

Scheme Details					
Option Ref. (Stage 5)					
Route B, Junction 2 (WR.ST50002)					
Option Component Ref (Stage 4)					
Mainline On-Line	Murthly Castle/ Birnam Junction	Dunkeld & Birnam Station	Dunkeld Junction	The Hermitage Junction	Dalguise Junction
MO.ST4.0013	BN.ST4.0018	DS.ST4.0001 DS.ST4.0012	DN.ST4.0002	HT.ST4.0005	DG.ST4.0002
Option Description					
<p>Whole Route Option B commences at the northern extent of the existing section of dual carriageway at the Pass of Birnam, south of Birnam and Dunkeld. The option is on-line, largely following the alignment of the existing single carriageway, and extends approximately 8.3 kilometres to tie-in to the next A9 dualling scheme, Tay Crossing to Ballinluig, approximately 0.5 kilometres north of the River Tay crossing.</p> <p>At the southern extent, the alignment closely follows the existing A9 and is on a right-hand curve with southbound widening. It is largely at existing ground level before transitioning to a left-hand curve and then to a further right-hand curve on the immediate approach to the existing junction with the B867 and Perth Road at Birnam. Option B also includes a new underbridge in the locality of the existing access to Murthly Estate, which links to the B867 to the west.</p> <p>Option B incorporates a 450 metre long cut and cover tunnel section of the A9 that commences approximately 820 metres north of the existing junction with the B867 and Perth Road at Birnam. On approach to the existing junction, the A9 begins to change vertically and is lower than existing ground. A grade separated junction is proposed in the locality of the existing junction with the B867 and Perth Road at Birnam. This junction incorporates a half diamond layout, with a northbound exit slip road and a southbound entry slip road. A bridge crosses over the A9 linking the B867, the proposed Birnam Junction, and Perth Road providing access to the communities of Birnam, Little Dunkeld and Dunkeld.</p> <p>The lowered section of the alignment between the existing junction with the B867 and Perth Road at Birnam and the southern extent of the tunnel is on a left-hand curve with the Highland Main Line railway immediately to the west and residential properties to the east. Continuing north, Option B is below existing ground level through Dunkeld & Birnam Station with the northern extent of the cut and cover tunnel approximately 450 metres south of the existing junction with the A923 and A822 at Little Dunkeld. As the A9 is lowered in the vicinity of the station, Station Road is extended across the structure providing direct access to the station. A replacement car park will be provided on the structure. As the A9 is lowered in the vicinity of the station, access to Birnam Glen will be stopped-up at this location. Alternative access to Birnam Glen will be provided via a new access road from the A822 to the west of the Highland Main Line railway. The Inchewan Burn will be lowered to accommodate the new A9 dual carriageway.</p> <p>Option B is generally on a straight approaching Dunkeld Junction, which is an at-grade elongated roundabout (or an eggabout, as described by young people in consultation with the Children's Parliament) in the locality of the existing junction with the A923 and A822 at Little Dunkeld. The roundabout provides connections to the A9 (north and south), A923, A822 and road to Inver with a segregated left lane between the A923 and A9 south to improve the overall capacity of the roundabout and reduce queueing traffic on the A923.</p> <p>To the north of the roundabout, the A9 is largely at existing ground level and is on a left-hand curve as it crosses the River Braan and approaches Inver. Option B transitions to a straight and passes Inver, which is to the west. A left-in left-out junction is proposed on the northbound carriageway immediately north of Inver to provide access to The Hermitage. The proposed junctions at Dunkeld and Dalguise will be used as turning points for traffic using the left-in left-out junction at The Hermitage.</p> <p>The alignment crosses the Highland Main Line in the locality of the existing rail crossing at Inver and continues on a right-hand curve before crossing the railway at the existing Inch crossing and transitioning to a straight to cross the River Tay. This section of A9 dualling terminates approximately 0.5 kilometres north of the River Tay crossing.</p> <p>To the south of the proposed River Tay crossing, and the existing priority junction with the B898 at Dalguise, Option B incorporates a grade separated junction. This junction incorporates loops in the northbound direction and slip roads in the southbound direction, facilitating all vehicle movements. The realigned B898 crosses under the A9 via an underbridge, connecting to a roundabout on the east side of the A9, which also connects to the southbound exit and entry slip roads.</p> <p>Option B incorporates a 70 miles per hour speed limit.</p>					
Transport Scotland Objectives					
Improve Operational Performance	<p>Improves journey time reliability, compared to the existing condition, by provision of a high standard dual carriageway with no gaps in the central reserve that allows safe overtaking.</p> <p>Future A9 journeys likely to be comparable to existing A9 journey times. Delays created by the at-grade roundabout at Dunkeld are offset by higher speeds on the new dual carriageway.</p>				

	<p>Future traffic flows on Perth Road likely to increase by up to 500 to 800 vehicles per day. Traffic on Station Road expected to increase by approximately 100 vehicles per day due to new access to the station.</p> <p>Two-way Annual Average Daily Traffic (AADT) flows on the A9 dual carriageway expected to be within the approximate range of 25,000 to 26,800 in 2041.</p>
Improve Safety	<p>No gaps in the central reserve, eliminating right-turn manoeuvres across oncoming traffic. Layout of A9 (Dual 2-lane All Purpose (D2AP) carriageway), Birnam Junction, The Hermitage and Dalguise Junction recommended for use on category 7A dual carriageways (also suitable for category 5 and 6 dual carriageways) and consistent with the overall A9 Dualling Programme. At-grade roundabout at Dunkeld not consistent with overall A9 Dualling Programme and not recommended for use on Category 7A dual carriageways (suitable for Category 5 and 6 dual carriageways) and will require a Departure from Standards.</p> <p>Junctions improve access to the A9 for local traffic by removing right-turn manoeuvres across oncoming traffic and generally allows compliant gradients and geometry on side roads. Some Relaxations and Departures from Standards necessary to avoid severe environmental impact on people, property and landscapes. Appropriate mitigation to reduce or eliminate potential hazards will be considered at future stages of design. At-grade roundabout at Dunkeld Junction may introduce potential for low severity accidents.</p> <p>For safety reasons, pedestrians, cyclists, motorbikes (with engines less than 50cc), animals and animal drawn vehicles are not permitted to use a cut and cover tunnel. Due to the high percentage of Heavy Goods Vehicles (HGVs) potentially containing hazardous materials travelling through the cut and cover tunnel, there will be a heightened requirement for emergency evacuation procedures. Crossing points with fire doors providing a safe refuge and an escape route will be provided. A cut and cover tunnel of this magnitude it likely to require a manned operations centre with emergency services access.</p>
Facilitate Active Travel	<p>Potential temporary diversions to sections of National Cycle Network (NCN) Route 77 and Core Paths (DUNK/10, DUNK/11, DUNK/15, DUNK/23, DUNK/57, DUNK/59, DUNK/64, DUNK/100, DUNK/137, DUNK/142, DUNK/144 and DUNK/145) during construction.</p> <p>Permanent diversion to NCN Route 77 and Core Paths (DUNK/57 and DUNK/142) in the locality of the existing Birnam Junction. Likely these routes will be diverted along Perth Road, although likely increase in traffic on Perth Road would need to be considered.</p> <p>Permanent diversion to Core Path (DUNK/11) as Birnam Glen is stopped-up. Diversion likely to be via Station Road and the steps at the station to reconnect with the Core Path west of the station.</p> <p>Permanent diversion to Core Path (DUNK/23), which crosses the River Braan on a footbridge. A new crossing will be required in the locality of the existing.</p>
Improve Integration with Public Transport	<p>A9 dual carriageway is expected to deliver economic growth and improved links to Public Transport facilities. Although journey times are anticipated to be comparable with existing A9 journey times, dualling will improve journey time reliability, compared to the existing condition, by provision of a high standard dual carriageway with no gaps in the central reserve that allows safe overtaking. The proposed junction at Birnam provides restricted access to and from the A9. Exclusion of northbound entry and southbound exit slip roads increases traffic on Perth Road, and may adversely impact local journey times and Public Transport. Access to the A9 for northbound traffic and from the A9 for southbound traffic would require to be provided at Dunkeld Junction. At-grade roundabout at Dunkeld may introduce delays to strategic bus services, particularly at peak times, compared to a grade separated junction. Impact on existing bus stops at Inver, replacement provision will be considered at more detailed stages of design, in consultation with relevant stakeholders.</p> <p>No direct access to Dunkeld & Birnam Station from the A9. Layout provides connection to the station from Perth Road through Birnam and Little Dunkeld. Replacement car parking provision on top of cut and cover tunnel at the station could potentially incorporate a bus stop and bus turning area to improve integration with Public Transport facilities.</p>
Construction Issues	
Constructability	<p>At this stage in the design process an initial review of constructability has been undertaken to ensure Option B can be constructed and to identify possible issues. Exact construction methods will be identified by the successful Contractor, allowing them to use their experience to identify innovative methods that may lessen complexity and reduce associated impacts, costs and construction time.</p> <p>Based on the ground investigation information available, soil conditions are expected to be predominantly dense to very dense materials, including potential for large boulders. In places, these deposits will be water bearing. Bedrock</p>

	<p>is possible at the lowered section to the south of the cut and cover tunnel and could potentially be encountered in excavations and in formation of the bored piled walls.</p> <p>The new access road to properties on Birnam Glen to the east of the station is in close proximity to Ladywell Landfill site. The ground conditions, nature and extent of the waste deposited in the landfill area are not known at this stage. There is potential for contaminated ground to be encountered in this area, which may require non-standard earthworks treatment. This may involve excavation and replacement of material or implementation of an engineered cap. The final form of remediation in this area will depend on the detailed proposals.</p> <p>A cut and cover tunnel (formation of a structure to form a tunnel in an open excavation, which is subsequently backfilled) proposed as near surface. As insufficient space for open excavation exists, likely formed using retaining walls in the verges and central reserve of the A9 dual carriageway over the 450 metre length. Likely, due to space constraints and ground conditions that retaining walls potentially will be constructed using large diameter bored piles to retain a height of approximately 10 metres, which will lengthen time for construction. Installation will require heavy plant in close proximity to residential properties, Dunkeld & Birnam Station, the Highland Main Line railway and the Category A Listed station building. Large boulders are present in the ground; therefore, vibration may be significant during piling operations, introducing a structural risk to adjacent residential properties and stakeholder assets.</p> <p>Tunnel walls would be designed to resist groundwater entry and the proposed bored piled solution would need to extend considerable depth below the base of the completed cut and cover tunnel. The bored piled walls may impact groundwater flow, which flows towards the River Tay.</p> <p>Maintaining access to the station during construction will be difficult given the level difference and the working area required to install the bored piled retaining walls. Temporary measures will be considered; however, it is likely that no car parking provision will be available during construction and there is a possibility that the station may need to close for a large duration of the works, subject to discussions with Network Rail and the community.</p> <p>Works to construct the cut and cover tunnel and other elements of the option will be immediately adjacent to the Highland Main Line railway. While some work can be completed with the railway operational, subject to suitable mitigation and monitoring being implemented, some work may be necessary under railway closures, affecting rail users. The Category A Listed station building is approximately 5 metres from the works, therefore there is a possibility of accidental damage due to vibration and the close proximity of heavy plant. To minimise the risk of damage, strengthening works to the building could be considered and careful monitoring would seek to ensure the structural integrity of the building is not adversely affected. Impacts on residential properties to the east would also need to be considered.</p> <p>There is a requirement for a retaining wall, approximately 8 metres high, adjacent to the Highland Main Line railway between Birnam Junction and the southern extent of the cut and cover tunnel. An embedded retaining wall could be constructed, however the height is at the limit of what is technically feasible without using ground anchors, to maintain structural stability, or a more complex solution.</p> <p>Generally, excavations and earthworks for the proposed junctions, which are largely off-line, can be undertaken with minimal disruption to the existing road network.</p> <p>Inchewan Burn requires to be lowered by approximately 5 metres to accommodate the dual carriageway. It may be possible to dam the burn upstream of the proposed works and pump water into the burn downstream of the works.</p> <p>This method is vulnerable to extreme weather events and is dependent on effective operation of pumping equipment. Equipment will therefore need to be continually monitored during the works to avoid possible flooding issues. Works would need to be undertaken in consultation with relevant environmental organisations as the burn is a tributary of the internationally important River Tay Special Area of Conservation (SAC).</p> <p>Bridge structures will likely be built in two stages as the individual carriageways are constructed. One half of the structure will be constructed along with the section of dual carriageway. Traffic is then moved to the newly constructed carriageway while the second half of the structure is constructed. Structures are then connected to form a single structure.</p> <p>Risks associated with working in close proximity to the River Tay, which in addition to the River Braan, is within the River Tay SAC, and also the Inchewan Burn, include siltation and polluted run-off and spillages entering the watercourse during construction, potentially causing harmful effects to SAC qualifying species, such as otter and fish.</p> <p>There are numerous existing overhead and underground public utilities in the locality of the A9, including that belonging to Scottish Water, Scottish Gas Networks (SGN), British Telecom (BT) and Scottish & Southern Energy (SSE). A number of these utilities will need to be diverted as a result of the works, particularly those in the locality of</p>
--	---

	<p>the cut and cover tunnel. Where possible, utilities will be diverted in advance of the main works. Given the scale of likely diversions, this work could take approximately 2 years.</p> <p>New access to Birnam Glen from the A822 and lowering of the Inchewan Burn would be completed as advanced works. It is likely that the cut and cover tunnel will be constructed as two separate tunnels, northbound and southbound, with the southbound cut and cover tunnel constructed first. The proposed junction at Dunkeld will be constructed once the cut and cover tunnel has been completed. The works will be undertaken under continuous Traffic Management, with reduced speed limits and narrow lane widths, which may increase the risk of accidents between opposing traffic flows. At junctions, temporary arrangements will be required, which may include a temporary roundabout at Dunkeld. This may result in significant congestion, particularly for local traffic as the A9 flow is dominant. At this stage, despite the relative space constraints, it is anticipated that 2-way traffic can be maintained on the A9 during construction, however some short closures may be necessary to complete structural works.</p>
Construction Cost	<p>£450 million - £900 million (approximate)</p> <p>Cost estimates have been undertaken on level of design undertaken at Stage 5 of the co-creative process. The costs include pre-construction costs (design and preparation costs, advanced works costs and land costs) and construction costs (preliminaries and indirect costs and direct construction costs, including structures, road pavement, earthworks, risks and opportunities and inflation). It should be noted that these cost estimates are for comparison purposes only and will be further refined upon further design work undertaken.</p>
Community Objectives	
Health, Noise and Well-being	<p>Potential dust nuisance during construction for residential properties in the immediate locality of A9 works. Measures may be implemented by the Contractor to reduce dust emissions, including appropriate storage and covering of stockpiled materials, use of sprinklers and hoses to prevent dust production and concrete mixing in enclosed areas.</p> <p>Likely no exceedance of UK air quality standards and objectives (nitrogen oxides (NO₂) and particulate matter (PM₁₀ and PM_{2.5})) as a result of road traffic emissions. The potential increase in traffic flows on Perth Road may result in a slight increase in concentrations, however concentrations of pollutants (nitrogen oxides and particulate matter) will remain below UK air quality standards and objectives.</p> <p>Traffic noise levels, compared to existing noise levels, are as follows:</p> <ul style="list-style-type: none"> • Within extents of cut and cover tunnel – expected to decrease, by at least 10 decibels. • At Birnam (outwith cut and cover extents) – expected to decrease, between 3 and 10 decibels. • At Little Dunkeld (outwith cut and cover extents) – expected to decrease, between 3 and 10 decibels. • At Dunkeld and Inver (outwith cut and cover extents) – similar to existing, any increase less than 3 decibels. • At Perth Road – similar to existing, any increase less than 3 decibels. <p>(Note: It is assumed that low noise surfacing will be provided on the A9, however no other mitigation, such as noise fences or noise bunds, is included, this will be considered in the future.)</p> <p>Potential for localised increased noise levels at tunnel extents due to traffic noise deflections from within the cut and cover tunnel section, however this may be reduced by the use of noise absorptive surfaces within the tunnel.</p> <p>Construction work will generate noise and vibration, potentially impacting residential properties in the locality of the works. Expected to be significant for those properties immediately adjacent to the cut and cover tunnel as bored piled walls are formed over a significant length. Noise and vibration limits during construction will be specified within a Construction Environmental Management Plan (CEMP) following noise and vibration monitoring. The approach will be agreed between the Contractor and the Environmental Health Officer of Perth & Kinross Council. The Contractor will also be required to develop and implement a Noise and Vibration Management Plan to meet the requirements set out in the CEMP.</p>
Landscape and Environment	<p>Proposed dual carriageway is generally on-line, therefore land-take is limited to areas immediately adjacent to the existing A9. Some additional land-take is required for the grade separated junctions at Birnam and Dalguise, and to a lesser extent for the roundabout at Dunkeld and access to Birnam Glen properties. The total land-take for Option A is approximately 49 hectares, although 1.4 hectares are within the cut and cover tunnel.</p> <p>Demolition of a residential property at Auchlou and electrical sub-station on Station Road will be required. Potential impact on residential property with associated industrial building at the existing junction between the A9 and A822 and commercial property within existing Birnam Industrial Estate (former veterinary surgery). Potential disturbance of land associated with current and previous land uses that may release pollutants if unmitigated, including the existing A9, Highland Main Line railway, Ladywell Landfill site and former curling pond and gravel pit (potentially infilled with</p>

	<p>unknown material). Expected to be mitigated by implementing appropriate waste management procedures identified in a CEMP. Further investigation required to identify mitigation for works in the locality of Ladywell Landfill site.</p> <p>Associated A9 earthworks within the River Tay 1 in 200-year floodplain at Inver and the River Tay crossing, will increase flood risk upstream. Requirement for compensatory floodplain elsewhere to replace that lost. Some road drainage complexities due to the depth of the cut and cover tunnel, and a pumping station may be necessary for effective discharge.</p> <p>Bridge structures over the River Braan and River Tay required at similar level to existing A9 bridges. Further crossings of seven minor watercourses required. Structures over watercourses likely to lead to changes to the physical characteristics (including the banks and beds), however some modification already exists in these areas. Inchewan Burn would require to be lowered by approximately 5 metres, crossing the A9 dual carriageway in a culvert. This involves major engineering works, extensively modifying the physical characteristics of the watercourse in an area that has previously been subject to river restoration, which, depending on constraints, may extent for a significant length. The modifications to the burn will likely prevent passage of migratory fish species and may result in increased deposition of river bed material, leading to possible blockages and therefore increased flood risk. Risk of potential harmful effects on the SAC qualifying species. Flood risk will likely increase during construction. The works would result in significant adverse impacts to Inchewan Burn and it may prove difficult to gain approval from the relevant statutory bodies to implement the works.</p> <p>Loss of less than 1 hectare of aquatic and terrestrial habitat associated with the River Tay SAC. Watercourse structures may introduce shading, further impacting SAC qualifying species, such as otter and fish.</p> <p>Loss of approximately 22 hectares of woodland designated on the Ancient Woodland Inventory, predominantly at the Dalpowie Plantation, Ring Wood and Inver Wood. Provision of compensatory woodland will be considered at future stages of design.</p> <p>Potential for impacts on protected species, including:</p> <ul style="list-style-type: none"> • Loss of otter habitat within the vicinity of the River Tay (SAC), River Braan (within the River Tay SAC) and Inchewan Burn. • Disruption to fish migration and habitat utilisation in Inchewan Burn. • Loss of high reptile habitat in discrete areas throughout the A9. • Loss of bat roost potential in trees, buildings and structures. • Potential loss of red squirrel shelters/habitat in woodland areas. • Potential loss of breeding bird habitat in woodland and scrub areas. • Potential construction related impacts, such as noise, vibration, dust, aquatic pollution and fragmentation of habitat. <p>Ecological surveys will be undertaken prior to construction for important habitats and protected species to inform assessments and potential mitigation requirements, which might include:</p> <ul style="list-style-type: none"> • Appointment of an Ecological Clerk of Works to supervise works. • Replacement / compensation habitat to replace that lost. • Creation of crossings suitable for certain species. • Seasonal constraints of works. • Controls to avoid or reduce potential effects on species as a result of vibration, noise, and light during construction. <p>Loss of existing, mature roadside woodland and alterations to landform as a result of the road itself, associated earthworks and new bridges. Underbridge at Murthly would contribute to the loss of woodland within Murthly Castle and Designed Landscape and there would be adverse impacts on the River Tay (Dunkeld) National Scenic Area (which the existing A9 currently passes through) and the landscape character.</p> <p>Impacts on visual amenity, both during construction and operation, including:</p> <ul style="list-style-type: none"> • Significant impacts on residents within Little Dunkeld, Inver, Inchmagrannachan. • Significant impacts on people using the A822, A923, B867, the Highland Main Line railway, NCN 77, Core Paths, the Tay Forest Park and Murthly Castle and Designed Landscape. • Lesser impacts on residents of Birnam and Inchfield. • Lesser impacts on visitors to the Hermitage, Inver Mill Caravan Park, Dunkeld Cathedral and Birnam Highland Games Park. <p>The introduction of street lighting on roundabouts and associated approach roads in an area that is currently not lit would have localised adverse impacts on landscape and visual amenity.</p> <p>Potential for landscaping on top of cut and cover tunnel (potentially available for community use), which would result in beneficial impacts for residents of Birnam and Little Dunkeld and those using Core Paths and cycle routes.</p>
--	---

	<p>Effects on landscape and visual receptors could be reduced by mitigation, including retaining existing woodland as far as practicable and new planting similar to the existing species.</p> <p>Excavations and retaining walls required to avoid impact on Dunkeld & Birnam Station and residential and commercial properties:</p> <ul style="list-style-type: none"> • Excavations – up to approximately 29 metres deep on approach to Dalguise Junction. • Embankments – Up to approximately 6 metres high at The Hermitage. • Retaining Walls – bored pile walls with a retained height of approximately 10 metres between Birnam and Dunkeld & Birnam Station. <p>(Note: Approximately 145,000 cubic metres of excavation required for tunnel section construction.)</p>
Safety	<p>No gaps in the central reserve, eliminating right-turn manoeuvres across oncoming traffic. Layout of A9 (Dual 2-lane All Purpose (D2AP) carriageway), Birnam Junction, The Hermitage and Dalguise Junction recommended for use on category 7A dual carriageways (also suitable for category 5 and 6 dual carriageways) and consistent with the overall A9 Dualling Programme. At-grade roundabout at Dunkeld not consistent with overall A9 Dualling Programme and not recommended for use on Category 7A dual carriageways (suitable for Category 5 and 6 dual carriageways) and will require a Departure from Standards.</p> <p>Junctions improve access to the A9 for local traffic by removing right-turn manoeuvres across oncoming traffic and generally allows compliant gradients and geometry on side roads. Some Relaxations and Departures from Standards necessary to avoid severe environmental impact on people, property and landscapes. Appropriate mitigation to reduce or eliminate potential hazards will be considered at future stages of design. At-grade roundabout at Dunkeld Junction may introduce potential for low severity accidents.</p> <p>For safety reasons, pedestrians, cyclists, motorbikes (with engines less than 50cc), animals and animal drawn vehicles are not permitted to use a cut and cover tunnel. Due to the high percentage of Heavy Goods Vehicles (HGVs) potentially containing hazardous materials travelling through the cut and cover tunnel, there will be a heightened requirement for emergency evacuation procedures. Crossing points with fire doors providing a safe refuge and an escape route will be provided. A cut and cover tunnel of this magnitude it likely to require a manned operations centre with emergency services access.</p>
Local Economy	<p>Future A9 journeys likely to be comparable to existing A9 journey times. Delays created by the at-grade roundabout at Dunkeld are offset by higher speeds on the new dual carriageway.</p> <p>Future traffic flows on Perth Road likely to increase by up to 500 to 800 vehicles per day. Traffic on Station Road expected to increase by approximately 100 vehicles per day due to new access to the station.</p> <p>A9 dual carriageway is expected to deliver economic growth and improved links to Public Transport facilities. Although journey times are anticipated to be comparable with existing A9 journey times, dualling will improve journey time reliability, compared to the existing condition, by provision of a high standard dual carriageway with no gaps in the central reserve that allows safe overtaking. The proposed junction at Birnam provides restricted access to and from the A9. Exclusion of northbound entry and southbound exit slip roads increases traffic on Perth Road, and may adversely impact local journey times and Public Transport. Access to the A9 for northbound traffic and from the A9 for southbound traffic would require to be provided at Dunkeld Junction. At-grade roundabout at Dunkeld may introduce delays to strategic bus services, particularly at peak times, compared to a grade separated junction. Impact on existing bus stops at Inver, replacement provision will be considered at more detailed stages of design, in consultation with relevant stakeholders.</p> <p>No direct access to Dunkeld & Birnam Station from the A9. Layout provides connection to the station from Perth Road through Birnam and Little Dunkeld. Replacement car parking provision on top of cut and cover tunnel at the station could potentially incorporate a bus stop and bus turning area to improve integration with Public Transport facilities.</p> <p>Two-way Annual AADT flows on the A9 dual carriageway expected to be within the approximate range of 25,000 to 26,800 in 2041.</p>
Active Travel and Recreation	<p>Potential temporary diversions to sections of NCN Route 77 and Core Paths (DUNK/10, DUNK/11, DUNK/15, DUNK/23, DUNK/57, DUNK/59, DUNK/64, DUNK/100, DUNK/137, DUNK/142, DUNK/144 and DUNK/145) during construction.</p> <p>Permanent diversion to NCN Route 77 and Core Paths (DUNK/57 and DUNK/142) in the locality of the existing Birnam Junction. Likely these routes will be diverted along Perth Road, although likely increase in traffic on Perth Road would need to be considered.</p>

	<p>Permanent diversion to Core Path (DUNK/11) as Birnam Glen is stopped-up. Diversion likely to be via Station Road and the steps at the station to reconnect with the Core Path west of the station.</p> <p>Permanent diversion to Core Path (DUNK/23), which crosses the River Braan on a footbridge. A new crossing will be required in the locality of the existing.</p>
Public Transport	<p>A9 dual carriageway is expected to deliver economic growth and improved links to Public Transport facilities. Although journey times are anticipated to be comparable with existing A9 journey times, dualling will improve journey time reliability, compared to the existing condition, by provision of a high standard dual carriageway with no gaps in the central reserve that allows safe overtaking. The proposed junction at Birnam provides restricted access to and from the A9. Exclusion of northbound entry and southbound exit slip roads increases traffic on Perth Road, and may adversely impact local journey times and Public Transport. Access to the A9 for northbound traffic and from the A9 for southbound traffic would require to be provided at Dunkeld Junction. At-grade roundabout at Dunkeld may introduce delays to strategic bus services, particularly at peak times, compared to a grade separated junction. Impact on existing bus stops at Inver, replacement provision will be considered at more detailed stages of design, in consultation with relevant stakeholders.</p> <p>No direct access to Dunkeld & Birnam Station from the A9. Layout provides connection to the station from Perth Road through Birnam and Little Dunkeld. Replacement car parking provision on top of cut and cover tunnel at the station could potentially incorporate a bus stop and bus turning area to improve integration with Public Transport facilities.</p>
Historic Environment	<p>Approximately 22 hectares of Murthly Castle Garden and Designed Landscape, less than 1 hectare of The Hermitage Garden and Designed Landscape and less than 1 hectare of Birnam Conservation Area affected (existing A9 already passes through these designations), with an adverse impact.</p> <p>Construction will be in close proximity to the Category A Listed station building and there is potential for the setting of this designation to be adversely affected during construction. Post construction, there would be a positive impact on the building as the link to the local community is reinstated.</p>

Future Scheme Development Beyond Co-Creative

The design and assessment undertaken for the co-creative process has been completed to inform the decision making process. However, further design refinement and scheme assessment is required on the preferred route to ensure the design is to the same level of detail as is normal for major Trunk Road projects at the route options stage, and sufficient assessment work is completed to allow the Scottish Ministers to make their decision on the preferred option with confidence that it can be delivered successfully through the planning process.

This will include, but not limited to, the following:

- Additional ground investigation, focussed on the lowered section of A9 for the on-line options (A, B and D) and for the offline option C, the ground investigation will need to focus on the locality of the off-line tunnel, at the northern and southern extents.
- Additional ecological and environmental surveys and consideration of environmental mitigation.
- Flood modelling and road drainage design.
- Design refinement and engineering assessment, including compliance with standards and constructability assessment.
- Design of key structures including, tunnels, bridges and retaining walls.
- Development of Non-Motorised User (NMU) routes.
- Additional traffic modelling and analysis.
- Public Utility diversions strategy.
- Consultation with statutory and non-statutory consultees.
- Consultation with affected landowners.
- Consideration of non-spatial options.
- Scheme cost review, including assessment of risks and opportunities.