grandhome which offsets any journey time benefits realised.
B2	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. There is also significant risk surrounding the construction and financial costs associated with the required bridge infrastructure and public transport only link between Dubford and Grandhome which offsets any journey time benefits realised.
C1	Select	The option provides economic benefits if 10% modal shift from car to bus can be achieved. The option also does not require any new infrastructure which removes significant financial and construction feasibility risk. Provides good integration between travel modes as links a number of Park & Ride sites.
C2	Select	The option provides economic benefits if 5% modal shift from car to bus can be achieved. The option also does not require any new infrastructure which removes significant financial and construction feasibility risk. Provides good integration between travel modes as links a number of Park & Ride sites.
D1	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. While not requiring any new infrastructure to operate, the route is too circuitous to provide any significant journey time benefits and is unlikely to be well utilised by bus users.
D2	Reject	The option does not provide any economic benefit and would require considerable subsidy to operate. While not requiring any new infrastructure to operate, the route is too circuitous to provide any significant journey time benefits and is unlikely to be well utilised by bus users.
E1	Select	The option provides economic benefits if 10% modal shift from car to bus can be achieved. The option does carry financial and construction risks due to the required bridge infrastructure but this can be partially offset by the additional economic benefits from the service routeing through the city centre and many other existing communities. This increases significantly general access to employment opportunities both on the periphery of Aberdeen and in the city centre. Most favoured option by the public (from on-line survey). Note E2 variant to E1 would yield similar results to E1.

Table Error! No text of specified style in document.:3: Active Travel Appraisal Scores

	Transport Planning Objectives										Risk Rating			
	TPO1	TPO5	TPO6	TPO7	TPO8									
Op.	Increase the modal share for sustainable travel	Increase the accessibility of employment opportunities	Are safe and secure	Are sufficiently direct for commuters	Provide good integration between modes	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion	Affordability	Public Acceptability	Risk and Uncertainty	Select or Reject?
4	2	2	2	3	2	1	1.8	2	3	1	Low	Medium	Low	Select
5	2	2	1	2	2	1	1	2	3	1	Low	Medium	Low	Select
7	3	3	3	2	3	0	3	2	3	2	Medium	Medium	High	Select
8	2	2	1	3	3	1	1	2	3	2	Low	Medium	Low	Select
9	2	2	2	3	3	0	2.3	2	3	2	Low	Medium	Medium	Select
11	2	2	3	2	3	1	2.8	2	3	2	Medium	Medium	Medium	Select
13	2	1	3	2	1	1	3	2	3	2	Low	Medium	Low	Select
15A	2	1	3	2	1	-1	3	2	3	2	Low	Medium	Medium	Select
15B	2	1	3	2	1	0	3	2	3	2	Medium	Medium	Medium	Select
19	2	1	3	2	1	1	3	2	3	1	Low	Low	Medium	Select
20	2	1	2	1	2	1	2.2	2	3	1	Low	Low	Medium	Select
23	2	1	1	1	2	0	1	2	3	1	Medium	Medium	Low	Select
24	2	1	1	2	2	1	1.1	2	3	1	Low	Medium	Low	Select
26	1	2	3	2	2	1	3	-1	3	2	Medium	Medium	Medium	Select
27	2	2	3	3	2	1	3	2	3	2	Medium	Low	Medium	Select
28	1	2	1	3	2	0	1	-1	3	2	Low	Medium	Low	Select
34	1	3	2	2	3	0	2	-1	3	1	High	Low	High	Select
35	1	2	3	1	3	1	3	-1	3	1	Low	Medium	Medium	Select
39	1	3	3	1	3	1	3	-1	3	1	Medium	Medium	Low	Select
40	1	3	3	2	3	0	3	-1	3	1	Medium	Medium	Medium	Select
41	2	2	1	2	3	1	1	2	3	2	Low	Low	Low	Select
45	2	2	3	3	3	1	3	2	3	1	Medium	Low	Medium	Select

Conclusions and Recommendations

Public Transport

It is recommended that the public transport Options C1, C2 and E1 (as shown in **Figure 1:5**) are worthy of further consideration. These options all generated economic benefits if sufficient modal shift can be achieved (although subsidy is required). 4.4.2 While an Option E2 which directly links Stoneywood and Dyce (similar to Options A2 and B2) has not been explored in detail, it would likely yield similar results to Option E1 and could be considered subject to further investigation.

It is noted that the Economy appraisal utilised ASAM to support the option appraisal. However, the granularity of the ASAM zoning system was not sufficiently disaggregated to account for individual masterplan sites and, in addition, the masterplan site's geographical boundaries often spanned across more than one individual ASAM zone. As such, the assessment utilised trip distribution patterns from the most appropriate 'neighbouring' ASAM zone. In addition, an uplift factor, based on population, was applied to generate an estimate of the benefits to existing communities (out with the development sites).

One key recommendation would therefore be to test the options in ASAM once the AWPR has been implemented and the ASAM model updated accordingly to reflect the changes in travel patterns and behaviours. This would provide a more robust assessment of the commercial reality of the options and the likely required subsidy.

Active Travel

All the active travel routes appraised at Part 2 are worthy of further consideration but it is recommended that the routes in the orbital network (those connecting the development sites between Blackdog, Dyce, Kingswells and Countesswells) be explored before development of the radial network (connecting Chapelton of Elsick with Loirston and the city centre).

In particular, **Option 7** (or 6), part of the orbital networ, which connects Grandhome with Davidson Mills/Stoneywood and onwards to Dyce, provides a very high level of benefit under all the criteria considered. This option includes the required implementation of a new bridge over the River Don to directly connect between the Grandhome and Davidson mills/Stoneywood sites. The option should be explored as a stand-alone active travel option (with the new bridge as a foot and cycle bridge only) and also in tandem with the public transport option (Option E1) which is also recommended for further consideration and includes the new bridge – in this case the bridge would be a public transport only link with active travel provision.

Other options (all part of the orbital network) which offer the greatest overall benefits against the criteria include:

Options 8, 9, 11 and 13 – which all provide links into the area around Dyce and the employment opportunities at Dyce and Kirkhill, with Option 11 linking between Newhills/Dyce and Kingswell).

Option 45 – which links between Kingswells and Westhill and provides greater access to the employment opportunities within both locations, as well as integration between bus and active travel modes at Kingswells Park & Ride site.

All of the recommended active travel routes, with those which provided the greatest benefit as outlined above highlighted in blue, are shown in **Figure 1:6**. Given the greater benefit these options provide; it would therefore be recommended that these options are pursued before others.

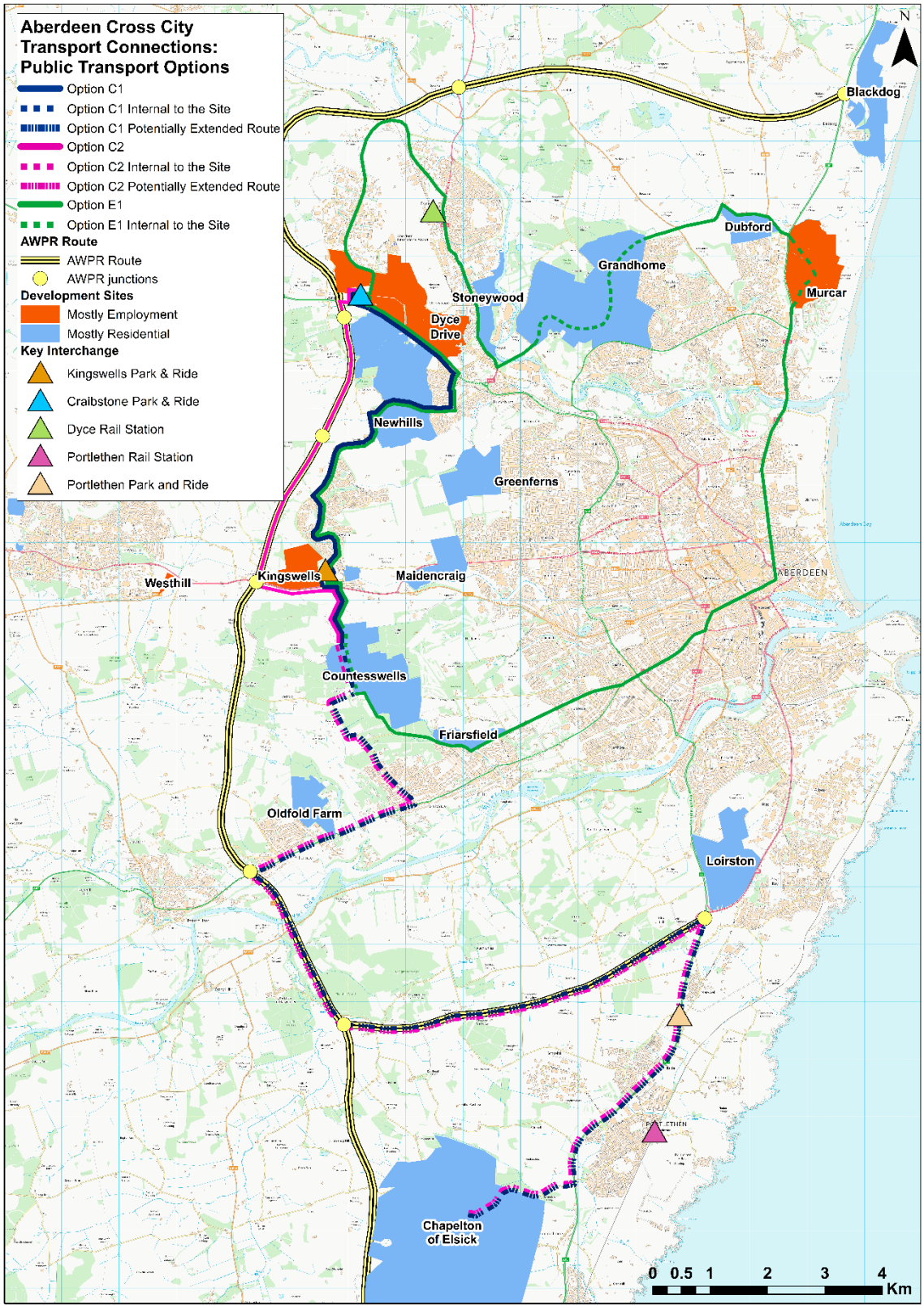

Figure Error! No text of specified style in document.:5: Final Public Transport Options

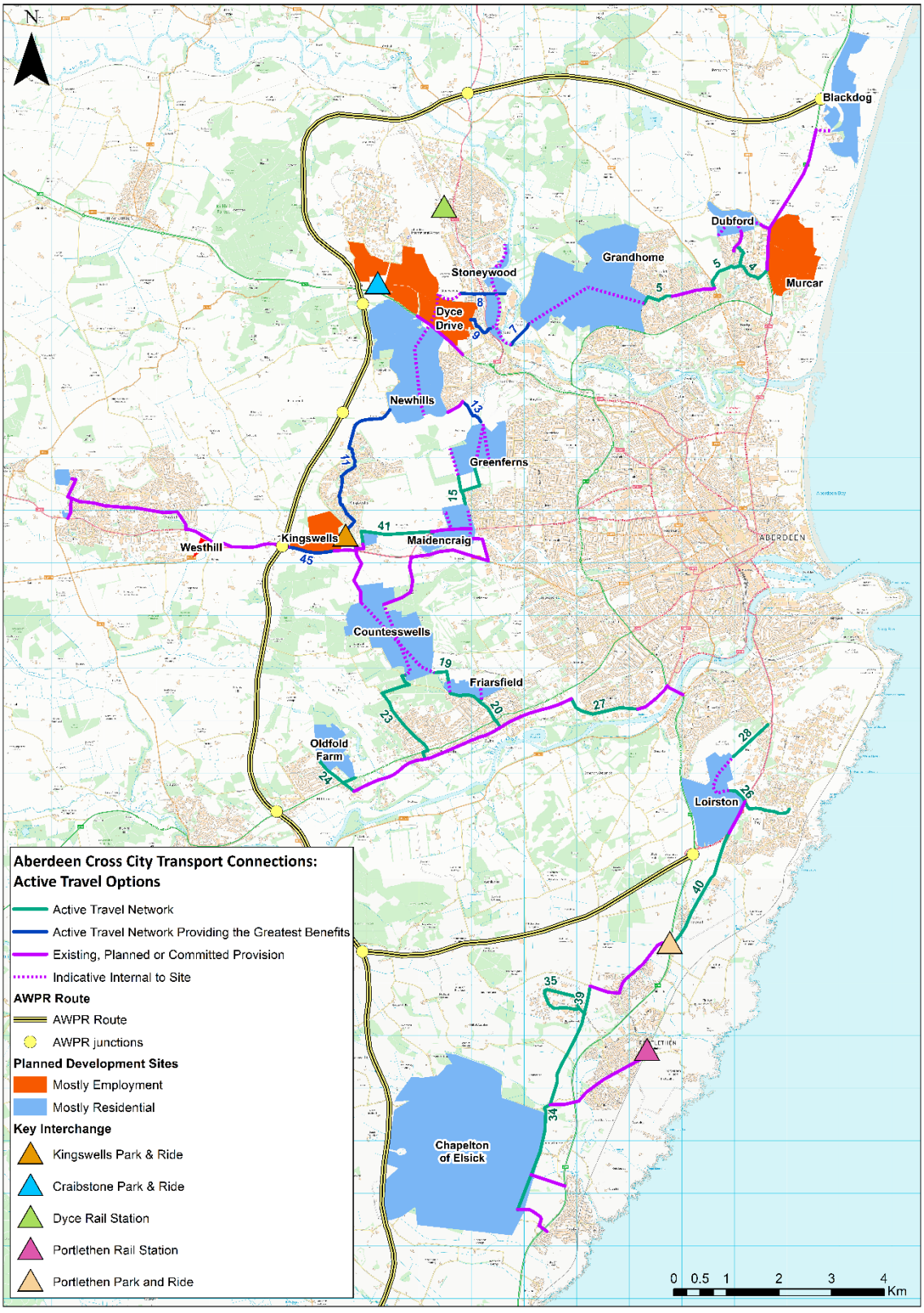

Figure Error! No text of specified style in document.:6: Final Active Travel Options, including those which provide greatest benefits