



# External Transportation Links to Aberdeen South Harbour

**STAG Detailed Options Appraisal Report  
Executive Summary**

On behalf of **Aberdeen City Council**



Project Ref: 45816/001 | Rev: AA | Date: January 2021

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| <b>For and on behalf of Stantec UK Limited</b> |                                |   |            |      |

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## Executive Summary

### Background

The External Transportation Links to Aberdeen South Harbour Study was originally commissioned in 2017 by Aberdeen City Council with the aim of examining transport connectivity to / from the new Aberdeen South Harbour at the Bay of Nigg, and to identify appropriate transport improvements which would then be taken forward for detailed appraisal. The study is an Aberdeen City Region Deal project, fully funded by the Scottish and United Kingdom Governments and has been undertaken in line with the Scottish Transport Appraisal Guidance (STAG).

The City Region Deal Agreement recognises the importance of the new harbour in accommodating existing and future demands on the port, noting that the project has national and regional significance. The City Region Deal Agreement states that *'both the UK Government and the Scottish Government commit to maximising the impact of the harbour expansion on the wider regional economy'*. The study therefore seeks to develop transport interventions which can maximise the wider regional economic benefits of the harbour development.

In 2018, after completion of the initial study which covered the *'Initial Appraisal: Case for Change'* and *'Preliminary Options Appraisal'* stages of STAG, Aberdeen City Council commissioned the subsequent stage of STAG, the *'Detailed Options Appraisal'*. Both the initial and subsequent stages of the study have been led by Stantec (formerly Peter Brett Associates).

While the initial study focus was on connectivity to the new harbour, this focus has widened as the study has progressed (as discussed below). Throughout the study, cognisance has been taken of the potential wider economic benefit the new harbour can bring to the region. The study fully recognises that improved connectivity to the harbour, and the industrial areas located nearby, can act as a key driver in improving the region's attractiveness for international trade and investment, and can support businesses in the oil, gas, and renewable energy supply chain to internationalise in key global markets. This will help address the economic challenges facing the region and capitalise on available opportunities.

### Aberdeen South Harbour

Aberdeen South Harbour (ASH) is located at the Bay of Nigg, approximately 0.8km to the south east of Aberdeen city centre and the existing Aberdeen Harbour. The development is being taken forward in response to constraints at the existing harbour and is an expansion of activities aimed at capitalising on new and emerging markets as the harbour will be able to accommodate larger vessels. Once complete, the new harbour will provide:

- 1,400m of quay at water depths of up to 10.5m;
- a turning circle of 300 metres;
- a channel width of 165m;
- a laydown area of 125,000 m<sup>2</sup>; and
- heavy lift capacity.

The main access to the new harbour will be located close to the existing Coast Road / St. Fitticks Road / Greyhope Road junction. The site will include two single storey welfare / administration buildings, a car park, and a bus turning circle and it is anticipated that 20-25 harbour staff will be based at the site.

A Transport Assessment was produced in 2015. This concluded that the traffic generated by the harbour could be accommodated by existing transport infrastructure and therefore no junction

improvements or significant additional road infrastructure were required upon opening. In 2016, Aberdeen City Council approved the Bay of Nigg Development Framework<sup>1</sup>. This covers the new harbour development site and the surrounding hinterland area, including Altens and East Tullos, and was developed with the aim of maximising the opportunities presented by the new harbour. The Development Framework identifies a series of infrastructure interventions or gateways where significant investment in external road infrastructure is required to realise the potential of the area. These included upgrading the road network in and around Altens and providing a direct link from the Bay of Nigg to East Tullos.

The Transport Assessment and the Bay of Nigg Development Framework formed an important starting point for this study and the analysis and outputs were used to inform both the baselining and subsequent option generation process.

### Case for Change and Preliminary Options Appraisal

The initial stage of the study, the development of the *Case for Change*, considered the problems, opportunities, issues, and constraints for the study, set Transport Planning Objectives, and developed and sifted a list of multi-modal transport options which sought to improve connectivity to the new harbour. In the *Preliminary Options Appraisal*, these options were then appraised, against the objectives, the STAG appraisal criteria (Environment, Economy, Safety, Accessibility & Social Inclusion, and Integration), and against Implementability criteria (Feasibility, Affordability and Public Acceptability). Options were then rejected or selected for further development and more detailed appraisal in the *Detailed Options Appraisal*. This *Detailed Options Appraisal* is the focus of this report. Full details of the *Case for Change* and *Preliminary Options Appraisal* can be found in the report, *External Transport Links to Nigg Bay - Pre and Part 1 Appraisal Report - v3.0, Peter Brett Associates (now part of Stantec), October 2018*.

### An Evolution of the Focus

As noted above, the initial scope of the study was to examine transport connectivity for the new Aberdeen South Harbour. As such, the options developed and appraised at the initial study stages, were developed with this aim in mind. However, in March 2020 Aberdeen City Council published their Proposed 2020 Local Development Plan ('Proposed Plan') which set out new proposed land use changes in the area in the immediate vicinity of the harbour.

Changes to the oil and gas sector in recent years means the energy industry is having to adapt and evolve and consider the potential for new sustainable and low/zero carbon energy resources. A 70-acre site (split between two areas) has been identified close to the new harbour, which includes green space and the existing East Tullos industrial estate. The area has been earmarked in the Proposed Plan and described as the city's first 'Energy Transition Zone' (proposed ETZ). Under the proposals, the land would be set aside for the development of low or zero-carbon or renewable energy industries, with businesses focussing on wind, biomass, solar and tidal sectors. It would also see the creation of a hydrogen production plant and a shoreside energy hub.

The location identified for the proposed ETZ seeks to maximise development opportunities with the proximity of the harbour a key enabler in the development and success of the zone. Access to the harbour is key to encouraging and supporting the delivery of low carbon energy and technologies, and alternative fuel production at the site, to facilitate the transition from oil and gas to green energy production.

In June 2020, the Scottish Government announced £62m in funding to support the oil and gas sector, focussed on north-east Scotland, to help the industry deal with the dual economic impacts of the COVID-19 pandemic and the suppressed oil prices. The funding will go towards several projects, including the proposed ETZ.

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<sup>1</sup> <https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2018/06/aberdeen-city-council-planning-authority-core-documents/documents/bay-nigg-development-framework-pdf/bay-nigg-development-framework-pdf/govscot%3Adocument/Bay%2Bof%2BNigg%2BDevelopment%2BFramework.pdf>

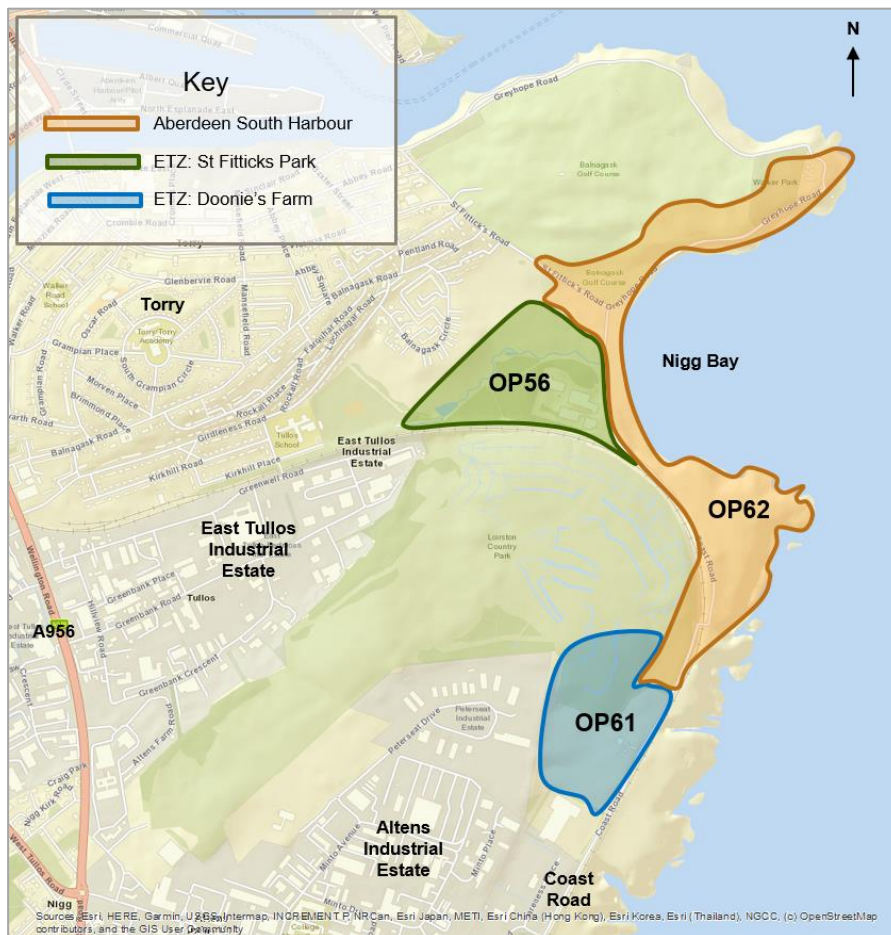
This emergence of the proposed ETZ means the study now requires to ensure appropriate transport connectivity **to / from** the harbour, the proposed ETZ and the surrounding industrial area and ensuring appropriate access **between** the harbour and proposed ETZ area. Any new connections therefore need to ensure appropriate linkages between the new harbour / proposed ETZ and business districts around Aberdeen and the wider regional economy, as well as with the nearby industrial areas of Altens and East Tullos.

*Proposed ETZ Background Details*

The Proposed Plan identifies two sites for the proposed ETZ:

- OP56 – St. Fitticks Park: 18.2ha site
- OP61 – Doonies Farm: 16.3ha site

The proposed sites for the proposed ETZ, OP56 and OP61, in relation to the new harbour, are shown in the figure below.



Energy Transition Zone and Aberdeen South Harbour Locations

Opportunity North East is leading on the development of an Outline Business Case (OBC) for the proposed ETZ, which includes the development of an outline masterplan to support the OBC.

It is recognised that several of the road options for this study provide a link between the East Tullos industrial estate, the proposed ETZ and the harbour with the alignment of these road options passing directly through the proposed ETZ site at St. Fitticks Park. This clearly has implications on the potential layout and useable land within this part of the proposed ETZ.

While this study and the work being undertaken to develop the proposed ETZ are being undertaken separately, both studies are fully cognisant of the work being undertaken within the other study. Clearly the proposed ETZ site at St. Fitticks has the potential to benefit from improved connections to East Tullos but the scale of the benefit will be dependent on the activities being undertaken at the proposed ETZ site – which at this stage are not yet fully established. These activities will, in turn, dictate the availability of land for a new road within the proposed ETZ site. Given the proposed ETZ masterplanning work is ongoing, it is too early to determine whether the activities to be located at the proposed ETZ could accommodate space for a road, and if a road is deemed to provide benefit, then the exact alignment of such a road through the site. To this end, while engineering work has been undertaken as part of this study to consider a link through St. Fitticks Park (linking East Tullos and the Coast Road), the exact alignments presented should not be taken as fixed and would be subject to change, if taken forward, as development of the proposed ETZ site progresses.

#### *Wellington Road Multi-modal Study*

The work being undertaken for this study has also taken cognisance of the ongoing *Wellington Road Multi-modal Corridor Study*. The study is looking at ways of improving travel for people and goods along the Wellington Road corridor. Among the objectives are improving air quality, facilitating school travel, safer travel for pedestrians and cyclists, and improving bus and freight movements. The study area is from A90(T) / A956 Charleston Interchange to the Queen Elizabeth Bridge. It also incorporates the side roads in proximity to Wellington Road, and any interaction with A90(T).

Additional traffic generated by the new harbour and proposed ETZ, as well as the infrastructure proposed under the various options being considered, have the ability to affect traffic flows, patterns and routing in the Wellington Road area. The need to collaborate to ensure that options are complementary has been important during the option development and appraisal process for both studies. Where options have the potential to constrain or support the proposals of the *Wellington Road Multi-modal Corridor Study* this is noted within the appraisal reporting.

#### **Smartening the Objectives**

The emergence of the proposed ETZ necessitated a review of both the Transport Planning Objectives (TPOs) for the study and the options themselves. The proposed ETZ and the activities likely to take place there are anticipated to generate additional traffic volumes to that envisaged for the new harbour and of a different traffic composition. The proposed ETZ has a transport impact in its own right and clearly has the potential to impact on the nature of the activities at the new harbour. This has implications not just on the likely benefits of any new road connection, but places additional weighting on public transport and active travel connections to ensure appropriate sustainable transport connections for those commuting to the sites.

Therefore, there are two main traffic variables:

- The quantity and type of traffic associated with **ASH**: commercial vehicle traffic; car-based travel; public transport journeys; and active travel journeys.
- The quantity and type of traffic associated with the **proposed ETZ**: commercial vehicle traffic; car-based travel; public transport journeys; and active travel journeys.

Given the widened focus of the study, the TPOs were revisited to ensure they are still relevant. This also provided an opportunity to rationalise the number of TPOs from the set of nine at the end of the Preliminary Options Appraisal stage. The final set of revised objectives agreed with the Client Group are shown in the table below.

Revised Transport Planning Objectives

| Revised TPO No. | Revised Objective  |
|-----------------|--|
| TPO1            | Provide a designated Heavy Goods Vehicle (HGV) route to/from ASH / proposed ETZ sites which is more efficient than alternative routes to: <ul style="list-style-type: none"> <li>minimise journey times to Aberdeen Western Peripheral Route (AWPR) / Charleston junction and King George VI Bridge; and</li> <li>help minimise inappropriate routeing and environmental and nuisance impacts</li> </ul> |
| TPO2a           | Maximise connectivity by all modes (car, public transport, and active travel) between Aberdeen South Harbour / Energy Transition Zone and prospective workers at the sites   |
| TPO2b           | Maximise connectivity between proposed ETZ and other energy-related businesses in the Aberdeen area (Business to Business)   |
| TPO3            | Futureproof access to the proposed ETZ / ASH for the widest range of abnormal loads possible and minimise the impact of abnormal loads travelling from and to the proposed ETZ / ASH   |
| TPO4            | Improve the resilience of transport connections to and from ASH /proposed ETZ  |
| TPO5            | Maximise the intermodal opportunities between the proposed ETZ and the existing rail network   |

### Revising the Options

A review of all the options recommended for detailed appraisal was also undertaken. No changes were required for the road options, but the public transport and active travel options were revised to ensure improved connectivity to the new harbour and the proposed ETZ sites by all transport modes.

The final set of options that have been appraised at the Detailed Appraisal Stage, with their appraisal presented within this report, are shown below in the table and corresponding figures. This includes four road options (with two variants within two of these), four public transport options and two active travel options.

Final options for Detailed Options Appraisal

| Mode             | Option | Option Description  |
|------------------|--------|---|
| Road             | A2a/b  | New road connection from Greenwell Road / Greenbank Road via St Fitticks Community Park to Coast Road with a new underbridge under the railway line   |
|                  | A3a/b  | New road connection from Greenwell Road / Greenbank Road via the former Ness Landfill site and a new bridge over the railway. Instead of this new bridge, a variant of Option A3 includes an additional link around the perimeter of the landfill site to a location south of the existing bridge on Coast Road |
|                  | A4     | Improve the existing route via Hareness Road through the provision of a new bridge over the railway on Coast Road and capacity improvements.  |
|                  | A5     | New road connection between Coast Road and Souter Head Road and a new bridge over the railway on Coast Road.  |
| Public Transport | B1     | Extend / enhance existing bus services between ASH / proposed ETZ sites (at both St. Fitticks and Doonies Farm) and Aberdeen City Centre.   |
|                  | B2     | New bus service between ASH and Aberdeen City Centre for cruise passengers.   |



| Mode          | Option | Option Description  |
|---------------|--------|---|
|               | B4     | New direct bus service linking Aberdeen City Centre with ASH and proposed ETZ site(s)   |
|               | B5     | New bus service loop linking Aberdeen city centre with ASH, proposed ETZ site (at St. Fitticks) and East Tullos Industrial Estate (dependent on new road link between proposed ETZ and East Tullos) |
| Active Travel | C1     | Enhanced active travel routes between ASH / proposed ETZ sites and Aberdeen City Centre   |
|               | C4     | Enhanced active travel routes between ASH / proposed ETZ sites and Wellington Road (south)  |



Road Option for Detailed Appraisal



Public Transport Options for Detailed Appraisal



Active Travel Options for Detailed Appraisal

## Detailed Options Appraisal

The detailed appraisal of the options has covered:

- Development of harbour and proposed ETZ anticipated traffic generation, geographical distribution, and profiling over the day
- Traffic modelling to inform various appraisal elements
- Assessment of the options against:
  - Transport Planning Objectives
  - STAG appraisal criteria
  - Implementability considerations (technical and operational)
- Cost to Government;
- Risk and Uncertainty
- Consultation and Engagement.

### Aberdeen South Harbour and proposed ETZ traffic generation

Traffic generation estimates for **ASH** were derived by:

- estimating annual cargo tonnage based on the relationship between quay length and cargo tonnage seen at comparator UK ports; and
- estimating annual trip generation – influenced by the anticipated cargo to be handled by the port – with an understanding of this derived through discussion with the Aberdeen Harbour Board and consideration of broad freight types at the comparator ports; and profiling trips across an average day, based on the 2015 Transport Assessment.

In the absence of definitive information on the exact nature of development at the **proposed ETZ**, the Siemens Green Port Hull (SGPH) at Alexandra Dock in Hull was used as a ‘model’ of the type of activity which could emerge at the site. SGPH comprises a wind turbine manufacturing facility, offices, warehousing, and a marine installation/commissioning base. Information from the Traffic and Transportation Chapter of the Environmental Statement for the Hull site was used to inform estimates of trip generation at the proposed ETZ.

### Traffic Modelling

To enable an economic assessment of the road options as well as feed into several further elements of the appraisal, the use of a traffic model was required. As well as providing traffic demand, trip distance and journey time data to feed into the assessment of the options, the traffic model provided visual representations of the operational performance of the options. A microsimulation traffic model developed by AECOM and being used in the *Wellington Road Multi-modal Corridor Study* was extended to allow the model to be effectively utilised for this study.

The 2019 ‘Base model’ simulates the behaviour of individual vehicles within the modelled road network and has formed the base platform for predicting the traffic patterns resulting from changes to traffic volumes and changes to the road network.

Future year traffic demands were generated for the future years of 2026 (the assumed opening year of any road option) and 2041 (15-years post opening). ‘Do Minimum’ models were developed to provide a representation of the future in 2026 and 2041 in the absence of any changes to the network. These

and each of the equivalent future models with the options in place included additional traffic demand over and above the 2019 Base model. This additional demand represents underlying background growth, local committed developments and the traffic estimated for the new harbour and proposed ETZ sites.

### **Cost to Government**

As the proposed road options are at the feasibility design stage, only high-level construction cost estimates have been developed. The estimates include optimism bias to reflect the uncertainties (at the 44% rate as per schemes at this stage of development). It is important to note that the cost estimates do not include allowances for the following:

- Costs associated with land / property acquisition;
- Statutory approvals / consents;
- Adjustments to existing public utility apparatus;
- Surveys and investigations;
- Design and works supervision fees; or
- Value Added Tax (VAT) and Inflation, as the date of construction is yet to be established.

At the next stage of preliminary and detailed design more detailed costs would be obtained. A high degree of cost uncertainty will remain until actual investigation and design work is undertaken.

### **Consultation and Engagement**

Consultation was undertaken with a number of key stakeholders during the Detailed Options Appraisal. This included discussion with the ETZ masterplanning team, Aberdeen South Harbour, bus operators, and a potentially impacted local business.

To inform the public acceptability appraisal of the options, a public engagement exercise was undertaken in late 2020. Due to the COVID-19 pandemic, it was not possible to run face-to-face public events. As such, all engagement activity was online. The key points from this engagement have been incorporated in the appraisal with full details of the engagement outcomes in the main body of this report and an associated appendix. Key points to note are:

- Of the road options (Options A2 – A5), Option A4 (a new bridge on Coast Road with Coast Road widening) was the only option where the overall engagement feedback highlighted net agreement with the option as opposed to net disagreement
- There was particularly negative response towards Options A2a and A2b (proposing an underpass of the railway and road route through St. Fitticks Park). In particular, there was negative feedback from the Torry community given the route through the park.
- There was also an overall net negative response towards Options A3a and A3b, although not as strong as towards Options A2a and A2b. Environmental concerns regarding the route through the landfill site were raised.
- There was a mixed response towards Option A5, with negative feedback from the local Burnbanks Village community
- There was a mixed response towards the bus options, Options B1, B2, B4 and B5
- There was overall positive agreement with the active travel options, Options C1 and C4.

### **Detailed Option Appraisal Summary**

The key advantages and disadvantages associated with each option from the Detailed Options Appraisal are presented below.

**Road Option A2a/b:**  
**New road link from either Greenwell Road (Option A2a) or Greenbank Road (Option A2b) across St Fitticks Park to new Coast Road junction, including new underbridge at the railway line**

Complementary Measures:  
 Signalling Greenwell / Wellington Road junction (Option A2a only)

Surface upgrades, drainage works and footway improvements on Greenwell / Greenbank Road

Potential parking restrictions / enforcement on Greenwell / Greenbank Road

Approximate Outline Cost £9m - £11m



**Advantages**

- Provide less circuitous routing to the new ASH / proposed ETZ area for HGV traffic from the city centre / West (George VI bridge)
- Enhances transport resilience and improves perceptions through provision of additional route and crossing of the railway (underbridge)
- Provides connection between the new ASH / proposed ETZ and East Tullos Industrial estate helping to maximise and support the regeneration of East Tullos
- Minor accident benefits (vehicles on lower speed roads)
- Provides the greatest increase in overall workforce accessibility to the area

**Disadvantages**

- Route requires cutting into Ness landfill site to south of the railway line, likely to be a costly exercise, with need to remove material and hazardous substances. There is high-cost uncertainty associated with this
- Underpass height clearance / alignment would limit route use by some abnormal loads and places a constraint on the route
- Increased HGV traffic on Wellington Road (between Hareness Road and Greenbank / Greenwell Road)
- Benefit Cost Ratio (BCR) is estimated in range: A2a: -0.3 to +0.3 and A2b: +0.8 to +1.1. *BCRs less than one indicate benefits less than scheme costs. Negative BCR indicates overall negative benefits – driven by the impact to existing traffic on Wellington Road – more pronounced in A2a due to new signals on Wellington Road at Greenwell Road*
- Impact on commercial property at eastern extent of Greenwell / Greenbank Road
- Constrains potential for sustainable transport options on Wellington Road (developed as part of the Wellington Road Multi-modal Corridor study)
- Constrains land availability within the proposed ETZ site at St. Fitticks due to space required for new road and associated earthworks / flood treatment
- Would impact on St Fitticks Community Park and potentially the northern tip of Tullos Hill Conservation Site
- Strong public disagreement with both option proposals

**Road Option A3a/b (including variant)**

**New road link from either Greenwell Road (Option A3a) or Greenbank Road (Option A3b) across the former Ness Landfill Site and a new bridge across the railway to Coast Road.**

**Variant: no new bridge and instead a link around the perimeter of the landfill site to the Coast Road**

Complementary Measures:

Signalising Greenwell / Wellington Road junction (Option A3a only)

Surface upgrades, drainage works and footway improvements on Greenwell / Greenbank Road

Potential parking restrictions / enforcement on Greenwell / Greenbank Road

Approximate Outline Cost £14m - £15m



**Advantages**

- Provide less circuitous routing to the new ASH / proposed ETZ area for HGV traffic from the city centre / West (George VI bridge)
- Enhances transport resilience and improve perceptions through provision of additional route and crossing of the railway (bridge)
- Provides connection between the new ASH / proposed ETZ and East Tullos Industrial estate helping to maximise and support the regeneration of East Tullos
- Does not constrain proposed ETZ activities as road does not route through the proposed site
- Minor accident benefits (vehicles on lower speed roads)
- Variant would provide direct link between East Tullos and ASH/ETZ without the need for the new bridge as proposed under Option A3a/b (although the new bridge on the Coast Road as proposed in Option A4 would be required). This would support harbour activities and the regeneration of the industrial estate.

**Disadvantages**

- Road gradient required from Coast Road to new bridge across railway (around 18%) is far higher than that recommended for HGVs on a strategic route and would not be useable by abnormal loads. In addition, a new Scottish Water access road would be at a gradient of 20%
- Retaining wall would encroach on Scottish Water land and require significant cutting into Ness landfill, likely to be a costly exercise, with need to remove material and hazardous substances. Very high levels of risk and uncertainty associated with this scale of intrusion into Ness landfill site (with a substantially increased risk for the variant given the additional distance through the landfill site). The variant connection between ASH and the strategic road network would be indirect
- Benefit Cost Ratio is estimated in range: A3a: 0.0 to +0.1 and A3b: +0.3 to +0.8. (note: variant not estimated)  
*BCRs less than one indicate benefits less than scheme costs – with low benefits driven by the impact on existing traffic on Wellington Road – more pronounced in A3a due to new signals on Wellington Road at Greenwell Road*
- Increased HGV traffic on Wellington Road (between Hareness Road and Greenbank / Greenwells Road)
- Impact on commercial property at the eastern extent of Greenwell / Greenbank Road
- Constrains the potential for sustainable transport options on Wellington Road (developed as part of the Wellington Road Multi-modal Corridor study)
- Strong public disagreement with both option proposals, although less than Option A2a/b

### Road Option A4

**New bridge on Coast Road combined with widening of Coast Road.**

Approximate Outline Cost £7m



#### Advantages

- Enhances existing route to Aberdeen South Harbour via Hareness Road
- Provides consistently reduced journey times to the Harbour / proposed ETZ area across all time periods
- Potential to provide access for long abnormal loads currently constrained by the alignment of the bridge on Coast Road
- Positive impact in terms of perception although Coast Road and Hareness Road remain the primary route to the harbour
- No additional traffic on Wellington Road north of Hareness Road
- Less constraint on the potential for sustainable transport options on Wellington Road (developed as part of the Wellington Road Multi-modal Corridor study)
- Provides improved link between the proposed ETZ site at Doonies Farm and ASH / proposed ETZ site at St. Fitticks
- One of the lowest cost road options
- Benefit Cost Ratio estimated in range: +1.4 to +2.0  
*A BCR figure greater than 1 indicates the benefits of the scheme are greater than the estimated scheme costs*
- Most publicly acceptable road option due to minimal impact on the environment and no impact on St. Fitticks Park

#### Disadvantages

- Hareness Road would remain the primary route and therefore traffic in Altens and at the Hareness Road roundabout would increase with ASH and proposed ETZ traffic
- Parking restriction may be required on Hareness Road, impacting on businesses within the industrial estate
- Would not provide a direct new connection between ASH / proposed ETZ and East Tullos
- Delivery of new bridge may require construction works through the Taylor's former landfill site and therefore feasibility is uncertain and there is potential for negative environmental impacts



**Road Option A5**  
**New road link between Coast Road and Souter Head Road and new bridge over the railway.**

Complementary Measures

Re-alignment of southern section of Coast Road (away from Burnbank village) to make the new link and Souter Head Road the primary through route to ASH / proposed ETZ area

Widening of Coast Road

Surface upgrades, drainage works on Souter Head Road

Potential parking restrictions / enforcement on Souter Head Road

Approximate Outline Cost £8m



**Advantages**

- Provides additional route to Aberdeen South Harbour
- Provides a shorter route to the AWPR than all existing routes
- Provides consistently reduced journey times (from Charleston junction and King George VI bridge) to Harbour / proposed ETZ area across all time periods (particularly to/from Charleston junction)
- Potential to provide access for long abnormal loads currently constrained by the alignment of the bridge on Coast Road
- Positive impact in terms of perception of access to the harbour
- Positive impact in terms of transport resilience
- No additional traffic impact on Wellington Road north of Hareness Rd and reduced traffic between Souter Head roundabout and Hareness Road
- Benefit Cost Ratio estimated in range: +1.5 – +2.3  
*A BCR figure greater than 1 indicates the benefits of the scheme are greater than the estimated scheme costs*
- Less constraint on the potential for sustainable transport options on Wellington Road (developed as part of the Wellington Road Multi-modal Corridor study)
- Improved link between the proposed ETZ site at Doonies Farm and ASH/proposed ETZ site at St. Fitticks
- Reduces traffic on Langdykes Road

**Disadvantages**

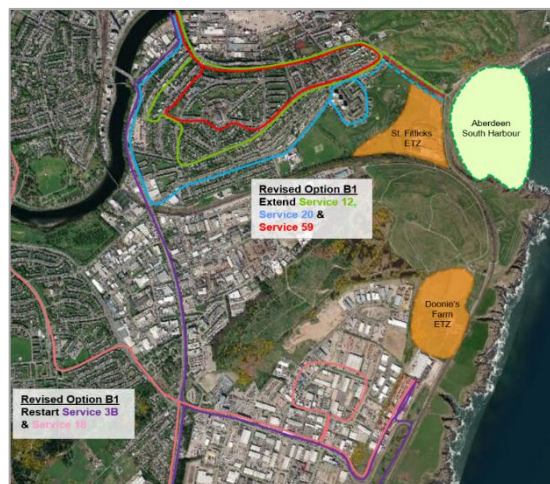
- Despite the realignment of Coast Road, there would be noise, vibration, and severance impacts, to some residents in Burnbanks Village – although this could be partly mitigated against through use of a low noise road surface
- Would not provide a direct connection between ASH / proposed ETZ and East Tullos
- Delivery of new bridge may require construction works through the Taylor’s former landfill site and therefore feasibility is uncertain and there is potential for negative environmental impacts
- Increased traffic levels on Souter Head Road impacting on commercial properties there
- Impact on commercial properties at east end of Souter Head Road with a potential requirement, at least in part, to relocate. Significant investment has been made at one specific site in recent years.
- Parking restriction may be required on Souter Head Road, impacting on businesses within the industrial estate
- Mixed public acceptability for the option with strong disagreement from Burnbanks village residents

### Public Transport Option B1

**Extend existing / reinstate (recently reduced / removed) bus services so that they serve Aberdeen South Harbour and the proposed ETZ sites.**

Extend / reinstate (recently reduced / removed) services:

- First Aberdeen Bus Service 3b between Mastrick, city centre and Altens
- First Aberdeen Bus Service 12 between Torry, city centre and Heathryfold
- First Aberdeen Bus Service 18 between Dyce, city centre and Altens
- First Aberdeen Service 20 between Balnagask, city centre and Dubford
- Stagecoach Service 59 between Balnagask and Northfield (Aberdeen Royal Infirmary)



For appraisal it has been assumed that:

- Extended / reintroduced services will operate throughout the day with a greater number of extensions at envisaged 'peak times' for staff movements
- No additional bus infrastructure will be required (as route would utilise the new turning circle at Aberdeen South Harbour and existing bus corridors / bus stops)

| Advantages   |
|--|
| <ul style="list-style-type: none"> <li>➤ Would improve access between potential workers and the new harbour and both proposed ETZ sites, particularly for those without access to a car</li> <li>➤ Would improve access between the sites and other energy related businesses across the region</li> <li>➤ May encourage modal shift to public transport amongst those accessing the new harbour and proposed ETZ sites</li> <li>➤ Services route via city centre enabling interchange to other bus services / rail</li> <li>➤ Provides improved link between the proposed ETZ site at Doonies Farm and ASH / proposed ETZ site at St. Fitticks</li> </ul> |

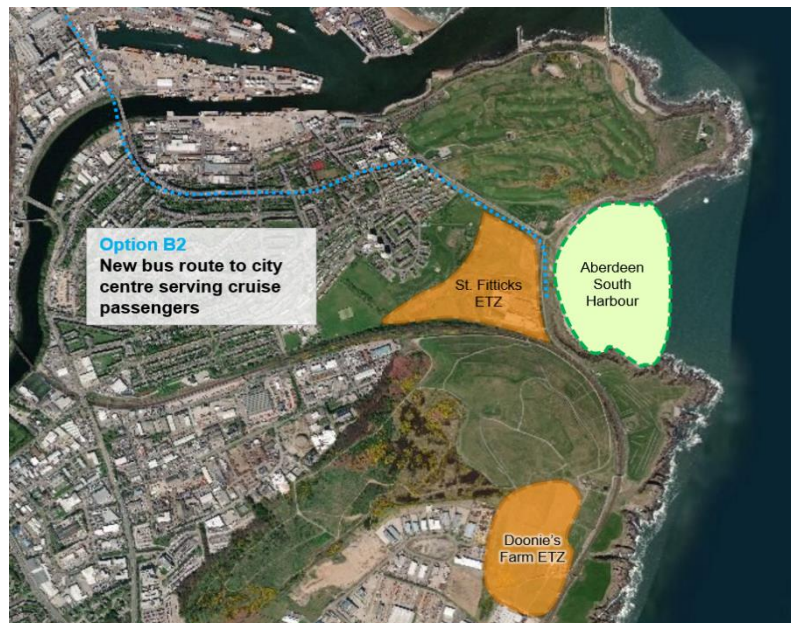
| Disadvantages  |
|--|
| <ul style="list-style-type: none"> <li>➤ The cost of service operation far outstrips the estimated achievable passenger revenue. The option would be loss making and require substantial financial support.</li> <li>➤ Mixed public acceptance of the proposals</li> </ul> |

### Public Transport Option B2

#### New bus service between Aberdeen South Harbour and Aberdeen City Centre primarily for cruise tourists

For appraisal it is assumed that:

- The service will run hourly between 0700 and 1900 and would operate only during the cruise season (assumed to be an approximate 7-month period between March / April – September / October)
- No additional bus infrastructure will be required (as route would utilise the new turning circle at Aberdeen South Harbour and existing bus corridors / bus stops)



| Advantages   |
|--|
| <ul style="list-style-type: none"> <li>➤ Boosts the ability of the harbour to cater for cruise tourism</li> <li>➤ Benefits the economy of the wider area by encouraging cruise passengers to explore the local tourism offering</li> <li>➤ The cost of the service depends on hours of operation and whether the service is operated on a contract basis or as a registered local service but could be operated to be commercially viable if cruise passengers were encouraged to come ashore</li> </ul> |

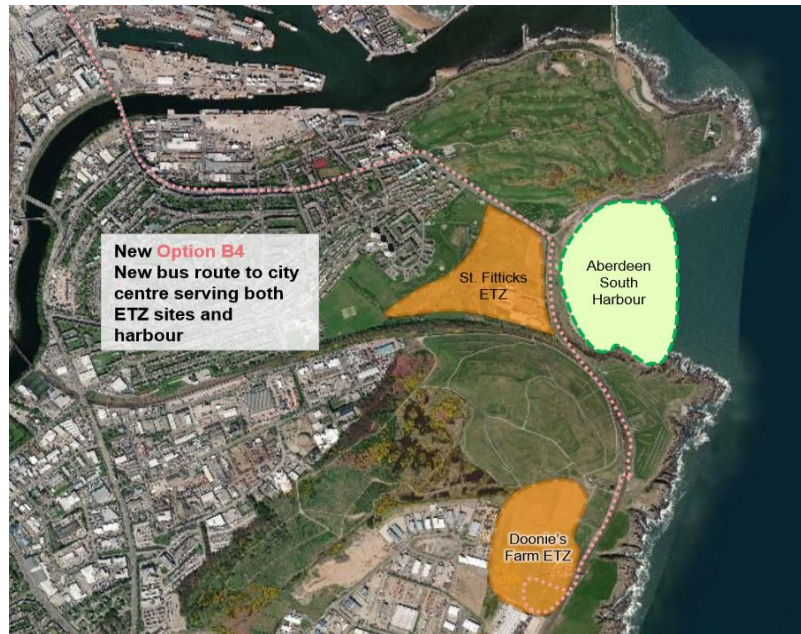
| Disadvantages   |
|---|
| <ul style="list-style-type: none"> <li>➤ Viability is dependent on cruise passengers wanting to come ashore and competing 'offers'. Careful planning and liaison with cruise operators is required.</li> <li>➤ Mixed public acceptance of the proposals but with more people disagreeing than agreeing</li> </ul> |

### Public Transport Option B4

#### New bus service between the city centre and Aberdeen South Harbour / both proposed ETZ sites

For appraisal it is assumed that:

- Service would operate in line with envisaged 'peak times' / shift movements for staff
- Bus infrastructure would need to be incorporated into the Doonies Farm proposed ETZ site to provide a turning point for the service



| Advantages  |
|---|
| <ul style="list-style-type: none"> <li>➤ Would improve access between potential workers and the new harbour and both proposed ETZ sites, particularly for those without access to a car (although of all public transport options this option has the lowest improved access)</li> <li>➤ Would improve access between the proposed ETZ sites and other energy related businesses across the region (although of all public transport options this option has the lowest improved access)</li> <li>➤ May encourage modal shift to public transport amongst those accessing the new harbour and proposed ETZ sites</li> <li>➤ Sustainably connects both proposed ETZ sites</li> <li>➤ Service routes via city centre enabling interchange to other bus services / rail</li> </ul> |

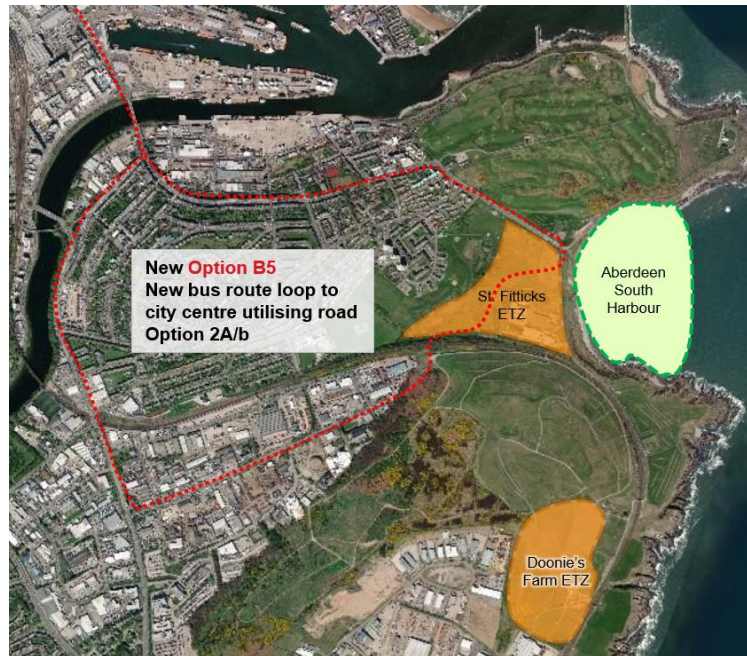
| Disadvantages  |
|--|
| <ul style="list-style-type: none"> <li>➤ Only serves the city centre meaning likely interchange required for those accessing the new service from further afield</li> <li>➤ The cost of service operation far outstrips the estimated achievable passenger revenue. The option would be loss making and require substantial financial support.</li> <li>➤ There may be a transfer of passengers from existing services (those travelling between the city and Torry) to the new service which may erode the commercial viability of existing public transport provision</li> <li>➤ Mixed public acceptance of the proposals</li> </ul> |

### Public Transport Option B5

**New circular bus service between the city centre and Aberdeen South Harbour / proposed ETZ site at St. Fillicks Park**

For appraisal it is assumed that:

- Road option A2 a/b (or A3 a/b) is in place
- Service would operate in line with envisaged 'peak times' / shift movements for staff
- Bus infrastructure would need to be incorporated into the proposed ETZ site at St. Fitticks Park
- The underpass (if Option A2 a/b/ were implemented) would need to enable suitable height clearance to accommodate the service, dependent on the bus vehicle type used



| Advantages  |
|---|
| <ul style="list-style-type: none"> <li>➤ Would improve access between potential workers and the new harbour / proposed ETZ site at St. Fitticks, particularly for those without access to a car</li> <li>➤ Would improve access between the proposed ETZ site at St. Fitticks and other energy related businesses across the region</li> <li>➤ May encourage modal shift to public transport amongst those accessing the new harbour and proposed ETZ site at St. Fitticks</li> <li>➤ Service routes via city centre enabling interchange to other bus services / rail</li> </ul> |

| Disadvantages   |
|---|
| <ul style="list-style-type: none"> <li>➤ Is dependent on a new road being implemented between East Tullos and the proposed ETZ site at St. Fitticks</li> <li>➤ Does not provide any improved public transport access to the proposed ETZ site at Doonies Farm</li> <li>➤ The cost of service operation far outstrips the estimated achievable passenger revenue. The option would be loss making and require substantial financial support</li> <li>➤ There may be a transfer of passengers from existing services (those travelling between the city and Torry) to the new service which may erode the commercial viability of existing public transport provision</li> <li>➤ Mixed public acceptance of the proposals but with more people disagreeing than agreeing</li> </ul> |

### Active Travel Option C1

#### Enhanced active travel routes between ASH / proposed ETZ sites and Aberdeen City Centre / Deeside Way

The route would involve:

- A new off-road cycle route (at least 3m wide shared use / segregated facility) through St Fitticks Park to Kirkhill Place
- Sections of shared use cycleway / cycle lanes, including on Wellington Road and South College Street
- Appropriate crossing facilities and signage as required
- Would be incorporated into road design within the proposed ETZ

While the delivery of the route is broadly feasible more detailed design work would be required.



| Advantages   |
|--|
| <ul style="list-style-type: none"> <li>➤ Would provide a reasonably direct cycleway between Aberdeen city centre and new harbour / both proposed ETZ sites</li> <li>➤ Connects the harbour / proposed ETZ area to the Deeside Way</li> <li>➤ Partly off-road/segregated route which avoids heavily trafficked routes improves the safety of active travel access to the area</li> <li>➤ Sustainable travel option strengthens the 'green transition' ethos of the proposed ETZ</li> <li>➤ May encourage modal shift</li> <li>➤ Aligns with policy aspirations to improve active travel access, including on Wellington Road</li> <li>➤ Potential to build into the active travel proposal improvements on Wellington Road being considered in the Wellington Road multi-modal corridor study</li> <li>➤ General public acceptance of the proposals with more people agreeing than disagreeing</li> </ul> |

| Disadvantages  |
|--|
| <ul style="list-style-type: none"> <li>➤ There are several pinch points on the route where the footway is less than the required minimum standard for a shared use facility and there is limited potential for widening. This would need to be explored at the detailed design stage.</li> <li>➤ Potential for providing improved active travel provision on Wellington Road may conflict with some of the proposals outlined in Wellington Road multi-modal corridor study</li> </ul> |

### Active Travel Option C4

#### Enhanced active travel routes between ASH / proposed ETZ sites and Wellington Road (South)

The route would involve:

- A new delineated cycle route on Hareness Road to connect existing off-road provision on Coast Road and the shared footway provision on Wellington Road south of Souter Head roundabout
- Appropriate crossing facilities and signage as required

While the delivery of the route is broadly feasible more detailed design work would be required.



| Advantages  |
|---|
| <ul style="list-style-type: none"> <li>➤ Would provide a reasonably direct cycleway between the south / Cove and new harbour / both proposed ETZ sites</li> <li>➤ Partly off-road/segregated routes improve the safety of active travel access to the area</li> <li>➤ Sustainable travel option strengthens the 'green transition' ethos of the proposed ETZ</li> <li>➤ May encourage modal shift</li> <li>➤ Aligns with policy aspirations to improve active travel access, including on Wellington Road</li> <li>➤ Potential to build into the active travel proposal improvements considered in the Wellington Road multi-modal corridor study</li> <li>➤ General public acceptance of the proposals with more people agreeing than disagreeing</li> </ul> |

| Disadvantages   |
|---|
| <ul style="list-style-type: none"> <li>➤ Interaction with HGV traffic on Hareness Road would need to be fully considered to avoid significant safety concerns. This would need to be explored at the detailed design stage</li> <li>➤ Concerns may be raised from drivers / businesses should a reduction in carriageway space be required</li> </ul> |

## Risk and Uncertainty

All of the options have a level of attached risk and uncertainty surrounding their delivery and operation. The range of differing risks and uncertainty associated with each of the options has been considered as part of this appraisal. The most significant risks are noted here.

### Key Risks and Uncertainty

| Option       | Option Description  | Key Risks and Uncertainty  |
|--------------|---|--|
| Road - A2a/b | New road connection from Greenwell Road / Greenbank Road via St Fitticks Community Park to Coast Road with a new underbridge under the railway line | <ul style="list-style-type: none"> <li>▪ Complex nature of new railway underpass likely to require extensive consultation and approvals from Network Rail</li> <li>▪ Route design will likely constrain land availability within the proposed ETZ</li> <li>▪ Community opposition to loss of St. Fitticks Park</li> <li>▪ Potential escalation in landfill waste removal costs</li> <li>▪ Underpass unable to be utilised by certain abnormal loads, reducing the use of the route and attractiveness of the connection</li> <li>▪ Uncertainty around traffic estimates which may be too high, meaning a lower than estimated Benefit Cost Ratio for the scheme</li> </ul> |
| Road - A3a/b | New road connection from Greenwell Road / Greenbank Road via the former Ness Landfill site and a new bridge over the railway.                       | <ul style="list-style-type: none"> <li>▪ New railway bridge will require consultation and approvals from Network Rail</li> <li>▪ Gradient of new link from new bridge over the railway to Coast Road in excess of current design standards which may limit its use by freight traffic</li> <li>▪ High potential for escalation in landfill waste removal costs and appropriate engineering solution</li> <li>▪ Uncertainty around traffic estimates which may be too high, meaning a lower than estimated Benefit Cost Ratio for the scheme</li> </ul>   |
| Road - A4    | Improve the existing route via Hareness Road through the provision of a new bridge over the railway on Coast Road and capacity improvements.        | <ul style="list-style-type: none"> <li>▪ Some potential escalation in landfill waste removal costs</li> <li>▪ Uncertain third-party land costs for adjacent landholdings along Coast Road to facilitate the creation of a wider road</li> <li>▪ Uncertainty around traffic estimates which may be too high, meaning a lower than estimated Benefit Cost Ratio for the scheme</li> </ul>  |
| Road - A5    | New road connection between Coast Road and Souter Head Road and a new bridge over the railway on Coast Road.  | <ul style="list-style-type: none"> <li>▪ Cost and business disruption to impacted businesses required to relocate from eastern end of Souter Head Road, and businesses on Souter Head Road more generally</li> <li>▪ Opposition from residents of Burnbanks Village due to noise and vibration impacts.</li> <li>▪ Some potential escalation in landfill waste removal costs</li> <li>▪ Uncertain third-party land costs for adjacent landholdings along Coast Road to facilitate the creation of a wider road</li> </ul>  |



| Option                  | Option Description  | Key Risks and Uncertainty   |
|-------------------------|---|---|
|                         |   | <ul style="list-style-type: none"> <li>▪ Uncertainty around traffic estimates which may be too high, meaning a lower than estimated Benefit Cost Ratio for the scheme</li> </ul>  |
| Bus - B1 / B2 / B4      | <p>B1: Extended existing bus services</p> <p>B4: New direct bus service linking Aberdeen City Centre with ASH and proposed ETZ site(s)</p> <p>B5: New bus service loop linking Aberdeen city centre with ASH, proposed ETZ site (at St. Fitticks) and East Tullos Industrial Estate</p> | <ul style="list-style-type: none"> <li>▪ Bus operators not willing to extend existing or operate new services on a commercial basis</li> <li>▪ Financial risk to the Council if subsidy required to introduce new services</li> <li>▪ Uncertainty around passenger demand estimates which may be too high, meaning higher subsidy may be required than that estimated</li> <li>▪ Impact on exiting bus services, which may be scaled back or withdrawn</li> <li>▪ If Option A2a or A2b is not implemented, then Option B5 is not possible as it requires the link through St. Fitticks park.</li> <li>▪ In order to not run in parallel with existing commercial services, new subsidised bus service options would need to show a clearly different purpose to existing services (per legislation as contained in <i>Section 63 of the Transport Act 1985 (as amended)</i>). This may be difficult.</li> </ul> |
| Bus - B2                | New bus service between ASH and Aberdeen City Centre for cruise passengers.   | <ul style="list-style-type: none"> <li>▪ Uncertainty around the volume of cruise ships expected to utilise the new harbour and the exact requirements of onward land-based travel when ships are docked</li> </ul>  |
| Active travel - C1 / C4 | <p>C1: Enhanced active travel routes between ASH / proposed ETZ sites and Aberdeen City Centre</p> <p>C4: Enhanced active travel routes between ASH / proposed ETZ sites and Wellington Road (south)</p>  | <ul style="list-style-type: none"> <li>▪ If use of the routes is not sufficient, the routes will not generate value for money</li> <li>▪ There may be concerns raised from drivers / businesses within Altens industrial estate should a reduction in carriageway space be required on Hareness Road to accommodate the active travel proposals</li> </ul>  |