

## 5 APPRAISAL OF LAND USE SCENARIO 3 – ELSICK

### 5.1 Introduction

This section summarises the results of an appraisal of Land Use Scenario 3. The land use scenario includes the Elswick site in addition to the Ury and Mains of Cowie sites which are common to all four scenarios. The format of this appraisal is consistent with *STAG* guidance.

#### 5.1.1 Proposal Description (Land Use Scenarios)

Land Use Scenario 3 includes the following development sites, with associated housing and employment assumptions:

- K142 Elswick 4,170 households and 1,376 jobs
- K73 Ury 230 households
- K122 Mains of Cowie 200 households

The scenario includes Structure Plan development allocations in all other locations as described in detail in the *Strategic Transport Modelling Report*, contained in Appendix A.

The Ury and Mains of Cowie sites are common to all four scenarios and have been appraised in detail in Section 6 of this Report. The following sections focus on the Elswick site which is the main site in Land Use Scenario 3.

#### 5.1.2 Transport Test 1

Transport Test 1 as specified by the Steering Group and supported by developer submissions, includes the following infrastructure:

- K142 Elswick - 2 accesses from A90 via a grade separated Bourtreebush junction and the existing grade separated Newtonhill Interchange

The transport test includes infrastructure which is committed in the *Structure Plan* as described in detail in Appendix A. Public transport provision has also been assumed for the purpose of this study, at levels commensurate with the implementability criteria.

Figure 5.1 confirms the indicative access strategy for the three sites included in Transport Test 1.



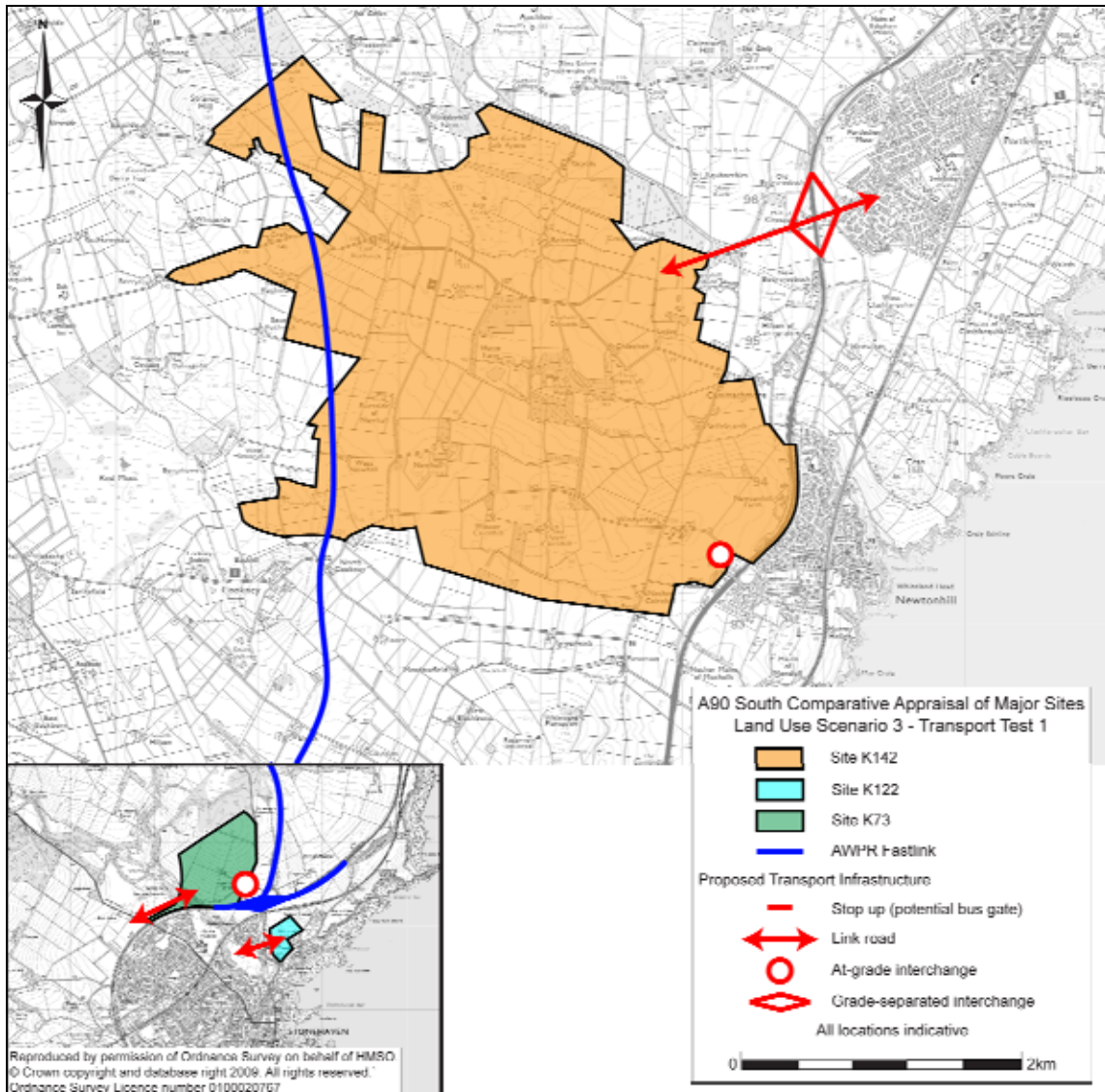


Figure 5.1 : Transport Test 1 Access Strategy

**5.1.3 Transport Test 2**

Transport Test 2 as specified by the Steering Group and supported by developer submissions, includes the following infrastructure:

- K142 Elsick – x2 accesses from A90 via a grade separated Bourtreebush junction and the existing grade separated Newtonhill Interchange with an additional access provided from the AWPR Fastlink

The transport test includes infrastructure which is committed in the *Structure Plan* as described in detail in Appendix A. Public transport provision has also been assumed for the purpose of this study, at levels commensurate with the implementability criteria.

Figure 5.2 confirms the indicative access strategy for the four sites included in Transport Test 2.



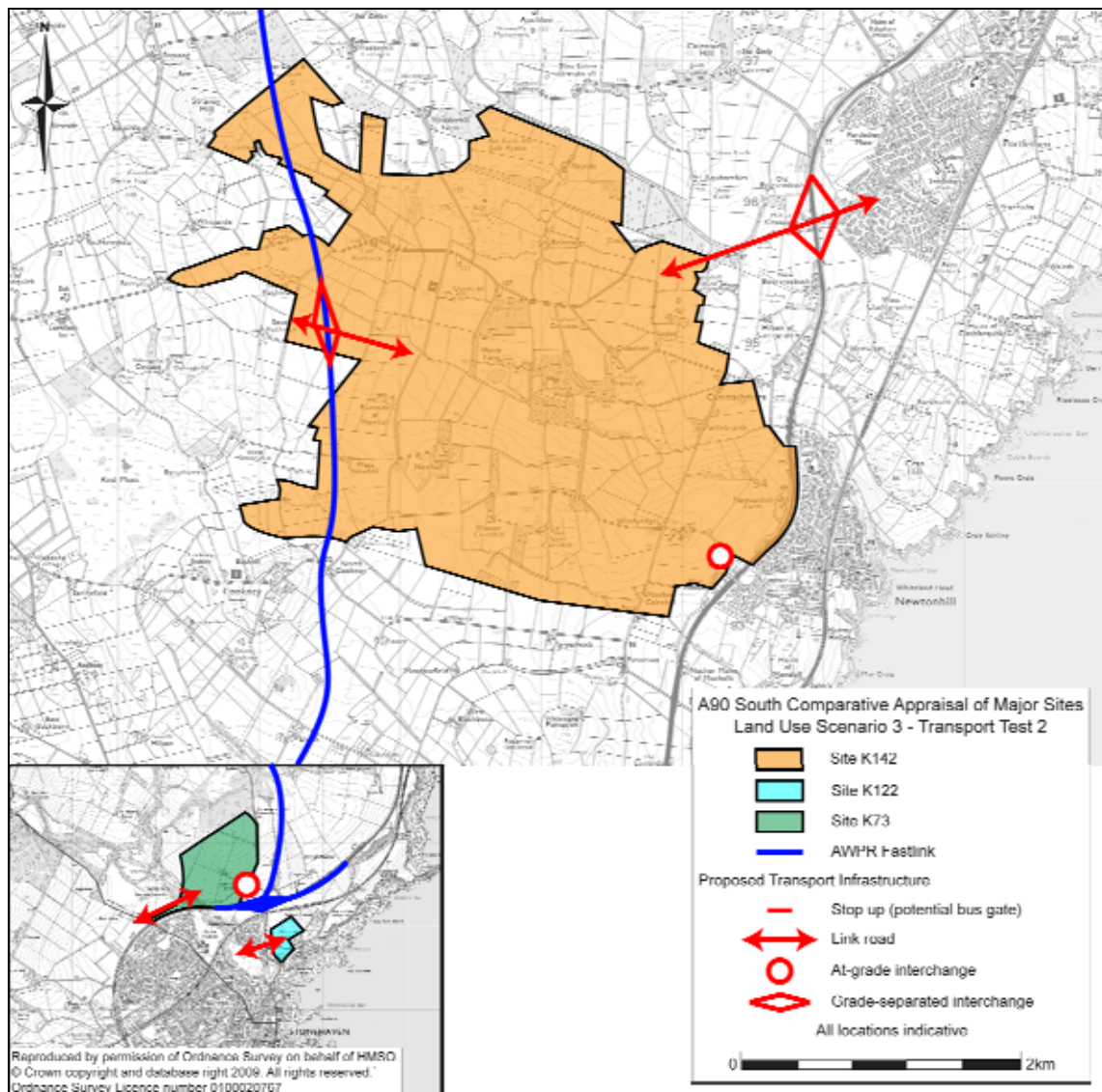


Figure 5.2 : Transport Test 2 Access Strategy

A detailed appraisal of existing public transport services has been undertaken as part of this study with a mode share for public transport usage for each site. Table 5.1 summarises the development generation (car drivers and public transport users) and mode share which has been assumed for the purpose of this study. The daily trip figure is a total figure (arrivals and departures) for residential and employment uses, it does not include active travel modes, goods vehicles or car passengers.

Table 5.1 : Development Trip Generation and PT Mode Share (Transport Test 1 & Test 2)

Site	Daily Trips	PT Mode Share
Elsick	19,541	11%



## 5.2 Background and context of the location

### 5.2.1 Geographic Context

The Elswick site is located to the west of Newtonhill. The site is bound by the A90(T) to the east and route of the proposed AWPR Fastlink to the west. The site can currently be accessed from the A90(T) via the Newtonhill Interchange and the at-grade Bourtreebush junction.

### 5.2.2 Social Context

The Elswick site is rural in nature with no existing villages only residential hamlets and farmsteads, contained within the site boundaries.

The *2009 Scottish Index of Multiple Deprivation (SIMD)* provides details on an area's demographics including a relative ranking of an area's deprivation based on 38 indicators across 7 domains including; income, employment, health, education, skills and training, housing, geographic access and crime.

Table 5.2 summarises the *SIMD* and *GAD* Rank which pertains to the development site.

Table 5.2 : *SIMD* Rank and *GAD* Rank

Site	<i>SIMD</i> Rank	<i>GAD</i> Rank
K142 Elswick	4,933	447
Maximum Rank for Scotland	6,505	6,505

The summary provided in Table 5.2 confirms that the site is within the top 25% overall least deprived areas in Scotland according to the *SIMD* rank.

The site is also within the top 10% most deprived areas in terms of access to local facilities, in Scotland according to travel *GAD* rank.

### 5.2.3 Economic Context

Portlethen and Newtonhill are located immediately to the east of the Elswick site.

Portlethen has a population of 6,632 and was developed as a new town in the 1970s to accommodate the demand for new housing in Aberdeen which was generated by the oil and gas boom. 2006 statistical data (obtained from [www.aberdeenshire.gov.uk/statistics](http://www.aberdeenshire.gov.uk/statistics)) confirms that the majority (64.2%) of the town's residents aged 16 – 74 work in Aberdeen City.

Newtonhill has a population of 3,066 and was originally a small fishing village. Recent years have seen significant expansion of the village to create a commuter town serving Aberdeen.

## 5.3 Cumulative Transport Impacts

Key indicators have been used to summarise the cumulative impact of Land Use Scenario 3 on the operation of the strategic road network. Data has been extracted from ASAM4, which pertains to the change in daily traffic flows (2007 – 2023 with the development scenario) on the A90(T) on the approach to Bridge of Dee and to the south of Charleston. In addition, data has been extracted with regard to the change in rail patronage and utilisation for trips travelling into Aberdeen in the AM peak hour. Data has been extracted for the rail network to the north of Portlethen. The analysis which has been undertaken using the ASAM4 model is described in detail in Appendix A.



Table 5.3 summarises the change in daily traffic flows and rail passenger numbers as extracted from ASAM4 for Transport Tests 1 and 2.

Table 5.3 : Cumulative Transport Impact – Key Indicators (Transport Tests 1 & 2)

Indicator	Location	Change	
		Test 1	Test 2
Daily traffic flows Change 2007-2023	A90(T) Bridge of Dee Approach	-2%	-3%
Daily traffic flows Change 2007-2023	A90(T) South of Charleston	20%	10%
AM Peak hour traffic flows Change 2007-2023	A90(T) Bridge of Dee Approach	-6%	+9%
AM Peak hour traffic flows Change 2007-2023	A90(T) South of Charleston	-6%	0%
Change in Peak Hour Rail Patronage and Utilisation 2007-2023	Northbound rail travel north of Portlethen	15%	15%

#### 5.4 Transport Planning Objectives

The following planning objectives have been set as part of this study and are described in Section 3.4:

- Objective 1 – **Make the most efficient use of the transport network**
- Objective 2 – **Reducing the need for people to travel**
- Objective 3 – **Making sure that walking and cycling are attractive choices**
- Objective 4 – **Making sure that public transport is an attractive choice**

The following sections summarise the results of the analysis which has been undertaken to enable Land Use Scenario 3 to be appraised against the above objectives.

##### 5.4.1 Objective 1 – Make the most efficient use of the transport network

###### Transport Test 1

A high level local S-Paramics model has been constructed to inform this study with journey time data collected for the northbound A90(T) between Charleston and Bridge of Dee. The modelling exercise is described in detail in Appendix B. A maximum journey time of around **30min** has been determined by the modelling undertaken with the additional of Land Use Scenario 3 generated traffic in 2023, an equivalent journey time of around 16min was recorded in the 2007 Base. The maximum journey time is reported for the AM peak period.

A maximum cordoned queue of around 7,000m has been recorded in this transport test which compares to a maximum cordoned queue of around 4,100m in the 2007 Base.

###### Transport Test 2

A maximum journey time of around **26min** has been determined by the modelling undertaken with the additional of Land Use Scenario 3 generated traffic in 2023, an equivalent journey time of around 16min was recorded in the 2007 Base. The maximum journey time is reported for the AM peak period.

A maximum cordoned queue of around 6,200m has been recorded in this transport test which compares to a maximum cordoned queue of around 4,100m in the 2007 Base.





## 5.4.2 Objective 2 – Reducing the need for people to travel

### Transport Test 1

ASAM4 has been used to predict the overall increase in vehicle kilometres which is generated by development of Land Use Scenario 3 in 2023. Comparison is made with the 2007 base model with the increase predicted to be **1,012 million kilometres** per year, which equates to an increase of 27% over the 2007 base of 3,819 million kilometres per year.

### Transport Test 2

Transport Test 2 is predicted to generate an increase in vehicle kilometres of **1,009 million kilometres** per year when compared to the 2007 base model, which equates to an increase of 26% over the 2007 base of 3,819 million kilometres per year.

## 5.4.3 Objective 3 – Making sure that walking and cycling are attractive choices

An appraisal of the accessibility of the sites by active travel modes (walking and cycling) has been undertaken based on their proximity to existing and potential future employment sites. The results of the appraisal do not alter between Transport Test 1 and 2.

Accession and Mapinfo GIS software packages have been used to inform the accessibility analysis which is presented in this study. Full details of the accessibility appraisal in terms of active modes of travel (walking and cycling), is presented in Appendix C.

The accessibility of the land use scenario sites has been appraised in terms of the sites proximity to existing and future employment opportunities in Aberdeenshire. Accession has been used to appraise the number of employees who currently work within a convenient walk (1.6km) or cycle (5km) of the land use scenario sites.

Table 5.4 summaries the employment population (existing and potential future) which is located within a convenient walk or cycle of the land use scenario sites.

Table 5.4 : Site Accessibility by Active Travel Modes

	Existing Employment	Existing + Future Employment
Access on Foot (1.6km)	1,924	3,300
Access by Cycle (5km)	13,260	14,636

Table 5.5 summarises the accessibility of the land use scenario sites to potential future employment sites based on a qualitative assessment.

Table 5.5 : Accessibility to Future Employment Sites<sup>29</sup>

Site	Future On-site Employment	North Portlethen (K136)	Marywell (K45 & K135)	Stonehaven (K36 & K67)
Elsick	√√	XX	XX	XX

Key:  
 XX Not accessible on foot or by cycle  
 X√ Not accessible on foot but accessible by cycle  
 √√ Potentially accessible on foot and by cycle

<sup>29</sup> Distance measured from centre of site



As can be seen from the summary which is presented in Table 5.5 it is anticipated that there will be future employment provided in the Elsick site with residents expected to be able to access these opportunities on foot or by cycle.

The accessibility of the Elsick site has also been appraised in relation to existing and proposed education amenities. Table 5.6 summarises the accessibility of the amenities in terms of active travel from the site.

Table 5.6 : Accessibility to Existing and Future Schools<sup>30</sup>

Site	Existing Primary School	Proposed Primary School	Existing Secondary School	Proposed Secondary School
Elsick	X√	√√	XX	N/A

The Elsick site is to be developed to include a primary school which will be accessible on foot and by cycle. The location of the nearest existing primary school in Newtonhill is considered to be accessible by cycle from the site. The nearest existing secondary school is located in Portlethen which is outwith convenient cycling distance of the site. It is expected that local bus services will offer the most realistic alternative to the private car when accessing Portlethen Academy.

An appraisal of the transport network in the vicinity of the sites has been undertaken with barriers to active travel (i.e. travel on foot or by cycle) highlighted.

Table 5.7 summarises existing issues and considerations for implementation to minimise the impact of the identified barriers to movement.

Table 5.7 : Assessment of Physical Barriers to Active Travel

Issue	Consideration
A90(T) presents a barrier to movement to the east of the Elsick site	Introduction of pedestrian/cycle crossing facilities in association with the grade separation of the Bourtreebush junction and improved facilities at the existing Newtonhill interchange
Proposed AWPR Fastlink has the potential to generate a barrier to active travel to the west of the site	Travel to the west is likely to be associated with leisure and the provision of underpasses (subject to AWPR design) as part of the AWPR Fastlink will minimise its impact as a barrier to active travel
Limited pedestrian/cycle network in vicinity of Elsick site	Provision of connection between site and existing transport networks

#### 5.4.4 Objective 4 – Making sure that public transport is an attractive choice

A review of the accessibility of Land use Scenario 3 sites has been undertaken in terms of existing public transport provision; in particular with regard to the accessibility of Aberdeen City Centre and Westhill in relation to the sites. The results of the appraisal do not alter between Transport Test 1 and 2.

Table 5.8 summarises journey time by public transport from the development site and provides a comparison with an equivalent journey by car.

<sup>30</sup> proposed secondary school assumed to be located at Loirston Loch



Table 5.8 : Existing Accessibility to Aberdeen City Centre and Westhill by Public Transport and Private Car

		<b>Elsick</b>
<b>Peak Hour Rail Travel</b>	<b>Nearest Rail Station</b>	<b>Portlethen</b>
	Distance to Rail Station <sup>31</sup>	5km
	Travel Time to Aberdeen <sup>32</sup>	32 – 34min
	Rail Frequency	2 services
Peak Hour Bus Travel	Travel Time to Aberdeen <sup>33</sup>	60min
Peak Hour Car Travel	Travel Time to Aberdeen <sup>34</sup>	32min
Peak Hour Bus Travel	Travel Time to Westhill <sup>35</sup>	70min
Peak Hour Car Travel	Travel Time to Westhill <sup>36</sup>	42min

The analysis which is presented in Table 5.8 suggests that car travel will provide the quickest mode of travel when accessing the centre of Aberdeen and Westhill from the site. Rail services are reported to provide a shorter journey time than bus services when accessing the city centre.

#### 5.4.5 Bus Measures

An appraisal of existing bus service provision has been undertaken as part of the study with existing issues and potential mitigation measures identified at each of the land use scenario sites. The results of the appraisal do not alter between Transport Test 1 and 2.

Table 5.9 summarises results of the bus service appraisal highlighting potential measures which could be introduced to address existing issues. Comment on the implementability of the identified measures is also provided in Table 5.9.

Table 5.9 : Potential Bus Measures

<b>Site</b>	<b>Criteria</b>	<b>Comment</b>
Elsick	Issue	Elsick site has a poor level of existing service provision due to its rural location although the eastern area of the site has a reasonable level of accessibility
	Potential Measure	Divert a proportion of Coastrider services (No.'s 107, 117 and X7) into the site
	Implementability	There is potential for a proportion of the Coastrider services to be diverted into the Elsick site, with the remainder routeing through Newtonhill and Portlethen. Additional buses will be required to maintain existing service frequencies and journey times to the centre of Aberdeen

31 Distance to nearest rail station estimated using <http://www.gmap-pedometer.com/>

32 Rail timetable information obtained (30/10/09) from <http://www.nationalrail.co.uk/>

33 Total average bus service journey time (including drive time estimated using Accession GIS software) + 5 minute wait time

34 Average car travel journey time data estimated using <http://www.transportdirect.info/> and assumes travel to City Centre with 5 minutes added for accessing car park

35 Peak hour journey time to Westhill by bus estimated using <http://www.transportdirect.info/> + 5 min wait time

36 Peak hour journey time to Westhill by car estimated using <http://www.transportdirect.info/> with 5 minutes added for accessing car park





The scale of the Elsick site could result in existing Coastrider services being required to undertake a significant detour from the existing route to serve the site. It is considered unlikely that the service diversion can be achieved without a significant impact on existing journey times and potentially the service frequency, so additional buses will be required to serve the route; with a potentially large financial commitment associated with the operation of the additional buses.

The diverted bus services are unlikely to travel through Portlethen when connecting the Elsick site with Aberdeen given the impact which this will have on journey times. Existing Newtonhill and Portlethen residents are therefore unlikely to benefit existing residents or bus service users.

Figure 5.3 confirms the routes of existing bus services which operate in the vicinity of the site and the route of the bus service diversion as detailed in Table 5.9.

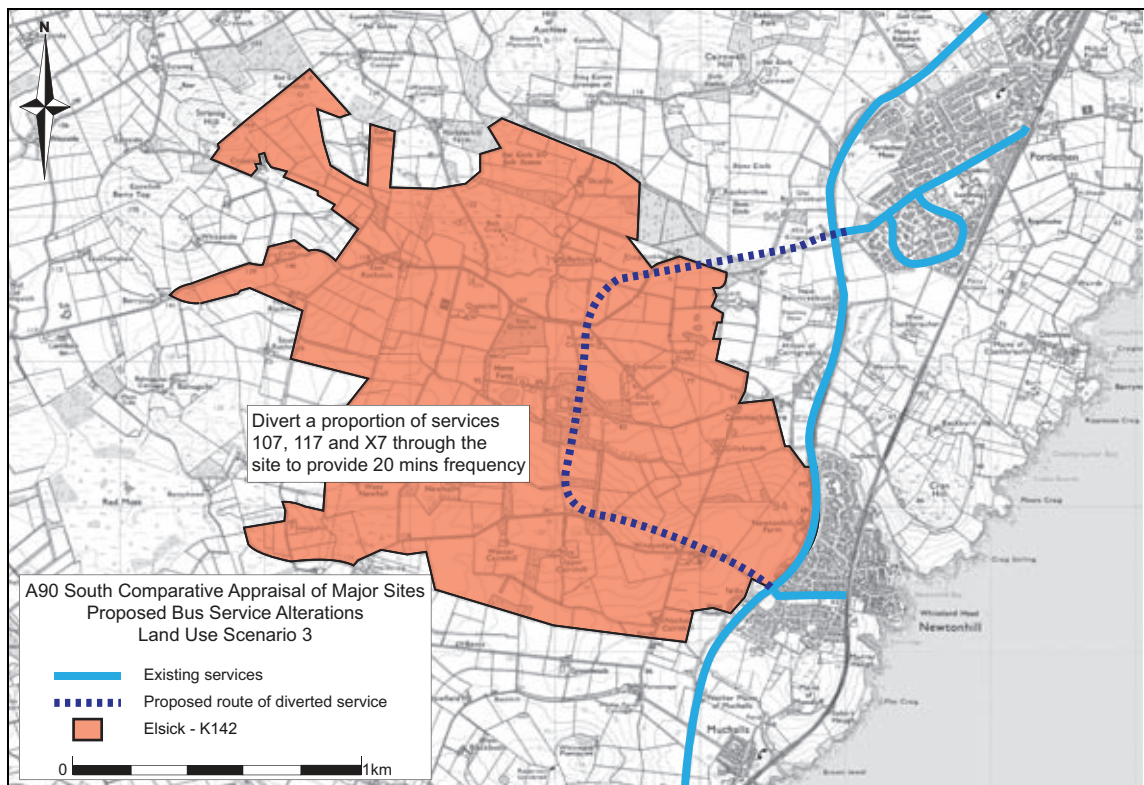


Figure 5.3 : Proposed Bus Service Alterations

Accession and Mapinfo GIS software packages have been used to inform the accessibility analysis which is presented in this study. Full details of the accessibility appraisal in terms of public transport services, is presented in Appendix D.

The accessibility analysis which is presented in Appendix D confirms that the diversion of bus services into the Elsick site will enable a large proportion of development residents to be within a 10min walk of buses which operate with a 30min service frequency and provide access to a number of destinations including Aberdeen, Portlethen and Stonehaven.

#### 5.4.6 Schoolhill Park & Ride

The Schoolhill Park & Ride is a commitment in the NESTRANS *Regional Transport Strategy 2021 (NESTRANS, 15 July 2008)* and is to be located immediately to the west of the A90(T) Findon Interchange.



The potential of future residents to use the Schoolhill Park & Ride has been appraised in terms of the Elsick site and can be summarised as follows:

- K142 Elsick – Park & Ride located approximately 6km to the north of the site and is likely to provide an attractive and convenient facility for Aberdeen commuters

#### 5.4.7 High Occupancy Vehicle Lane

An appraisal has been undertaken of the proposed development’s impact on the proposed High Occupancy Vehicle (HOV) lane which is to be located on the northbound A90(T) between Charleston and Bridge of Dee. Aberdeen City Council has a commitment to further investigation of a HOV lane in this location following completion of the AWPR. Table 5.10 summarises the issues and impact which has been identified. In summary, the Elsick site does not impact on the design of the HOV lane, but does have an impact on its effective operation

Table 5.10 : Impact on HOV lane

Site	Design Issue	Cumulative Traffic Impact
K142 Elsick	No impact	HOV lane would not operate satisfactorily as currently designed using existing roadspace (Peak period traffic flows > 3000 vehicles)

#### 5.5 Implementability Appraisal

The Implementability Appraisal has been undertaken taking cognisance of the following seven point scale of assessment set out in *STAG*:

- +3 Major benefit
- +2 Moderate benefit
- +1 Minor benefit
- 0 No benefit or impact
- -1 Small negative impact
- -2 Moderate negative impact
- -3 Major negative impact

The transport interventions which are to be introduced to support development of the Elsick site have been assessed against the following *STAG* implementability criteria:

- Technical Issues
- Operational Issues
- Financial Issues
- Public Issues

##### 5.5.1 Technical Issues

#### Transport Test 1 – Appraisal Score: -1

##### Small Negative Impact

The Elsick site’s eastern boundary is located adjacent to the A90(T) with the existing



Newtonhill grade separated interchange located immediately to the south-east of the site. Access is currently provided into the site from the interchange and it is expected to be relatively straightforward to provide a suitable form of development access from the junction. The scale of development is expected to require a second point of access from the trunk road network and it is proposed to provide this by grade separating the Bourtreebush junction located to the north-east of the site. Grade separation of the junction will provide an improved facility in terms of its efficient and safe operation than the current junction arrangement.

The impact of the existing A90(T) as a barrier to movement for residents is minimised by the existing grade separated crossing and can be further minimised by the provision of pedestrian and cycle facilities as part of the grade separation of the Bourtreebush junction.

Diverted bus services are expected to be relatively straightforward to introduce with the provision of two grade separated development access junctions.

#### **Transport Test 2 – Appraisal Score: -2**

##### **Moderate Negative Impact**

Transport Test 2 introduces an additional development access from the AWPR Fastlink which is to be located to the west of the site. The development access junction will be formed on a strategic road and it is unclear whether this would be acceptable to Transport Scotland or if the junction can be accommodated in the AWPR Fastlink road scheme.

### **5.5.2 Operational Issues**

#### **Transport Test 1 & 2 – Appraisal Score: +1**

##### **Minor Benefit**

The scale of the developments is likely to enable diverted bus services to be self-financing following the first 3 - 5 years being underwritten by developers. The location of the Elsick site provides opportunity to divert a proportion of existing Coastrider services (No. 107, 117 and X7) into the site. Additional buses will be required to minimise the impact on existing journey times and service frequency. The introduction of new buses will effectively introduce a new service to serve the Elsick site with existing service provision remaining at current levels.

It is considered that the proposed Schoolhill Park & Ride facility will attract Elsick residents travelling into Aberdeen.

### **5.5.3 Financial Issues**

#### **Transport Test 1 & 2 - Appraisal Score: 0**

**No Benefit or Impact** – It is expected that the majority of the transport infrastructure costs which will be associated with the development of the sites will be borne by developers.

The scale of the development is expected to support the diversion of bus services without the need for financial support following initial funding by developers.

### **5.5.4 Public Issues**

#### **Transport Test 1 – Appraisal Score: 0**



**No Benefit or Impact** – The development transport proposal could generate objections by introducing additional transport movements in rural areas. The Elswick site is located to the west of the A90(T) which separates the development from existing Newtonhill residents. The majority of trips which are predicted to be generated by the site are expected to travel north via the A90(T). The Bourtreebush junction is likely to provide the more attractive junction to access the A90(T). This will minimise the development's impact on the existing Newtonhill grade separated interchange and minimise the potential for opposition to the development from local residents.

Grade separating the Bourtreebush junction is likely to generate delay for traffic using the A90(T) during construction although grade separating the interchange is likely to be welcomed by existing Portlethen residents and employees.

#### **Transport Test 2 – Appraisal Score: 0**

**No Benefit or Impact** – The majority of trips which are predicted to be generated by the site are expected to travel north with the AWPR Fastlink expected to provide an attractive facility for residents. Construction of a development access on the AWPR Fastlink may be relatively straightforward, but further investigation is required. There may be an opportunity to construct the interchange in association with the Fastlink without causing delay for existing road users, subject to phasing requirements that are not yet known.

#### **5.5.5 Summary**

The concepts of operational implementability, financial impacts to government and public acceptability of transport interventions can be complex to summarise. An overall feasibility factor has been derived for this DPMTAG Study based primarily on Technical Implementability of infrastructure for ease of comparison.

#### **Transport Test 1 – Small Negative Impact (-1)**

Transport Test 1 requires grade separation of the Bourtreebush junction to enable the site to be fully developed.

#### **Transport Test 2 – Moderate Negative Impact (-2)**

The provision of an additional development access from the AWPR Fastlink may not be acceptable to Transport Scotland as it is unclear whether the interchange could be accommodated within the strategic road scheme.

#### **5.6 STAG Criteria**

The transport interventions which have been developed to support the development of Land Use Scenario 3 have been appraised in terms of the following criteria as defined by STAG:

- Environment
- Safety
- Economy
- Integration
- Accessibility & Social Inclusion

Again, a seven point scale of assessment has been used to illustrate relative impacts.



### 5.6.1 Environment

#### Transport Test 1 – Appraisal Score: -1

##### Small Negative Impact

Aberdeenshire Council maintain a database of locations which are subject to environmental constraints. Information has been extracted from the database by Aberdeenshire Council for use in this study. The database indicates Areas of Landscape Significance, the *Aberdeenshire Sites and Monuments Record (SMR)*. The database confirms the location and significance of the sites with the majority of sites classified as having environmental constraints which do not preclude development.

There are large areas of environmental constraints shown to be located in the vicinity of Bettyhill House and Cammachmore which could have an impact on the layout of the development, although these are unlikely to have an impact on the location and form of development accesses. A small Aberdeenshire *SMR* site is located adjacent to the Bourtreebush junction and this may have an impact on the form and scale of improvements which can be introduced at the junction. The *SMR* sites don't preclude development due to their classification.

The site's rural location and scale are expected to enable the majority of development to be located in a relatively remote location from existing properties, so the development is unlikely to have a significant impact on a large number of residential receptors.

Further environmental assessment would be required should any transport infrastructure be progressed.

#### Transport Test 2 – Appraisal Score: -1

##### Small Negative Impact

There are no significant environmental constraints shown to be located to the west of the site which are likely to have an impact on the form or location of a development access taken from the AWPR Fastlink.

### 5.6.2 Safety

#### Transport Test 1 – Appraisal Score: +2

##### Moderate Benefit

It is expected that the majority of development generated traffic will access the site via the A90(T) and minimise the development's impact on the local road network.

Development of the Elswick site will require grade separation of the existing Bourtreebush junction which will provide a form of interchange which is expected to be safer than the current junction arrangement for all modes of travel.

Development of the Elswick site will include a network of pedestrian and cycle facilities which is likely to provide an improvement over the existing situation which requires pedestrians and cyclists to use the rural road network to travel in the vicinity of the areas.





**Transport Test 2 – Appraisal Score: +2**

**Moderate Benefit**

Construction of a development access on the AWPR Fastlink is not expected to have an impact on the safe operation of the road scheme as the interchange will be constructed prior to the road becoming operational.

**5.6.3 Economy**

**Transport Test 1 – Appraisal Score: -1**

**Small Negative Impact**

The majority of trips which are predicted to be generated by the Elsick site are expected to be travel north to employment opportunities located in and around Aberdeen. The majority of trips are expected to be attracted to the existing A90(T) which is located to the east. While this will increase the magnitude of traffic travelling on the A90(T) in the vicinity of the site, it is expected that the AWPR and AWPR Fastlink will remove a significant proportion of existing traffic from the road.

The development of the site to the scale which is proposed should enable the diversion of existing bus service to become self financing following the first 3 – 5 years being underwritten by developers

ASAM4 has been used to provide an indication of the impact of the land use scenario in terms of the ratio of traffic volume to road link capacity. Table 5.11 confirms the ration of traffic flow to link capacity on the northbound A90(T) in the 2023 AM peak hour.

*Table 5.11 : Peak Hour Traffic Volume/Capacity*

	<b>Bridge of Dee</b>	<b>South of Charleston</b>
Volume/Capacity (PCUs)	112%	97%

The analysis predicts that the northbound A90(T) will be operate above capacity at Bridge of Dee in the AM peak period with the addition of development generated traffic. Local modelling has shown that queues may extend back close to Charleston at peak times The A90(T) is predicted to operate close to capacity to the south of Charleston.

The analysis indicates that some congestion will occur at this location but that the congestion is similar to 2007 levels as detailed in Appendix A.

ASAM has been used to provide an indication of the land use scenario in terms of congestion. Comparison has been made between 2007 and 2023 for each land use scenario with a 3% increase over the 2007 base year (5,799 hours time lost in the base).

**Transport Test 2 – Appraisal Score: 0**

**No Benefit or Impact**

This transport test includes the formation of a development access on the AWPR Fastlink which is to be constructed to the west of the site. It is expected that a significant proportion of development generated trips will utilise the Fastlink to access Aberdeen and the surrounding area. This will reduce the development’s impact on the existing A90(T).



The provision of a development access from the AWPR Fastlink has been appraised to have a minor impact on the overall impact of development generated traffic. Table 5.12 confirms the ratio of traffic flow to link capacity on the northbound A90(T) in the 2023 AM peak hour.

Table 5.12 : Peak Hour Traffic Volume/Capacity

	Bridge of Dee	South of Charleston
Volume/Capacity (PCUs)	112%	89%

The trend which is predicted for Transport Test 1 is replicated by Transport Test 2 although the analysis shows the impact of introducing an access onto the AWPR Fastlink, with less impact at Charleston. The analysis indicates that some congestion will occur at this location but that the congestion is similar to 2007 levels as detailed in Appendix A.

ASAM has been used to provide an indication of the land use scenario in terms of congestion. Comparison has been made between 2007 and 2023 for each land use scenario with a 2% increase over the 2007 base year (5,799 hours time lost in the base).

#### 5.6.4 Integration

##### Transport Test 1 & 2 – Appraisal Score: 0

###### No Benefit or Impact

It is considered that the use of the existing Newtonhill grade separated interchange and grade separation of the Bourtreebush junction will enable the Elsick site to be accessible from Newtonhill and Portlethen by all modes of travel. It is expected that the improvement of the Bourtreebush junction will minimise the impact on journey times to Aberdeen by diverting bus services into the site.

#### 5.6.5 Accessibility & Social Inclusion

##### Transport Test 1 & 2 – Appraisal Score: +1

###### Minor Benefit

Diversion of existing Coastrider bus services into the site will be implemented without impacting on the level of service provision or journey times offered by existing services through the introduction of additional buses that would not then route via Portlethen. Existing users would not be affected if sufficient additional buses were provided to cover both the diverted and Portlethen routes.

Development of the Elsick site will include a range of facilities and amenities including employment opportunities and education, retail and community facilities which will benefit both future and existing residents living in the vicinity of the site.





## 6 APPRAISAL OF LAND USE SCENARIO 4 – STONEHAVEN (& COMMON SITES)

### 6.1 Introduction

#### 6.1.1 Proposal Description (Land Use and Transport Options)

This section summarises the results of an appraisal of Land Use Scenario 4. The land use scenario includes the Mill of Forest and Mains of Cowie sites in addition to the Ury and Mains of Cowie sites which are common to all four scenarios. The format of this appraisal is consistent with *STAG* guidance.

#### 6.1.2 Proposal Description (Land Use Scenarios)

Land Use Scenario 4 includes the following development sites, with associated housing and employment assumptions:

- K89 Mill of Forest                      2,085 households and 688 jobs
- K101 East Newtonleys                2,085 households and 688 jobs
- K73 Ury                                      230 households
- K122 Mains of Cowie                  200 households

The scenario includes *SPD* development allocations in all other locations as described in detail in the *Strategic Transport Modelling Report*, contained in Appendix A.

The Ury and Mains of Cowie sites are common to all four scenarios and have been appraised in detail within this section in addition to the Mill of Forest and East Newtonleys sites. The land use scenario is supported by one transport test whereas Land Use Scenarios 1 – 3 were supported by two tests.

The land use scenario as specified by the Steering Group and supported by developer submissions includes the following infrastructure:

- K89 Mill of Forest – Access from the A90 via an altered A90/A92 Glaslaw Interchange and a local access from Mill of Forest Road to the east
- K101 East Newtonleys – Access from the A92 and a local access from the A957 to the north
- K73 Ury – x1 access from A957 Slug Road and x1 access from B979
- K122 Mains of Cowie – x1 access from B979 and x1 access from Golf Course Road

The transport test includes infrastructure which is committed in the *Structure Plan* as described in detail in Appendix A. Public transport provision has also been assumed for the purpose of this study, at levels commensurate with the implementability criteria.

Figure 6.1 confirms the indicative access strategy for the four sites included within Land Use Scenario 4.



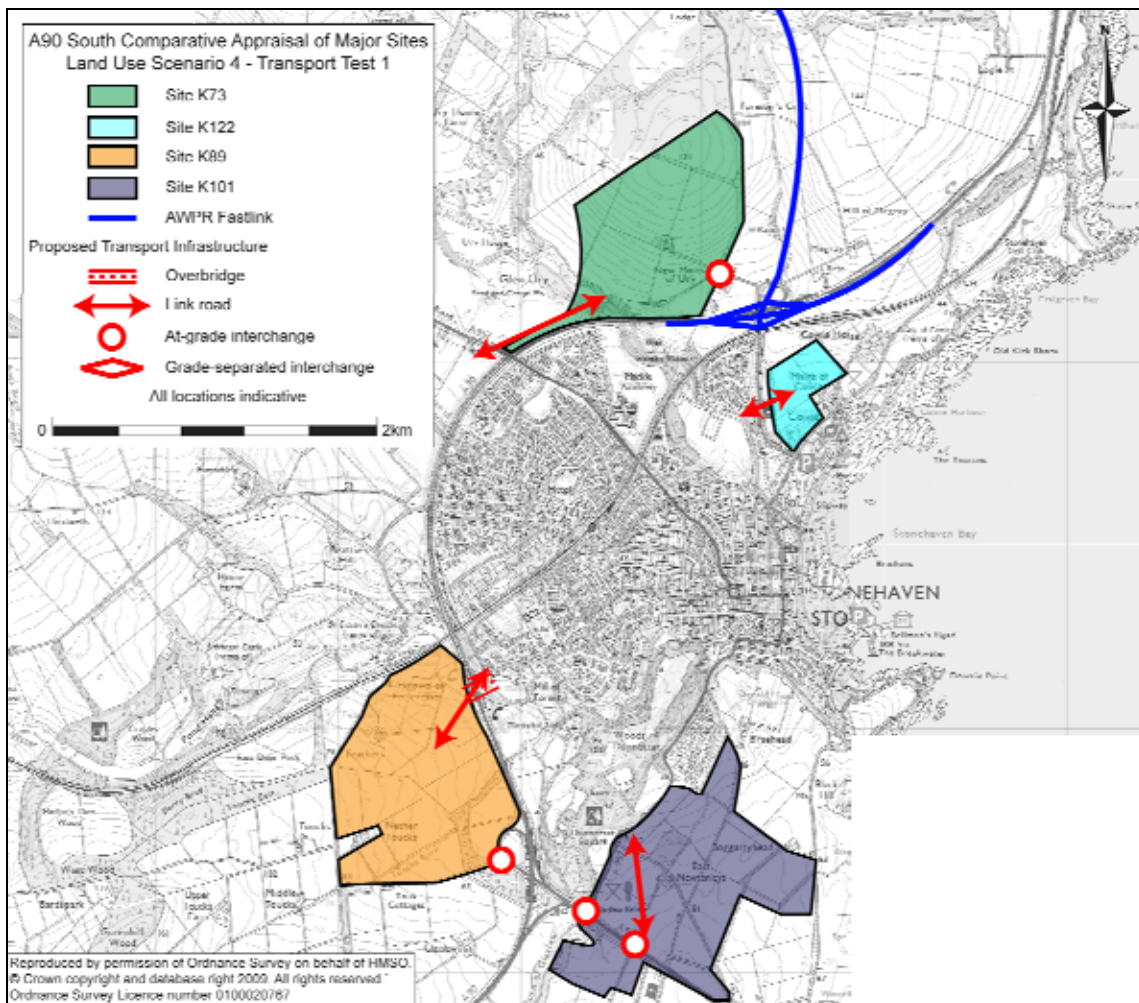


Figure 6.1 : Access Strategy

A detailed appraisal of existing public transport services has been undertaken as part of this study with a mode share for public transport usage for each site. Table 6.1 summarises the development generation (car drivers and public transport users) and mode share which has been assumed for the purpose of this study. The daily trip figure is a total figure (arrivals and departures) for residential and employment uses, it does not include active travel modes, goods vehicles or car passengers.

Table 6.1 : Development Trip Generation and PT Mode Share

Site	Daily Trips	PT Mode Share
Mill of Forest	9,472	12%
East Newtonleys	9,520	12%

## 6.2 Background and context of the location

### 6.2.1 Geographic Context

The Mill of Forest site is located to the west of Stonehaven and is bound on the east by the A90(T) and north by the Dundee – Aberdeen rail line. The site can currently be accessed from the A92/A90(T) via the Glaslaw Interchange.





The East Newtonleys site is located to the south of Stonehaven and is bound on the south by the A92 and west by the A957. An unclassified road currently provides access into the site from the A957.

The Ury site is located to the north of Stonehaven and is bound on the east by the B979 and the south by the A90(T). Access is currently provided into the site from the B979 with the road providing access to and from the northbound A90(T) immediately to the south-east of the site.

The Mains of Cowie site is bound to the west by the B979 and the south by Golf Course Road which facilitates access into Stonehaven from the southbound A90(T). There is currently no vehicular access into the site.

### 6.2.2 Social Context

The land use scenario sites are located on the edge of Stonehaven and are rural in nature with no existing villages only residential hamlets and farmsteads, contained in the site boundaries.

The *2009 Scottish Index of Multiple Deprivation (SIMD)* provides details on an area's demographics including a relative ranking of an area's deprivation based on 38 indicators across 7 domains including; income, employment, health, education, skills and training, housing, geographic access and crime.

Table 6.2 summarises the *SIMD* and *GAD* rank which pertains to the development site.

Table 6.2 : *SIMD* Rank and *GAD* Rank

Site	<i>SIMD</i> Rank	<i>GAD</i> Rank
K89 Mill of Forest	5,092	281
K101 East Newtonleys	5,092	281
K73 Ury	5,940	257
K122 Mains of Cowie	5,940	257
Maximum Rank for Scotland	6,505	6,505

The summary provided in Table 6.2 confirms that the site is within the top 25% overall least deprived areas in Scotland according to the *SIMD* rank.

The site is also within the top 10% most deprived areas in terms of access to local facilities, in Scotland according to travel *GAD* rank.

### 6.2.3 Economic Context

The sites are all located on the edge of Stonehaven.

Stonehaven has a population of 10,614 and was originally developed round the town's harbour in the 16th century. The greatest proportion (50.3%) of residents aged 16 – 74 work in Aberdeenshire with 46.3% working in Aberdeen City.

## 6.3 Cumulative Transport Impacts

Key indicators have been used to summarise the cumulative impact of Land Use Scenario 4 on the operation of the strategic road network. Data has been extracted from ASAM4 which pertains to the change in daily traffic flows (2007 – 2023 with the development scenario) on the A90(T) on the approach to Bridge of Dee and to the south of Charleston. In addition, data has been extracted with regard to the change in rail patronage and utilisation for trips travelling into



Aberdeen in the AM peak hour. Data has been extracted for the rail network to the north of Portlethen. The analysis which has been undertaken using the ASAM4 model is described in detail in Appendix A of this report.

Table 6.3 summarises the change in daily traffic flows and rail passenger numbers as extracted from ASAM4 for Transport Tests 1 and 2.

Table 6.3 : Cumulative Transport Impact – Key Indicators

Indicator	Location	Change
Daily traffic flows Change 2007-2023	A90(T) Bridge of Dee Approach	-4%
Daily traffic flows Change 2007-2023	A90(T) South of Charleston	8%
AM Peak hour traffic flows Change 2007-2023	A90(T) Bridge of Dee Approach	-8%
AM Peak hour traffic flows Change 2007-2023	A90(T) South of Charleston	-1%
Change in Peak Hour Rail Patronage and Utilisation 2007-2023	Northbound rail travel north of Portlethen	19%

## 6.4 Transport Planning Objectives

The following planning objectives have been set as part of this study and are described in Section 3.4:

- Objective 1 – **Make the most efficient use of the transport network**
- Objective 2 – **Reducing the need for people to travel**
- Objective 3 – **Making sure that walking and cycling are attractive choices**
- Objective 4 – **Making sure that public transport is an attractive choice**

The following sections summarise the results of the analysis which has been undertaken to enable Land Use Scenario 4 to be appraised against the above objectives.

### 6.4.1 Objective 1 – Make the most efficient use of the transport network

A high level local S-Paramics model has been constructed to inform this study with journey time data collected for the northbound A90(T) between Charleston and Bridge of Dee. The modelling exercise is described in detail in Appendix B. A maximum journey time of around **29min** has been determined by the modelling undertaken with the additional of Land Use Scenario 4 generated traffic in 2023, an equivalent journey time of around 16mins was recorded in the 2007 Base. The maximum journey time is reported for the AM peak period.

A maximum cordoned queue of around 6,500m has been recorded in this transport test which compares to a maximum cordoned queue of around 4,100m in the 2007 Base.

### 6.4.2 Objective 2 – Reducing the need for people to travel

ASAM4 has been used to predict the overall increase in vehicle kilometres which is generated by development of Land Use Scenario 4 in 2023. Comparison is made with the 2007 base model with the increase predicted to be **1,052 million kilometres** per year, which equates to an increase of 28% over the 2007 base of 3,819 million kilometres per year.



### 6.4.3 Objective 3 – Making sure that walking and cycling are attractive choices

An appraisal of the accessibility of the sites by active travel modes (walking and cycling) has been undertaken based on their proximity to existing and potential future employment sites.

Accession and Mapinfo GIS software packages have been used to inform the accessibility analysis which is presented in this study. Full details of the accessibility appraisal in terms of active modes of travel (walking and cycling), is presented in Appendix C.

The accessibility of the land use scenario sites has been appraised in terms of the sites proximity to existing and future employment opportunities in Aberdeenshire. Accession has been used to appraise the number of employees who currently work within a convenient walk (1.6km) or cycle (5km) of the land use scenario sites.

Table 6.4 summaries the employment population (existing and potential future) which is located within a convenient walk or cycle of the land use scenario sites.

Table 6.4 : Site Accessibility by Active Travel Modes

	Existing Employment	Existing + Future Employment
Access on Foot (1.6km)	2,155	3,531
Access by Cycle (5km)	15,749	17,125

Table 6.5 summarises the accessibility of the land use scenario sites to potential future employment sites based on a qualitative assessment.

Table 6.5 : Accessibility to Future Employment Sites<sup>37</sup>

Site	Future On-site Employment	North Portlethen (K136)	Marywell (K45 & K135)	Stonehaven (K36 & K67)
Mill of Forest	√√	XX	XX	X√
East Newtonleys	√√	XX	XX	X√
Ury	None	XX	XX	√√
Mains of Cowie	None	XX	XX	X√

**Key:**

XX	Not accessible on foot or by cycle
X√	Not accessible on foot but accessible by cycle
√√	Potentially accessible on foot and by cycle

As can be seen from the summary which is presented in Table 6.5 it is anticipated that there will be future employment provided in the Mill of Forest and East Newtonleys site with residents expected to be able to access these opportunities on foot or by cycle.

The accessibility of the sites has also been appraised in relation to existing and proposed education amenities. Table 6.6 summarises the accessibility of the amenities in terms of active travel from the site.

<sup>37</sup> Distance measured from centre of site



Table 6.6 : Accessibility to Existing and Future Schools<sup>38</sup>

Site	Existing Primary School	Proposed Primary School	Existing Secondary School	Proposed Secondary School
Mill of Forest	√√	√√	X√	N/A
East Newtonleys	X√	√√	X√	N/A
Ury	X√	√√	√√	N/A
Mains of Cowie	√√	√√	√√	N/A

The Mill of Forest and East Newtonleys sites are to be developed to include a primary school which will be accessible on foot and by cycle. A primary school is also planned to be introduced in the vicinity of the Mains of Cowie site. With this provision, all four sites will be located within convenient walking distance of a primary school.

It is considered that Mackie Academy is located within convenient cycling distance of all four sites.

An appraisal of the transport network in the vicinity of the sites has been undertaken with barriers to active travel (i.e. travel on foot or by cycle) highlighted.

Table 6.7 summarises existing issues and considerations for implementation to minimise the impact of the identified barriers to movement.

Table 6.7 : Assessment of Physical Barriers to Active Travel

Issue	Consideration
A90(T) presents a barrier to movement to the east of the Mill of Forest site	Introduction of pedestrian crossing facilities in association with new vehicle link to Mill of Forest Road
Limited pedestrian/cycle network in vicinity of Mill of Forest site	Provision of connection between site and existing transport networks via new vehicular and pedestrian bridge over the A90(T)
Limited pedestrian network in vicinity of East Newtonleys site	Provision of connection between site and existing transport networks
The site at East Newtonleys is located on an area of land which is over 70m higher than the town centre	Provide adequate alternatives to walking and cycling i.e. public transport links
Glen Ury presents a barrier to movement to the west of the Ury site	Provide foot/cycle crossing of the river as part of a vehicular bridge over Glen Ury
The site at Ury is located on an area of land which is over 45m higher than the town centre	Provide adequate alternatives to walking and cycling i.e. public transport links

#### 6.4.4 Objective 4 – Making sure that public transport is an attractive choice

A review of the accessibility of Land use Scenario 4 sites has been undertaken in terms of existing public transport provision, in particular with regard to the accessibility of Aberdeen City Centre and Westhill in relation to the sites.

An average weighted journey time has been derived for the Mill of Forest and East Newtonleys sites based on the number of houses to be accommodated in the sites to enable comparison of the scenarios to be undertaken.

<sup>38</sup> Primary school assumed to be provided in the vicinity of the Mains of Cowie site and proposed secondary school assumed to be located at Loirston Loch



Table 6.8 summarises journey time by public transport from the development site and provides a comparison with an equivalent journey by car.

Table 6.8 : Existing Accessibility to Aberdeen City Centre and Westhill by Public Transport and Private Car

		Mill of Forest	East Newtonleys	Weighted Average Journey Time	Ury	Mains of Cowie
Peak Hour Rail Travel	Nearest Rail Station	Stonehaven	Stonehaven		Stonehaven	Stonehaven
	Distance to Rail Station <sup>39</sup>	2km	3km		3km	2km
	Travel Time to Aberdeen <sup>40</sup>	34–38min	34-38min	36min	36-40min	33-37min
	Rail Frequency	4 services	4 services		4 services	4 services
Peak Hour Bus Travel	Travel Time to Aberdeen <sup>41</sup>	65min	65min	65min	60min	55min
Peak Hour Car Travel	Travel Time to Aberdeen <sup>42</sup>	39min	40min	40ins	37min	39min
Peak Hour Bus Travel	Travel Time to Westhill <sup>43</sup>	70min	68min	69min	70min	68min
Peak Hour Car Travel	Travel Time to Westhill <sup>44</sup>	57min	57min	57min	53min	54min

The analysis which is presented in Table 6.8 suggests that rail travel will provide a realistic alternative to the car to access the centre of Aberdeen from the sites. Car travel is expected to provide the shortest journey time when accessing Westhill from the sites.

Bus services are shown to provide a journey time which is greater than that offered by both rail and car. It is considered that buses will provide the least attractive mode of travel to access the centre of Aberdeen

Rail services are likely to provide the most attractive alternative to the car for journeys between Stonehaven sites and the centre of Aberdeen. The frequency of services which can be accessed from the station and journey time to the city centre enable rail services to provide an attractive alternative to the private car to access Aberdeen City Centre.

#### 6.4.5 Bus Measures

An appraisal of existing bus service provision has been undertaken as part of the study with existing issues and potential mitigation measures identified at each of the land use scenario sites.

<sup>39</sup> Distance to nearest rail station estimated using <http://www.gmap-pedometer.com/>

<sup>40</sup> Rail timetable information obtained (30/10/09) from <http://www.nationalrail.co.uk/>

<sup>41</sup> Total average bus service journey time (including drive time estimated using Accession GIS software) + 5 minute wait time

<sup>42</sup> Average car travel journey time data estimated using <http://www.transportdirect.info/> and assumes travel to City Centre with 5 minutes added for accessing car park

<sup>43</sup> Peak hour journey time to Westhill by bus estimated using <http://www.transportdirect.info/> + 5 min wait time

<sup>44</sup> Peak hour journey time to Westhill by car estimated using <http://www.transportdirect.info/> with 5 minutes added for accessing car park





Table 6.9 summarises results of the bus service appraisal highlighting potential measures which could be introduced to address existing issues. Comment on the implementability of the identified measures is also provided in Table 6.9.

Table 6.9 : Potential Bus Measures

Site	Criteria	Comment
Mill of Forest	Issue	Mill of Forest site currently has no bus services routeing through the site although services route past the site on the A90(T).
	Potential Measure	Extend Stonehaven town service (No. 108) into site utilising new infrastructure including Mill of Forest Road link and bridge.
	Implementability	Site to be served by an extension to the Stonehaven town service (No. 108) which is currently under threat. Road infrastructure including a new link to Mill of Forest Road required to accommodate service. It is expected that funding will be required to enable the service to operate with a 30min frequency.
East Newtonleys	Issue	East Newtonleys site currently has no bus services routeing through the site although services route past the site on the A92 and the Stonehaven town service currently terminates at Braehead to the north of the site.
	Potential Measure	Extend Stonehaven town service (No. 108) into site.
	Implementability	Site to be served by an extension to the Stonehaven town service (No. 108) which is currently under threat. It is expected that funding will be required to enable the service to operate with a 30min frequency.
Ury	Issue	Services 107, 117 and X7 currently connect the Ury site with Aberdeen. Current A90/B979 interchange arrangement does not facilitate the services to route past the site when returning from Aberdeen.
	Potential Measure	Stop services at site in association with junction alterations introduced as part of the AWPR Fastlink construction. Divert Stonehaven town service (No. 108) through site using future A957-B979 link road.
	Implementability	ACPTU has expressed concern with regard to any proposal to divert Coastrider bus services into the Ury site as there is an issue with the existing journey time between Stonehaven and Aberdeen City Centre. Site to be served by an extension to the Stonehaven town service (No. 108) which is currently under threat. It is expected that funding will be required to enable the service to operate with a 30min frequency.
Mains of Cowie	Issue	Mains of Cowie site served by bus services which provide connection to the centre of Aberdeen in addition to the centre of Stonehaven and the town's rail station.
	Potential Measure	Current level of service provision expected to be adequate to serve a site of the scale and location proposed.
	Implementability	Additional bus stops to be provided on the B979 adjacent to the site with access provided to Service No. 108 from the stops.

It is understood that the existing Stonehaven town bus service is currently under threat and the extension of the service to serve all four sites will assist in supporting the service. The introduction of infrastructure improvements in association with development of the sites, including provision of a road crossing of Glen Ury and the A90(T) will provide potential for the route of the existing bus service to be made more efficient.

The circular bus service will provide connection between the sites and existing Stonehaven amenities including the town centre and rail station providing opportunity for onward journey to Aberdeen by rail.



ACPTU has suggested that a 30min service should be introduced which is an improvement over the current service provision. This will benefit existing residents but require initial financial commitment from developers to fund the improvements.

Figure 6.2 confirms the routes of existing bus services which operate in the vicinity of the sites and the route of the bus service extension as detailed in Table 6.9.

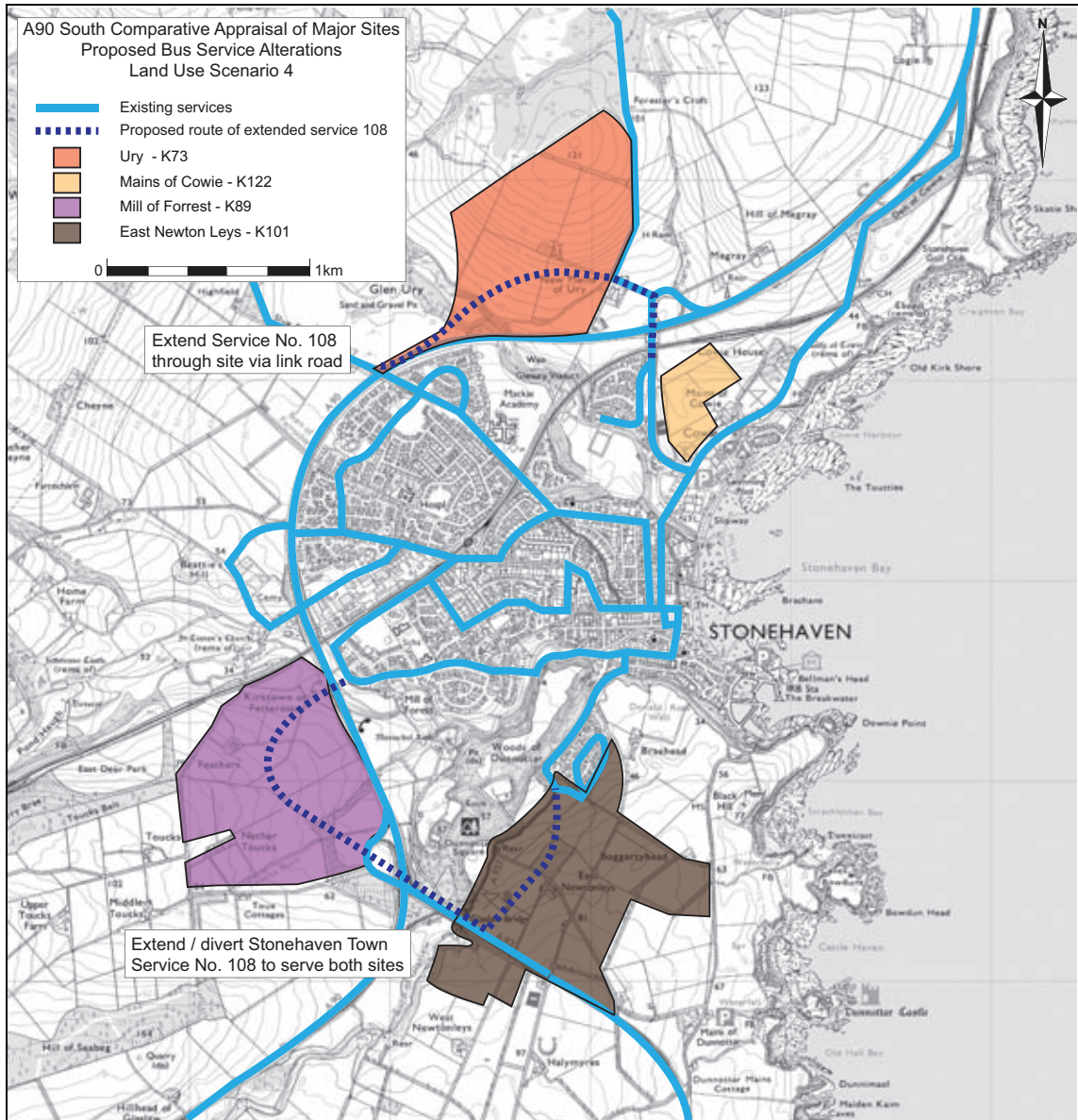


Figure 6.2 : Proposed Bus Service Alterations

Accession and Mapinfo GIS software packages have been used to inform the accessibility analysis which is presented in this study. Full details of the accessibility appraisal in terms of public transport services, is presented in Appendix D.

The accessibility analysis which is presented in Appendix D confirms that the extension of bus services into the land use scenario sites will enable a large proportion of development residents to be within a 10min walk of buses which operate with a 30min service frequency and provide access to a number of destinations including Aberdeen, Portlethen and Stonehaven.



#### 6.4.6 Schoolhill Park & Ride

The Schoolhill Park & Ride is a commitment in the NESTRANS *Regional Transport Strategy 2021 (NESTRANS, 15 July 2008)* and is to be located immediately to the west of the A90(T) Findon Interchange.

The potential of future residents to use the Schoolhill Park & Ride has been appraised in terms of the land use scenario site and can be summarised as follows:

- K89 Mill of Forest – Park & Ride expected to be attractive to future Aberdeen commuters given its location to the north of the site
- K101 East Newtonleys – Park & Ride expected to be attractive to future Aberdeen commuters given its location to the north of the site
- K73 Ury – Park & Ride expected to be attractive to future Aberdeen commuters given its location to the north of the site
- K122 Mains of Cowie – Park & Ride expected to be attractive to future Aberdeen commuters given its location to the north of the site

#### 6.4.7 High Occupancy Vehicle Lane

An appraisal has been undertaken of the proposed development's impact on the proposed High Occupancy Vehicle (HOV) lane which is to be located on the northbound A90(T) between Charleston and Bridge of Dee. Aberdeen City Council has a commitment to further investigation of a HOV lane in this location following completion of the AWPR. Table 6.10 summarises the issues and impact which has been identified. In summary, the design of the HOV lane is not affected by the Stonehaven proposals, but the operation of the HOV lane would be subject to traffic impact from it.

Table 6.10 : Impact on HOV lane

Site	Design Issue	Cumulative Traffic Impact
K89 Mill of Forest	No impact	HOV lane would not operate satisfactorily as currently designed using existing roadspace (Peak period traffic flows > 3,000 vehicles)
K101 East Newtonleys	No impact	
K73 Ury	No impact	
K122 Mains of Cowie	No impact	

#### 6.5 Implementability Appraisal

The Implementability Appraisal has been undertaken taking cognisance of the following seven point scale of assessment which is set out in *STAG*:

- +3 Major benefit
- +2 Moderate benefit
- +1 Minor benefit
- 0 No benefit or impact
- -1 Small negative impact



- -2 Moderate negative impact
- -3 Major negative impact

The transport interventions which are to be introduced to support development of Land Use Scenario 4 sites have been assessed against the following *STAG* implementability criteria:

- Technical Issues
- Operational Issues
- Financial Issues
- Public Issues

### 6.5.1 Technical Issues – Appraisal Score: -1

#### **Minor Negative Impact**

The A90(T) presents a barrier to movement between Stonehaven and the Mill of Forest site which is located to the west of the town. An unclassified road currently forms the southern and western boundaries of the site with the local road network connecting to the strategic road network at the A90(T)/A92 Glaslaw Interchange. It is proposed to provide vehicular access into the site from the Glaslaw Interchange, which is expected to be relatively straightforward to implement, however, a new bridge over the A90(T) will be required to provide a second vehicular access from Mill of Forest Road. The existing layout of the Glaslaw Interchange will also require to be revised to enable access to be provided into the site to and from the southbound carriageway of the A90(T).

The East Newtonleys site is expected to be relatively straightforward to access given its proximity to the local (A92 and A957) and strategic (A90(T)) road networks with access provided onto the A90(T) via the existing Glaslaw Interchange which is located less than 500m to the west of the site.

The Ury site is expected to be relatively straightforward to provide one point of access into the site from the B979 with an existing interchange facilitating access to and from the northbound A90(T) provided to the east of the site. It is, however, expected to be technically challenging to provide a second vehicular access into the site and permit full development of the site. The provision of a second access from the A957 will require construction of a bridge over Glen Ury.

It is considered to be relatively straightforward to access the Mains of Cowie site from both the B979 and Golf Course Road. The topography of the site may impact on the form and location of the development accesses.

It is expected to be relatively straightforward to extend the Stonehaven town bus service into all four sites in association with the proposed infrastructure improvements.

### 6.5.2 Operational Issues – Appraisal Score: +1

#### **Minor Benefit**

The scale of the developments is likely to enable bus service alterations to be self-financing following the first 3 - 5 years being underwritten by developers.

It is intended to extend the Stonehaven town bus service (No. 108) into the Mill of Forest, East Newtonleys and Ury sites in association with road infrastructure improvements, including a new link (and associated crossing of the A90(T)) to Mill of Forest Road. The provision of the new



link and crossing provides scope to extend the existing Stonehaven town service into both sites to provide a more efficient route through the town in addition to ensuring that the service remains self financing by increasing the population living along the route of the service.

The provision of bus stops on the B979 adjacent to the Mains of Cowie site will provide opportunity for residents to access bus services which currently route along the B979, without a requirement for the Stonehaven town service to be diverted or extended.

### **6.5.3 Financial Issues – Appraisal Score: 0**

#### **No Benefit or Impact**

It is expected that the majority of the transport infrastructure costs which will be associated with the development of the sites will be borne by developers.

The scale of the development is expected to support the extension of the Stonehaven town bus service without the need for financial support following initial funding by developers.

### **6.5.4 Public Issues – Appraisal Score: -1**

#### **Small Negative Impact**

It is expected that there will be minimal levels of objection to the development of either site in terms of their transport impact as they are located within convenient access of the strategic road network with a large proportion of trips anticipated to be attracted to the A90(T).

The East Newtonleys site is located adjacent to the local road network (A92 and A957) and it is considered that it will be straightforward to provide vehicular access into the site with no significant level of construction required.

The provision of access into the Mill of Forest site is anticipated to require an increased level of engineering works when compared to the East Newtonleys site as it will require the construction of a bridge over the A90(T) to enable access to be provided from Mill of Forest Road, in addition to providing direct access from the A90(T) at the Glaslaw Interchange. Although the scenario will not require the construction of additional junctions on the strategic road network, construction of a new bridge over the A90(T) could generate delay for existing road users during construction of the structure.

The Ury and Mains of Cowie sites will not require the provision of new access junctions on the A90(T) and it is considered that development of the sites and the associated infrastructure improvements are unlikely to generate significant levels of objection to the sites. There could however be objection to the construction of a bridge over Glen Ury to enable a second vehicular access to be provided into the Ury site.

Improvements to transport infrastructure and service provision are likely to be welcomed by existing Portlethen residents and employees.

### **6.5.5 Summary**

#### **Moderate Negative Impact (-2)**

The concepts of operational implementability, financial impacts to government and public acceptability of transport interventions can be complex to summarise. An overall feasibility factor has been derived for this DPMTAG Study based primarily on Technical Implementability of infrastructure for ease of comparison.





Land Use Scenario 4 will require construction of two bridges, one over the A90(T) and the second over Glen Ury, to provide a second point of vehicular access into the Ury and Mill of Forest sites. It is considered that the East Newtonleys and Mains of Cowie sites will be relatively straightforward to access.

## 6.6 STAG Criteria

The transport interventions which have been developed to support the development of Land Use Scenario 4 have been appraised in terms of the following criteria as defined by STAG:

- Environment
- Safety
- Economy
- Integration
- Accessibility & Social Inclusion

Again, a seven point scale of assessment has been used to illustrate relative impacts.

### 6.6.1 Environment – Appraisal Score: -2

#### **Moderate Negative Impact**

Aberdeenshire Council maintain a database of locations which are subject to environmental constraints. Information has been extracted from the database by Aberdeenshire Council for use in this study. The database indicates Areas of Landscape Significance, the *Aberdeenshire Sites and Monuments Record (SMR)*. The database confirms the location and significance of the sites with the majority of sites classified as having environmental constraints which do not preclude development.

The area to the east of the East Newtonleys site is shown to be an Aberdeenshire Area of Landscape Significance. There are no environmental constraints which are likely to have an impact on the location and form of development access provided from the A92 and A957.

The area surrounding the Glaslaw Interchange is shown to be an Aberdeenshire SMR site which could have an impact on the form of access into the Mill of Forest site, although its classification does not preclude development. There are no environmental constraints shown to be on the route of the proposed link to Mill of Forest Road and its associated crossing of the A90(T).

There are no environmental constraints shown to be located in the vicinity of the Mains of Cowie site which are likely to have a major impact on the form and location of development accesses.

A large proportion of the Ury site is shown to be an *SMR* site which could have an impact on the development of the site in addition to the form and location of development access junctions although its classification does not preclude development.

Further environmental assessment would be required should any transport infrastructure be progressed.





### 6.6.2 Safety – Appraisal Score: 0

#### No Benefit or Impact

It is anticipated that no new junctions will be required on the strategic road network to provide access into the development sites with no potential associated impact on the safe operation of the network. It is understood that the A957 is to be realigned to route through the East Newtonleys site as part of its development. This is expected to provide a safer facility for existing and future road users.

The Mill of Forest site will require the construction of a new crossing to provide access into the site from Mill of Forest Road in addition to an access from the existing Glaslaw Interchange. There could, however, be safety implications associated with vehicles undertaking u-turn manoeuvres if the junction layout is not revised to enable all movements to be undertaken at the interchange. The current arrangement only permits access to or from the northbound carriageway of the A90(T) from the west of the trunk road.

The provision of access into the Ury and Mains of Cowie sites will require the provision of a new junction on the A957 to provide a second point of access into the Ury site, and from the B979 and Golf Course Road to provide access into the Mains of Cowie site. Construction of any new junction can provide opportunity for an impact on the operation of the road network on which it is sited, however, the design of the junctions will minimise the potential to generate a detrimental impact on the road network in terms of its safe operation.

Development of the land use scenario sites will include a network of pedestrian and cycle facilities which is likely to provide an improvement over the existing situation and provide convenient access to existing facilities in Stonehaven.

### 6.6.3 Economy – Appraisal Score: 0

#### No Benefit or Impact

The majority of trips which are predicted to be generated by the land use scenario are expected to access the strategic road network to travel north to employment opportunities which are located in and around Aberdeen. It is expected that a proportion of traffic will be attracted to the AWPR Fastlink and not have an impact on the operation of the A90(T) to the north of Stonehaven. In addition, it is expected that the AWPR and AWPR Fastlink will remove existing traffic from the A90(T).

The development of the land use scenario sites to the scale which is proposed should enable the implementation of bus service enhancements to become self financing following the first 3 – 5 years being underwritten by developers.

ASAM4 has been used to provide an indication of the impact of the land use scenario in terms of the ratio of traffic volume to road link capacity. Table 6.11 confirms the ratio of traffic flow to link capacity on the northbound A90(T) in the 2023 AM peak hour.

Table 6.11 : Peak Hour Traffic Volume/Capacity

	Bridge of Dee	South of Charleston
Volume/Capacity (PCUs)	110%	88%

The analysis predicts that the northbound A90(T) will be operate over capacity at Bridge of Dee in the AM peak period with the addition of development generated traffic. Local modelling has



shown that queues could extend close to Charleston in the morning peak. The A90(T) is predicted to operate within capacity to the south of Charleston.

The analysis indicates that some congestion will occur at this location but that the congestion is similar to 2007 levels as detailed in Appendix A.

ASAM has been used to provide an indication of the land use scenario in terms of congestion. Comparison has been made between 2007 and 2023 for each land use scenario with a 1% increase over the 2007 base year (5,799 hours time lost in the base).

#### **6.6.4 Integration – Appraisal Score: +1**

##### **Minor Benefit**

The East Newtonleys site will extend the existing Stonehaven pedestrian/cycle network which currently terminates at Braehead.

Construction of a new bridge over the A90(T) with associated pedestrian/cycle facilities as part of the development of the Mill of Forest site, will ensure that the site is connected to Stonehaven by all modes of travel.

A new bridge is to be constructed over Glen Ury to provide vehicular access into the site from the A957. The link will facilitate access by the extended Stonehaven town bus service in addition to access by pedestrians and cyclists using the facilities which will be provided in association with the link road.

It is expected that any improvements to local bus services including alterations to the route of the existing Stonehaven town bus service, can be accommodated without any detriment to existing travellers

#### **6.6.5 Accessibility & Social Inclusion – Appraisal Score: +2**

##### **Moderate Benefit**

Construction of a new bridge over the A90(T) and Glen Ury to provide access from Mill of Forest Road into the Mill of Forest site and from the A957 into the Ury site, is expected to enable alterations to existing bus routes to be accommodated without impacting on the journey time and frequency of existing services. The road infrastructure will provide opportunity to alter the route of the Stonehaven town service to provide a more efficient service than currently provided. In addition, development of the sites will assist in supporting the viability of the Stonehaven town bus service.

Development of the Mill of Forest and East Newtonleys sites will include a range of facilities and amenities including employment opportunities and education, retail and community facilities which will benefit both future and existing residents living in the vicinity of the sites.





**7 COMPARISON OF MAJOR SITES**

**7.1 Introduction**

To provide a means of transport based comparison of the Land Use Scenarios and appropriate Transport Options a set of key indicators were agreed by the Steering Group. These indicators are set out in the framework shown in Table 7.1.

*Table 7.1 : Framework for Matrix Indicators*

<b>Impacts</b>	<b>Description</b>	<b>Indicators</b>
<b>Cumulative Impact</b>	Link based assessment of the cumulative impact on the trunk road network and rail network	ASAM4 indicators (e.g. traffic flow, rail passenger capacity)
<b>Objective 1</b>	<b><i>Make the most efficient use of the transport network</i></b> Efficiency of Road Network  Efficiency of Public Transport Network	ASAM4 indicators (e.g. journey times, capacity)  ASAM4 indicators (e.g. journey times, capacity)
<b>Objective 2</b>	<b><i>Reducing the need for people to travel</i></b> Overall distances travelled	ASAM4 indicators (e.g. Demand and Vehicle Kilometres travelled)
<b>Objective 3</b>	<b><i>Making sure that walking, cycling are attractive choices</i></b> Destination facilities within active travel range  Assessment of physical barriers to active travel	Accession indicators (e.g. to existing employment). Comment on potential new facilities.  Qualitative Assessment
<b>Objective 4</b>	<b><i>Making sure that public transport is an attractive choice</i></b> Public Transport network location  Public Transport opportunities to Aberdeen City Centre Public Transport measures	Review access to rail, bus networks and Park & Rides Existing rail and express bus frequency and journey times. Comment on potential for effective bus provision
<b>Social</b>	General comment on the level of social accessibility impact	Qualitative Assessment
<b>Economic</b>	General comment of economic efficiency related to journey times	ASAM4 data to key locations.
<b>Environmental</b>	General comment on environmental constraints  Carbon Emissions Impact	Qualitative Assessment by Aberdeenshire Council ASAM4 data
<b>Safety</b>	General comment on safety of access strategies	Qualitative Assessment
<b>Feasibility</b>	High Level Technical Feasibility	Qualitative Assessment
<b>Funded</b>	Significance of cost, evidence based input from Aberdeenshire Council	Qualitative Assessment, potentially informed by local appraisal
<b>Timing</b>	Discussion of timing issues	Qualitative Assessment

Through the appraisal, in Section 3 – 6, the study has now been able to develop results into a summarised form. Appraisal Summary Tables (ASTs) are contained in Appendix E for each Land Use Scenario Transport Option. The ASTs are based on STAG Part 1 forms but have



been slightly adapted for this study. Costs to government have been removed from the forms as they did not directly apply to this study, due to any interventions being developer led.

The ASTs, although a summary in themselves, are not easily read for comparing results side by side. An overall summary Table was developed for this purpose with key indicators and is contained in Appendix F.

The Steering Group did not want this Comparative Study to recommend which Land Use option would be the most appropriate in transport terms, but rather desired to see all the data provided to weigh up options beside other planning criteria.

## 7.2 Common Themes

Some common themes have come forward from the strategic modelling assessment that is applicable for any Land Use Scenario in the A90 (T) corridor as based on the assumptions in the study:

- Congestion in the Bridge of Dee area is likely to continue as this is a key pinch point
- Journey times from Findon to Charleston may continue to come under pressure at peak times
- Traffic levels using the AWPR Charleston and Stonehaven Interchanges are likely to be higher than previously predicted
- The substantial growth in regional traffic levels is likely to increase the time to travel between South Aberdeenshire and Aberdeen city centre
- The occupancy of rail services between Stonehaven and Aberdeen is forecast to remain close to or above seated capacity
- There are limited public transport options available for travelling between new developments and areas out with Aberdeen City Centre

On a local level common themes for all scenarios include the need to address barriers to active travel and the need to implement bus service improvements. Local modelling has suggested that all scenarios require further assessment of their impacts on the Bridge of Dee area.

## 7.3 Comparative Impacts or Benefits

A summary of the comparative relationship between the scenarios has been reviewed from the point of view of key strategic and local indicators developed in the study.

### 7.3.1 Scenario 1: Banchory Leggart and Schoolhill

The relatively close proximity of Banchory Leggart and Schoolhill to Aberdeen would minimise the length of the vehicle journeys and produce the least Carbon emissions of the Scenario options.

Strategic modelling has indicated that the close proximity of Banchory Leggart to the Bridge of Dee concentrates the development traffic in an already congested area and is likely to present the highest risk for delays to this area of the network compared to the other options. The introduction of a second A90 access junction helps to alleviate these impacts, but congestion in this area remains likely. When reviewed under local modelling conditions overall queues in the area were similar to other scenarios, but as traffic queues were backing into the development an effective transport management system has not yet been established. Journey times on the A90



were the most efficient in comparison to other scenarios, mainly due to the queueing into the development rather than on the A90, but also due to a slight potential enhancement of the network gained by the Leggart Terrace bus gate.

The Schoolhill proposal creates less substantial access issues compared to other options, as Findon Interchange has the potential to provide access to the A90.

Banchory Leggart has good short term potential for extending existing public transport services to serve the site, and is forecast to generate a slightly higher public transport mode share compared to other options. It also has long term potential to support new local services. In interim periods some support for public transport would be required to reduce impact on existing users of City services and provide other local services. There is also potential to integrate the Schoolhill site with the proposed Park & Ride at Findon. Further investigation into the potential benefits of Leggart Terrace as a bus priority route from the Park & Ride could be undertaken at this site.

Banchory Leggart has poor access to the rail network, however, accommodating additional population at Schoolhill (relatively close to Portlethen station) could support the desire for improved services to/from this area.

In terms of potential to use active travel, the Banchory Leggart and Schoolhill sites have the highest overall potential of all sites to promote walking to access employment and similar potential to Scenario 2 in promoting cycling to employment opportunities.

The feasibility of introducing transport infrastructure for this proposal will rely on joint working between local councils and the trunk road authority to develop a new junction on the A90 and satisfactory traffic management arrangements between Charleston and Bridge of Dee. The existing arrangement tested has not been demonstrated to operate effectively. In the modelling undertaken queueing traffic blocking back from the Bridge of Dee, causes queueing back into the development site at peak times of day.

Introducing a second junction on the A90 presents some more technical constraints, but appears from first inspection to be beneficial from an operational aspect. Further assessment will also be required into the viability of a A90 High Occupancy Vehicle lane being investigated by Aberdeen City Council, as there are negative design and traffic impacts on this potential intervention.

### **7.3.2 Scenario 2: Banchory Leggart and West Portlethen**

With the relative close proximity of Banchory Leggart and West Portlethen to Aberdeen, vehicle distance and Carbon emissions statistics compare favourably compared to other options.

Although, public transport mode share and passenger levels are also similar to that forecast for Scenario 1, the overall impact to travel time lost due to congestion is the highest of all Scenarios.

Strategic modelling has indicated that the West Portlethen site would see development-related traffic accessing the A90 to the west, but the level of traffic there is predicted to be slightly less than 2007 levels, due to the AWPR/Fastlink. When reviewed under local modelling conditions overall queues in the area between Charleston and Bridge of Dee were similar to other scenarios but with queues backing into Banchory Leggart. As with Scenario 1, an effective transport management system has not yet been established and requires further assessment. The journey times on the A90 were good in comparison to other scenarios, mainly due to the queueing into





the development, but also due to the slight potential enhancement of the network gained by the Leggart Terrace bus gate.

A new grade-separated interchange at Bruntland Road (Bourtreebush) would improve access to the A90 – reducing delays and mitigating the risk of further road traffic accidents at this location.

The potential for public transport services to West Portlethen appears broadly similar to that for Schoolhill. Both developments could access and support new Park & Ride services at Findon and rail services at Portlethen Station. As with Scenario 1, further investigation into the potential benefits of Leggart Terrace as a bus priority route from the Park & Ride could be undertaken. Scenario 2 has long term potential to support new local services. In interim periods some support for public transport would be required to reduce impacts on existing users of City bus services and provide other local services.

In terms of potential to use active travel, the Portlethen sites has less potential than Schoolhill to promote walking to access employment, however, the combination of Banchory Leggart and West Portlethen has the highest overall potential to promote cycling to access employment with a similar level to Scenario 1.

As with all scenarios, the feasibility of introducing transport infrastructure for this proposal will rely on joint working between local councils and the trunk road authority to develop a new junction on the A90 and satisfactory traffic management arrangements between Charleston and Bridge of Dee. The existing arrangement tested has not been demonstrated to operate effectively. In the modelling undertaken the blocking back from the Bridge of Dee, causes queuing back into the development site at peak times of day.

Introducing a second junction the A90 presents some more technical constraints but appears from first inspection to be beneficial from an operational aspect. This scenario also relies on additional junction improvements at Bruntland Road (Bourtreebush). As with other scenarios further assessment will be required into the viability of a A90 High Occupancy Vehicle lane being investigated by Aberdeen City Council, as there are negative design and traffic impact impacts on this potential intervention.

### **7.3.3 Scenario 3: Elsick**

Situated further from Aberdeen, the Elsick development would generate slightly longer road journeys compared to Scenarios 1 and 2, although the Carbon emissions statistics are similar to Scenario 2.

With this rural location, Elsick also generates slightly less public transport mode share than for Scenarios 1 and 2, however, due to the larger scale of a single development site, Elsick could be more self contained in nature, reducing the number of journeys made out with the settlement.

Elsick-related traffic would access the A90 to the South of Charleston Interchange, which would increase traffic at this section of the A90 in excess of present day levels.

Strategic modelling has suggested that the inclusion of direct access to the AWPR Fastlink reduces the impact of the Elsick development on the performance of the A90, however, the section of the A90 between Findon and Charleston would remain heavily trafficked. When reviewed under local modelling conditions overall queues in the area between Charleston and Bridge of Dee were similar to other scenarios but with all queues being held on the A90 and



potentially extending as far as Charleston. The journey times on the A90 were not as efficient as Scenarios 1 and 2.

The Elsick development would provide a new grade-separated interchange at Bruntland Road (Bourtreesbush), reducing delays and mitigating the risk of road traffic accidents at this location

There is potential for public transport services to Elsick to access and support new Park & Ride services at Findon and rail services at Portlethen Station. With the scale of completed development, Elsick may present long term potential to support alterations to existing bus services and the development of new routes. In interim periods major support would be required for more buses on the high profile Coastrider route, to reduce negative diversion impact on existing users.

In terms of potential to use active travel, the Elsick site has similar potential to Scenario 2 to promote walking to access employment, but it has the least overall potential of any scenario to access employment opportunities within cycling distance.

As with all scenarios, the feasibility of introducing transport infrastructure for this proposal will also rely on joint working between local councils and the trunk road authority to develop satisfactory traffic management arrangements between Charleston and Bridge of Dee. This scenario also relies in the first instance on additional junction improvements at Bruntland Road (Bourtreesbush) and then on another potential junction onto the AWPR Fastlink. Further assessment will be required into the viability of a High Occupancy Vehicle lane being investigated by Aberdeen City Council, as from first inspection there are negative traffic impacts on this potential intervention, although less design issues to overcome than Scenario 1 and 2.

#### **7.3.4 Scenario 4: Mill of Forest and Newtonleys**

Situated further south, Stonehaven-related developments would generate the longest vehicle journeys and the highest Carbon emissions of the options considered.

The public transport mode share and increase in patronage levels associated with the Mill of Forest and Newtonleys developments are similar to that forecast for other developments.

These developments, particularly Mill of Forest is the closest of the major sites in walking distance to a train station, potentially encouraging use of existing Stonehaven train services and supporting the introduction of improved service patterns, although the site is outside the general classification of a conveniently accessible walking distance to rail. As with other scenarios, there is also potential to utilise the proposed Park & Ride at Findon. In interim periods local bus route extensions would require support, in the long term they may be self sustaining.

Strategic modelling has shown that Stonehaven developments are anticipated to increase traffic levels to the West of Stonehaven, however the A90 and AWPR Fastlink is anticipated to cope with this additional pressure without significantly affecting strategic journey times – a point illustrated by the Stonehaven Scenario producing the least time lost due to congestion of all development options. When reviewed under local modelling conditions overall queues in the area between Charleston and Bridge of Dee were similar to other scenarios, but with all queues being held on the A90 and potentially extending as far as Charleston. The journey times on the A90 were not as efficient as Scenarios 1 and 2.



In terms of potential to use active travel, the Stonehaven sites has similar potential to Scenario 2 in potential to promote walking to access employment, but it has relatively low overall potential to access employment opportunities within cycling distance.

As with all scenarios, the feasibility of introducing transport infrastructure for this proposal would also rely on joint working between local councils and the trunk road authority to develop satisfactory traffic management arrangements between Charleston and Bridge of Dee. This scenario also relies on a new bridge over the A90 from Mill of Forrest Road and connection into the existing A90/A92 interchange. East Newtonleys requires junction connections from the A92 and A957. As with Scenario 3, further assessment will be required into the viability of a High Occupancy Vehicle lane on the A90 that is being investigated by Aberdeen City Council as from first inspection there are negative traffic impacts on this potential intervention, although less design issues to overcome than Scenario 1 and 2.

#### 7.4 Risks Comparison

In addition to technical challenges that require further investigation and the need for additional local transport modelling to be undertaken, there is a series of risks associated with developing transport options for the scenarios these include:

- Phasing requirements
- Changes in transport trends
- Changes to committed infrastructure
- Other unforeseen risks

In terms of phasing requirements there may be difficulties on bringing forward public transport to areas that are currently not served by bus services. Constructing major infrastructure prior to developments becoming commercially viable may also be a risk and should also be considered.

Where transport trend change, such as with a rise in income increasing car ownership there may be difficulties in developing appropriate infrastructure or supporting bus services in the long term. The risk of maintaining bus services over a long period of time must be considered for any future development.

There is also risk with the development of committed infrastructure that has been assumed in the development of the comparative appraisal. Should government budgetary constraints preclude certain infrastructure or rail enhancements then the Land-Use scenarios and transport options may require being re-appraised.

Other unforeseen events can impact on development. Where development is placed all in one location and reliant on individual pieces of infrastructure or new public transport services becoming established then it would be hard to address the necessary land allocations, should difficulties occur. Ideally, to reduce risk, a development should be able to be relatively simple to implement and grow over time, utilising existing established transport networks and services or have the ability to adapt in a sustainable way. Where a development can meet these low risk criteria there is more chance of keeping to the principles of sustainable transport, to support the aims of the Structure Plan and the Local Development Plan. Deliverability plans for individual phases of development would be needed to assess this fully in respect of the development sites considered in this study.

