

NATIONAL CAPITAL AUTHORITY

GUNGAHLIN DRIVE EXTENSION ALIGNMENT ASSESSMENT

EXECUTIVE SUMMARY REPORT

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1.0 BACKGROUND

The National Capital Authority (NCA) commissioned Young Consulting Engineers Pty Ltd, as project managers and civil engineers to undertake a comprehensive analysis to be undertaken of the Gungahlin Drive Extension (GDE) proposals from the Barton Highway to the Glenloch Interchange.

The GDE is a proposed arterial road, as defined in the National Capital Plan, that the ACT Government is currently proposing to construct as part of the Canberra metropolitan road network. This road is to meet the needs of road transport movements between the northern part of Canberra, primarily from the Gungahlin District, and the southern and Central Canberra districts.

The proposed arterial road is shown in the General Policy Plan – Metropolitan Canberra (Figure 1) of National Capital Plan.

Part of the new arterial passes by the Australian Institute of Sport (AIS) at Bruce. A Preliminary Assessment carried out by the previous ACT Government formed the basis of its Variation 138 to the Territory Plan, which proposed an eastern alignment being adopted by the government at the time. A change in the ACT Government has resulted in the exploration of a western alignment for which design and impact studies have recently been carried out.

There is a need to provide a comparative analysis of the two options with particular assessment of the relative impacts of the both options on the health and well being of athletes at the AIS as well as assessing the effect of each option on the future planning and development of the AIS through its master planning.

Part of the GDE is proposed as an upgrade of Caswell Drive from Belconnen Way to the Glenloch Interchange. The current ACT Government proposal is to align the new road partly within Black Mountain Reserve and provide continued local access to Caswell Drive and Belconnen Way for residents of Aranda. The main reason for the solution proposed by the ACT Government for this section of the road is the result of representation from the Aranda community to reduce potential noise and other impact of new road works.

There is a need to test the assumptions for the scale and location of the road proposals on this section of GDE so as to avoid or minimise the impact of the road from intruding into Black Mountain Reserve while recognising and ameliorating the potential impacts on the Aranda residents. This requires in particular a review of the road transport system proposed to serve the needs of the population in Gungahlin and the role of GDE in the metropolitan arterial road network in general.

2.0 OBJECTIVES OF BRIEF

The objectives of the brief were:

1. Identify relevant studies that have been prepared related to the GDE in terms of its need, scale and location;
2. Evaluate if there is sufficient available data to carry out a comparative study of the Eastern and Western options for GDE as it passes by the AIS;
3. Provide a comparative assessment of the environmental, engineering and urban design impacts of the Eastern and Western road options of the road past the AIS; and
4. Assess the options for providing GDE from Belconnen Way to Glenloch Interchange in a way that avoids or minimises intrusion into the Black Mountain Reserve and maintains effective control of noise impact on residents in the Aranda area.

3.0 SUBCONSULTANTS

To assist in the assessments the following sub-consultants were appointed to carry out the nominated roles:

- i) Scott Wilson Nairn Pty Ltd
Traffic and Transport Planners
Role: Traffic and Transport Planning Assessment
- ii) Dorrrough Britz and Associates Landscape Architects
Role: Visual assessment of Eastern Alignment

The NCA appointed Professor John Black, Head of the School of Transport Engineering at the University of NSW to conduct a peer review of the assessment reports.

4.0 STUDIES

4.1 Metropolitan Traffic and Transport needs for Gungahlin

This review is primarily aimed to provide answers, from a traffic and transport perspective, to the following questions:-

- ◆ Is the GDE necessary?;
- ◆ Which alignment is preferred?;
- ◆ What standard of road should GDE be?;
- ◆ What assumptions are made in the traffic and transport analysis?; and
- ◆ What other impacts and effects will GDE produce? In answer to the question **“Is GDE necessary?”** the following points apply:-
 - ◆ All roads leading to and from Gungahlin will be badly congested without GDE;
 - ◆ Travel times and costs to Gungahlin are higher than all other areas except Queanbeyan now but will become higher than Queanbeyan by 2031;
 - ◆ There are existing unwanted traffic movement through residential areas in Belconnen and Lyneham, which are mainly due to Gungahlin traffic and these will get worse without GDE;
 - ◆ Even increased self-containment cannot reduce the traffic flow sufficiently to avoid building GDE;
 - ◆ Even the Inter-town Light Rail Transport (LRT) and other public transport initiatives cannot reduce the traffic flow sufficiently to avoid GDE; and
 - ◆ Building the Crace Arterial / Monash Drive will not reduce the traffic flow sufficiently to avoid GDE and this is the only other proposed arterial on the General Policy Plan that will effect GDE.

Based on the traffic and transport analysis there is negligible difference between the traffic flows on the two alignments. The option to provide a full diamond interchange at Belconnen Way and allow Caswell Drive to be downgraded to a collector road, thus diverting heavy traffic away from residential streets in Aranda, is preferred.

In answer to the question **“what standard of road should GDE be?”** the answer is it should be of parkway standard. A Parkway has continuous grade separation, low grades, long curves, restricted side access throughout and with noise and landscaped treatment. It needs to be a Parkway because of the following:-

- ◆ It requires two lanes in each direction to accommodate the traffic demand;

- ◆ Grade separation is necessary throughout as at-grade intersections would be untenable;
- ◆ A 4-lane Parkway has more capacity than a 6-lane Arterial;
- ◆ Parkway standards are much safer than arterial standards;
- ◆ A Parkway's smooth flows and optimum speeds produce less emissions per Vehicle-Kilometre than an at-grade arterial;
- ◆ Parkway speeds help divert traffic away from congested arterials such as Northbourne Avenue; and
- ◆ A corridor has been set aside which was always intended for a Parkway.

The following fundamental assumptions have been made in the traffic and transport analysis:-

◆ **Population**

- Existing Population of Canberra is based on the 2001 Census; and
- The future population is based on Gungahlin growing to 100,000 from ACT Government sources, which is assumed to occur by 2031. In addition, tests have been made with Gungahlin populations of 46,000 in 2011 and 80,000 in 2021. These tests show that GDE is needed well before the year 2011 and the section near Belconnen Way needs to be built before 2006;

◆ **Mode Split**

- Mode Split (the motorized share taken by public transport) has been predicted in detail at the zone level (not a blanket assumption); and
- An option of 20% average Mode Split has been modelled, including an Inter-town LRT and other supporting policies. It does not make sufficient difference to GDE traffic to avoid building the Parkway.

◆ **Other Road Options**

- The effect of the Crace Arterial and Monash Drive has been tested. It also does not make sufficient difference to GDE traffic to avoid building the Parkway.

Some of the other impacts and effects predicted to be produced by GDE include:-

- ◆ **Travel Costs** – GDE is predicted to produce longer trips but of shorter duration, leading to some decreases in average travel costs in Canberra;
- ◆ **Trip Generation Rates** – GDE is forecast to slightly increase daily trip making rates;
- ◆ **Mode Split** – GDE is expected to slightly reduce mode split, but this is offset by increased trip making so that public transport ridership is not expected to be reduced;

- ◆ **Emissions** – GDE will have little effect on the growth or savings of total pollutant emissions in Canberra. GDE will increase emissions near the AIS but reduce emissions in the locations in Canberra where they are most intense and more likely to be dangerous to health. Emission intensities near AIS with GDE are only a fraction of those in Civic; and
- ◆ **Economics** – A preliminary economic evaluation shows that GDE would be economically well worthwhile.

4.2 Alignment Evaluation at AIS Precinct

The extent of the GDE alignment assessed at the AIS Precinct is between the point of divergence of the Eastern and Western Alignments, approximately 700m north of Ginninderra Drive and the point of convergence on Bruce Ridge.

The lengths of the Western and Eastern alignment over this section of GDE are 2580m and 2800m respectively, ie, the Eastern Alignment is 220m or about 8% longer than the Western Alignment.

The alignments were evaluated using the following criteria:

- AIS Masterplan impacts
- AIS Precinct access and through traffic
- AIS Services impacts
- Parking at the AIS
- Noise at the AIS
- Air Quality at the AIS
- Horizontal Geometry of the GDE at the AIS
- Vertical Geometry of the GDE at the AIS
- Cross Section of the GDE at the AIS
- Earthworks associated with the construction of GDE at the AIS
- Construction time and staging impact on the AIS
- Construction costs for GDE associated with the AIS
- Fauna and Flora near the AIS
- Cultural Heritage near the AIS
- Visual Assessment of GDE near the AIS

The results of the evaluation are summarised in the following table.

The comparative assessment showed that the Eastern Alignment of GDE has significantly less impact on the operations and further planning of the AIS.

These impacts would be important for the continuing success of the AIS as an internationally renowned sporting facility. It is also preferred as it has less overall environmental impact.

GUNGAHLIN DRIVE EXTENSION

AIS PRECINCT IMPACTS

Comparative Assessment of corridor options

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
1. AIS Masterplan impacts	<ul style="list-style-type: none"> • Changes to Territory and National Capital Plans will impact on opportunities and flexibility for the AIS Masterplan. • Implementation of the AIS Masterplan will be delayed. • The adverse impact on future planning may result in reduced viability for the AIS. 	<ul style="list-style-type: none"> • No variation to Territory Plan required. • There are significant opportunities for growth and flexibility in the AIS Masterplan in the future. • An early start on Masterplan implementation is possible. • AIS investment in new facilities at the site can continue unimpeded. 	Eastern alignment preferred, as there are minimal impacts on the AIS Masterplan.
2. AIS Precinct access and through traffic	<ul style="list-style-type: none"> • Reduced potential to connect to the East Bruce precinct. • Through traffic within AIS precinct remains a problem. • 3 new road bridges and 1 new pedestrian / cycleway across GDE required. 	<ul style="list-style-type: none"> • Access maintained to the East Bruce precinct with through traffic within the AIS precinct eliminated. • 1 new road bridge and 1 new pedestrian / cycleway underpass required. 	Eastern alignment preferred.

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
3. AIS Services impacts (water supply, telecommunications & power)	<ul style="list-style-type: none"> • High impact on services. 	<ul style="list-style-type: none"> • Low impact on services. 	Eastern alignment preferred.
4. Parking at the AIS	<ul style="list-style-type: none"> • Significant impact on existing parking with 2200 spaces lost requiring relocation to east of the AIS with significantly increased walking distances and reduced safety with pedestrian / cyclist conflict. 	<ul style="list-style-type: none"> • No impacts 	Eastern alignment preferred.
5. Noise at the AIS	<ul style="list-style-type: none"> • Climbing traffic lane will create more noise once constructed. • Predominant winds will carry noise towards the AIS and their residences. • Significantly longer exposure to noise in construction phase. 	<ul style="list-style-type: none"> • Lower noise impacts at AIS (and Kaleen residences). • More noise at the AIS playing fields. • AIS is upwind of noise source reducing its impact. • Impact on O'Connor and Bruce Ridge Nature reserves which can be partially mitigated with design. 	Eastern alignment preferred.

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
6. Air Quality at the AIS	<ul style="list-style-type: none"> • Vehicle emissions within guidelines. • GDE will slightly increase emission intensities compared to present levels. • Emission levels are a fraction of those in Civic. • Predominant winds will concentrate some vehicle emissions at the AIS. • Climbing lane south of Battye Street will increase emission levels at the AIS. <p><i>Note: Australian Sports Commission has concerns relating to health of athletes.</i></p>	<ul style="list-style-type: none"> • Vehicle emissions within guidelines. • GDE will slightly increase emission intensities compared to present levels. • Emission levels are a fraction of those in Civic. • Predominant winds will disperse vehicle emissions away from the AIS. <p><i>Note: Australian Sports Commission is carrying out independent studies on impact of emissions on Athletes however results not yet available.</i></p>	Little difference between either alignment with respect to vehicle emissions, however the AIS is upwind of predominant winds and the impact will be less for the Eastern alignment.
7. Horizontal Geometry of GDE at the AIS	<ul style="list-style-type: none"> • Meets AUSTROAD design guidelines. 	<ul style="list-style-type: none"> • Meets AUSTROADS design guidelines. • 220m (8%) longer than Western alignment. 	Little difference in either route.

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
8. Vertical Geometry of the GDE at the AIS	<ul style="list-style-type: none"> • Steep gradient (7%) requiring a 700m long climbing lane and widened formation. • 1.8km long cutting with impacts on drainage and AIS access. • Deficiencies in sight distances at several locations. 	<ul style="list-style-type: none"> • Moderate gradients, no greater than 4%. 	Eastern alignment preferred.
9. Cross Section of the GDE at the AIS	<ul style="list-style-type: none"> • Cutting depth up to 12.6m near Battye Street (average approx 7m) with steep batters retained within concrete retaining walls and concrete stabilised batters. • 8.5m deep cutting at Bruce Ridge. 	<ul style="list-style-type: none"> • Cutting depth up to 5.5m north of Bruce Ridge (average approx 3m) with flat batters and no retaining walls in hard finishes. • 9.2m deep cutting at Bruce Ridge • Maximum fill depth 7m at Ginninderra Drive overpass and up to 5m elsewhere. 	Eastern alignment preferred.

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
10. Earthworks associated with the construction of the GDE at the AIS	<ul style="list-style-type: none"> • Approx 500,000m³ of excavation, 450,000m³ exported to other sections of GDE. • Significantly longer construction time • Greater vehicle emissions and noise during construction. 	<ul style="list-style-type: none"> • Approx 300,000m³ of excavation, 100,000m³ exported to other sections of GDE. • Reduced construction time, vehicle emissions and noise. 	Eastern alignment preferred.
11. GDE Construction time and staging impact on the AIS	<ul style="list-style-type: none"> • Little opportunity for staging of road works and disruption at AIS for a significantly longer time. 	<ul style="list-style-type: none"> • Opportunity to stage construct major bridges and reduced disruption to AIS. 	Eastern Alignment preferred.
12. Construction Costs for the GDE associated with the AIS	<ul style="list-style-type: none"> • Significantly higher cost due to greater excavation and finishes to batters, service relocations, additional bridge structures, car park relocations and storm water drainage works. 	<ul style="list-style-type: none"> • Lower cost due to better topography and minimal services requiring adjustment. 	Eastern alignment preferred (\$10m lower construction cost for this option).

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
13. Fauna & Flora near the AIS	<ul style="list-style-type: none"> • High impact on endangered grasslands. • High impact on remnant woodland south of Battye Street. • No endangered fauna species. 	<ul style="list-style-type: none"> • Low impact on endangered grassland. • High impact on lower slopes of Bruce Ridge open forest but this area is already disturbed by a cycle path, several access tracks and power line clearings. • No endangered fauna species. 	Eastern alignment preferred.
14. Cultural Heritage near AIS	<ul style="list-style-type: none"> • Minimal impact. 	<ul style="list-style-type: none"> • Minimal impact. 	Little difference in either route.

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
<p>15. Visual Assessment of GDE near the AIS</p>	<ul style="list-style-type: none"> • Due to road being located in a cutting past the AIS the road would not be visually intrusive from the AIS and East Bruce. • GDE would be very visible from Ginninderra Drive and the Link road and Battye Street overpasses. • Driver experience would be of a semi-enclosed space formed by the cutting. • Retaining walls forming lower 3m of cutting relieved by artwork on the walls and concrete faced upper batters relieved by planting on the bench separating the walls and batters • Impacts of cutting at Bruce Ridge mitigated by confining construction , retaining trees and new planting. 	<ul style="list-style-type: none"> • Embankment at Ginninderra Drive overpass will dominate the view from Ginninderra Drive. • Extensive views to south towards AIS with Black Mountain and Tower dominating the skyline. • Extensive views over Kaleen grasslands and the treed suburbs of Kaleen towards north from Ginninderra Drive overpass. • GDE will be screened against backdrop of O'Connor Ridge and will create an abrupt junction between the natural vegetation and the degraded and developed valley floor. • South of the AIS GDE will have a major impact on this area due to its stark contrast with the open forest vegetation. 	<p>As the two alignments have totally different characteristics and traverse differing landscape forms it is not possible to make a comparable assessment.</p>

ELEMENT	WESTERN ALIGNMENT	EASTERN ALIGNMENT	COMMENT
15. Visual Assessment of GDE near the AIS (continued from previous page)		<ul style="list-style-type: none"> • Impacts of cutting at Bruce Ridge mitigated by confining construction, retaining trees and new planting. 	

4.3 Assessment of Options at Aranda Precinct

The alignment of GDE at Aranda has considered several alignments over the history of the project.

An assessment of 2 options recently proposed (June 2002 and November 2002) and an alternative conceptual arrangement developed during the assessment was made considering the comments made by Aranda residents on the ACT Government's Preliminary Assessment and the desire to minimise the impacts on Black Mountain Reserve.

Three options were assessed, namely:

- Option 1: The June 2000 Roads ACT Feasibility Study. This Option contained GDE within present road boundaries but relocated Caswell Drive, which continued to serve as access to Aranda but also formed the northbound off-ramp from GDE to Belconnen Way, closer to Aranda residences.
- Option 2: The Preliminary Assessment (PA) alignment (30 November 2002). This Option moved GDE into Black Mountain Reserve and maintained Caswell Drive in its present form as the access to Aranda and both the northbound and southbound ramp connections between Belconnen Way and GDE; and
- Option 3: An alternative concept developed by Young Consulting Engineers. This Option downgraded the function and scale of Caswell Drive into a local collector street with its own junction with Caswell Drive by moving GDE further into Black Mountain Reserve and providing dedicated northbound and southbound ramp connections between GDE and Belconnen Way.

While it is considered that Option 3 provides the best outcome for Aranda residents, in terms of improved amenity, the need to provide coordinated, linked signals at Belconnen Way for the new Caswell Drive intersection and ramp intersections does impact on the capacity of the junction and delays and congestion will occur at peak times by the year 2031.

However, notwithstanding this disadvantage the concept is considered achievable as it achieves the best outcome for Aranda residents. Hence it is recommended for further design analysis.