Proposal Details				
Name and address of authority or organisation promoting the proposal:		Aberdeen Greenbelt Alliance		
Proposal Name	AGA East	Name of Planner	Aberdeen Greenbelt Alliance	
Proposal Description	Dual two lane carriageway road with 40mph speed limit between Altens and Bridge of Don formed in tunnel over much of its length. AGA proposal for the route to form part of the Modern Transport System described in the MTS STAG Part 1. A secondary AGA West route forms part of the overall AGA proposals but is not assessed in this Part 1 STAG Summary Assessment.	Estimated Total Public Sector Funding Requirement	Capital Cost	£633m (Predicted Out-turn Cost) (Additional items would include land costs, public utilities diversions)
			Annual revenue support	£2m per annum O&M costs
			Present Value of costs	-
Funding sought from	Scottish Executive (81%) Aberdeen City Council (9.5%) Aberdeenshire Council (9.5%)	Amount of Application	£633m (Predicted Out-turn Cost) (Additional items would include land costs, public utilities diversions)	

Background Information	
Geographic Context	Aberdeen is the urban centre of North-East Scotland. The existing trunk road network runs through Aberdeen, with the local road network entering the city radially. The existing highway infrastructure in many areas is significantly constrained, with the trunk road bridge across the River Dee being unable to accommodate heavy goods vehicles and the trunk road through Aberdeen having a number of traffic signal controlled junctions and at grade roundabouts. In addition, over much of its length the trunk road is on a steep vertical alignment and is closely bounded by a mix of residential, leisure and commercial premises. These various constraints result in diversion by drivers onto local roads, causing further congestion across the network. The study area passes from Altens in the south through Loirston Country Park and across the Aberdeen to Dundee railway line, continuing north towards the River Dee estuary and Aberdeen harbour to the east of the city centre, before continuing along the beachfront area through Kings Links and Royal Aberdeen golf courses to Bridge of Don north of the Aberdeen Exhibition and Conference Centre.
Social Context	The study area skirts the industrial/commercial/residential areas at Altens, Balnagask and Bridge of Don, the industrial/commercial areas adjacent to Aberdeen harbour and the recreational areas adjacent to the beach including Kings Links and Royal Aberdeen golf courses. The main existing route in this area is the A956 which connects the A90 at Bridge of Don to the A90 at Charleston and numerous city centre streets along its route.
Economic Context	Congestion within Aberdeen has become of increasing concern, in terms of both environmental impacts associated with congested traffic and with the economic impact on areas north of Aberdeen. Economic activity within the study area is primarily industrial/commercial with Aberdeen Harbour prominent in the centre of the study area and industrial estates at Bridge of Don and Altens. Economic activity is adversely affected due to complex journeys and increasing and unreliable journey times through the city. This affects both Aberdeen City and Aberdeenshire. It should be noted that the AGA may supplement the AGA East proposal with the AGA West if considered necessary to secure the transport and economic benefits required by the MTS.

Planning Objectives	
Objective	Performance against planning objective
The planning objectives are detailed in the MTS and WPR STAG Part 1 Assessments. The AWPR objectives are grouped into the five Government Objectives and are detailed at the end of this Assessment Summary. These objectives are grouped into three categories below for assessment as planning objectives.	
Acceptability and Participation (Objective AP1)	Public consultation was held in March/April 2005. The results of the consultation are contained in a separate public consultation report. The AGA East proposal was submitted during the public consultation and developed further by the AWPR Project Team.
Deliverability (Objective D1)	Refer to the Implementability Appraisal and Government Objectives for Transport in this STAG Assessment.
Reduce Congestion (Objectives EV3, EV4, EA4, IT3, IT4, IT5, AB4)	The AGA East being closest to the city centre attracts some of the highest traffic flows of all the route options providing relief to certain streets, but this includes commuters travelling into the city centre via the junction proposed at the Beach Boulevard. Increased traffic flows from the AGA East is likely to result in severe congestion occurring on existing streets leading to the city centre. The effect of any congestion or queuing on the Beach Boulevard and surrounding streets on the operation of the main AGA junction and tunnel sections will need to be determined. The route also attracts traffic to the A956 Wellington Road and improvements to existing infrastructure including Charleston Junction are likely to be required.
Improve Economic Activity (Objectives EA3, EA4, IL3, IL4, IP2)	The AGA East provides access between proposed rail freight transfer depots, industrial estates and businesses and Park and Ride car parks in the A90/A956 corridor although it does not provide access to the rail freight depot at Dyce. This will facilitate the reallocation of road space to more appropriate priority forms of transport. Integration with other public transport measures proposed in this corridor will reduce the need to travel through the city centre. The route does not provide a connection from the main residential areas on the western periphery of Aberdeen and wider areas of Aberdeenshire to the industrial estates and main employment areas and this traffic will continue to use the existing radial routes and city streets.

Planning Objectives	
Objective	Performance against planning objective
Enhance Safety (SA2, SA3)	A consistent, high quality route is provided with one high capacity junction at the Beach Boulevard to improve user safety. The AGA East provides some of the greatest reductions in traffic levels on parts of the existing road network, particularly in the east of the city, with increases in others. The route is in tunnel over approximately 3.6km. Overall the route provides the lowest accident savings.
Rationale for selection or rejection of proposal	

Implementability Appraisal	
Technical	**AGA East** **Scheme Length** 10km **Speed Limit and design standards** 40mph – provided to match the speed limits of adjacent roads and due to the horizontal curvature of the alignment at Balnagask which at 360m is the desirable minimum radius for 70kph; and at Bridge of Don which at 510m is the desirable minimum radius for 85kph. The stopping sight distance for 70kph is 120m. It may be necessary to provide widening in the bored tunnel to achieve this standard. **Junctions** At grade roundabout at the A956 Wellington Road Grade separated junction at the Beach Boulevard At grade roundabout at the A90 at Bridge of Don **Local Routes** Passes below St Fittick's Road (Balnagask) and various streets including the Beach Boulevard adjacent to the city centre. **Earthworks and Ground Conditions** The route skirts the edge of the former land fill site at Nigg Bay with excavation and disposal of contaminated material likely to be required. Geology along tunnel sections includes rock underlying superficial deposits in the south along the section of bored tunnel. A key aspect of this section of the alignment is the presence of the Dee Fault running broadly northeast/southwest across the route at the Dee/harbour area. The cut and cover tunnels would be constructed within the superficial soils with the possibility of some bedrock being encountered at depth. Limited ground investigation information indicates that rock around the harbour area is at depths in excess of 27m. The proximity of the North Sea and level of the proposed route alignments is such that the majority of excavation would be within water bearing materials. This would be a consideration during construction when selecting the appropriate construction method, particularly to avoid floatation and basal heave. The permanent design of the structures would also have to accommodate the constant hydraulic head on joints to ensure a water tight structure. The ground conditions represent risk areas in relation to the design, construction, programme and cost of the proposed route.

Implementability Appraisal	
	Tunnel Sections To the south of the Dee, the tunnel would comprise of twin bores with cross passages between the bores. To the north of the Dee, the route comprises cut and cover tunnel. **Bored Tunnel** Approximately 1.4km of twin bored tunnel is required. The horizontal and vertical alignments of the tunnel are within appropriate limits. A Tunnel Boring Machine will be required and would have to accommodate mixed ground conditions due to the depth of the superficial deposits, the Dee fault and the bedrock. This would increase the complexity of the machine and hence its cost. Key risk areas would be water inflows and face stability, which could be accommodated with appropriate ground stabilisation measures ahead of the face. **Cut and Cover** Approximately 2.2km of cut and cover tunnel is required. The key risks associated with the cut and cover works are the depth of the superficial materials and groundwater. Current indications are that the construction would be generally within the water bearing sand and beach deposits with much of the work below the water table. This carries a fairly high risk during construction and would require either significant dewatering or local pumping. Furthermore the depth of the bedrock will constrain the available construction methods. If this area of work is not carefully investigated and engineered and adequate toe in to rock provided or groundwater mitigation measures employed, the stability of the cut and cover section could be compromised. A further key aspect of this element is the long term stability and watertightness of the structure due to the high water table. The AGA proposal indicates that by placing the road underground this frees up development potential above the tunnel. If overhead development is likely, the structures foundations, roof and walls would require strengthening. **Structures** Other structures required are as follows: • Aberdeen - Dundee railway line, Railway bridge • Twin bridges for the grade separated junction • River Don Bridge crossing • Retaining walls at the harbour junction to minimise landtake The railway and junction bridges would be conventional structures. The River Don crossing would be a major structure, most probably cable stayed with a main span of approximately 275m and a single tower estimated to be approximately 110m high. This could be reduced if two towers are adopted. The retaining walls would be provided between the main carriageway and the slip roads at the harbour junction to minimise landtake.

Implementability Appraisal	
	There is a risk relating to programme as the route has not been developed to the same level as the Murtle Route. It is anticipated that this will add at least one year to the programme with the earliest completion date being 2011. Any delay beyond this date will affect the scheme cost estimate due to additional construction inflation. **AGA West** The AGA West is an associated single carriageway improvement which would form part of the overall AGA proposal to provide relief to traffic from the west of Aberdeen. This route would involve upgrades of existing roads and sections of new road constructed between Bridge of Muchalls to the south of Newtonhill, passing Netherley, crossing the River Dee to the west of Peterculter Golf Club, passing west of Peterculter and Westhill and connecting to the A90 at Blackburn. This route is not currently reviewed as part of this STAG appraisal.
Operational	Operation of the route will be undertaken through the Scottish Executive term contract for management of the trunk road network or by a PPP concession company.
Financial	The scheme is likely to be procured as a Design and Build or Public Private Partnership (eg DBFO) project. Funding of the capital costs will be split between the funding partners Scottish Executive (81%), Aberdeen City Council (9.5%) and Aberdeenshire Council (9.5%). The route will be maintained through the Scottish Executive term contract for management of the trunk road network or by a PPP concession company. Accurate estimation of costs is particularly difficult at this stage due to the high risks associated with tunnelling. Particular technical risks are related to ground conditions, land prices and service diversions. High contingencies are common in tunnelling due to risk. Operational costs in addition to normal road maintenance will be incurred. These include tunnel operation and maintenance costs, and life cycle costs such as jet fans, fire systems, pumps, cladding etc and would be around £225,000 per km of bore per annum (approx £2m per annum). A summary of the costs is provided below: • Roadworks - £37m • Bored Tunnel - £179m • Cut and Cover - £299m • Don Crossing - £27m • Other Structures - £11m • Total - £553m at Q1 2005 prices (£633m out-turn cost 2011 prices) Additional items would include land costs, public utilities diversions and operational costs.
Public	Public consultation was held in March/April 2005. The proposal was submitted during the public consultation and developed further by the AWPR Project Team in accordance with UK design standards.

Government's Objectives for Transport		
The AWPR objectives are detailed overleaf. These are also the objectives referred to in the Planning Objectives Assessment. Please note that the environmental assessment covers the southern and western corridors only, except for property counts which relate to the entire scheme. The environmental assessment is split into categories included in DMRB Volume 11. In addition, separate assessments describing the cumulative impacts on the River Dee SAC and a general assessment of impacts on special needs facilities are included. The individual categories do not contain reference to these impacts to avoid double counting of impacts. The assessment indicates the potential for impacts or benefits prior to mitigation.		
Objective	Assessment Summary	Supporting Information
Environment	River Dee SAC **Potential for major cost or negative impact**	Crosses the Dee SAC with qualifying species including salmon, otters and the endangered freshwater pearl mussel. Potential impacts through noise and vibration, increased sediment flow and potential pollution associated with construction activities. Increased surface water run-off due to impermeable road surface may result in detrimental impacts to water quality/quantity although it is likely that discharges would be to the North Sea where dilution of pollutants would be high. Potential for impacts on marine environment at mouth of River Dee from tunnelling activities. Potential for pollution to reach the SAC as a result of runoff from accidental spills. Mitigation will include adopting measures and design solutions to control sediment run off during construction; although additional complexities will result due to tunnelling below ground; and sustainable drainage systems during operation.
	Special Needs Residential Facilities **Potential for no impact or benefit**	None in close proximity to route.

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Objective	Assessment Summary	Supporting Information
	Land Use (property impacts) **Potential for major cost or negative impact**	19 properties require demolition. The AWPR Project Team is currently reviewing these impacts. However, there will be demolition requirements on commercial/recreational businesses in the harbour/Beach Boulevard area. Close proximity to urban, commercial and industrial areas. Passes through Nigg Holiday Park. Passes approximately 100m south east of Nigg Parish Church. Passes through Loirston Country Park. Skirts edge of former landfill site at Nigg Bay. Passes through public ground at Balnagask. In tunnel below Balnagask (Nigg Bay) Golf Course, potential risk of surface settlements. In tunnel below the dockyard on northern side of Aberdeen Harbour, potential risk of surface settlements. Passes through Queen's Links Leisure Park. Passes close to the Patio Hotel, adjacent to the Beach Boulevard. Passes through Kings Links Golf Course. Passes through Royal Aberdeen Golf Course.

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Objective	Assessment Summary	Supporting Information
	Noise and Vibration **Potential for moderate cost or negative impact**	During operation, traffic movement along the route would result in an increase in traffic noise to properties. This has been estimated as: ▪ 205 properties within 50m ▪ 366 properties within 100m ▪ 655 properties within 200m ▪ 1069 properties within 300m Noise reductions along Anderson Drive and other current commuter routes due to reduced traffic volumes. Significant increase in noise levels adjacent to the Beach Boulevard area due to significant increase in traffic volumes. Increased noise levels at the tunnel mouths at the Balnagask, Beach Boulevard, River Don and Bridge of Don areas. Mitigation such as low noise surfacing, bunds and noise barriers will be employed where appropriate.
	Air Quality **Potential for no benefit or impact**	Significant reduction in traffic levels and hence pollution levels in the Air Quality Management Zone around the harbour. However, there will be a subsequent significant increase in traffic levels at the Beach Boulevard area with an increase in pollution occurring. Potential for localised air quality impacts for some properties along the route once operational at the sections not in tunnel and at the locations where ventilation of tunnel sections occurs.

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Objective	Assessment Summary	Supporting Information
	Water Quality, Drainage and Flood defence **Potential for moderate cost or negative impact**	Passes under River Dee estuary and over River Don estuary. Potential for impacts on existing flood defence works along foreshore. Potential for impacts on marine water quality during construction of tunnel. Increased surface water run-off due to impermeable road surface may result in detrimental impacts to water quality/quantity. it is likely that discharges would be to the North Sea where dilution of pollutants would be high. Potential for groundwater impacts through disturbance of contaminated land or surface water discharges. Potential for pollution to reach local waterways as a result of runoff from accidental spills. Mitigation such as sustainable drainage systems will be employed although surface water run-off from the tunnel sections will require to be pumped to attenuation and treatment facilities. It may be possible to discharge surface water run-off to the North Sea where dilution of pollutants would be high.
	Disruption Due to Construction **Potential for major cost or negative impact**	Potential for temporary localised minor decreases in air quality due to dust, plant and equipment during construction. Potential for temporary localised increases in noise due to plant, equipment and works during construction. Potential major short term impacts on local road network due to vehicle and plant access required in city areas.

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Objective	Assessment Summary	Supporting Information
		During construction DMRB recognises that impacts are greatest for properties within 100m of the works. This has been estimated as: ▪ 205 properties within 50m ▪ 366 properties within 100m Tunnel drilling, construction of bridge and excavation along the route could result in short term impact through increased sediment flow and potential pollution associated with construction activities. Short term impacts on landscape and visual amenity during construction. Potential major short term impacts on recreational area at Queen's Links Leisure Park. It should be noted that construction of the cut and cover tunnel within the Kings Links and Royal Aberdeen Golf Courses will result in the disruption of these courses for the duration of the works. Mitigation will include adopting measures and design solutions to control noise, vibration and sediment run off during construction.

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Objective	Assessment Summary	Supporting Information
	Biodiversity **Potential for moderate cost or negative impact**	Passes approximately 400m to west of Nigg Bay SSSI. Mitigation could be provided to reduce this impact. 1.5 km section of route through Tullos Hill DWS Habitat loss and fragmentation unlikely to be able to be mitigated Passes approximately 300m to east of Kincorth Hill DWS and LNR. Mitigation could be provided to reduce this impact. Impacts on River Don Estuary DWS and Donmouth LNR. Mitigation could be provided to reduce this impact. Approximately 2 km section of route through Balgownie/Blackdog Links DWS. Mitigation could be provided to reduce this impact.

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Objective	Assessment Summary	Supporting Information
	Visual Amenity and Landscape **Potential for major cost or negative impact**	Construction within a landscape which is partially fragmented and industrial, though generally of high sensitivity and quality. Significant adverse impact as the route passes through waterfront area which features a high concentration of public amenity receptors. Significant adverse impact upon the setting of St. Fittick's Church (ruin). Passes through large sections of designated Urban Green Space (Finalised Aberdeen Local Plan City Wide Proposals, 2004). Significant visual impact caused by bridge crossing mouth of the River Don which is otherwise open in this area. Approximately 4.0km (48%) of the route lies within Greenbelt (the remainder being within Urban Green Space).

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Objective	Assessment Summary	Supporting Information
	Cultural Heritage **Potential for moderate negative impact**	Passes 100m east of Gordon Barracks Married Quarters (Grade B and C listed). Passes 100 m east of Boundary Markers No. 63, 64, 65 and 66 (Grade B listed). Passes 100m to east of 78-88 St Clement Street (Grade B listed). Passes 100m to west of Beach Ballroom (Grade B listed). Passes 100 m east of York Street Nursery School (Grade B listed) in tunnel. Directly through Footdee Squares (Grade B listed) in tunnel. Passes below St Fitticks Church (Grade B listed), close proximity to tunnel entrance. Passes 100m east of Nigg Parish Church (Grade B listed). Passes 100m south-east of Loirston House (Grade C(s) listed). Passes 100m to north of Cat Cairn SAM. Passes 150m to north-west of Baron's Cairn SAM.

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Objective	Assessment Summary	Supporting Information
	Pedestrians, Equestrians, Cyclists and Community Effects **Potential for minor cost or negative impact**	On the basis of currently available information, there is potential for recreational pathways (including cycleways) to be directly impacted through severance or indirectly affected through visual and noise disturbance. There is also potential for pedestrian and cycleway access to community facilities including the Queen's Links Leisure Park to be disrupted. The design will maintain pathways as far as practicable.
	Vehicle Travellers **Potential for major cost or negative impact**	The majority of the route is contained within tunnel and there will be no views from the road of note through these stretches; of the remainder, four sections are conventional road construction. Where views are available, to the west they will be restricted to short- to medium-range views of built development within the City of Aberdeen and, to the east, will be either contained by local topography at Tullos Hill or open to the North Sea. Based on the traffic flows provided and speed limit of 40mph, driver stress is assessed to be moderate.
	Geology and Soils	There are no sites of geological interest identified and although some rock cutting will be required the associated impact would be considered negligible. The potential for made ground contamination can not be assessed in detail, due to the lack of data in this area. However, it is expected that potential for made ground contamination is likely in areas with an industrial past. The route is likely to intercept blown sand and raised beach deposits along the coast, especially in the Northern part. Groundwater is expected to be at shallow depth in the vicinity of significant watercourses and below other areas of low lying ground. Where road cutting and tunnelling is required in these areas, such that the water table is intercepted, there is likely to be a local reduction in water table levels. This

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Objective	Assessment Summary	Supporting Information
		may have a significant effect where local vegetation and habitat, or private water supplies, are dependant on groundwater.
	Policies and Plans **Does not comply with Local Plans**	This route does not comply with the line in the draft Aberdeen City Council and Aberdeenshire Council local plans. Both local plans anticipated that the WPR would proceed as the Murtle Route, no other route has this benefit.
Safety	Accident Savings (PV1) **Minor Benefit**	The AGA East route achieves the lowest level of accident savings of all the routes at approximately £3.5m per annum in 2025.
Economy	Traffic volumes (2010 AADT)	**AGA East 2010 Flows** Nigg to harbour junction 36200 Through harbour junction 18800 Harbour junction to Bridge of Don 22500 **Existing Roads** **Without AWPR** **With AWPR** King Street at Bridge of Don Market Street 28100 16700 (-41%) Bridge of Dee 32000 28900 (-10%) Auchmill Road 41300 42700 (+3%) Netherley Road 3400 2800 (-18%)
	Journey time savings (PV2)	£978,984,000
	Vehicle Operating Costs (PV3)	£55,457,000
	User Charges (PV4)	-£86,000
	Private Sector Revenue Impact (PV5)	£160,000
	Public Sector Investment Costs (PV6)	£541,212,000
	Public Sector Operating Costs (PV7)	£2,040,000
	Taxation impacts (PV8)	£25,927,000

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Objective	Assessment Summary	Supporting Information
	Present Value of Benefits (PV1+PV2+PV3+PV4+PV5)	£1,034,515,000 (Note: Accident Savings PV1 are not included)
	Present Value of Costs (PV6+PV7+PV8)	£569,179,000
	Net Present Value (PVB-PVC)	£465,336,000
	Benefit to Cost Ratio (PVB/PVC)	1.8
	Overall Economy Assessment **Minor Benefit**	Lowest BCR achieved,(1.8 based on an estimated cost of £600m).Capital expenditure exceeds lowest by over £400m.
Integration	Transport Integration **Minor Benefit**	The route provides access between proposed rail freight transfer depots, industrial estates and businesses and Park and Ride car parks in the A90/A956 corridor, although it does not provide access to the rail freight depot at Dyce, nor the park and ride car parks on the western fringes. The route will facilitate the reallocation of road space to more appropriate priority forms of transport and integration with other public transport measures proposed in the MTS for the A90/A956 corridor.
	National Transport Targets **Complies to a lesser degree**	The AGA East on its own would not provide the function performed by other AWPR route options in relation to its role in the Modern Transport System (MTS). The objectives of the MTS endeavour to ensure that the package of measures proposed comply with National Transport Policies. The AGA East is not in accordance with Aberdeen and Aberdeenshire's Local Transport Strategies.
Accessibility and Social Inclusion	Accessibility and Social Inclusion **Minor Benefit**	Does not supports development of all of the public transport improvements as proposed within Modern Transport System, such as park and ride as these sites are not provided close to the route. Supports development primarily in the A90/A956 corridor. Accessibility to and from the harbour junction is yet to be determined as the route attracts additional traffic volumes to the existing streets in this area.

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Objective	Assessment Summary	Supporting Information
	Change in Severance – Global Impact **Minor Benefit** Change in Severance – Local Impact **Minor Negative Impact**	Route reduces severance within city, and reduces severance between destinations to the north and south of Aberdeen. Route introduces severance along sections not in tunnel. Most significant at the harbour/beach area where grade separated junction formed.

Aberdeen Western Peripheral Route Objectives

Acceptability and Participation
AP1 The strategy will be developed through public participation and be endorsed by the Community.

Deliverability
D1 The strategy will be achievable, both practically and financially, and demonstrate best value.

Environmental Objectives
EV3 - To reduce the impact of traffic, including in particular HGV traffic, on Aberdeen and the surrounding area whilst incurring minimal damage to the natural environment.

EV4 - To contribute towards reducing air pollution problems, particularly in the city centre where the problems are greatest.

Economic Objectives
EA3 - To provide access between proposed rail freight transfer depots, industrial estates and businesses, Park and Ride car parks, road and air links, to ensure journey times and costs are minimised.

EA4 - To reduce congestion and remove the bottleneck in the Trans European Network thereby increasing the reliability of journey times through and around the City, helping to limit the effects of peripherality nationally and internationally.

Safety Objectives
SA2 - To provide a consistent, high quality, efficient and effective route with a minimal number of high quality, high capacity junctions to maximise user safety.

SA3 - To reduce the traffic levels on the existing road networks thereby reducing the risk of accidents.

Integration Objectives
IT3 - To produce a consistent standard of route that will bypass the city from A90 (North) to A90 (South) and attract nonessential traffic away from Aberdeen and inappropriate minor routes.

IT4 - To allow the reallocation of road space to more appropriate priority forms of transport.

IT5 - To provide access between proposed Park and Ride car parks.

IL3- To provide good accessibility to the land required for the sustainable development of Aberdeen

IL4- To provide an attractive link from residential areas on the periphery of Aberdeen and Aberdeenshire to the industrial estates and main employment areas on the periphery of Aberdeen and Aberdeenshire, reducing the need to travel through the city centre.

IP2- To produce a route which will improve access to employment and generate job opportunities thereby contributing to the social inclusion policies of both Councils.

Accessibility Objectives
AB4- To significantly reduce the level of traffic in Aberdeen without reducing accessibility to or within the city.