



## **Aberdeen Western Peripheral Route**

### **Development of Preferred Route Final Assessment Stage Report**

**Autumn 2006**

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## **1 Introduction**

### **1.1 Route Options**

Based on the major options and variants thereof brought forward from the Initial Assessment (refer to Initial Assessment Stage Report, Autumn 2006), the Final Assessment decisions are split into three parts, as follows:

- Southern Area – Stonehaven to Cookney.
- Central Area – North or South of Hare Moss (including decision on junction form / priority).
- Northern Area – River Dee to North Kingswells

The geographical split described above takes account of the fact that as a result of the decisions taken during the Initial Assessment, only one route option remains between Cookney and the Burnhead area.

To enable the Final Assessment, further engineering development was undertaken on each of the options. Further assessment work was also undertaken in relation to environmental issues and costs.

The Final Assessment of the options was then undertaken as follows:

- Likely significant environmental, engineering and economic factors in relation to each option were assessed.
- A further 'Negative' assessment, similar to that carried out at the Initial Assessment Stage was undertaken.
- A 'Positive' assessment was carried out whereby options were assessed comparatively by means of a cascading series of decisions, leading to identification of the preferred route within each of the parts described above

This report presents the findings of the Final Assessment Stage.

The assessment was undertaken by the Project Team, which comprised of the following:

Transport Scotland – Project Team  
AWPR Managing Agent Team  
Jacobs

Thereafter, the results of the assessment were presented on 13 April 2006 to a Partner's Panel comprising representatives of the three funding partnership bodies:

Aberdeen City Council  
Transport Scotland

Aberdeenshire Council

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## 1.2 Junction Options

The Final Assessment also considered junction form in relation to the route options at the following locations:

- Stonehaven
- Charleston
- Burnhead
- Milltimber (A93)
- South Kingswells (A944)

As per the route options assessment, the likely significant Environmental, Engineering and Economic factors in relation to each option at each location were assessed.

## **2 Route Options**

### **2.1 Overview**

The main options and variants thereof within the three areas identified are summarised below and all options are illustrated in Figures 1, 2 and 3 which are shown in Appendix A.

### **2.2 Southern Section (Stonehaven to Cookney: Figure 1)**

- Orange Option 1: From the A90 at Megray passing west of Kempstone Hill and Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.
- Orange West Option 2: From the A90 at Megray passing west of Kempstone Hill and Hill of Muchalls, crossing the Burn of Muchalls at South Cookney and passing to the east of Cookney.
- Orange East Option 3: From the A90 at Megray passing west of Kempstone Hill and through Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.
- Red Option 4: From the A90 at Megray passing through Kempstone Hill and east of Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.
- Purple Option 5: From the A90 at Megray passing east of Kempstone Hill and crossing the Burn of Muchalls south of Montgatehead and passing to the east of Cookney.
- Red/Orange Option 6: From the A90 at Megray passing through Kempstone Hill and Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.
- Orange East/Red Option 7: From the A90 at Megray passing west of Kempstone Hill and east of Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.
- Purple/Red Option 8: From the A90 at Megray passing east of Kempstone Hill and Hill of Muchalls, crossing the Burn of Muchalls at Elrick and passing to the east of Cookney.

### **2.3 Central Section (A90 at Charleston to Blaikiewell: Figure 2)**

- Blue Option 9: From Charleston passing south of Hare Moss and Greenloaning and passing through Cleanhill Wood with the Fastlink connecting to a junction on the AWPR west of Hill of Blairs.
- Purple Option 10: From Charleston passing north of Hare Moss and Greenloaning and south of Hill of Blairs and passing through Cleanhill Wood with the Fastlink connecting to a junction on the AWPR west of Hill of Blairs.
- Blue Option 11: From Charleston passing south of Hare Moss and Greenloaning and immediately south of Burnhead connecting to a junction on the Fastlink at Blaikiewell.
- Purple Option 12: From Charleston passing passing north of Hare Moss and Greenloaning and immediately south of Burnhead connecting to a junction on the Fastlink at Blaikiewell.

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- Blue option 13: From Charleston passing south of Hare Moss and Greenloaning and between Burnhead and Craigentath connecting to a junction on the Fastlink south of Blaikiewell.
- Blue Option 14: From Charleston passing south of Hare Moss and Greenloaning and north of Burnhead connecting to a junction on the Fastlink at Blaikiewell.
- Purple Option 15: From Charleston passing passing north of Hare Moss and Greenloaning and between Burnhead and Craigentath connecting to a junction on the Fastlink south of Blaikiewell.
- Purple Option 16: From Charleston passing passing north of Hare Moss and Greenloaning and north of Burnhead connecting to a junction on the Fastlink at Blaikiewell.

### **2.4 Northern Section (River Dee to North Kingswells: Figure 3)**

- Orange Option 17: Passing through the International School and Upper Beanshill, east of Beans Hill, west of Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Red Option 17A: A minor variant of Option 17 passing through Kippie Lodge.
- Blue Option 18: Passing east of the International School and through Upper Beanshill, east of Beans Hill, west of Rotten O’Gairn and east of Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Purple Option 19: Passing east of the International School and west of Upper Beanshill, east of Beans Hill, Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Orange/Purple Option 20: Passing through the International School and Upper Beanshill, east of Beans Hill, Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Orange/Blue Option 21: Passing through the International School and Upper Beanshill, east of Beans Hill, west of Rotten O’Gairn and east of Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Blue/Orange Option 22: Passing east of the International School and through Upper Beanshill, east of Beans Hill, west of Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Blue/Purple Option 23: Passing east of the International School and through Upper Beanshill, east of Beans Hill, Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.
- Purple/Orange Option 24: Passing east of the International School and west of Upper Beanshill, east of Beans Hill, west of Rotten O’Gairn and Auchlea Moss before crossing the A944 at East Kingsford and heading on to North Kingswells.

## **3 Route Options Assessment**

### **3.1 General**

The tables included in Appendix B identify the likely significant environmental, engineering and economic factors assessed at this time in relation to each of the options considered. These tables form the basis of the decisions made at the Final Assessment Stage, which are discussed below. It should be noted that the assessment of environmental factors does not take into account any possible mitigation measures.

### **3.2 Southern Section (Stonehaven to Cookney)**

#### **3.2.1 Decision 1**

Following a further 'negative' assessment as a result of information that emerged during the Final Assessment consultation process, a decision was taken to suspend Options 4, 6 and 8 from further consideration for the following reason:

- These options result in very significant impacts on the Kempstone Hill Complex and Kempstone Hill Cairn (although currently unscheduled, the site is potentially of National Importance in relation to archaeology/cultural heritage and is being assessed for scheduling).

Thereafter a cascading series of decisions were taken based on a 'positive' assessment whereby options were compared in pairs to identify the preferred route within the Southern Section.

#### **3.2.2 Decision 2 – Option 1 versus Option 2**

Option 1 is preferred over Option 2 for the following reasons:

- There are fewer properties within close proximity (100m) of the route thus reducing impact on the local population.
- It runs close to the BP and Shell pipelines over a significantly shorter length.
- The cost is lower.

#### **3.2.3 Decision 3 – Option 3 versus Option 7**

Option 3 is preferred over Option 7 for the following reason:

- Although there are similar impacts, Option 3 has a reduced cost, primarily due to a lesser volume of earthworks and less expensive structures on the basis of form and complexity.

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### 3.2.4 Decision 4 – Option 3 versus Option 5

Option 3 is preferred over Option 5 for the following reasons:

- The overall landscape impacts are lower.
- The route is less likely to affect private ground water supplies.
- The disruption during construction based on the volume of earthworks is estimated to be less.
- The cost is significantly lower primarily due to greatly reduced earthworks which contribute better to the overall earthworks strategy for the scheme.

However, it is noted that Option 3 is likely to have operational impacts on a larger local population.

### 3.2.5 Decision 5 – Option 1 versus Option 3

Option 1 is preferred over Option 3 for the following reasons:

- There is no demolition required.
- The impact on important cultural heritage sites is lower.

### 3.2.6 Summary – Southern Section

The Project Team recommends Option 1 for the Stonehaven to Cookney Section.

## 3.3 Central Section (A90 at Charleston to Blaikiewell)

### 3.3.1 Decision 6

Following a further ‘negative’ assessment as a result of information that emerged during the Final Assessment consultation process, a decision was taken to suspend Options 9 and 10 from further consideration for the following reasons:

- These options result in potentially significant ecological impacts on four areas of long established woodland resulting in habitat loss, fragmentation and disturbance.
- These options also result in potentially substantial landscape impacts on Craingles Hill.

Thereafter a cascading series of decisions were taken based on a ‘positive’ assessment whereby options were compared in pairs to identify the preferred route within the Central Section.



### **3.3.2 Decision 7 – Option 13 versus Option 15**

Option 13 is preferred over Option 15 for the following reasons:

- It passes through less valuable agricultural land.
- It has lesser ecological impacts, avoiding significant impacts on Greenloaning Long Established Woodland.
- The southern route would have a lesser impact on the hydrology of Hare Moss as a result of the reduction in watercourse realignments.
- It avoids the need for reduced standard horizontal curvature, is shorter and provides a more flowing alignment.
- The cost is lower.

### **3.3.3 Decision 8 – North or South of Hare Moss**

It is noted that Options 11, 13 and 14 all follow the same alignment as they pass south of Hare Moss while Options 12, 15 and 16 all follow the same alignment to the north. As such, taking account of Decision 7, it was considered that the options south of Hare Moss are preferred over the options north of Hare Moss. Therefore, Option 11 is preferred over Option 12 and Option 14 is preferred over Option 16.

### **3.3.4 Decision 9 – Option 13 versus Option 11**

Option 13 is preferred over Option 11 for the following reasons:

- It is further from the local population and reduces severance of the Maryculter East community.
- It has lower landscape impacts in the Blaikiewell Open Farmland area.

### **3.3.5 Decision 10 – Junction Form**

Based on the provision of a half priority/dumbbell grade-separated form of junction provision, Option 13 is preferred over Option 14 for the following reasons:

- It is further from the local population and reduces severance of the Maryculter East community.
- It has lower ecological impacts particularly in relation to long established woodland and Blaikiewell Burn.
- It impacts on fewer sites of cultural heritage interest.

### **3.3.6 Decision 11 – Junction Form**

Based on the provision of an at-grade roundabout form of junction provision, Option 14 is preferred over Option 13 for the following reasons:

- The ecological impacts particularly in relation to Cleanhill Wood and Blaikiewell Burn would be greatly reduced by alignment improvements afforded by the introduction of the roundabout.
- It reduces landscape and visual impacts for the residents of Maryculter East.

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## **3.3.7 Decision 12 – Junction Form**

Based on the provision of a free flow grade-separated form of junction provision, Option 14 is preferred over Option 13 for the following reason:

- It provides the only sensible angle for alignment connectivity between the Fastlink and the Charleston Leg of the AWPR.

However, it is noted that a free flow junction layout would result in considerably increased environmental impacts as a result of the larger overall junction footprint and the crossings of Blaikiewell and Burnhead Burns.

## **3.3.8 Summary – Central Section**

The Project Team recommends Option 14 on the basis of provision of an at-grade or free flow grade-separated form of junction, however, if a half priority/dumbbell grade-separated form of junction is proposed, the Project Team recommends Option 13.

## **3.4 Northern Section (River Dee to North Kingswells)**

The options between the River Dee and North Kingswells were split into two groups, those which required demolition of the International School and those which did not.

### **3.4.1 Decision 13**

Following a further 'negative' assessment as a result of information that emerged during the Final Assessment consultation process, a decision was taken to suspend Option 17A from further consideration for the following reasons:

- It would require the introduction of a considerable reduction in horizontal design standards within the vicinity of Milltimber Junction with consequent safety implications.
- It would pass close to residential facilities within the Camphill (Milltimber) Estate resulting in exacerbated noise and visual impacts.
- It would render the Kippie Lodge golf course unusable
- It would require demolition of Milltimber Farm and the associated buildings.

Thereafter a cascading series of decisions were taken based on a 'positive' assessment whereby options were compared in pairs to identify the preferred route within the Northern Section.

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### 3.4.2 Decision 14 – Option 17 versus Option 20

Option 20 is preferred over Option 17 for the following reasons:

- There are fewer properties demolished and within close proximity (100m) of the route thus reducing impact on the local population.
- It has reduced impacts on watercourses.
- It has reduced landscape impacts.
- The disruption during construction is considered to be lower on the basis of earthworks movement and proximity to properties.
- The cost is lower.

### 3.4.3 Decision 15 – Option 20 versus Option 21

Option 20 is preferred over Option 21 for the following reasons:

- There are fewer properties demolished and within close proximity (100m) of the route thus reducing impacts on the local population.
- It has reduced impacts on watercourses.
- It has reduced landscape impacts.
- The disruption during construction is considered to be lower on the basis of earthworks movement and proximity to properties.
- The cost is lower.

### 3.4.4 Decision 16 – Option 18 versus Option 22

Option 22 is preferred over Option 18 for the following reasons:

- It has reduced ecological impacts in relation to the Auchlea Moss District Wildlife Site (DWS) and Kingshill Woods.
- It has reduced landscape impacts.
- The disruption during construction is lower on the basis of earthworks movement and proximity to properties.
- The cost is lower.

### 3.4.5 Decision 17 – Option 22 versus Option 23

Option 23 is preferred over Option 22 for the following reasons:

- There are fewer properties demolished and within immediate proximity (50m) of the route thus reducing impacts on the local population.
- It has reduced impacts on watercourses.
- It has reduced landscape impacts.
- It impacts on fewer and less significant sites of cultural heritage value.
- The disruption during construction is lower on the basis of earthworks movement and proximity to properties.
- It has more flowing horizontal and vertical alignment.
- The cost is lower.

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## **3.4.6 Decision 18 – Option 19 versus Option 24**

Option 19 is preferred over Option 24 for the following reasons:

- There are fewer properties demolished and within immediate proximity (50m) of the route thus reducing impact on the local population.
- It has reduced impacts on watercourses.
- It has reduced landscape impacts.
- The cost is lower.

## **3.4.7 Decision 19 – Option 19 versus Option 23**

Option 19 is preferred over Option 23 for the following reason:

- There are fewer properties demolished and within close proximity (100m) of the route thus reducing impact on the local population.

## **3.4.8 Summary – Northern Section**

The Project Team recommends Option 19 if the International School is to be retained, however, Option 20 is recommended if the International School is to be demolished and relocated.

## **4 Junction Options**

### **4.1 Overview**

The options at each of the five junction locations identified are summarised below and all options are illustrated in Figures 4 to 16, which are shown in Appendix C.

### **4.2 Junction Options**

#### **4.2.1 Stonehaven**

- Option 1: Provision of a half diamond dumbbell grade-separated junction with southbound slips connecting to a roundabout with new link road over the railway and retention of the existing loop for northbound traffic (Figure 4).
- Option 2: Provision of a half diamond grade-separated junction with southbound slips connecting to the B979 and retention of the existing loop for northbound traffic (Figure 5).

#### **4.2.2 Burnhead**

- Option 1: Provision of a half priority/dumbbell grade-separated junction with north-facing slips only (Figure 6).
- Option 2: Provision of a free flow grade-separated junction that caters for an AWPR North to Charleston movement, or vice versa, only (Figure 7).
- Option 3: Provision of an at-grade roundabout junction (Figure 8).

#### **4.2.3 Charleston**

- Option 1: Provision of a two-bridge grade-separated junction (Figure 9).
- Option 2: Provision of a single bridge signalised priority grade-separated junction (Figure 10).
- Option 3: Provision of a full diamond dumbbell grade-separated junction (Figure 11).

#### **4.2.4 Milltimber (A93)**

- Option 1: Provision of a full diamond dumbbell grade-separated junction located between the A93 and Contlaw Road (Figure 12).
- Option 2: Provision of a split diamond grade-separated junction with north facing slips on the A93 and south facing slips on the B9077 (Figure 13).
- Option 3: Provision of a looped dumbbell grade-separated junction located between the A93 and Contlaw Road (Figure 14).

#### **4.2.5 South Kingswells (A944)**

- Option 1: Provision of a single bridge signalised priority junction (Figure 15).
- Option 2: Provision of a two-bridge grade-separated junction, with signals at the north facing slip roads to cater for the existing cycle lane (Figure 16).

## **5 Junction Options Assessment**

### **5.1 General**

The junction assessment considered the likely significant engineering and economic factors as assessed for the route options and in the case of Burnhead Junction environmental factors were also assessed. It also considered the cost implications of the options identified and their performance in relation to traffic based on micro simulation modelling.

### **5.2 Junction Options Assessment**

#### **5.2.1 Stonehaven**

Option 1 is preferred as it performs better in traffic terms by exhibiting less queuing traffic during operation, while still retaining as much of the existing layout as possible, improving constructability.

#### **5.2.2 Burnhead**

The form of junction at Burnhead is dependant on further decisions in relation to route choice and additional assessment work on the junctions under consideration. Refer to Section 6.3, 'Further Decisions'.

#### **5.2.3 Charleston**

Option 2 is preferred as it performs as well as Option 1 in traffic terms and requires less land and only one crossing of the A90, reducing costs and improving constructability.

#### **5.2.4 Milltimber (A93)**

Option 3 is preferred as it minimises demolition in Milltimber and additional traffic volumes on the B979 past the Camphill Community while also reducing land take.

#### **5.2.5 South Kingswells (A944)**

Option 2 is preferred as it performs significantly better in traffic terms and minimises the widening and consequent property frontage impacts along the A944. It also allows off-line construction of the structures, improving constructability.

**6**

**Summary**

**6.1 Preferred Route Options**

**6.1.1 Southern Section**

Option 1 is recommended for the Stonehaven to Cookney Section.

**6.1.2 Central Section**

Refer to Section 6.3, 'Further Decisions'.

**6.1.3 Northern Section**

Refer to Section 6.3, 'Further Decisions'.

**6.2 Preferred Junction Options**

**6.2.1 Stonehaven**

Option 1 is recommended for the Stonehaven Junction.

**6.2.2 Burnhead**

Refer to Section 6.3, 'Further Decisions'.

**6.2.3 Charleston**

Option 2 is recommended for the Charleston Junction.

**6.2.4 Milltimber (A93)**

Option 3 is recommended for the Milltimber Junction.

**6.2.5 South Kingswells (A944)**

Option 2 is recommended for the South Kingswells Junction.

## **6.3 Further Decisions**

### **6.3.1 Burnhead Junction**

Following further consideration of the route options in the Burnhead area, a decision was taken by the Partner's Panel to take forward Option 14 as the preferred route in the Central Section as a result of the reduced landscape and visual impacts on the properties at Burnhead. This decision left either the at-grade roundabout or free-flow grade separated junction options available.

Further assessment work by the Project Team in relation to the at-grade roundabout and the free-flow grade separated junctions was requested. An additional report assessing the environmental, engineering and economic issues in relation to the two options will be prepared to inform the final decision in relation to junction form.

### **6.3.2 International School Demolition**

Following consideration it was decided that the route would follow Option 20 through the present site of the International School at Milltimber. This option reduced property demolition in the area but will necessitate the relocation of the school. Further details regarding the consideration of this decision are provided in the separate Consolidation Assessment Report prepared by Transport Scotland.

### **6.3.3 Route Announcement**

Based on the route and junction options selected as described above, the preferred route for the AWPR was announced on 2 May 2006 by the Minister for Transport. The layout of the preferred scheme is shown in Figure 17 in Appendix D.

### **6.3.4 Stonehaven Junction**

During further development of the design a revised proposal was developed for Stonehaven Junction based on a modified version of Option 2 as described above. This option was assessed and performed acceptably in terms of traffic queuing, provided better connectivity between the trunk roads and required less land. This modified Option 2 was adopted for the scheme although it is noted that it is more costly than the previously preferred Option 1.

### **6.3.5 Fastlink Cross-section**

The scheme has been developed on the basis of the Fastlink being a dual carriageway. Further details regarding the consideration of this decision are provided in the separate Consolidation Assessment Report prepared by Transport Scotland.



**Appendix A: Route Options Figures**



**Appendix B: Route Options Assessment Tables**



**Appendix C: Junction Options Figures**



**Appendix D: Preferred Scheme Layout**

