Detailed Appraisal	**D19 - Dundee Northern Relief Road**
Estimated total Public Sector Funding Requirement:	***Capital Costs/grant*** £100m - £250m. ***Annual Revenue Support Present*** - ***Value of Cost to Gvt*** £100m - £250m. ***BCR/PVB*** 1 - 3 / £100m - £250m.

Summary Impact on STAG Criteria

	- - -	- -	-	0	+	++	+++
Environment		1	2		1 and 2		
Safety					1	2	
Economy						2	1
Integration					1 and 2		
Accessibility and Social Inclusion					1 and 2		

(Judgement based on available information against a 7pt. scale.)

Intervention Description:

This intervention supports the objectives to reduce conflict between strategic and local traffic in Dundee, and to improve the connectivity of Aberdeen to the Central Belt,

Improvement to the A90 at Dundee could take the form of:

1. A new Northern Peripheral Bypass road around Dundee from the A90 west of Invergowrie to the A90 north of Dundee; or
2. Upgrading of roundabouts and associated junctions on the A90 Kingsway.

Both options could incorporate a package of associated bus priority, cycle lanes and pedestrian measures on or across the Kingsway.

Summary: Rationale for Selection

A new outer bypass would contribute significantly to the objective of reducing journey times between the Central Belt and Aberdeen, with an approximate reduction of 10-15 minutes, by reducing the conflict between long distance and local traffic through removing up to 50 per cent of traffic from the Kingsway. This would have consequential environmental benefits to those living and working adjacent to the A90, and would enable the Kingsway to perform a role as a regional distributor road with potential for the introduction of bus priority measures.

The outer bypass would have a potentially moderate benefit to Air Quality in Dundee's Air Quality Management Area (AQMA) by moving 50 per cent of the traffic away from the A90.

Alternatively, grade separation of all or some of the at-grade roundabouts on the A90 Kingsway would contribute to the two objectives above, albeit to a lesser extent.

Although this option would avoid any environmental impact north of the city, provision of grade separated junctions in an urban area would have adverse impacts on the communities adjacent to the A90.

The bypass route is expected to provide more value for money than the on-line upgrade.

Table D19.1.1 STPR Objectives

STPR Objectives	
STPR Objective 1: To reduce the conflict between long distance and local traffic.	**1: Strongly Positive (1) / Positive (2) –** A new outer bypass would reduce the conflict between long distance and local traffic as it would remove up to 800 vehicles in the peak from the existing route. This equates to approximately 50 per cent of the existing flows. Grade separation of the junctions on the Kingsway would reduce the conflict between local traffic and long distance traffic. The A90 through Dundee is approaching theoretical capacity and is particularly affected by the operation of at grade junctions along the length of the route. Both scenarios would therefore meet the objective but the outer bypass would be more effective.
STPR Objective 2: To improve bus/rail interchange opportunities.	**2: Neutral –** No impact.
STPR Objective 3: To improve the public transport accessibility and competitiveness to Dundee West.	**3: Positive (1) / Slightly Positive (2) –** This intervention would improve efficiency on the approaches to and through Dundee, resulting in reduced congestion through Dundee and improved public transport accessibility. The introduction of bus priority measures would improve public transport competitiveness. Although these impacts would improve the journey times for public transport services, the impact on public transport accessibility and competitiveness to Dundee West is not likely to be significant without improvements to services. Both options would contribute to the objective, with the outer bypass being more effective.
STPR Objective 4: To promote continuing reduction in accident rates and severity rates across the strategic transport network.	**4: Positive** – The accident rate on a new bypass is forecast to be approximately 80 per cent lower than on the existing network, although the severity rate is likely to rise by around 40 per cent due to higher speeds on the new route. Grade separation of the junctions on the Kingsway would reduce vehicle conflicts and therefore the number of junction related accidents. Overall, this intervention is forecast to improve road safety in Dundee.
STPR Objective 5: To promote journey time reductions, particularly by public transport, between Aberdeen and the Central Belt primarily to allow business to achieve an effective working day when travelling between these centres.	**5: Positive –**The provision of an outer bypass around Dundee would also improve the efficiency and reliability of the transport network in and around Dundee. The potential reduction of approximately 50 per cent of total trips on the Kingsway would reduce congestion. Journey times are expected to decrease by around 10 - 15 minutes for vehicles using the bypass. Journey time savings for public transport services between Aberdeen and the Central Belt would be lower if direct services bypassing Dundee were introduced. Grade separation of the junctions on the Kingsway in Dundee would result in journey time reductions and increased journey time reliability. These benefits would result in increased business productivity due to more efficient movement of people and goods.

Table D19.1.2 STAG Criteria

STAG Criteria		
Criteria:	**Assessment Summary:**	**Supporting Information:**
Environment:	**Minor benefit / Moderate Negative Impact (1)** **Minor Benefit / Minor Negative Impact (2)**	The Northern Peripheral Bypass would result in beneficial environmental effects, particularly to the local environment along the A90 corridor, in terms of reducing transport related air pollution in the designated Air Quality Management Area. Noise modelling suggests that the intervention could produce increased noise effects on the local population, particularly to the north of Dundee along the proposed route. The severity and scale of this effect would depend on the final location of the route, proximity to sensitive receptors and noise attenuation incorporated within the road design. However, it is assumed that there would be a benefit to the noise profile within Dundee, particularly along the A90, due to reduced traffic volumes. The new bypass could have an adverse effect on the natural environment to the north of Dundee, including potential for effects on local watercourses, biodiversity, archaeology, landscape and visual intrusion. The degree to which the environment in this area would be affected would depend on the final route and design of the intervention. Accordingly, the intervention has been assessed as having a potentially adverse effect at this stage of the decision making process. (1) Provision of grade separated junctions on the A90 would reduce congestion and increase the speed of traffic flows, improving accessibility for traffic through Dundee. Air, climate and noise effects are considered to be largely neutral, with positive effects from reduced congestion offset by negative effects from increased traffic speed. Any adverse severance effects are likely to be offset by the proposals for new pedestrian and cycling facilities along and across the road, and these would also help encourage healthy lifestyles. However, there is potential for moderate adverse effects on cultural heritage assets, particularly the Stone Circle Scheduled Monument, and minor adverse effects on local landscape receptors, such as Caird Park and Castle, and Camperdown Country Park. Effects on biodiversity, geology and soils, and the water environment are considered to be neutral, as there is little new land-take required. There is potential for short term construction effects and disturbance to local receptors. However, it is envisaged that these could be controlled by adherence to standard best practice construction techniques. (2)
Safety:	**Minor Benefit (1) / Moderate Benefit (2)**	Both interventions would reduce the accident rate on this section of the transport network. National statistics indicate that the outer bypass option would lead to accident reductions of up to 80 per cent, depending on the level of provision. National statistics indicate that the severity rate (proportion of accidents with serious or fatal casualties) could increase by up to 40 per cent for traffic transferring onto the new outer bypass. However, although there could be a higher proportion of severe and fatal accidents, the total number of accidents would reduce. Grade separation of the remaining junctions on the A90 Kingsway could also reduce the number of accidents by removing the conflict between local and longer distance traffic.
Economy:	**Major Benefit (1) / Moderate Benefit (2) /**	**Transport Economic Efficiency (TEE):** Both options would provide journey time savings for strategic journeys passing through Dundee and for local journeys within the city. These savings are expected to be considerably greater for the outer bypass option. Congestion would be reduced on the Kingsway and other locations within Dundee, resulting in increased reliability of journey times for trips remaining on this route and for those on the new route. These options would also provide improved productivity for freight movements. Journey time savings and congestion reductions provide the majority of the economic benefits; however significant accident benefits are also forecast. The economic performance indicates that both options would provide a benefit to cost ratio of between 1 and 3.

		Wider Economic Benefits (WEBs): Significant improvements to journey time, reliability and quality would have a major positive impact on the efficiency, productivity and competitiveness of businesses using the route to travel between destinations in Aberdeen and the Central Belt. Benefits should accrue from the lower cost of travel for freight and business users, improved access to customers and suppliers and improvements to competitiveness by addressing issues of remoteness and peripherally. Similar benefits would also accrue to businesses based at key strategic sites in Dundee resulting from reduced congestion and potential reductions in traffic volumes along the Kingsway. **Economic Activity and Location Impacts (EALIs):** The improvements proposed as a part of this intervention should benefit businesses across the north east by improving connectivity to customers, suppliers and other businesses in the Central Belt and further south. Key sectors to benefit from improved accessibility would include energy, food processing and other manufacturing industries, as well as tourism. Reduced congestion on the A90 would also benefit key businesses based along the Kingsway and at sites to the west of the city centre, such as Ninewells Hospital, Dundee Technology Park and Dundee Medipark. Overall, the intervention would assist in the promotion of strategically important sites in Dundee and across the north east of Scotland for further development and economic growth.
Integration:	**Minor Benefit (1 and 2)**	**Transport Integration:** This intervention would have no significant effect on transport integration. **Transport and Land-Use Integration:** The bypass would improve access to/from the businesses located along the Kingsway by removing through traffic. Other land use integration would depend on planning policy for new developments along the bypass. **Policy Integration:** This intervention may have a minor impact on road traffic reduction aspirations.
Accessibility and Social Inclusion:	**Minor Benefit (1 and 2)**	**Community Accessibility:** The reduction of flows on routes through Dundee could result in improved opportunities to walk and cycle in the city, particularly with the outer bypass option, as the connectivity between the city centre and areas north of the Kingsway could experience significant improvements. **Comparative Accessibility:** This intervention would improve accessibility to areas of Dundee city and the north east of Scotland.

Table D19.1.3 Key Strategic Outcomes

Key Strategic Outcomes (KSOs)		
Objective:	**Assessment Summary:**	**Supporting Information:**
Improve Journey Times and Connections:	**Moderate Benefit (1) / Minor Benefit (2)**	The provision of an outer bypass around Dundee or grade separated junctions on the Kingsway would result in reduced journey times and improved journey time reliability, improving connections, especially between the north east and the Central Belt and from areas to the east of the Kingsway to the centre of Dundee. Benefits to public transport services would be more noticeable if direct services bypassing Dundee were introduced. The potential for new bus priority measures on the Kingsway will have a positive impact on public transport journey times within Dundee.
Reduce Emissions:	**Moderate / Minor Benefit (1)** **Neutral (2)**	Dundee has an Air Quality Management Area as a direct result of the traffic volume within the city centre, as well as the wider local authority area. Removal of 50 per cent of traffic to an outer bypass could result in a substantial improvement to air quality within the Air Quality Management Area; however, the degree of improvement is uncertain. Overall, it is expected that changes in CO_2e emissions from transport as a result of this intervention are likely to be negligible. It is not expected that this intervention would encourage modal shift to public transport. (1) This intervention does not aim to remove cars from the road or encourage a modal shift to public transport but it is accepted that it could include provision for bus and cycle lanes. (1 and 2) Any improvement in air quality due to reduced congestion could be offset by increased, less fuel efficient, vehicle speeds. Grade separation of existing junctions would make efficient use of the existing A90. (2)
Improve Quality, Accessibility and Affordability:	**Moderate Benefit (1) / Minor Benefit (2)**	Both interventions would reduce conflict between local and strategic trips, reduce congestion and enable commuters travelling to locations within Dundee to benefit from improved accessibility. The outer bypass option would provide greater benefits. Neither intervention is likely to impact on affordability.

Table D19.1.4 Scottish Government's Strategic Objectives

Scottish Government's Strategic Objectives		
Objective:	**Assessment Summary:**	**Supporting Information:**
Safer and Stronger:	**Moderate Benefit (1) / Minor Benefit (2)**	The provision of an outer bypass around Dundee would result in a reduced accident rate although accident severity could increase with increased speeds on the route. Grade separation on the Kingsway would result in reduced conflict between strategic and local trips providing a safer environment for road users, cyclists and pedestrians. The provision of bus priority could improve the quality and accessibility of public transport. There would be no effect on affordability of public transport.
Smarter:	**Neutral (1 and 2)**	This intervention would improve access to schools, colleges and universities within the corridor.
Wealthier and Fairer:	**Major Benefit (1) / Moderate benefit (2)**	Both options would result in reduced journey times and increased journey time reliability for the movement of people and goods resulting in increased accessibility to the north east of Scotland, increased opportunities and increased productivity. The benefits from the outer bypass would be higher than those of the grade separation.
Greener:	**Moderate / Minor Benefit (1)** **Neutral (2)**	The outer bypass would bring a possible moderate benefit to air quality in Dundee's Air Quality Management Area. Both options would help to relieve congestion on the Kingsway which would reduce bus journey times on the local road network, potentially encouraging greater use of public transport. However, this is considered to be an indirect effect as the intervention does not directly promote use of public transport.
Healthier:	**Minor Benefit (1/2)**	Reduced traffic flows on the A90 could make walking and cycling easier, with a positive effect on health. The outer bypass and grade separation options would also improve access to health services for some people, especially to Ninewells Hospital in the west of Dundee.

Table D19.1.5 Implementability Appraisal

Implementability Appraisal	
Technical:	This intervention would be relatively straightforward in technical terms. Implementation would be easier for the outer bypass as only the existing network at either end would be affected. By comparison, the grade separation of the Kingsway would result in significant temporary disruption on existing routes. When implementing the intervention it would be critical that demand management is considered as diversionary routes during construction could have a significant impact on local and strategic trips both into and through the city. Careful planning would be necessary so as to avoid creating congestion on the rest of the road network in Dundee.
Operational:	Operation of the outer bypass would be the responsibility of Transport Scotland as the Trunk Road authority. It is possible that the Kingsway would be de-trunked with responsibility passed to the local authority. No significant operational issues are anticipated from this intervention.
Public:	The outer bypass is likely to be viewed positively by local and strategic road users, although residents local to the proposed route may have reservations about the intervention due to increased emissions and noise pollution. The environmental impact associated with the outer bypass is likely to prompt public criticism.