

## Appendix D. Exhibition Boards

# Welcome

Welcome to this exhibition on the Pass of Birnam to Tay Crossing section of the A9 Dualling Programme. We are here today to provide you with an update on our progress since the previous public exhibitions for the project in 2013, and to seek your feedback and comments on the current design options.

We would like to show you some of the challenges that we have been trying to address, and how we have used the new information we have gathered to develop the previous route options.

Please take your time to study the information on display and speak to one of the members of the team present today. It will assist us in our assessment work if you could complete the feedback form available.

In particular, we would appreciate your views on the following:

- **Any local features or constraints that you think may be important for us to know about**
- **How the different options may affect you**
- **Any other options that you think we should consider.**

Your feedback will be considered as part of the further development, refinement and assessment of the route options.



# Programme objectives

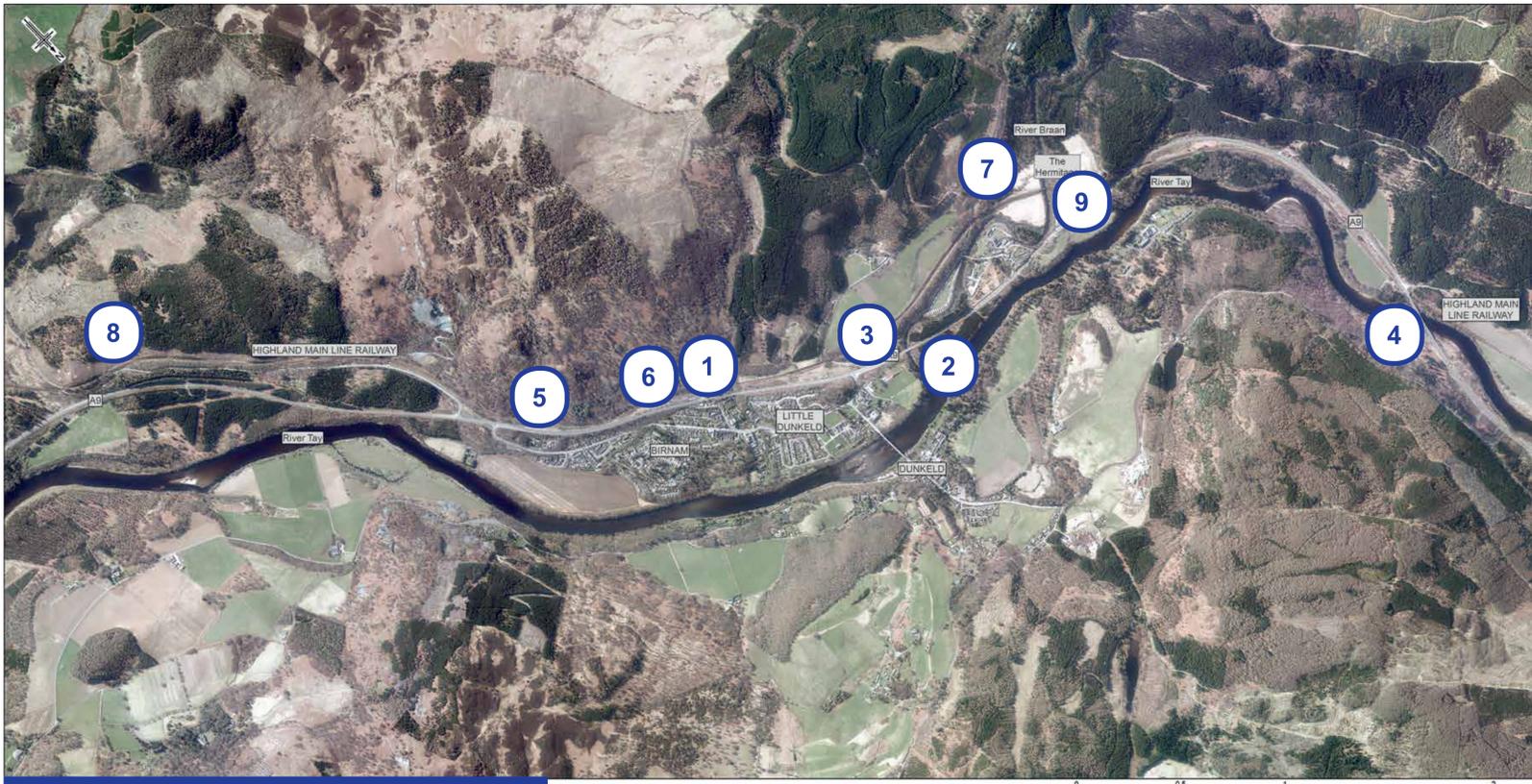
The Scottish Government has committed to dualling the A9 between Perth and Inverness by 2025. The overall A9 Dualling Programme objectives are to:

- **Improve the operational performance of the A9 by:**
  - **Reducing journey times**
  - **Improving journey time reliability**
- **Improve safety for both motorised and Non-Motorised Users (NMUs) by:**
  - **Reducing accident severity**
  - **Reducing driver stress**
- **Facilitate active travel within the corridor**
- **Improve integration with public transport facilities.**

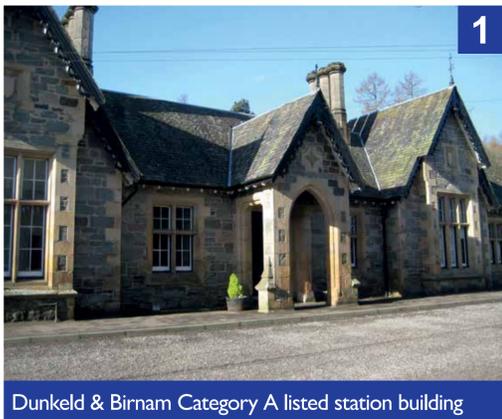


# Project constraints

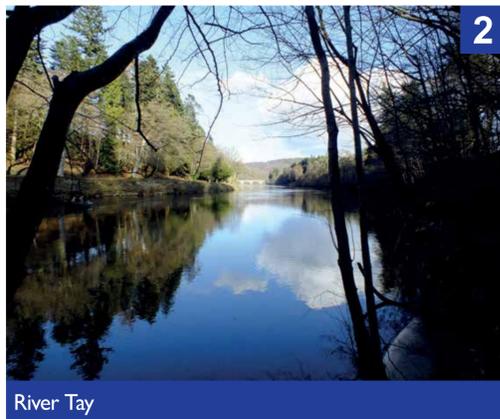
The route options have been developed taking into consideration the constraints on the design, identified throughout the corridor, as part of previous and current studies, including those shown here:



Pass of Birnam to Tay Crossing project – location of constraints



Dunkeld & Birnam Category A listed station building



River Tay



Highland Main Line railway



River Tay Crossing



Non-Motorised User (NMU) routes e.g. pedestrians and cyclists



Dunkeld & Birnam Station car park



Ancient woodland



Topography



The Hermitage

# Development of early route options (2009 – 2012)

In 2009, Transport Scotland commissioned AECOM (formerly URS) to develop route options for the Pass of Birnam to Tay Crossing project. This included considering the engineering, environmental and economic impacts of dualling options through further study, design and assessment work.

The assessment considered an on-line corridor for a dual carriageway, i.e. widening of the existing carriageway. Off-line options, remote from the existing carriageway, had already been discounted, primarily due to the surrounding landscape and resulting environmental impact.

A total of five alternative route options were considered. Each option followed the same linear route, with different levels and junction layouts.

The possible junction arrangements were shown at a previous exhibition in February 2012, and are summarised on the following panels.



Existing A9 carriageway at Birnam

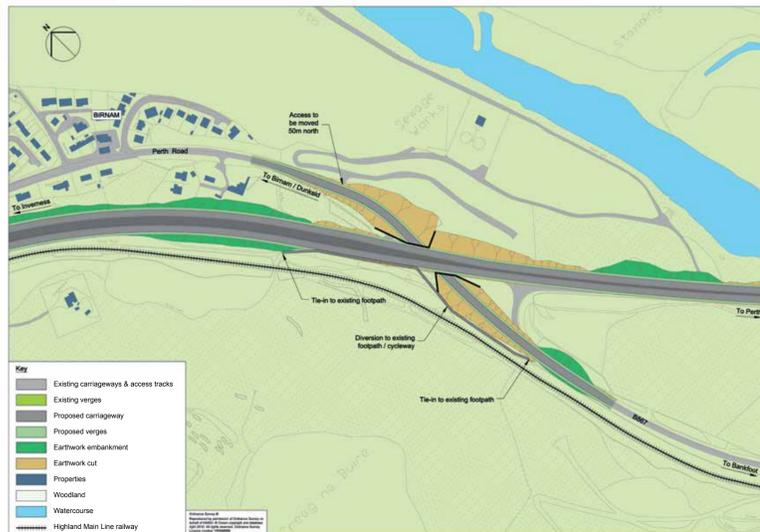
# Development of early route options (2009 – 2012)

## Birnam junction options (2012):



### Birnam junction option 1

- Compact grade-separated junction (with accesses on loops)
- Underbridge structure
- Facilitates all vehicle movements.



### Birnam junction option 2

- Connection of B867 and Perth Road
- Underpass structure
- No access to or from the A9.

## Dunkeld junction options (2012):



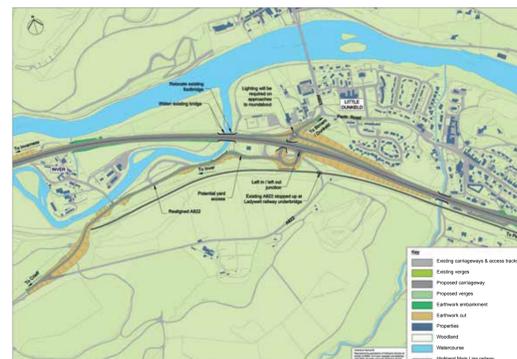
### Dunkeld junction option 1

- Compact grade-separated junction (with accesses on loops)
- Overbridge structure
- Facilitates all vehicle movements.



### Dunkeld junction option 2

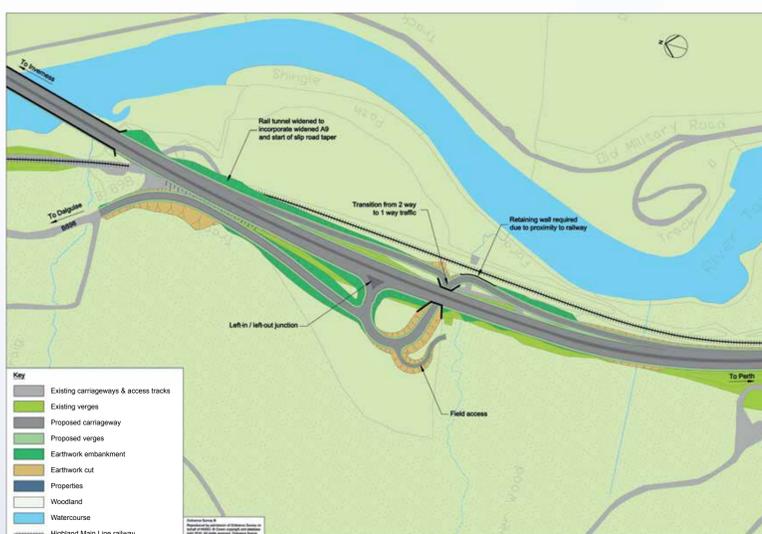
- At-grade roundabout
- Facilitates all vehicle movements.



### Dunkeld junction option 3

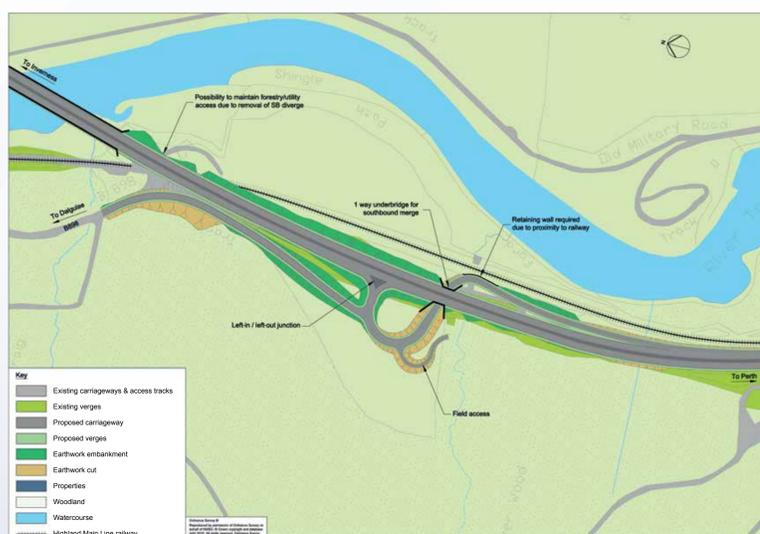
- Compact grade-separated junction (with accesses on loops)
- Underbridge structure
- Facilitates all vehicle movements (diverted access to the A822 Old Military Road).

## Dalguse junction options (2012):



### Dalguse junction option 1

- Compact grade-separated junction (with accesses on loops)
- Underbridge structure
- Facilitates all vehicle movements.



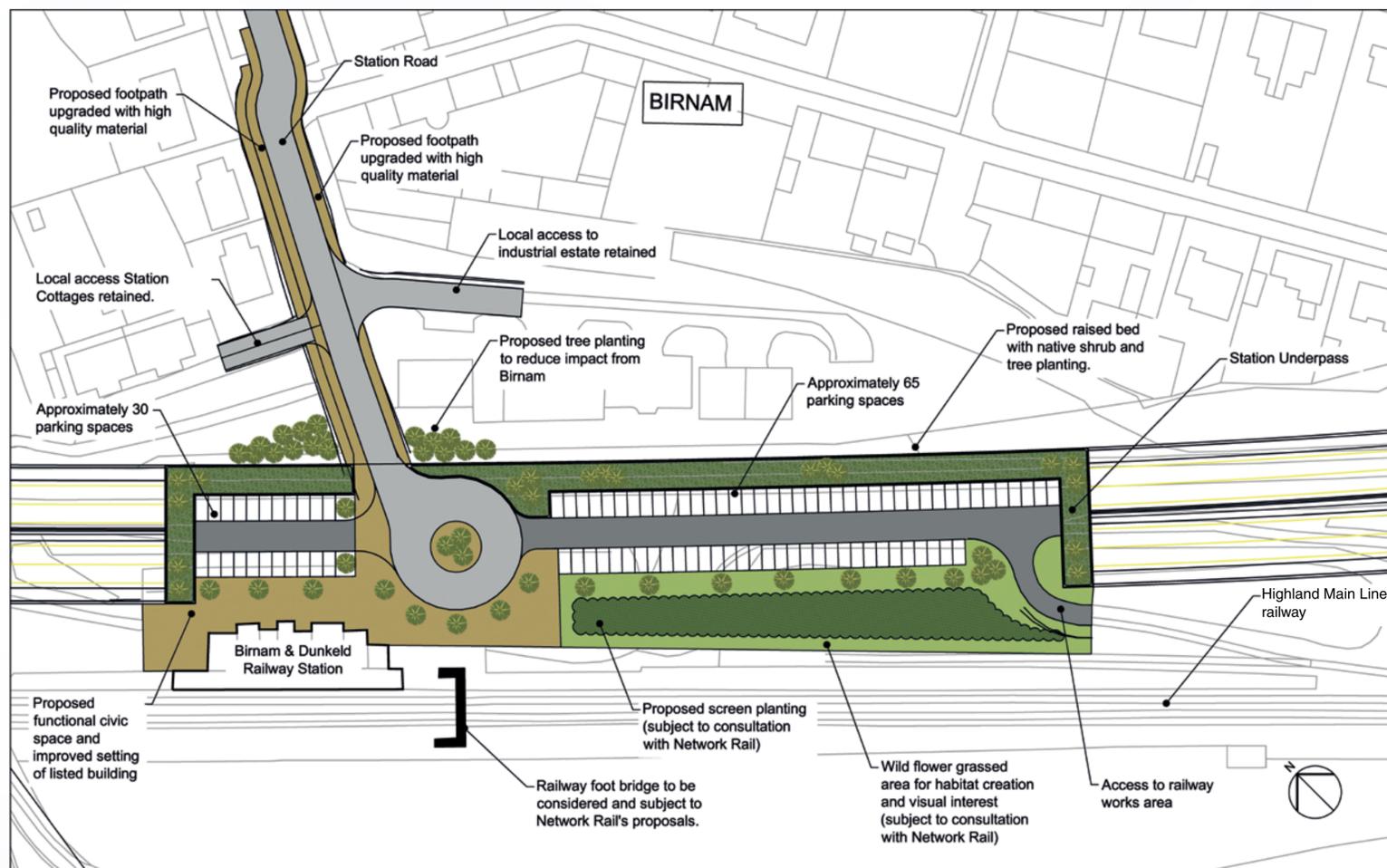
### Dalguse junction option 2

- Compact grade-separated junction (with accesses on loops)
- Underbridge structure
- No southbound diverge slip road.

# Alternative route options (June 2013)

A number of issues emerged from the route options shown at the February 2012 exhibition, including:

- **Widening of the A9 in the vicinity of Dunkeld & Birnam Station to the west impacted on the existing car park, significantly reducing car park provision**
- **There was insufficient space to provide a fully compliant left-in/left-out junction at the existing station access**
- **Did not address the accessibility issues around the station for Non-Motorised Users (NMUs) e.g. pedestrians, cyclists and equestrians**
- **The dualled A9 would be in close proximity to the Category A listed station building.**



Lowered A9 with structure at existing ground level, reconnecting Station Road

In response to those concerns, and following feedback from the public and Perth & Kinross Council at the February 2012 exhibition, an alternative option was developed.

This option lowered the A9 close to the station and incorporated a structure at existing ground level to allow Station Road in Birnam to be reconnected over the A9 directly to Dunkeld & Birnam Station. This would potentially provide direct local access to the station with car parking and landscape planting on the structure. This lowered option was exhibited in June 2013 together with the at-grade option, which would provide the dual carriageway at the same level as the existing A9.

# Corridor-wide engineering and environmental studies (2013 – 2014)

During this period, and in response to the Scottish Ministers' commitment to full dualling of the A9 between Perth and Inverness by 2025, corridor-wide engineering and environmental studies were carried out.

The Preliminary Engineering Services (PES) and Strategic Environmental Assessment (SEA) work considered constraints and opportunities associated with the dualling, and presented the emerging approach to the route design.

The key findings were:

- **The A9 would be designed to a high-standard dual carriageway which would have grade-separated junctions with no at-grade roundabouts or gaps in the central reserve. Some left-in/left-out junctions may be considered, but only in exceptional circumstances**
- **The dualling would take place broadly within a 200 metre-wide corridor around the existing A9 road**
- **The character of the surrounding landscape is an important attribute of the A9 corridor, therefore emphasising the overall design of the road in the local environment, views of the road and views from the road are important factors for consideration.**

The corridor options being considered formed part of the programme-wide summer 2013 exhibitions. The reports on that work were published on the Transport Scotland website.

These can be found at:

[www.transportscotland.gov.uk/road/a9-dualling/a9-dualling-document-library](http://www.transportscotland.gov.uk/road/a9-dualling/a9-dualling-document-library)



# Developing the route options (2013 – 2014)

In parallel with the wider corridor studies, work around the lowered option continued to consider some of the specific challenges associated with it, namely:

- **The development of the design of the lowered A9 to allow the road to cross over the Inchewan Burn, which is a tributary of the River Tay Special Area of Conservation (SAC)**
- **Consultation with the Tay Fisheries Board to gain an understanding of the value of Inchewan Burn as a habitat for salmon and trout**
- **An assessment of the visual impact of the lowered and at-grade options**
- **A preliminary assessment of constructability and potential impacts associated with construction of the options.**



The access to Dunkeld & Birnam Station for the at-grade option remained a concern. There is a lack of available space between the A9 dual carriageway and the Highland Main Line railway at the station. If a left-in/left-out junction was selected, it would be of a significantly reduced geometric standard, and would not provide adequate vehicle turning provision. The impact on the station car park due to the at-grade option also remained a concern.

# Developing the route options (2013 – 2014)

As part of the ongoing development of this project, and in light of the Strategic Environmental Assessment (SEA) work in relation to the landscape and scenic value of the route corridor, it was considered important to examine in more detail what the options would look like.

In particular, the lowered option requires several large retaining wall structures which have the potential to detract from the current rural landscape. Similarly, there is a potential impact from the at-grade option on the setting of the listed station building.

A Virtual Reality Model (VRM) was produced for both options and is on display at this exhibition. The model has helped us identify a number of issues, which have helped us to refine the options to produce those displayed on later panels.

The significant structures which would be needed, and the narrow working space at the station, also raised some concerns around how the options could be built, and what the impacts might be in terms of construction noise, vibration and traffic management. It was concluded that more detailed information on ground conditions would be needed to help in that assessment.

Therefore, constructability and ground conditions have been examined in more detail than would be usual for a route options assessment. Given the nature of the location, it has been important to be able to undertake more work on these aspects before making a final decision on the preferred option.



At-grade option



Lowered option

Indicative view only. Subject to change.

# Developing the current route options (2014 – present)

Jacobs UK Ltd was appointed in August 2014 to take forward the work undertaken by AECOM as part of a wider commission to design the dualling of the A9 between the Pass of Birnam and Glen Garry.

Jacobs' first priorities were to consider the design, constructability and visual impacts of the options using the emerging ground investigation data and the visualisation work already produced.

In addition to the possible impacts of the options on local people, a particular focus was placed on the potential landscape impacts on the National Scenic Area.



# Ground investigation (2014 – 2015)

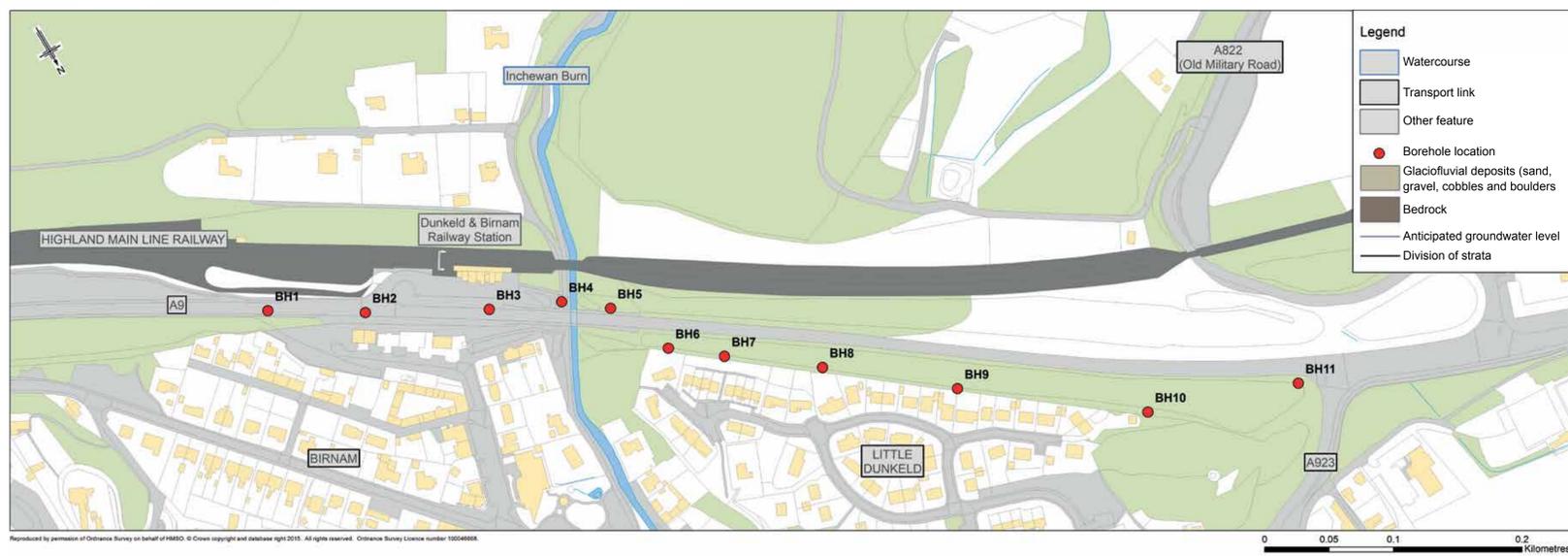
To inform the design work and constructability assessments, a detailed ground investigation was undertaken. Key facts about the investigation include:

- **A tender value in excess of £2.5 million**
- **300 boreholes and 200 trial pits**
- **61 boreholes and 16 trial pits excavated close to Dunkeld & Birnam Station**
- **Typical borehole depth of 25-30 metres, with some in excess of 45 metres.**

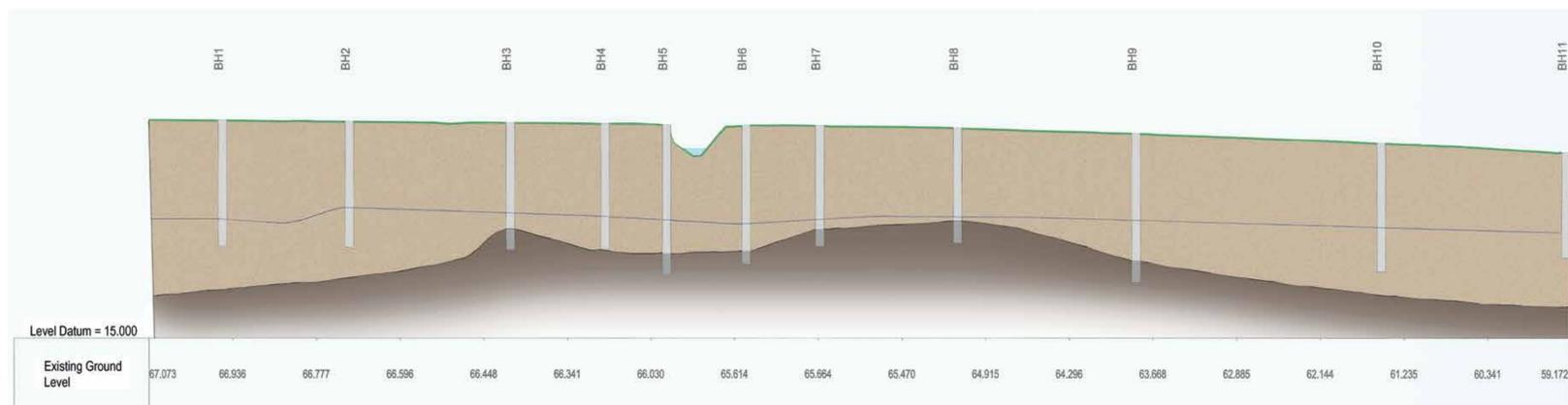
The investigation identified granular material, comprising predominantly of sands and gravels. However, large boulders were recorded in a number of boreholes in the vicinity of the proposed lowered A9 option. The boulders were extremely difficult to break through and would add a significant degree of complexity to construction.

Many of the boreholes include systems to monitor groundwater. The water levels recorded to date suggest the ground water level will generally be below the level of the lowered A9 option.

A geotechnical section including the extent of the boreholes and interpreted ground make-up is shown below.



Plan of selected borehole locations



Profile showing existing ground conditions

## Geotechnical sections

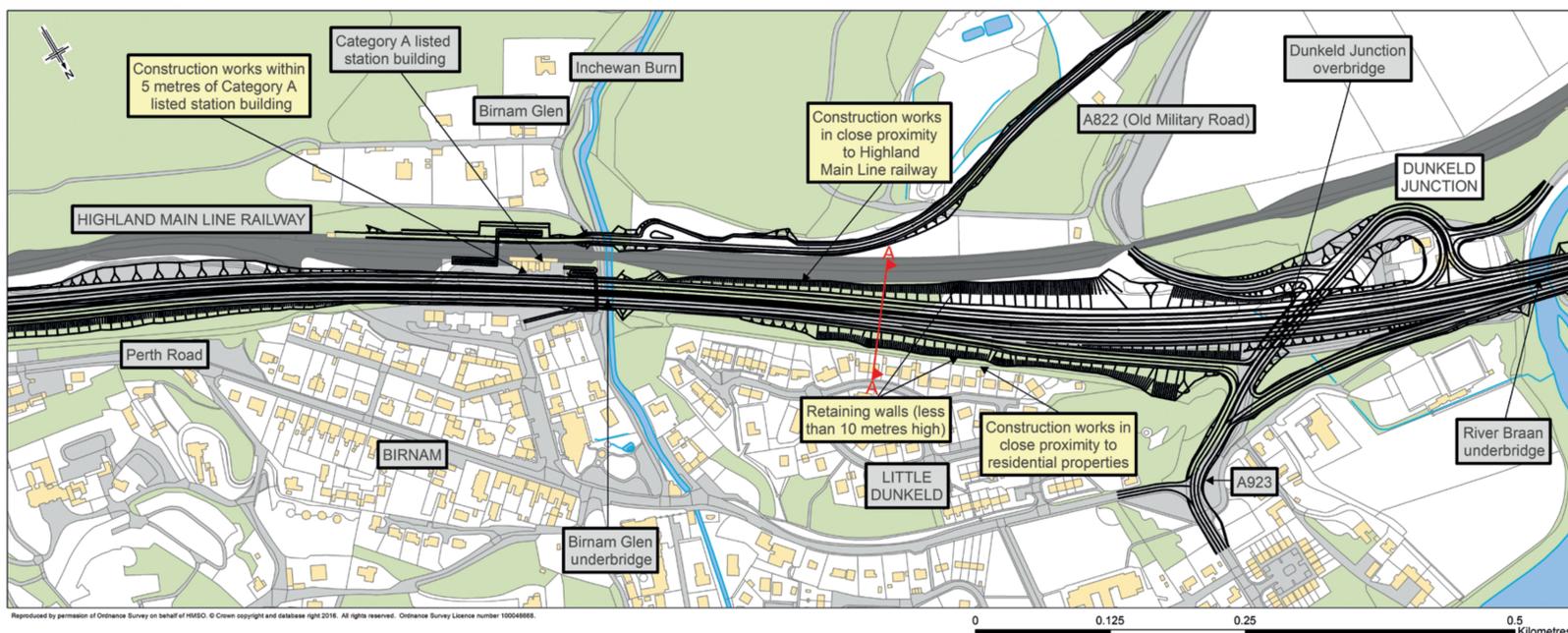


# Constructability – initial review of previous route options

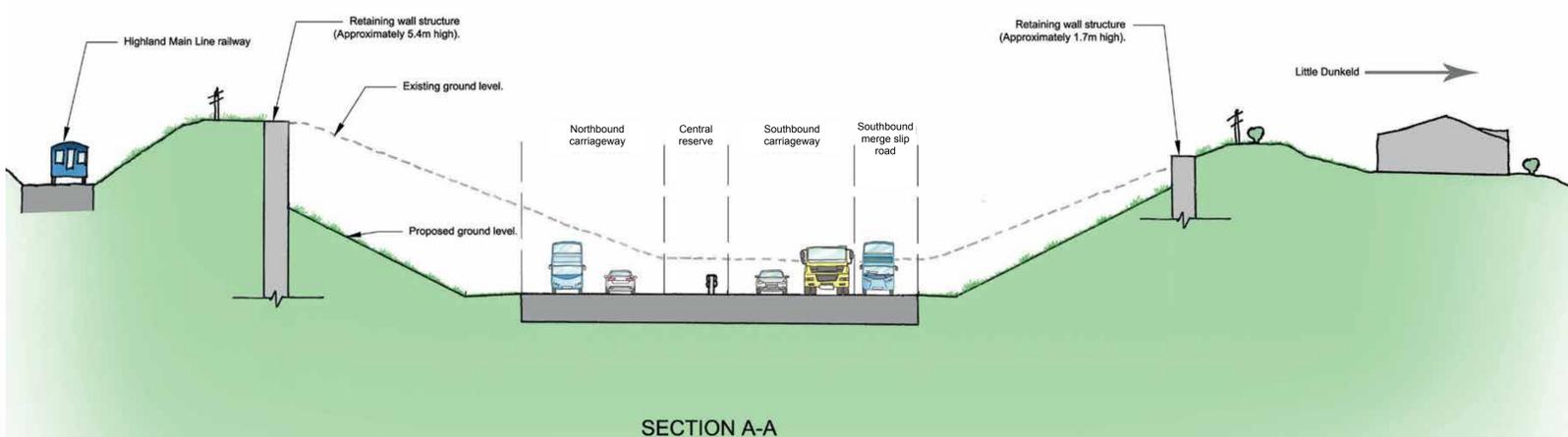
## At-grade option:

- North of Dunkeld & Birnam Station, the at-grade option is at or slightly below the level of the existing A9. Retaining wall structures would be necessary on the east and west sides of the carriageway to avoid encroachment toward residential properties and the Highland Main Line railway. These walls would have a maximum height of approximately seven metres. Construction of the retaining walls will be difficult in such a constrained and sensitive corridor

- Construction works will be within five metres of the Category A listed station building
- Some construction activities close to the Highland Main Line railway may have to take place during periods of no train movements, which may extend the duration of the programme
- In terms of traffic management during construction, the aim is to provide one lane of traffic in each direction at all times, excluding during major critical construction events. The use of local roads as diversions will be avoided whenever possible.



Plan, at-grade option highlighting constructability issues

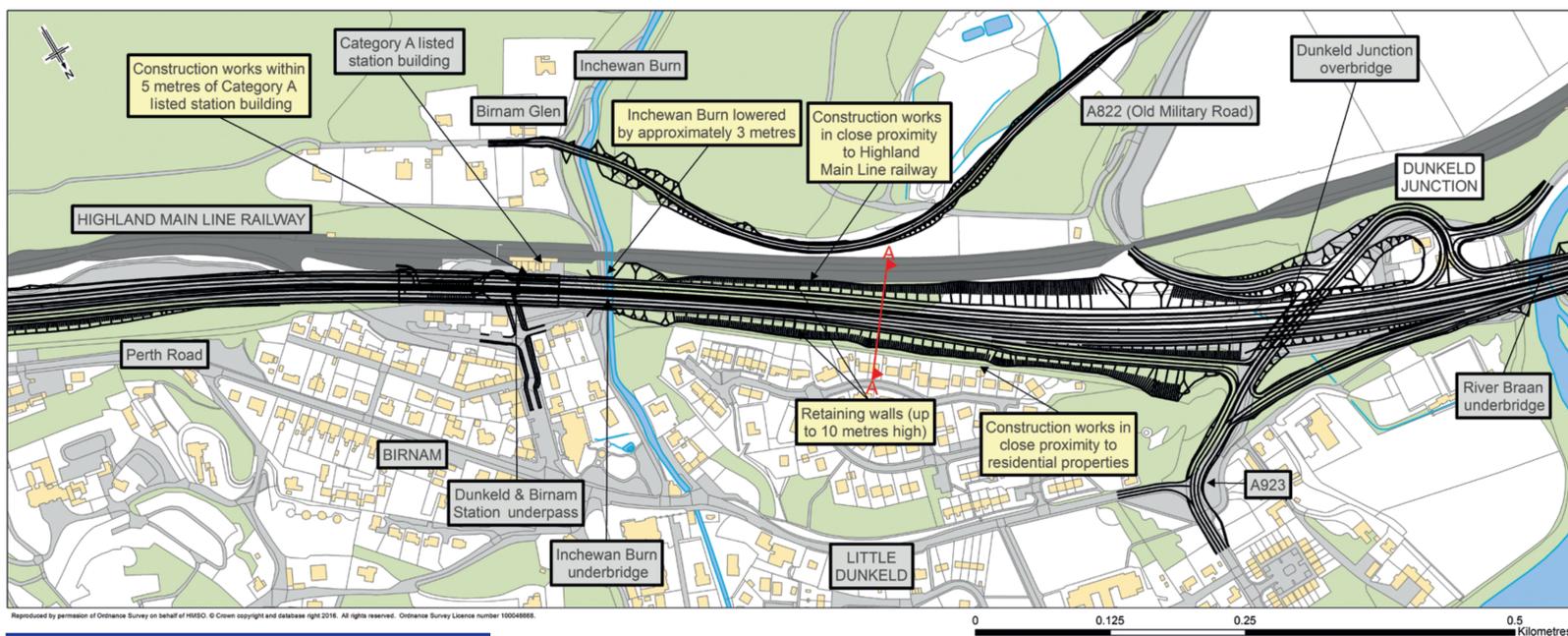


Section AA, indicative cross-section of at-grade option

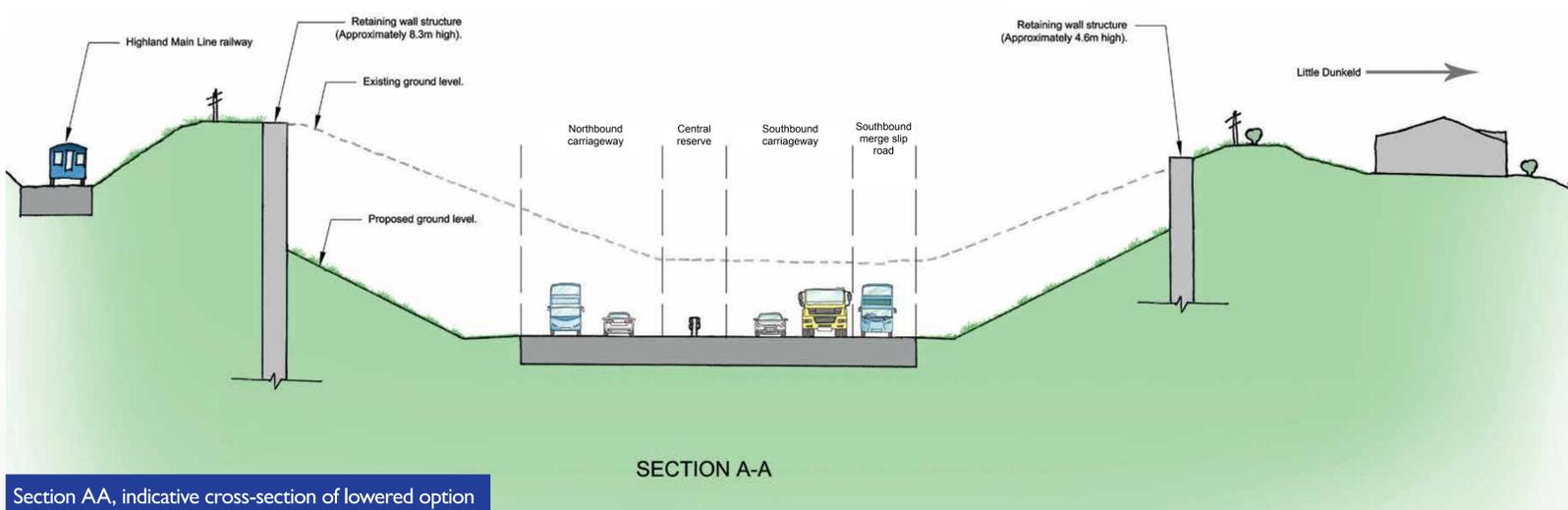
# Constructability – initial review of previous route options (continued)

## Lowered option:

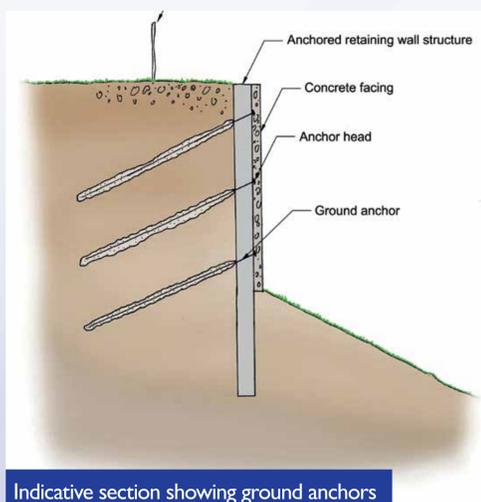
- The A9 is lowered close to the station and a structure incorporated at existing ground level to allow Station Road in Birnam to be reconnected over the A9 to Dunkeld & Birnam Station. A new car park will be provided on the structure
- Significant retaining walls would extend to the north and south of the structure at the station. These walls would be up to ten metres high and would need to be embedded at least ten metres below ground. In addition, long ground anchors would be needed to hold back the walls to ensure their stability, and these would extend into neighbouring land below the railway to the west and properties to the east and is therefore unlikely to be permitted. Construction of the retaining walls will be difficult in such a constrained and sensitive corridor
- Construction works will be within five metres of the Category A listed station building
- Some construction activities close to the Highland Main Line railway may have to take place during periods of no train movements, which would extend the duration of the programme
- In terms of traffic management during construction, the aim is to provide one lane of traffic in each direction at all times, excluding during major critical construction events. The use of local roads as diversions will be avoided whenever possible.



Plan, lowered option highlighting constructability issues



Section AA, indicative cross-section of lowered option



Indicative section showing ground anchors

# Landscape and visual impacts – previous at-grade and lowered options

The Virtual Reality Model (VRM) which is available to view today shows the previous route options developed between 2012 and 2014.

Both options include an overbridge structure at the proposed Dunkeld grade-separated junction and retaining wall structures to the immediate north of Dunkeld & Birnam Station. These features will be prominent, particularly for the lowered option, where the proposed A9 dual carriageway is below existing ground level and retaining wall structures would be up to ten metres high.

As such, the lowered option would result in a more urban appearance on the local environment, with the deck of the structure partially obscuring the scenic views from the road.

The at-grade option is at a similar level to the existing carriageway, however visibility from the road would be adversely affected by the proposed Dunkeld junction overbridge.

The lowered option would reduce road users' view of the surrounding landscape, as the A9 is at a reduced height and surrounded by significant retaining wall structures. Views of traffic on the A9 from surrounding properties would be obscured by the lowered option. However, the new car park on top of the proposed underpass at Dunkeld & Birnam Station may be visible from some properties, as would any lighting associated with the car park.



# The current design options

We have been working to further develop the previous options as a result of the emerging details around landscape, ground conditions, visual impact and constructability issues and to take the consideration of the findings of the Preliminary Engineering Services (PES) and Strategic Environmental Assessment (SEA).

Further consultation has also been undertaken with stakeholders, including Network Rail, given the close proximity of the railway and the potential impacts on it and Dunkeld & Birnam Station.

## The design work has focused on:

- **Modifications to the design of the main dual carriageway, resulting in three options being developed**
- **Modifications to the design of junction options at Birnam, Dunkeld and Dalguise**
- **Station relocation to allow improved vehicular access and car parking arrangements, whilst maintaining Non-Motorised User (NMU) e.g. pedestrian and cyclist access along Birnam Glen Road**
- **Further development of options for the River Tay Crossing.**

## The three options developed and being assessed comprise:

- **Option A (previous at-grade option)**
- **Option B (previous lowered option)**
- **Option C (new option).**

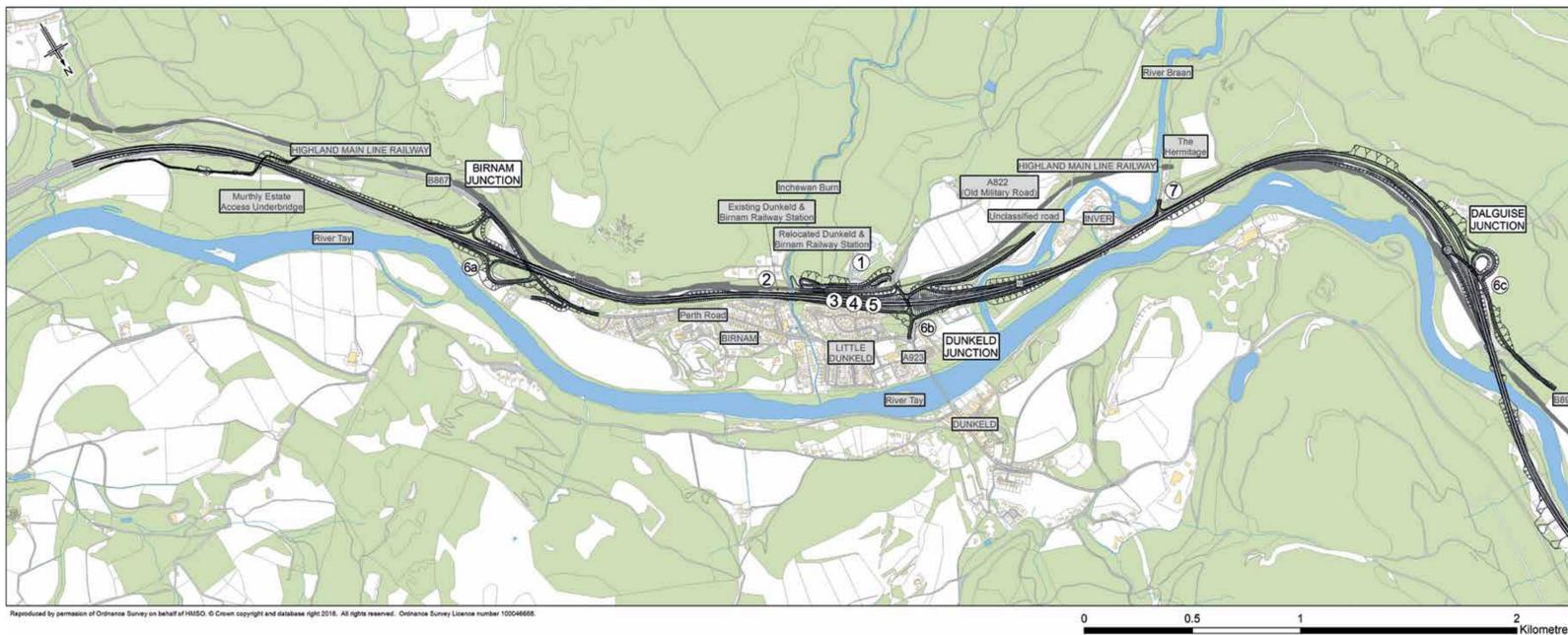
The options are described and overview plans provided on the following panels. More detailed plans of the mainline and junction options are available to view at the exhibition tables. Please ask a member of our team here today if you need any further assistance or information.



# Option A – at-grade option

## Option A

1. Dunkeld & Birnam Station relocated immediately north of Inchewan Burn to resolve previous accessibility issues
2. Category A listed station building may remain in its current location, without vehicular access
3. The A9 is raised higher to the north of the station, to reduce the extent of retaining walls next to properties to the east and the railway to the west. This will also allow the junction at Dunkeld to be below the mainline
4. Raised alignment of A9 fits better with natural topography
5. Increased prominence of A9 and its influence on neighbouring area
6. Grade-separated junctions proposed:
  - a. Birnam junction – grade-separated junction incorporating connection and realignment of the B867 and Perth Road, crossing the A9 on an underbridge structure
  - b. Dunkeld junction – grade-separated junction incorporating connection and realignment of the A923 and A822 (Old Military Road), crossing the A9 on an underbridge structure
  - c. Dalguise junction – grade-separated junction incorporating realignment of the B898, crossing the A9 on an underbridge structure
7. Left-in/left-out junction at The Hermitage.

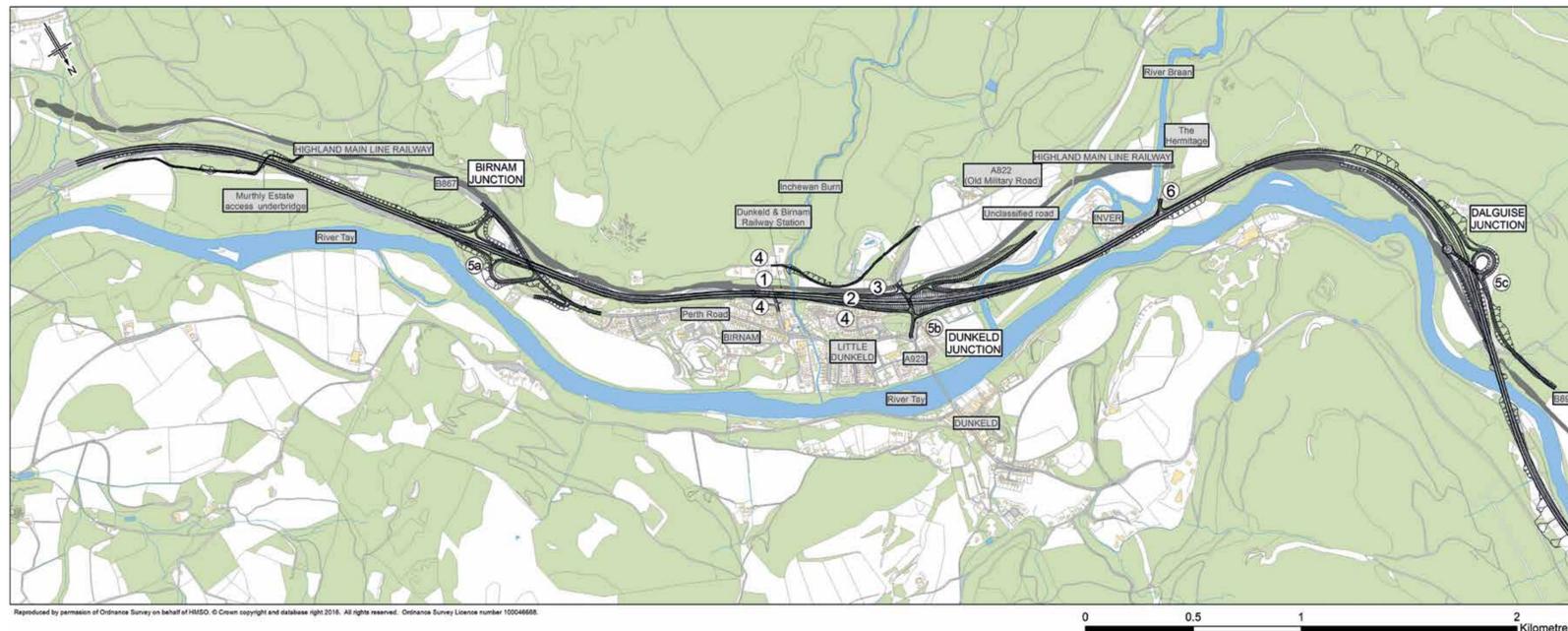


Plan, option A – design features

# Option B – lowered option

## Option B

1. Relatively unchanged from the lowered option presented at the previous exhibitions in 2013 – aside from alterations to grade-separated junctions
2. Significant engineering solutions necessary to build close to Dunkeld & Birnam Station, Highland Main Line railway and residential properties. This results in increased construction complexity, cost and a longer programme of construction
3. Restrictions placed on contractor to mitigate disruption on the railway, which may involve significantly more work being carried out at night
4. Greater noise and vibration issues would be inevitable during construction
5. Grade-separated junctions proposed:
  - a. Birnam junction – grade-separated junction incorporating connection and realignment of the B867 and Perth Road, crossing the A9 on an underbridge structure
  - b. Dunkeld junction – grade-separated junction incorporating connection and realignment of the A923 and A822 (Old Military Road), crossing the A9 on an overbridge structure
  - c. Dalguise junction – grade-separated junction incorporating realignment of the B898, crossing the A9 on an underbridge structure
6. Left-in/left-out junction at The Hermitage.

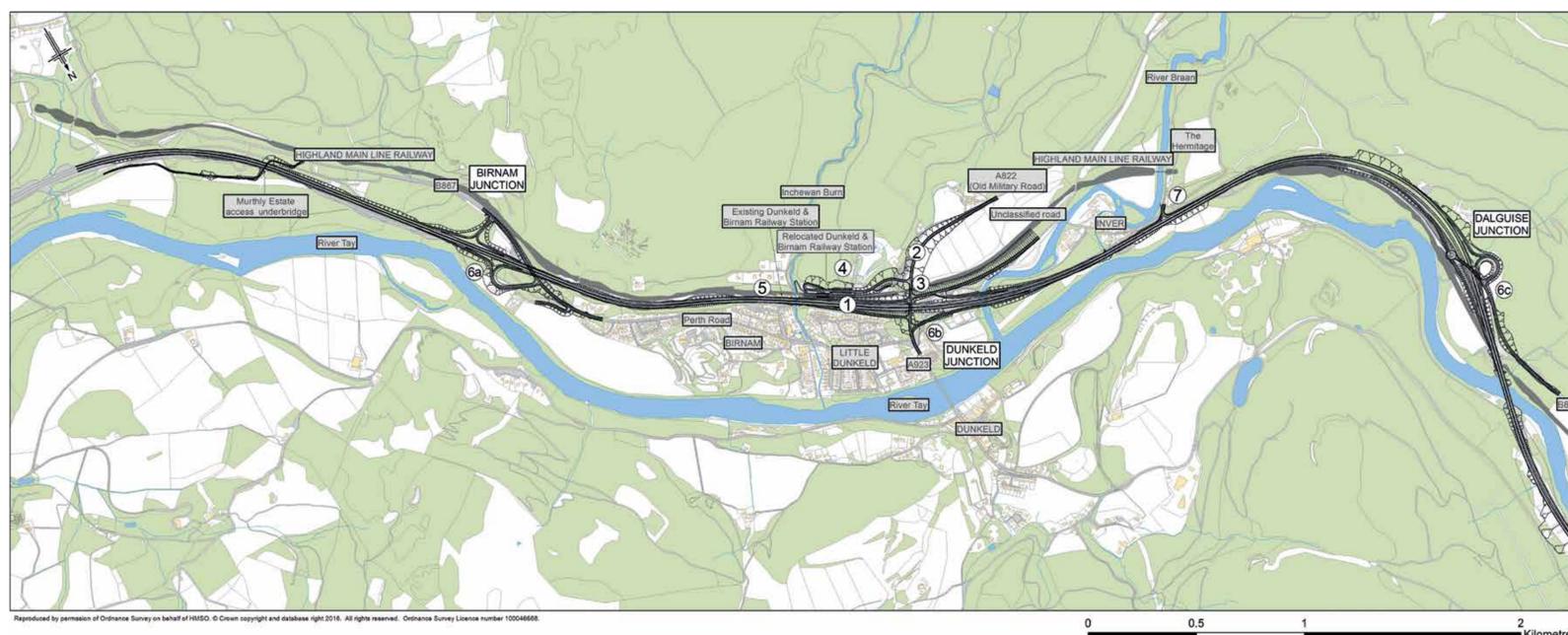


Plan, option B – design features

# Option C – new option

## Option C

1. Closer to existing carriageway levels than Option A to ease traffic management issues during construction
2. The A822 (Old Military Road) and A923 are realigned to connect to the new junction at Dunkeld and need to be lowered considerably. Significant earthworks are required for the A822 (Old Military Road) and A923
3. New railway underbridge required for realigned A822 (Old Military Road) / A923
4. Dunkeld & Birnam Station relocated immediately north of Inchewan Burn to resolve previous accessibility issues
5. Category A listed station building may remain in its current location without vehicular access.
6. Grade-separated junctions proposed:
  - a. Birnam junction – grade-separated junction incorporating connection and realignment of the B867 and Perth Road, crossing the A9 on an underbridge structure
  - b. Dunkeld junction – grade-separated junction incorporating connection and significant realignment of the A923 and A822 (Old Military Road), crossing the A9 on an underbridge structure. The realignment of the A923/A822 (Old Military Road) is more extensive than other options and requires construction of a new underbridge structure across the Highland Main Line railway
  - c. Dalguise junction – grade-separated junction incorporating realignment of the B898, crossing the A9 on an underbridge structure
7. Left-in/left-out junction at The Hermitage.



Plan, option C – design features

# Possible station relocation

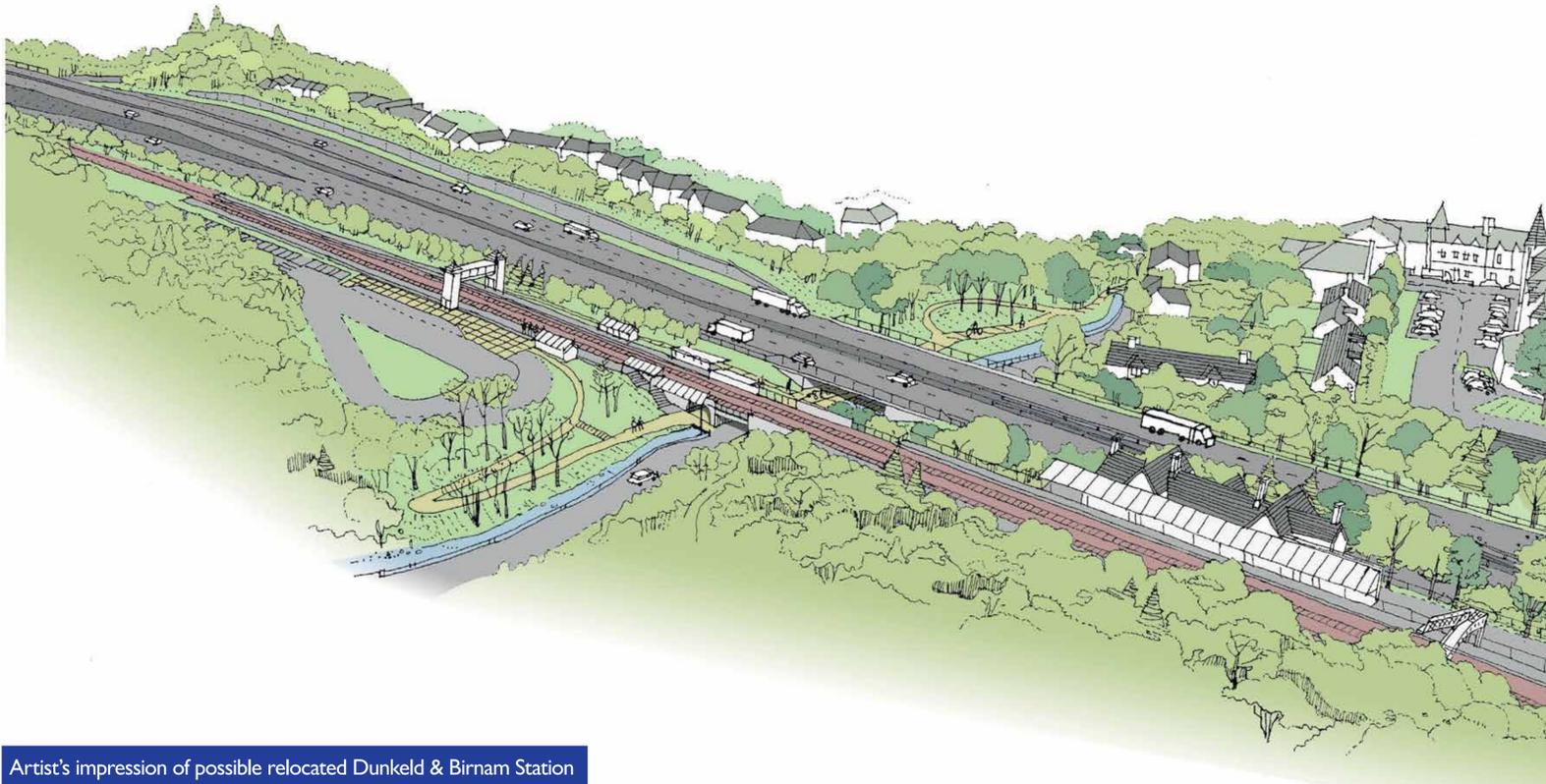
Options A and C are at-grade in the vicinity of Dunkeld & Birnam Station. Due to the constrained nature of the site and the standard of dual carriageway proposed, suitable access cannot be provided to the station in its current position.

For options A and C we propose to relocate the station to the west of the railway on land to the north of Birnam Glen Road and Inchewan Burn.

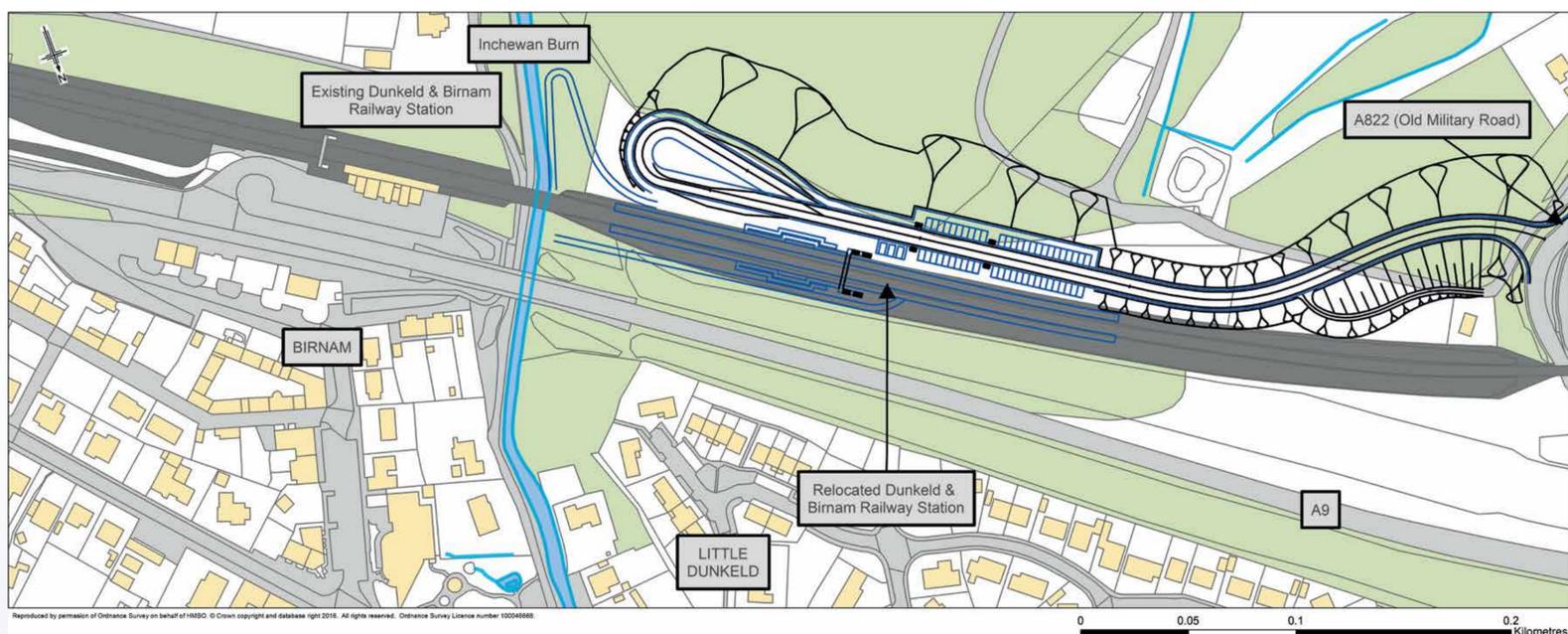
The below artist's impression shows a possible view of a relocated Dunkeld & Birnam Station. Key features could include:

- New access road with footways from the A822 (Old Military Road)

- Replacement car park with approximately 50 vehicle car parking spaces including disabled parking spaces
- Station access and platform compliant to current legislation
- Bus turning circle, bus stop and vehicle drop-off point
- Non-Motorised User (NMU) access to and from Dunkeld continuing and improved via Birnam Glen, as well as being catered for along the new access road.



Artist's impression of possible relocated Dunkeld & Birnam Station



Plan of possible relocated Dunkeld & Birnam Station

# Tay Crossing structure

The road alignment at the Tay Crossing Jubilee Bridge is identical for all alignment options. The road is proposed to be widened on the southbound side of the existing bridge to avoid environmental constraints, including the steep landscape and heavily wooded areas to the west of the carriageway.

**To accommodate this alignment, the following two options for the structure were considered:**

- **Retain the existing bridge to carry the northbound carriageway and build a new bridge to carry the southbound carriageway**

**Or**

- **Demolish the existing bridge and construct a new bridge to carry both carriageways.**

Options under consideration for either a new parallel structure or a new replacement structure are described below. All temporary construction works would remain outwith the extents of the River Tay.

For Options 1 and 2, permanent structures are outwith the extent of the River Tay avoiding any impact on the Special Area of Conservation (SAC). However, Option 3 includes a permanent support within the river, which may have a detrimental impact on the SAC.



## Option 1

- **Three-span bridge with two intermediate supports. The deck is a concrete slab supported by steel box girders of constant depth.**



## Option 2

- **Three-span bridge with two intermediate supports. The deck is a concrete slab supported by steel box girders that have a varying depth along the bridge. The intermediate supports are at an angle to reduce the length of the central span.**



## Option 3

- **Three-span bridge with two intermediate supports. The deck is a concrete slab supported by steel girders of constant depth. The intermediate supports are within the boundary of the River Tay SAC to match the configuration of the existing bridge.**

# Ongoing design development

In addition to refining the options and selecting the preferred route, the next stage of the project will also include more detailed consideration of accesses, lay-bys and facilities for Non-Motorised Users (NMUs) such as pedestrians and cyclists.

Further consultation with affected people, local communities, businesses, the public and statutory stakeholders will also be undertaken on an ongoing basis.

The timescales for the next stages of the Pass of Birnam to Tay Crossing project are:

<b>Preferred Route Option selection</b>	Summer / Autumn 2016
<b>Development of Preferred Route Option and Environmental Impact Assessment</b>	Autumn 2016 to Autumn 2017
<b>Statutory (planning) process</b>	Autumn 2017 to Winter 2018

# What happens next?

The route options assessment work will continue with a focus on a number of remaining issues, including:

- Local feedback from this exhibition
- Development of the potential for relocation of the station
- Further landscape, visual and environmental assessments
- Close working with Network Rail regarding proposals affecting the station and the design and construction of the project adjacent to the railway
- Further development of Non-Motorised User (NMU) routes
- Further constructability assessment.

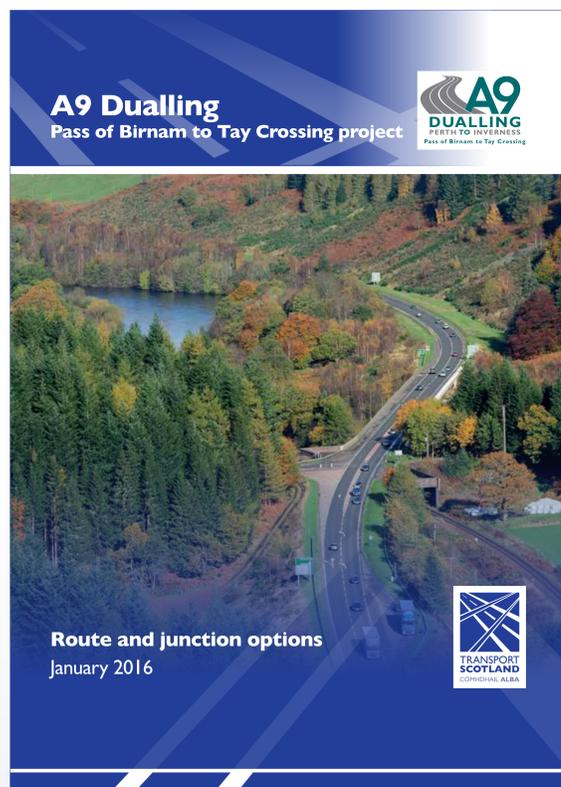
The Design Manual for Roads and Bridges (DMRB) Assessment will consider the advantages, disadvantages and constraints associated with the route options, relating to environmental, engineering, economic and traffic issues.

The options presented today, together with any other options you identify during or after these exhibitions, will be subject to further development. We will keep you updated through a range of direct communications and consultations including further public exhibitions, local drop-ins and one-to-one discussions.

**We welcome your comments and feedback on the route options using the feedback form available at the exhibition or on the project website.**

We would appreciate your views on the options presented and specifically on the following:

- Local information and constraints that you think may be important for us to know about
- How the junction options may affect you
- Any other options that you think we should consider.



**A9 Dualling Programme**  
Southern section public exhibitions  
Pass of Birnam to Tay Crossing project



Feedback form

---

**Introduction**

Thank you for attending our A9 Dualling Pass of Birnam to Tay Crossing public exhibition. We would be grateful if you could take the time to provide any feedback or comments you may have on the reverse of this feedback form and then return this to us by email or post (details below) as soon as possible and by **Friday 18 March 2016**.

**Your details (optional)**

Name:

Address:

Postcode:

Telephone:

Email:

Please email or post completed responses (address opposite) as soon as possible and by **Friday 18 March 2016** to the Jacobs A9 Dualling team, to whom any queries may be directed.

Email: [A9dualling@jacobs.com](mailto:A9dualling@jacobs.com)

Further information on the A9 Dualling Pass of Birnam to Tay Crossing project: [www.transportscotland.gov.uk/project/a9-pass-birnam-tay-crossing](http://www.transportscotland.gov.uk/project/a9-pass-birnam-tay-crossing)

Information on the wider A9 Dualling Programme: [www.transportscotland.gov.uk/a9dualling](http://www.transportscotland.gov.uk/a9dualling)

Post to:

**Sarah Morgan**  
Stakeholder & Communication Manager  
Jacobs UK Ltd  
95 Bothwell Street  
Glasgow  
G2 7HX

PLEASE USE THE FOLLOWING PAGE TO RECORD YOUR COMMENTS OR FEEDBACK.

**Please leave feedback forms in the feedback box provided at the exhibition or send via email or by post to the address below. This will help the ongoing development of the Pass of Birnam to Tay Crossing project.**

Email:  
**A9dualling@jacobs.com**

Or by post to:  
Sarah Morgan  
Stakeholder & Communication Manager  
Jacobs UK Ltd  
95 Bothwell Street  
Glasgow  
G2 7HX

**Please provide feedback as soon as possible and by Friday 18 March 2016.**

### Further information

Further information on the A9 Dualling Pass of Birnam to Tay Crossing project, along with these exhibition panels, summary leaflet, feedback form, drawings and visualisations from this exhibition, can be found on the Transport Scotland A9 Dualling website at:

**[www.transportscotland.gov.uk/project/a9-pass-birnam-tay-crossing](http://www.transportscotland.gov.uk/project/a9-pass-birnam-tay-crossing)**

Information on the wider A9 Dualling Programme can be found at:

**[www.transportscotland.gov.uk/a9dualling](http://www.transportscotland.gov.uk/a9dualling)**

Contact details for Transport Scotland's A9 Dualling team:

Telephone:  
**0141 272 7100**

Email:  
**[a9dualling@transportscotland.gsi.gov.uk](mailto:a9dualling@transportscotland.gsi.gov.uk)**