APPENDIX I

Additional Surface Transport Information

Memorandum

3 December 2014

To	Simon Kinchington, Cathy Crawley		
Copy to	-		
From	Michael Yong, Aaron Donges, David Blair	Tel	(07) 3316 3137
Subject	Response to TMR RFI for CG-assessed EIS Sunshine Coast Airport Extension	Job no.	41/25151

1 Introduction

The Department of Transport and Main Roads (TMR) has reviewed Chapter B14: Surface Transport of the Sunshine Coast Airport Expansion Project Environmental Impact Statement (EIS). As a result of this review, TMR have identified three items (Item 7, 8 and 9) which require clarification and/or further investigation. These items, and the corresponding responses, are provided in Section 2.1, 2.2 and 2.3. This memorandum forms GHD's response to TMR's Request for Information (RFI) which was received on 4 November 2014.

2 Response to Request for Information

2.1 Item 7 – Degree of Saturation

TMR COMMENT:

In the Surface Transport report (Chapter B14 of the EIS), Table 14.13a. and Table 14.13e the figures shown are not accurate. The degree of saturation of intersections in the 2012 baseline case is higher than for 2018 for both with and without development. Generally, a growth level of traffic of 3% per year is accepted, however these figures are suggesting no growth and furthermore a decrease.

GHD RESPONSE:

Variations in the Degree of Saturation (DOS) between the baseline and the 'with' and 'without' development scenarios in Table 14.13a and Table 14.13e are largely due to the optimisation of existing cycle and phase times in the SIDRA intersection analysis. The cycle times, phase times and results were compared, and are provided in Table 1.

The existing David Low Way / Airport Drive intersection is a four-leg signalised intersection with a split (north-south) and diamond (east-west) signal phase arrangement, and a cycle time of 80 seconds in the AM peak and 85 seconds in the PM peak. The total intersection demand in 2012 is 1650 vehicles per hour (vph) in the AM peak and 1795 vph in the PM peak, with a corresponding DOS of 0.825 and 0.767, respectively.

The total intersection demand is projected to increase to 1762 vph and 1902 vph in the AM and PM peak, respectively for the without development scenario in the peak construction year of 2018. To cater for the projected increase in demand at the intersection, the following measures were proposed:

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- Optimise the cycle time to 85 seconds in the AM peak
- Increase phase times (i.e. Phases A and D) in the AM peak.

The resulting DOS is 0.673 and 0.863 in the AM and PM peak, respectively. The proposed improvements reduced the DOS in the AM (and Midday) peak compared to the baseline (2012) case. The DOS in the PM peak has worsened compared to the baseline case as no improvements were implemented.

For the with development scenario in 2018, total intersection demand is projected to increase to 1763 vph and 1905 vph in the AM and PM peak, respectively. The additional traffic generated in the peak construction phase at the intersection is considered marginal (i.e. additional one vehicle in the AM peak and three vehicles in the PM peak). This is because the main access point for construction traffic is at the David Low Way / Finland Road intersection.

The resulting DOS is 0.673 and 0.874 in the AM and PM peak, respectively. With the addition of construction traffic the DOS in the AM peak has remained unchanged and marginally reduced in the PM peak compared to the without development scenario (however, the DOS is still within acceptable thresholds of DOS).

The projected demand in the opening year (2020) for the without development scenario is 1831 vph and 1955 vph in the AM and PM peak, respectively. The corresponding DOS is 0.968 and 0.901 in the AM and PM peak, respectively. The proposed improvements (i.e. optimised cycle time of 85 seconds and increase in phase time) have reduced the DOS for the AM (and Midday) peak compared to the baseline case. However, the DOS in the PM peak has increased as no improvements were implemented.

The projected demand in the opening year (2020) for the with development scenario is 1900 vph and 2002 vph in the AM and PM peak, respectively. The corresponding DOS is 0.698 and 0.901 in the AM and PM peak, respectively. An additional 69 vph and 47 vph are expected due to the development and have been found to not significantly impact the performance of the intersection.

Table 1 Summary of modelled phase and cycle times in SIDRA

Assessment scenario	Peak hour	DOS	Demand (vph)	Modelled phase time by sequence (s)				Modelled cycle time (s)
				A	B	C	D	
Baseline (2012)	AM	0.825	1650	14	27	12	27	80
	MID	0.873	1728	14	27	12	27	80
	PM	0.767	1795	19	27	12	27	85
Construction peak – without development traffic (2018)	AM	0.673	1762	18	27	12	28	85
	MID	0.641	1807	19	27	12	27	85
	PM	0.863	1902	19	27	12	27	85
Construction peak – with development traffic (2018)	AM	0.673	1763	18	27	12	28	85
	MID	0.641	1807	19	27	12	27	85
	PM	0.874	1905	19	27	12	27	85
Operations peak – without development traffic (2020)	AM	0.698	1831	18	27	12	28	85
	MID	0.666	1859	19	27	12	27	85
	PM	0.901	1955	19	27	12	27	85
Operations peak – with development traffic (2020)	AM	0.698	1900	18	27	12	28	85
	MID	0.666	1997	19	27	12	27	85
	PM	0.901	2002	19	27	12	27	85

2.2 Item 8 – Impacts at the David Low Way / Airport Drive intersection

TMR COMMENT:

In the Surface Transport report (Chapter B14 of the EIS), the report identifies impacts above the 95th percentile at state-controlled road, David Low Way / Airport Drive intersection, which exceed queue length capacity storage in the PM Peak hour. However no mitigation measures have been identified to address these impacts.

GHD RESPONSE:

As discussed in Chapter B14 of the EIS, comparison of the 'without' and 'with' development scenarios suggests that the reduction in performance at the intersection is due to growth in background traffic rather than the addition of construction or operations traffic. As the reduced intersection performance

estimated in the construction (2018) and operations (2020) phase is due to growth in background traffic, no mitigation measures were proposed.

2.3 Item 9 – Sight distances at the David Low Way / Finland Road intersection

TMR COMMENT:

The Surface Transport report (Chapter B14 of the EIS), identifies that the sight distance is acceptable at David Low Way / Finland Road intersection, based on visual observation, non-technical assessment. In accordance with Austroads Guide to Road Design, Part 4A, Chapter 3, these must be calculated and measured by a RPEQ engineer and require assessment by TMR.

GHD RESPONSE:

Chapter B14 of the EIS (p. 615) states that based on visual observation, the sight distance from Finland Road was adequate when looking east from the David Low Way / Finland Road intersection. It was noted, however, that the presence of a sharp corner and vegetation along the northern edge of David Low Way results in reduced sight distance when looking west from the intersection. As such, Chapter B14 of the EIS acknowledges that reduced sight distance on the west approach could compromise the safe operation of traffic movements at this intersection and notes that the intersection is sub-standard in its current layout.

A sight distance assessment at the David Low Way / Finland Road intersection was undertaken as per Austroads *Guide to Road Design – Part 4A, Chapter 3* (the Guide) with distance measurements recorded in the presence of a RPEQ engineer during a site visit on 28 November 2014. A range of sight distance types are identified within the Guide. The sight distance types shown in Table 2 were assessed as part of the sight distance assessment at the David Low Way / Finland Road intersection.

Table 2 Austroads sight distance types

Sight distance type	Definition	Application
Approach Sight Distance (ASD)	The minimum level of sight distance which must be available on the minor road approaches to all intersections to ensure that drivers are aware of the presence of an intersection	Measurement of the minimum sight distance along Finland Road (minor road) on approach to the David Low Way / Finland Road intersection
Safe Intersection Sight Distance (SISD)	The minimum distance which should be provided on the major road at any intersection	Measurement of the minimum sight distance along David Low Way (east and west) on approach to the conflict point at the David Low Way / Finland Road intersection
Minimum Gap Sight Distance (MGSD)	Based on distances corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning	Estimation of gap acceptance parameters and measurement of the minimum sight distance along David Low Way (east and west) from the

Sight distance type	Definition	Application
	manoeuvre at intersections	David Low Way / Finland Road intersection

Source: Austroads, 2010 *Guide to Road Design – Part 4A, Chapter 3*

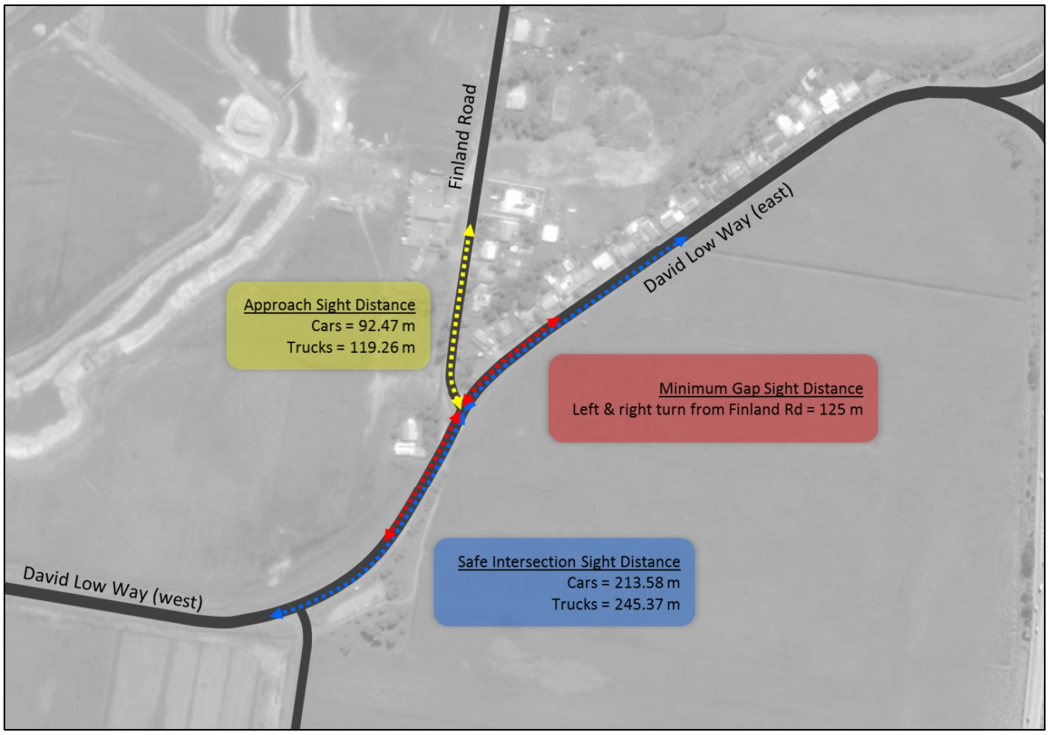
Estimation of the minimum required sight distances for each sight distance type (refer to Table 2) were based on relevant equations within the Guide. For the purpose of the assessment, an operating speed of 10 km/h in excess of the posted speed limit has been assumed in order to provide a conservative assessment. The following parameters form the basis for the assessment:

- Assessed speed limit on David Low Way (east of the intersection) = 70 km/h
- Assessed speed limit on David Low Way (west of the intersection) = 90 km/h
- Assessed speed limit on Finland Road = 70 km/h
- Reaction time = 2 seconds[1]
- Observation time = 3 seconds
- Decision time (reaction time + observation time) = 5 seconds
- Critical gap (left turn) = 5 seconds
- Critical gap (right turn from minor road across two-lane, two-way road) = 5 seconds
- Coefficient of deceleration = 0.36 for cars and 0.24 for trucks
- Longitudinal grade = 0%

These parameters were used to estimate the minimum sight distances required for each sight distance type. These minimum distances are shown in Figure 1.

[1] A reaction time of 2 seconds has been selected for the assessment based on guidance provided in Table 5.2 of Austroads *Guide to Road Design – Part 3*. It should be acknowledged that arguments can be provided for the use of either a 2 or 2.5 second reaction time as the description of when and where to use each of these reaction times only partially accords with the existing conditions of the study intersection. A reaction time of 2 seconds has been adopted with consideration of the broader context of the intersection and its proximity to generally urban land uses and road conditions. The use of a 2 second reaction time is therefore considered to be a more accurate representation of road use and the user experience.

Figure 1 Minimum required sight distances



Source: Google Earth

Note: Distances shown along each approach road have been presented for illustrative purposes only. These distances represent the minimum required sight distance (e.g. for the Approach Sight Distance, a distance of 119.26 m (trucks) has been presented rather than 92.47 m (cars) as this represents the minimum required sight distance).

The actual sight distances which were measured at the David Low Way / Finland Road intersection for each sight distance type are presented in Figure 2.

Figure 2 Measured sight distances

Source: Google Earth

A comparison of the minimum required sight distances (Figure 1) and the measured sight distances (Figure 2) suggests that sight distances at the intersection are adequate for each sight distance type, with the exception of the David Low Way approach (west of the intersection). Sight distances at this approach are inadequate according to the SISD and MGSD sight distance types. A summary of the estimated shortfall in required versus measured sight distances is provided in Table 3.

Table 3 Summary of sight distance shortfalls on David Low Way (west of intersection)

Sight distance type	Required distance	Measured distance	Shortfall
SISD	Cars: 213.58 m	Cars: 112.5 m	Cars: 101.08 m
	Trucks: 245.37 m	Trucks: 112.5 m	Trucks: 132.87 m
MGSD	125 m	112.5 m	12.5 m

According to the assessment, sight distances at the David Low Way / Finland Road intersection are inadequate for vehicles turning both left and right out of Finland Road and for vehicles approaching the

intersection from the west along David Low Way. This finding is consistent with the results of the visual observation discussed in Chapter B14 of the EIS.

This sight distance assessment has been undertaken as per Austroads *Guide to Road Design – Part 4A, Chapter 3* and distance measurements have been recorded in the presence of a RPEQ engineer during a site visit on 28 November 2014. Authorisation of the sight distance assessment is provided below. It should be noted that this authorisation relates to the sight distance assessment only (Section 2.3 of this memorandum) and is not given for the remainder of this document.

RPEQ number: *12871*

Name of RPEQ engineer: *David Blair*

Signature of RPEQ engineer:

Chapter B14, Section 14.17 of the EIS suggested measures to mitigate the impact on traffic operations and safety caused by inadequate sight distances at the David Low Way / Finland Road intersection. One of the key mitigation measures proposed at the intersection was the installation of traffic signals. Full signalisation would address existing safety concerns and issues associated with the current inadequacy of sight distances at the intersection.

Other mitigation measures, some of which were identified in Chapter B14 of the EIS, which could be investigated further, include:

- Speed reduction from 80 km/h to 60 km/h along David Low Way on the western approach to the intersection
- Installing signs on approach to the David Low Way / Finland Road intersection informing motorists of the presence of construction vehicles and/or turning traffic
- Investigate the necessity of constructing a short right-turn lane into Finland Road from David Low Way (east) and/or acceleration/deceleration lanes on approach and departure to/from Finland Road, respectively.

Regards

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