

## Aberdeen City Council, Aberdeenshire Council, Nestrans Aberdeen Access from the South Executive Summary

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### 1 INTRODUCTION

This Executive Summary concludes a study undertaken by SIAS Limited on behalf of Aberdeen City Council, Aberdeenshire Council and Nestrans concerning access to Aberdeen from the South. Full reporting can be found in *Aberdeen Access from the South – Core Document – Transport Report (Draft)* (SIAS Ref. 69019). The study has been carried out in a manner consistent with Scottish Transport Appraisal Guidance (STAG) and is considered appropriate to feed into the transport appraisal input to a STAG Part 1. The study follows on from original work undertaken by JMP Consulting and its final report *Aberdeen South Access Study – Final Report* produced in November 2006. This follow on study has been undertaken as a result of the Scottish ministerial announcement on 1 December 2005 regarding the preferred Aberdeen Western Peripheral Route (AWPR) alignment corridor with an additional new spur road to Stonehaven. The announcement presented a configuration of the AWPR sufficiently different from that previously considered to warrant this updated study.

On 2 May 2006 the Minister announced the preferred alignment for the AWPR and the Stonehaven spur.

### 2 AIMS

The initial purpose of this study was to revisit the previous study by JMP, as a result of the revised route for the AWPR and to consider the proposed short, medium and long term options including a 1000 space Park and Ride facility, introducing alternative options where necessary. To that end, the main aims of the study were to:

- Review the Aberdeen South Access Study in light of the revised proposed route for the AWPR
- Review the options identified in the original study for the short, medium and long term
- Review the preferred location for a Park & Ride facility to the south of the city
- Identify and test alternative solutions where appropriate

The main focuses of the study have been the A90 (T) Stonehaven Road and A956 Wellington Road corridors to the south of Aberdeen including the four main road bridges over the River Dee namely:



- Bridge of Dee
- Queen Elizabeth II Bridge
- King George VI Bridge
- Victoria Bridge

Although the aim of the study was not to produce detailed designs, the deliverability of any identified improvements and their compatibility with wider objectives needed to be considered, with further investigation and detailed design would need to be considered at a future date.

### 3 PROBLEMS AND ISSUES

Problems and issues for Aberdeen, to which access to Aberdeen from the South contribute, have been summarised in the following paragraphs.

Traffic problems in Aberdeen South are not due to one cause but are attributable to a range of social, economic, geographic and transportation issues, which when combined, result in significant delay to all modes of traffic. In particular, this reduces public transport performance and affects efficient movement of freight.

In a social context, there is a general movement of population from Aberdeen City to Aberdeenshire which brings an increase in commuter trips. The population of Aberdeen City is projected to fall by 23% in the 20 years from 2004, while the population of Aberdeenshire is projected to rise by 8% over the same period.

Committed developments of both industry and housing in Aberdeen South will exacerbate the current traffic problems unless infrastructure is in place. In an economic context, structure and local plans are aiming for diversification in the local economy, which will require a Modern Transport System (MTS) to support it.

Road traffic issues regarding access to Aberdeen from the South arise in the main from the River Dee and its four road crossings, which are significant points of congestion. Conflicting movements of traffic to the city centre and to the Tullos/Altens industrial areas on Wellington Road in the AM peak, and vice versa in the PM peak, are also a source of congestion. Freight access is an issue due to width restrictions which require an HGV ban on Bridge of Dee, and height restrictions on Riverside Drive. Growth in traffic in recent years means that key areas are now over capacity at peak times for extended periods.

Existing public transport services link housing and industrial areas. Some bus priority measures are already in operation on Wellington Road, but the level of congestion means public transport services, along with all other modes of transport, are significantly delayed. Key locations have inadequate pedestrian and cyclist facilities, making these modes of travel unattractive to all but the most discerning users.

The perception of poor, or a lack of, travel choices has an influence on travel habits, and the nature of small villages and rural areas in Aberdeenshire results in a high level of car use. Improvements to the public transport, walking and cycling network are required in order to provide alternative travel choices and change travel habits.

Problems can be summarised as:

- problems for freight and commercial traffic due to insufficient infrastructure, routeing and gradients



- existing congestion and delay around development sites, the development of which would support the local plan aims to make the City of Aberdeen more attractive to families, with the chance to enhance the more deprived areas around Torry and Balnagask
- the desire to promote more sustainable, socially inclusive and healthy modes of transport (i.e. proposed Park and Ride) will be hampered by inability to operate effectively in the south of Aberdeen due to the congested road network
- geographic constraints due to gradients, river, embankments, and existing development and property boundaries
- safety and comfort issues for pedestrians and cyclists at key locations
- congestion causing delays to existing public transport
- no effective relationship between public transport and employment shift working patterns linked with main residential sites throughout the city

#### **4 STAG AND TRAFFIC MODELS**

STAG sets out the process to enable practitioners (and decision makers) to identify value for money transport solutions to identified transport problems. This Transport Scotland/Scottish Government guidance provides a framework for practitioners to use when undertaking a transport planning and appraisal process, from the earliest phases of planning, through appraisal and implementation, to post evaluation.

In undertaking the appraisal, SIAS has made use of the S-Paramics microsimulation traffic models developed by JMP Consulting and used in the previous study.

Information from ASAM, the Aberdeen Sub Area Model of TMfS, was used taking cognisance of the preferred route of the Aberdeen Western Peripheral Route (AWPR) and other proposals currently contained in the MTS.

#### **5 PLANNING AND LOCAL OBJECTIVES**

A workshop with key stakeholders was held on 6 March 2007 to discuss the current and future problems and issues, and to develop key objectives for the study.

In setting the objectives, consideration was given to the relevant transport and planning aspirations of central and local government, as set out in relevant Local and Regional Transport Strategies, Local Plans and Structure Plans, as well as the development objectives.

In accordance with the MTS Strategy for the north east up to 2011, this study has investigated elements of the original study objective to “investigate proposals to improve traffic flows and reduce delays for all modes of traffic on trunk and local roads approaching Aberdeen from the South” in traffic operation terms.

Planning objectives were established to provide a clear indication of what this appraisal is trying to achieve. The appraisal is concerned with investigating potential transport changes in the study area. The planning objectives have focused on desired transport outcomes following a broad consideration of the actual and potential future situation in the study area, drawing significantly on the appreciation of existing and potential problems.

The key objectives were agreed as:

- Economy - To reduce congestion and unreliability, and have effective journey times particularly where it impacts on the efficient movement of goods



- Safety - To reduce the incidence of, and potential for, collisions and all transport related collisions especially vulnerable users, such as cyclists, pedestrians and motorcyclists
- Social Inclusion & Accessibility - To encourage socially-inclusive and healthy transport modes other than single car occupancy
- Social Inclusion & Accessibility - To improve the accessibility between residential and employment areas
- Environment - To improve the local environment by reducing air pollution problems
- Integration - To integrate transport with land use planning to ensure that transport networks serve development in an efficient, effective and sustainable way

## 6 OPTION GENERATION

A workshop with key stakeholders was held on 6 March 2007 to develop and propose options and ideas for the short, medium and long term which would form the basis of assessment of Access to Aberdeen from the South.

The development of these options was undertaken to provide realistic and deliverable measures within the assessment timeframes. The options previously developed and tested by JMP formed part of this exercise, as did additional measures raised by NESTRANS and the Freight Quality Partnership.

The workshop session allowed the key stakeholders an opportunity to develop short, medium and long term ideas as possible transport solutions. Key areas were highlighted as requiring specific solutions:

1. Garthdee/ Bridge of Dee
2. King George VI Bridge
3. Queen Elizabeth II Bridge
4. Wellington Road
5. Hareness
6. Souterhead Roundabout
7. A90 Corridor/ Charleston
8. General consideration

The stakeholders were split into two groups and plans of the key areas were distributed. It was crucial that all options be considered at this stage, regardless of constraints such as cost, scale and deliverability. As a result a number of solutions were developed.

## 7 OPTION SIFTING AND APPRAISAL

The initial option sifting process involved scoring each of the options generated at the workshop against the key planning objectives, to ascertain which met the specified objectives. Where the options had the potential to meet the objectives, they were then considered as either part of a package for traffic model assessment, or as a measure worthy of future consideration, but outwith the scope of this study's traffic model testing.

Packages were brought together, taking the likely beneficial measures at each of the key locations in combination, i.e. Bridge of Dee, King George VI Bridge, QEII Bridge, Wellington Road, Hareness Roundabout, Souterhead Roundabout and Charleston Interchange etc. Where



items within a package clearly failed to provide any benefit to network performance they were removed from subsequent evaluation.

The modelling years considered for the test packages were:

- 2008
- 2012 with Aberdeen Western Peripheral Route
- 2027 with Aberdeen Western Peripheral Route

The packages of short (2008), medium (2012) and long term (2027) option testing for application within the S-Paramics model were discussed between Aberdeen City Council, Nestrans and SIAS to ensure focused testing and agreement prior to undertaking any network evaluation.

The meeting was conducted at St Nicholas House, Aberdeen on 12 July 2007 and this combined with subsequent communication, outlined key short, medium and long term packages for consideration.

It was agreed that the assessment of bus priority and Park and Ride were appropriate for the medium term. To that end, the preferred site for a 1,000 space Park and Ride facility and any priority measures required to ensure reliable bus journey times, has been considered. For the purpose of this study a desktop review was undertaken to confirm/review the appropriateness of sites (e.g. if adequate access cannot be achieved due to the new proposed layout of the AWPR).

In addition to the traffic model tests it was vitally important to consider other road users including pedestrians and cyclists, as well as alternative travel such as public transport (rail and bus).

## 8 ANALYSIS AND POTENTIAL SOLUTIONS

The appraisal was conducted based on STAG methodology, considering the agreed planning objectives, the Government's key criteria and implementability criteria. A seven point scale has been used for considering the relative size or scale of a scheme's impact.

### *Short Term 2008*

The short term Do-Minimum model was based on the 2004 Base S-Paramics model infrastructure, with the addition of dualling from Charleston to Souterhead on the A956.

The short term Do-Minimum model represents an assessment year of 2008. Growth was derived from the Aberdeen Sub Area Model (ASAM3b) model and is summarised as follows for the AM and PM peak periods from 2004 to 2008:

- AM: 31475 vehicles, resultant growth of 3.7% (1,175 vehicles) to 2008 giving 32,650 vehicles
- PM: 40496 vehicles, resultant growth of 3.2% (1,292 vehicle) to 2008 giving 41,788 vehicles in 2008

Four work packages were agreed by Aberdeen City Council and Nestrans, and assessed using the 2008 Do-Minimum S-Paramics model as the reference case. The summary findings for the work packages are provided in the following sections.

The traffic modelling results found that if nothing is done in the short term, the problems relating to congestion, delay, accessibility, public transport unreliability, HGV routeing, industrial access and egress would all remain and deteriorate. It will not be possible in the short



term to address all of the issues, however, some local network changes, changes to public transport service provision (service frequency and routes) and increased liaison with business communities could assist in limiting the deterioration.

Local junction improvements such as segregated left turn lanes and reviewed signalised junction operation will assist the network operation and are listed below:

1. segregated left turn lane Great Southern Road to King George VI Bridge
2. segregated left turn lane King George VI Bridge to West Tullos Road
3. segregated left turn lane Wellington Road to Hareness Road
4. segregated left turn lane Great Southern Road to Stonehaven Road
5. extended 3 lanes on Wellington Road northbound approach to Hareness Roundabout
6. adjusted traffic signals Southerhead Roundabout
7. adjusted traffic signals Balnagask Road/Somerfield junction
8. adjusted traffic signals Wellington Road/Greenbank Road

Additional measures, which were unsuitable for model testing, were suggested by stakeholders. These have been initially scored in the option appraisal tables (some positive, some negative) in Appendix B but excluded from the overall appraisal. The measures for the short term include: *public transport subsidies at peak times, prevention of rat running through residential areas, improved public transport access to East and West Tullos industrial estates and setting up a TMO for the Altens, Tullos and Cove areas to implement green travel plan initiatives.*

Some of these additional suggestions are reflective of other elements within the Regional and Local Transport Strategies and the delivery of these strategies can provide additional benefit.

### ***Medium Term 2012***

In order to undertake the medium term testing, a reference case model was developed:

- 2012 Do-Minimum = Short Term Do-Minimum model + Short Term improvements, also includes AWPR and new Charleston and Schoolhill interchanges

Six work packages were agreed by Aberdeen City Council and Nestrans and carried out in the 2012 Do-Minimum S-Paramics model:

- Package 1 – signalise Bridge of Dee and King George VI Bridge
- Package 2 – create separate pedestrian/cycle bridge, remove footway on Bridge of Dee, signalise Hareness Rd/Wellington Rd junction
- Package 3 – one way gyratory using Bridge of Dee and KGVI Bridge
- Package 4 – replace Southerhead Roundabout with signal controlled junction providing bus priority and improved pedestrian/cyclist facilities
- Package 5 – Park and Ride options
- Package 6 - High Occupancy Vehicle (HOV) options on Stonehaven Road

The traffic growth applied to the 2004 base model, using ASAM3b forecasts to form the 2012 future year model matrices (with Aberdeen Western Peripheral Route), can be summarised as follows for the AM and PM peak periods from 2004 to 2012:

- AM: 31475 vehicles, resultant growth of 3.9% (1212 vehicles) to 2012 giving 32687 vehicles



- PM: 40496 vehicles, resultant growth of 4.6% (1873 vehicles) to 2012 giving 42369 vehicles

The traffic modelling results again found that in the medium term at 2012 with the AWPR in place, significant problems would still occur around the industrial areas of Wellington Road, which will provide an obstacle to future development and economic growth.

The safety improvement of providing a separate pedestrian/cycle bridge will also allow the removal of the width restriction from Bridge of Dee and this will reduce localised HGV journey distances and travel times which will in turn reduce their impact on air quality around the River Dee and to residential properties on Riverside Drive.

A revision to infrastructure at the critical Souterhead and Hareness Roundabouts was investigated and showed potential to significantly improve access, while also providing significant benefits to pedestrians and cyclists. At Hareness, land acquisition and a redesign of the junction will provide a significant saving in journey times for vehicles exiting Hareness Road during the PM peak. The provision of traffic signals will significantly enhance the pedestrian/cycle facilities and enable provision for public transport priority. Careful consideration of public transport movements around Abbotswell Crescent and West Tullos Road should further improve network operation and safety.

At Souterhead Roundabout, a complete re-design of access points onto Wellington Road from Langdykes Road, Souterhead Road and Wellington Circle will permit full signalisation through a staggered junction arrangement. As with Hareness, the implementation of full traffic signal control will significantly enhance pedestrian and cycle facilities while providing opportunities to incorporate public transport priority.

An investigation of previous Park and Ride studies, combined with revised traffic modelling, indicate that Schoolhill would offer the most efficient Park and Ride location to the south of Aberdeen in traffic operation terms. Crucially, installing signalised junctions also provides the opportunity to initiate bus priority which would enhance any Park and Ride facility south of Souterhead.

HOV lanes on Stonehaven Road and HGV lanes on Wellington Road were considered in the medium term. The HOV analysis showed that some benefits could be achieved with a lane on the A90 northbound towards Bridge of Dee. The investigation for HGV crawler lanes on Wellington Road was inconclusive, and found that additional information and understanding of the problems for HGVs on Wellington Road southbound is required.

Additional measures, which were unsuitable for model testing, were suggested by stakeholders. These have been initially scored in the option appraisal tables (some positive, some negative) in Appendix B but excluded from the overall appraisal. The measures for the medium term include: *strengthening of quality bus partnerships with bus operators, introduction of quality bus partnership to improve services to Stonehaven and Portlethen, parking review and restrictions where required in Aberdeen city centre, shuttle buses travelling around Aberdeen South and linking to rail, integrated bus services to station and integrated ticketing, linkage to industrial estates from Schoolhill Park and Ride via Cairnrobin and provide infrastructure to give link to Altens, underpass / priority measures to get buses to / from Park and Ride, provide a link for public transport between Stonehaven Road and Wellington Road.*

Some of these additional suggestions are reflective of other elements within the Regional and Local Transport Strategies and the delivery of these strategies can provide additional benefit.



***Long Term 2027***

In order to undertake the long term testing, two reference S-Paramics traffic models were developed:

- 2027 Do-Nothing = Medium Term Do-Minimum model + Short Term (2008) preferred improvements, using 2027 traffic demands
- 2027 Do-Minimum = Medium Term Do-Minimum model + Medium Term (2012) preferred improvements, using 2027 traffic demands

Four packages were agreed by Aberdeen City Council and Nestrans. The packages were:

- Package 1 – widen Bridge of Dee (BOD)
  - (a) with roundabouts at junctions
  - (b) with traffic signals at junctions
- Package 2 – new two-way bridge upstream of Bridge of Dee
- Package 3 – new bridge upstream of Bridge of Dee to form gyratory (BOD one way southbound, new bridge one-way northbound)
- Package 4 – HOV lane on Great Southern Road from Bridge of Dee to King George VI Bridge in both directions

In all packages Leggart Terrace is diverted onto Stonehaven Road and traffic can no longer access the southern roundabout of the Bridge of Dee from Leggart Terrace.

The growth applied to the 2004 base model, using ASAM3b forecasts to form the 2027 future year models (with AWPR), can be summarised as follows for the AM and PM peak periods from 2004 to 2027:

- AM: 31475 vehicles, resultant growth of 11.5% (3612 vehicles) to 2027 giving 35087 vehicles
- PM: 40496 vehicles, resultant growth of 10.5% (4272 vehicles) to 2027 giving 44768 vehicles

The traffic modelling results found that in the long term further problems would develop at the River Dee Bridge crossings, though the improvements introduced in the medium term at Hareness and Southerhead Roundabouts could cater for long term forecasts.

The resolutions to problems at Bridge of Dee in the longer term are limited and most would involve some form of compulsory purchase of land and/or property. The least intrusive solution is a widening of the Bridge of Dee which would maintain the existing alignment of the A90 (T) South Anderson Drive and the A90 (T) Stonehaven Road. Widening the Bridge of Dee, while technically possible, will meet opposition as it is a grade A listed historic monument.

Any solution around Bridge of Dee will require Leggart Terrace to be diverted to tie in with the A90 (Stonehaven Road) at a point south of the existing junction. Otherwise options of either a roundabout or traffic signal control at the southern junction of Bridge of Dee will be unable to cater for the forecast traffic flows.

The long term testing also identified continued problems at King George VI Bridge/Riverside Drive and the option of a larger roundabout considered during the short term tests may require further consideration.

Additional measures, which were unsuitable for model testing, were suggested by stakeholders. These have been initially scored in the option appraisal tables (some positive, some negative) in



Appendix B but excluded from the overall appraisal. The measures for the longer term include: *local charging schemes (parking, congestion etc.), heavy rail options, improved coastal route east of A956 for development access, More trains at Portlethen, New pedestrian/cycle footbridge options across the network, additional pedestrian/cycle bridge to connect at RGU over the River Dee, raise height under Wellington Suspension Bridge (Riverside Drive at South College Street), enhancement of existing Crossrail proposals to include additional stations to improve rail access to industrial and residential areas to the south of the city.*

Some of these additional suggestions are reflective of other elements within the Regional and Local Transport Strategies and the delivery of these strategies can provide additional benefit.

