B14 AIRPORT AND SURROUNDS SURFACE TRANSPORT

CONTENTS

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GLOSSARY

AADT	Average Annual Daily Traffic
AM	Morning
DOS	Degree of Saturation
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
ESA	Equivalent Standard Axle
GARID	Guidelines for Assessment of Road Impacts of Development
HCM	Highway Capacity Manual
HV	Heavy Vehicle
km	kilometre
km/h	kilometres per hour
LOS	Level of Service
LV	Light Vehicle
m	metre
PIA	Pavement Impact Assessment
PM	Afternoon
RUMP	Road Use Management Plan
SCR	State-controlled Road
SCRC	Sunshine Coast Regional Council
TMP	Traffic Management Plan
vph	vehicles per hour
vpd	vehicles per day

14.1 INTRODUCTION

14.1.1 Purpose

This chapter reviews the existing traffic and transport situation in and around the study area of the Sunshine Coast Airport Expansion Project (the Project) and investigates the traffic impacts associated with the construction and operation of a new 13/31 runway and upgraded airport terminal building at the Sunshine Coast Airport (SCA).

The purpose of this study is to determine the existing performance of the surrounding State-controlled road (SCR) network, to assess the impact of construction and operations traffic on the network and to determine the necessity, and subsequent extent, of road and intersection upgrades.

14.2 METHODOLOGY AND ASSUMPTIONS

14.2.1 Methodology

The following methodology was adopted to prepare this Traffic and Road Impact Assessment Report:

- Review and analyse existing data including Project-specific data, previous planning work, and regional and local plans which reference SCA
- Undertake site visits to complete a road network inventory and to observe existing traffic operations and road conditions. This was conducted on Tuesday, 18 September 2012
- Meet with the Department of Transport and Main Roads (DTMR) to discuss the proposed expansion plan, traffic assessment approach, study intersections, network performance requirements, potential future road upgrades and key issues. A meeting was held with DTMR on Tuesday, 18 September 2012 to discuss and agree the above-mentioned study parameters and to identify DTMR requirements
- Review and analyse existing baseline traffic data including identification of key road links and study intersections, determination of current design traffic volumes for the morning (AM), midday peak and evening (PM) peak hours, existing heavy vehicle routes and active and public transport networks, and potential future transport upgrades
- Evaluate the performance of the existing study intersections. The study intersections for the baseline, construction and operations scenarios, as agreed with DTMR, are as follows:
  - Airport Drive/Kittyhawk Close
  - David Low Way/Airport Drive
  - Sunshine Motorway/David Low Way
  - David Low Way/Finland Road
- Analysis of the study intersections for the baseline, construction and operations scenarios were based on 2012 peak hour traffic volumes sourced from traffic count data provided by DTMR and traffic count surveys undertaken on Thursday, 15 March 2012 and Tuesday, 18 September 2012
- Review Project data, including Project description, proposed construction and operations scheduling, construction and operations traffic data, flight scheduling, historical and forecasted passenger volumes
- Identify the peak construction year based on construction data provided by Project Support and estimate the volume of vehicles on the road network as a result of construction activities. Construction data as discussed in Chapter A5 of the Environmental Impact Statement (EIS)
- Estimate the volume of vehicles on the road network as a result of opening year (2020) and 10-year design horizon (2030) operations activities:
  - Estimation of the volume of operations traffic for the 'without' development scenario was based on 2.87 per cent per annum growth in historical (2005 to 2012) annual passenger volumes at the airport. Lag factors were applied to both domestic and international flight purposes to account for passenger arrival/departure protocols at the airport. Mode share splits for 2012 were provided by SCA and assumed to remain consistent for future design years. Assumed vehicle occupancy rates were then applied to estimate the volume of vehicles anticipated on the road network. The number of airport employees required to meet passenger demand has been estimated based on a ratio of 25 employees per 100,000 annual passengers to be consistent with Urbis economic assumptions. Directional splits for both employees and passengers were assumed based on current traffic distributions, current and future population and the location of tourism and employment centres.
  - Estimation of the volumes of operations traffic for the 'with' development scenario was based on forecasted daily passenger volumes in the peak day of airport operations. These volumes were multiplied by 365 to determine annual volumes. Lag factors were applied to both domestic and international flight purposes to account for passenger arrival/departure protocols at the airport. Mode share splits for 2012 were provided by SCA and assumed to remain consistent for future design years. Assumed vehicle occupancy rates were then applied to estimate the volume of vehicles anticipated on the road network. The number of airport employees required to meet passenger demand has been estimated based on a ratio of 25 employees per 100,000 annual passengers, to be consistent with Urbis economic assumptions. Directional splits for both employees and passengers were assumed based on current traffic distributions, current and future population and the location of tourism and employment centres

- Undertake a road and traffic impact assessment to determine whether traffic generated as a result of construction and operations traffic needs to be mitigated and whether these activities trigger the need for a more detailed Pavement Impact Assessment (PIA)
- To determine the road pavement impacts, the assessment has been conducted along the main haulage/access routes including:
  - Finland Road
  - David Low Way
  - Airport Drive
- Identify any additional traffic and transport issues associated with the construction and operation of the new runway and upgraded airport terminal
- Summarise key findings, draw conclusions as a result of the assessment and provide measures to mitigate any identified traffic and transport issues.

14.2.2 Assumptions and technical limitations

The following assumptions and technical limitations underpin this Traffic and Road Impact Assessment Report:

- This assessment is based on Project scheduling, vehicle and manning estimates prepared by Project Support. This information, is discussed in Chapter A5 of the EIS
- This assessment is based on historical, forecasted passenger numbers and flight scheduling data
- It is assumed that traffic survey data, either provided by DTMR or sourced independently for the purpose of this study, is representative of regular traffic operations
- It is assumed that 2012 mode share estimates provided by SCA are applicable to future year scenarios.

14.3 POLICY CONTEXT AND LEGISLATIVE FRAMEWORK

This report has been prepared in line with DTMR's *Guidelines for Assessment of Road Impacts of Development* (GARID) and the Terms of Reference developed for the EIS. GARID forms the legislative framework for this assessment as it states that:

> *DTMR will not approve development unless any road impacts of the development can be managed to maintain a safe and efficient road system for all users, as required by the Transport Infrastructure Act 1994. This approach is supported by the legislative powers of both the Integrated Planning Act 1997 [Sustainable Planning Act 2009] and the State Development and Public Works Organisation Act 1974 which enable DTMR to impose conditions to mitigate the road impacts of proposed developments as part of the development planning process.*

In addition to GARID, the local, state and federal documents presented in **Table 14.3a** have been reviewed as part of this study.

14.4 TRAFFIC ASSESSMENT CRITERIA

14.4.1 GARID criteria

The impact of construction and operations traffic on the SCR network, and the necessity for further investigation and/or road upgrade works, was assessed in line with GARID. The guidelines stipulate the following criteria:

> *Criteria 1 – All points of access between the development and the [State-controlled Road] (SCR) network need to be considered for both the construction and operational stages. This includes direct access to an adjacent SCR or indirect access via an intersection of a local government access road with a SCR.*
>
> *Criteria 2 – Generally, pavement impacts need to be considered for any section of a SCR where the construction or operational traffic generated by the development equals or exceeds 5 per cent of the existing [Equivalent Standard Axles] (ESAs) on the road section.*
>
> *For operation of the road links and intersections, assessment is required where the traffic generated by the construction activities exceeds the following thresholds set by Criteria 3 and Criteria 4 in GARID.*
>
> *Criteria 3 – Traffic operation impacts need to be considered for any section of a SCR where the construction or operational traffic generated by the*

Table 14.3a: Significant local, state and federal documents

Local	State	Federal
• Maroochy Plan 2000	• Connecting SEQ 2031: An Integrated Regional Transport Plan for South East Queensland	• *Aviation Transport Security Act 2004*
• Sunshine Coast Airport Master Plan 2007	• Guidelines for Assessment of Road Impacts of Development	• Aviation Transport Security Regulations 2005
• Sunshine Coast Sustainable Transport Strategy 2011-2031	• Queensland Transport and Roads Investment Program 2013-14 to 2016-17	
• Sunshine Coast Active Transport Plan 2011-2031	• South East Queensland Regional Plan 2009-2031	
	• *Transport Infrastructure Act 1994, Transport Security (Counter Terrorism) Act 2008*	

development equals or exceeds 5 per cent of the existing [Average Annual Daily Traffic] (AADT) on the road section, intersection movements or turning movements.

Criteria 4 – Traffic operation impacts need to be addressed for all sections along the haul road where the development traffic equals or exceeds 5 per cent of the existing ESAs.

A traffic operation assessment focussing on overtaking lanes, road width and provision for heavy commercial vehicle movements at intersections will be required, even if an assessment of traffic operations along an identified haul route is not triggered by Criterion 3.

14.4.2 Vehicle classification and composition

As outlined in Criteria 2 of GARID, a PIA is required for any section of a SCR where the construction or operations traffic generated by the development equals or exceeds 5 per cent of the existing ESAs on the road section. Calculation of ESAs is based on ratios which determine the equivalent impact of each type of heavy vehicle on the road network.

For the purpose of this report, ESA ratios for both construction and operations activities have been based on DTMR's *Road Planning and Design Manual*. The ESA ratios used to assess the impact of heavy vehicles on the road network are shown in **Table 14.4a**. The Austroads vehicle classifications, for which the ESAs are cross-referenced, are presented in **Figure 14.4a**.

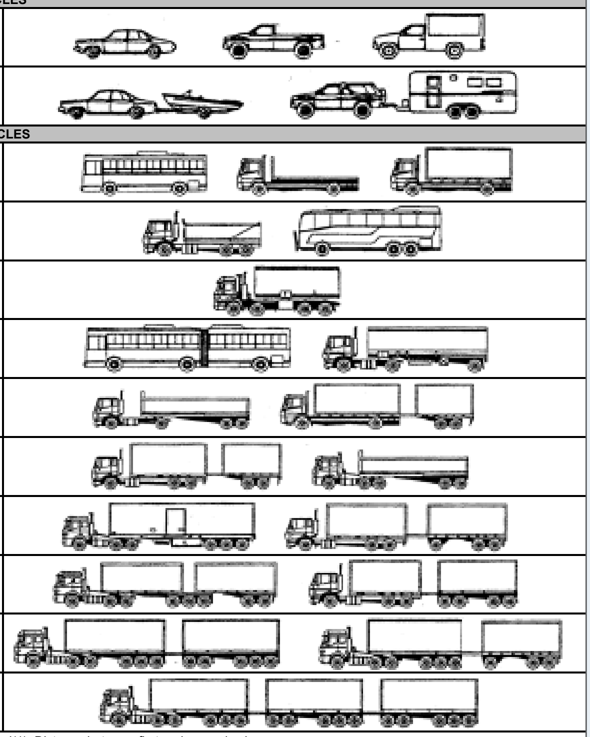
Table 14.4a: Equivalent Standard Axles by Austroads vehicle class

Austroads vehicle classification	Vehicle haulage purpose	ESAs (loaded)
Class 3	Small volume deliveries, service trucks, light lifting equipment	*3.00*
Class 4	Water trucks, additional deliveries and service trucks	3.70
Class 5	Heavy lifting equipment	4.40
Class 6	Plant and equipment deliveries	4.40
Class 9	*Quarry materials and surplus terrestrial fill (truck and dog)*	7.30
Class 10	Heavy earthmoving equipment (e.g. excavators and rollers)	7.20

Figure 14.4a: Austroads vehicle classifications

Level 1 Length (indicative) Type	Level 2 Axles and Axle Groups Axles	Groups	Level 3 Vehicle Type Typical Description	AUSTROADS Classification Class	Parameters
LIGHT VEHICLES					
Short up to 5.5m		1 or 2	**Short** Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	d(1) ≤ 3.2m and axles = 2
	3, 4 or 5	3	**Short - Towing** Trailer, Caravan, Boat, etc	2	groups = 3 d(1) ≥ 2.1m, d(1) ≤ 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5
HEAVY VEHICLES					
Medium 5.5m to 14.5m	2	2	**Two Axle Truck or Bus**	3	d(1) > 3.2m and axles = 2
	3	2	**Three Axle Truck or Bus**	4	axles = 3 and groups = 2
	> 3	2	**Four Axle Truck**	5	axles > 3 and groups = 2
Long 11.5m to 19.0m	3	3	**Three Axle Articulated** Three axle articulated vehicle, or Rigid vehicle and trailer	6	d(1) > 3.2m, axles = 3 and groups = 3
	4	> 2	**Four Axle Articulated** Four axle articulated vehicle, or Rigid vehicle and trailer	7	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2
	5	> 2	**Five Axle Articulated** Five axle articulated vehicle, or Rigid vehicle and trailer	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2
	≥ 6	> 2	**Six Axle Articulated** Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3
Medium Combination 17.5m to 36.5m	> 6	4	**B Double** B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6
	> 6	5 or 6	**Double Road Train** Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6
Large Combination Over 33.0m	> 6	> 6	**Triple Road Train** Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6

Typical Configuration



Definitions:
Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)
d(1): Distance between first and second axle
d(2): Distance between second and third axle

Source: Austroads, n.d.

14.4.3 Road link performance

A road link Volume to Capacity (V/C) analysis has been conducted in accordance with Austroads' *Guide to Traffic Engineering Practice: Part 2 – Roadway Capacity* to determine road link performance. The following road link (mid-block) capacities have been adopted for the assessment and takes into account existing road characteristics and geometry. A threshold V/C ratio of 1 has been adopted for the analysis.

- David Low Way (two-lane, two-way) – 2290 vehicles per hour (vph) (two-way)
- Airport Drive – 2785 vph/direction (northbound)
- Airport Drive – 2767 vph/direction (southbound)
- Sunshine Motorway approaches – 3593 vph/lane (eastbound) – west of Airport Drive
- Sunshine Motorway approaches – 3605 vph/lane (westbound) – west of Airport Drive.

14.4.4 Intersection performance criteria

To assess traffic operation impacts (Criteria 3 and Criteria 4 of GARID), SIDRA 6 intersection modelling software was used to assess the operational performance of the study intersections. The performance measures presented in the ensuing sub-headings were adopted to determine the performance of the study intersections. It should be noted that these performance measures apply to the assessment of both the construction and operations phases of the airport.

Degree of Saturation (DOS)

The Degree of Saturation (DOS) is the ratio between the volume of traffic entering an intersection and the capacity of the intersection. According to DTMR guidelines, the desirable upper limits prescribed for each intersection type are as follows:

- 0.80 for priority-controlled intersections
- 0.85 for roundabouts
- 0.90 for signalised intersections.

Level of Service (LOS)

The Level of Service (LOS) is an indication of the operational performance of an intersection. It is based on service measures such as delay, DOS and traffic density during a given flow period. For the analysis, LOS based on controlled delay has been determined in accordance with the Highway Capacity Manual (HCM) as presented in **Table 14.4b**.

For this study, a threshold LOS D by intersection approach has been adopted for the assessment.

Average Delay (seconds)

The average delay represents the average control delay experienced per vehicle at an intersection. The average delay also includes the geometric delay at intersections.

95th Percentile Queue Length (metres)

The 95th percentile queue length is defined as the queue that would be exceeded in 5 per cent of cases. Calculated queue lengths were investigated to determine whether they could be contained within the available storage and not impact on adjacent intersections or property access points.

14.5 EXISTING CONDITIONS

14.5.1 Existing road network

14.5.1.1 Road links

The following road links have been identified as key to the current and future movement of vehicles to and from the airport:

- Sunshine Motorway
- David Low Way
- Airport Drive
- Finland Road.

Table 14.5a presents a description of the key road links in the vicinity of the Project site. These key roads and their interaction with the broader road network are presented in **Figure 14.5a**.

Sunshine Motorway

Sunshine Motorway is a sealed, SCR that provides the primary road connection from the Bruce Highway at Sippy Downs in the south, via Mooloolaba and Maroochydore, to Peregian in the north.

North of the David Low Way interchange, Sunshine Motorway is a two-lane, two-way road with sealed 1.5 m wide (approx.) shoulders and a speed limit of 100 km/h.

Table 14.4b: HCM LOS criteria

	Controlled Delay per vehicle in seconds (D)	
Level of Service	**Signals and Roundabouts**	**Stop and Give-Way Signs**
A	D ≤ 10	*D ≤ 10*
B	10 < D ≤ 20	10 < D ≤ 15
C	20 < D ≤ 35	15 < D ≤ 25
D	35 < D ≤ 55	25 < D ≤ 35
E	*55 < D ≤ 80*	35 < D ≤ 50
F	80 < D	50 < D

Table 14.5a: Summary of key roads

Road	Configuration	Speed limit	Owner
Sunshine Motorway	Four-lane, Two-way Two-lane, Two-way	100 km/h	DTMR owned, State-controlled road, sealed
David Low Way	Two-lane, Two-way	60 km/h*	DTMR owned, State-controlled road, sealed
Airport Drive	Four-lane, Two-way	60 km/h	SCRC owned. Main road access to SCA, sealed
Finland Road	One-lane, Two-way	No posted speed limit	SCRC owned. Narrow and partially sealed

Note:

(*) The speed limit on David Low Way ranges between 60 km/h and 80 km/h along the entirety of the route. As David Low Way is a 60 km/h speed zone in the immediate vicinity of the SCA, this speed limit has been presented in **Table 14.5a***.*

Figure 14.5a: Existing and proposed state-controlled road network

Source: DTMR, 2013

South of this interchange, the motorway is a four-lane, two-way road with sealed 1.5 m wide (approx.) shoulders and a speed limit of 100 km/h. Visual observations in September 2012 indicated that the pavement surface, road marking and lighting were in relatively good condition (refer to **Figure 14.5b**).

The Sunshine Motorway was developed on a raised embankment through the Maroochy River floodplain to provide flood immunity. It does not include formal longitudinal drainage, such as kerb and channel or swale drains. A number of culverts and a bridge over Marcoola drain provide cross drainage for the Motorway.

Sunshine Motorway Cane Underpass

An existing cane underpass beneath the Sunshine Motorway is proposed to be used as part of the construction access road network. The underpass was established to provide occupational access to either side of the motorway. As-constructed drawings for the underpass (TMR, 1993) indicate the underpass has 4.5 m clearance and provides approximately 4 m of trafficable width. The existing underpass and connecting access road is currently unsealed. The access road appears to be wholly within the Sunshine Motorway road corridor, and is grade-separated from the motorway; in some areas it is also separated by either dense vegetation or fencing.

Figure 14.5b: Images of Sunshine Motorway

Top left: Image looking north along the Sunshine Motorway, showing the Finland Road overpass

Top right: Image looking north along the Sunshine Motorway, from the Finland Road overpass

Bottom left: Image looking north along the Sunshine Motorway, showing the exit to David Low Way

Bottom right: Image looking south along the Sunshine Motorway

Source: GHD, 2012

David Low Way

David Low Way (also known as Maroochydore-Noosa Road) is a sealed, state-controlled district road that provides a connection from Noosa Heads in the north to Maroochydore in the south. David Low Way is a two-lane, two-way road and, due to the length and variety of adjacent land uses over its entirety, is subject to a range of speed limits and shoulder widths. The portion of David Low Way directly relevant to the airport expansion has a posted speed limit of 60 km/h and shoulder widths of approximately 1-2 m, as shown in **Figure 14.5c**. Visual observations in September 2012 indicated that the pavement on David Low Way was in relatively good condition. DTMR have indicated that they have no plans to rehabilitate the pavement of David Low Way in the vicinity of Finland Road within the next five years (i.e. up to 2019).

Figure 14.5c: Images of David Low Way

Top left: Image looking south along David Low Way, adjacent to the eastern boundary of the airport

Top right: Image looking west along David Low Way towards the David Low Way/Airport Drive intersection

Bottom left: Image looking east along David Low Way from the David Low Way/ Finland Road intersection

Bottom right: Image looking west along David Low Way from the David Low Way/Finland Road intersection

Source: GHD, 2012

Airport Drive

Airport Drive is owned by Sunshine Coast Regional Council (SCRC) and provides a connection from David Low Way to the existing airport terminal. As shown in **Figure 14.5d**, this link is a four-lane, two way road with a wide grassed median separating opposing traffic movements. This link has a posted speed limit of 60 km/h and also provides the primary access from David Low Way to the existing and proposed industrial/commercial developments located to the west of the airport, on either side of Airport Drive. Access to these developments is provided via the Airport Drive/ Kittyhawk Close roundabout intersection. Visual observations in September 2012 indicated that the pavement on Airport Drive was in relatively good condition.

Figure 14.5d: Images of Airport Drive

Top left: Image looking north from David Low Way towards Airport Drive

Top right: Image looking north along Airport Drive showing approach lanes to the airport

Bottom left: Image looking north along Airport Drive showing departure lanes from the airport

Bottom right: Image looking south along Airport Drive showing the Airport Drive/ Kittyhawk Close roundabout intersection

Source: GHD, 2012

<u>Finland Road</u>

Finland Road is a SCRC-owned no through road which currently provides local residential access. This road intersects with David Low Way in the south, crosses the Sunshine Motorway via an overpass (refer to **Figure 14.5b**), and terminates to the west of the existing 12/30 airport runway. Due to the low-lying topography and proximity to the Maroochy River, Finland Road is susceptible to flooding and could experience complete inundation in the event of the 100 year Average Recurrence Interval flood.

As shown in **Figure 14.5e**, the condition of Finland Road varies significantly over its entirety; with the road link able to be divided into three distinct pavement sections. The first section of Finland Road runs north from the intersection with David Low Way for approximately 2.8 km. While this section of Finland Road is sealed, the pavement condition is poor due to repeated patching work and pavement edge decay. This section has a narrow one-lane, two-way road width (3.5 m approx.) with gravel shoulders on either side of the road at widths of 1-2 m. The next section of Finland Road runs north for approximately 1 km and includes a bridge overpass over the Sunshine Motorway. The pavement condition and delineation of this two-lane, two-way sealed section is better than the first section. According to DTMR's bridge branch, the bridge structure was designed to T44 and HP 320 standard and is considered acceptable for heavy vehicle use.

It should be noted, however, that DTMR requires a detailed assessment once actual vehicle specifications are known. The final one-lane, two-way section of Finland Road is unsealed and continues north for approximately 1.5 km.

Figure 14.5e: Images of Finland Road

Top left: Image looking north-east along David Low Way, showing entrance to Finland Road

Top right: Image looking north along Finland Road, showing poor pavement condition (first section) and flood susceptibility

Bottom left: Image looking north-east along Finland Road, showing improved pavement condition (second section) and approaching left-turn

Bottom right: Image looking south-west along Finland Road, showing approach to Sunshine Motorway bridge overpass

Source: GHD, 2012

14.5.1.2 Intersections

The following four intersections have been identified as likely to be significantly impacted by the future movement of construction and operations traffic as a result of the airport expansion:

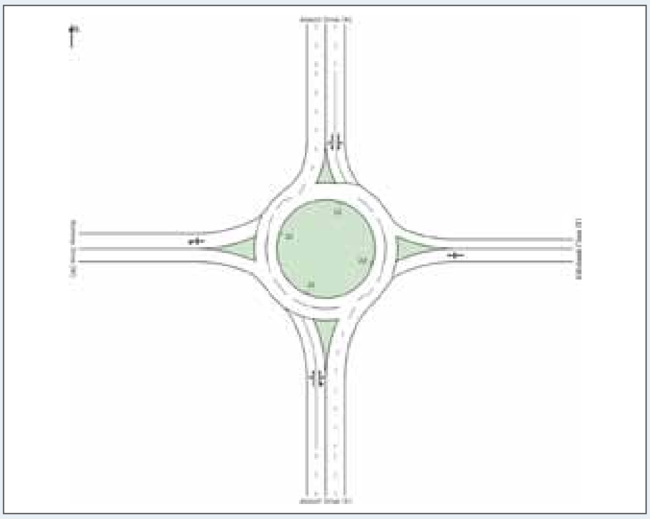
- Airport Drive/Kittyhawk Close roundabout
- David Low Way/Airport Drive signalised intersection
- Sunshine Motorway/David Low Way roundabout
- David Low Way/Finland Road priority intersection.

The existing performance of the study intersections has been assessed in **Section 14.10.2** of this report. The following section presents an overview of the four study intersections.

<u>Airport Drive/Kittyhawk Close intersection</u>

As shown in **Figure 14.5f**, the Airport Drive/Kittyhawk Close intersection is a four-leg roundabout. This intersection provides access to the existing industrial developments on either side of Airport Drive. Visual observations in September 2012 indicated that the pavement condition, delineation and lighting were in relatively good condition.

Figure 14.5f: Images of Airport Drive/Kittyhawk Close intersection



Top left: Conceptual layout of the Airport Drive/Kittyhawk Close intersection

Top right: Image looking north along Airport Drive towards the Airport Drive/Kittyhawk Close intersection

Bottom left: Image looking east along Runway Drive towards the Airport Drive/Kittyhawk Close intersection

Bottom right: Image looking west along Kittyhawk Close towards the Airport Drive/Kittyhawk Close intersection

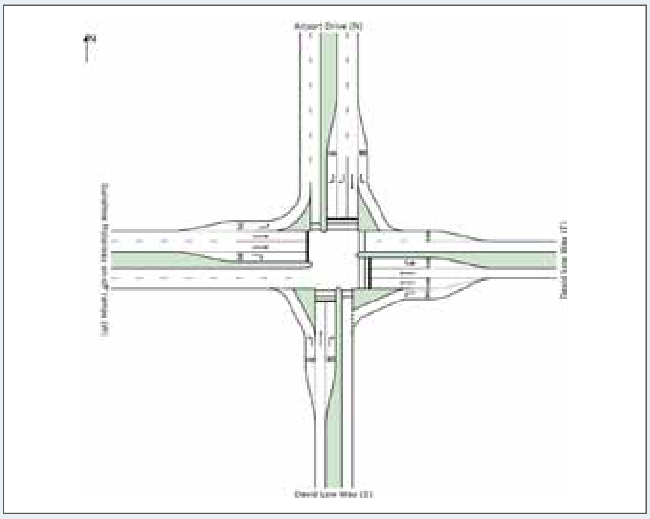
Source: GHD, 2012

David Low Way/Airport Drive intersection

The David Low Way/Airport Drive intersection is a four-leg signalised intersection with slip lanes on each leg (refer to **Figure 14.5g**). The western leg of the intersection links directly to the Sunshine Motorway, where north-south intra and inter-regional road connections are available. As a result of the direct connection, this leg provides the primary access to the airport for passengers from both the north and the south. Pedestrian crossing facilities are provided on the northern, southern and eastern legs of the intersection. On-road cycle provisions are available on the western, eastern (left-turn slip lane only) and southern approaches to the David Low Way/Airport Drive intersection with corresponding cycle departure lanes provided on the eastern and southern departures lanes from the intersection. A discussion on the existing walk and cycle network is provided in **Section 14.8.1**.

Visual observations in September 2012 indicated that the pavement condition, delineation and lighting at the intersection were in relatively good condition.

Figure 14.5g: Images of David Low Way/Airport Drive intersection



Top left: Conceptual layout of the David Low Way/Airport Drive intersection

Top right: Image looking south along Airport Drive towards the David Low Way/Airport Drive intersection

Bottom left: Image looking east along David Low Way towards the David Low Way/Airport Drive intersection

Bottom right: Image looking west along David Low Way towards the David Low Way/Airport Drive intersection

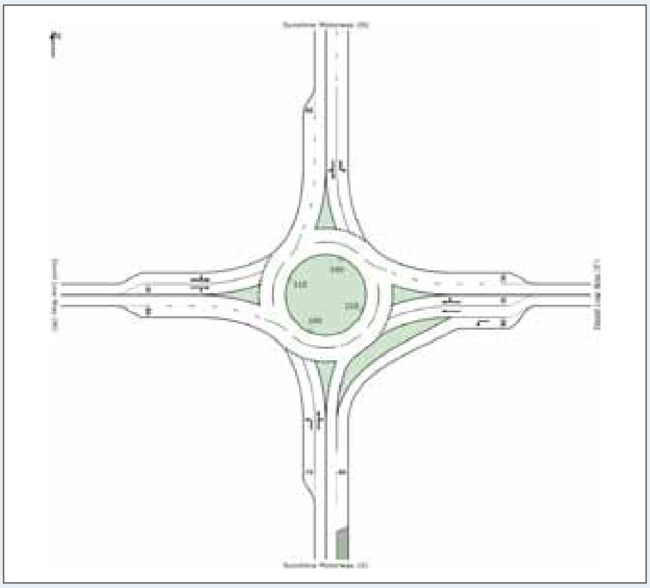
Source: GHD, 2012

Sunshine Motorway/David Low Way intersection

The Sunshine Motorway/David Low Way intersection is a four-leg roundabout with a continuous left-turn movement from David Low Way to the Sunshine Motorway (southbound). This intersection is considered to be of strategic importance with regard to the airport as it provides both intra and inter-regional vehicle access to Finland Road and the airport.

Through movements (mainline) on the Sunshine Motorway are grade-separated and have been excluded from the intersection analysis (refer to **Figure 14.5h**).

Figure 14.5h: Images of Sunshine Motorway/David Low Way intersection



Top left: Conceptual layout of the Sunshine Motorway/David Low Way intersection

Top right: Image looking east along David Low Way towards the Sunshine Motorway/David Low Way intersection

Bottom left: Image looking east at the Sunshine Motorway/David Low Way intersection showing the roundabout circulating lanes and Sunshine Motorway overpass

Bottom right: Image looking west along David Low Way showing the continuous left turn movement used to access the Sunshine Motorway (southbound)

Source: GHD, 2012

David Low Way/Finland Road intersection

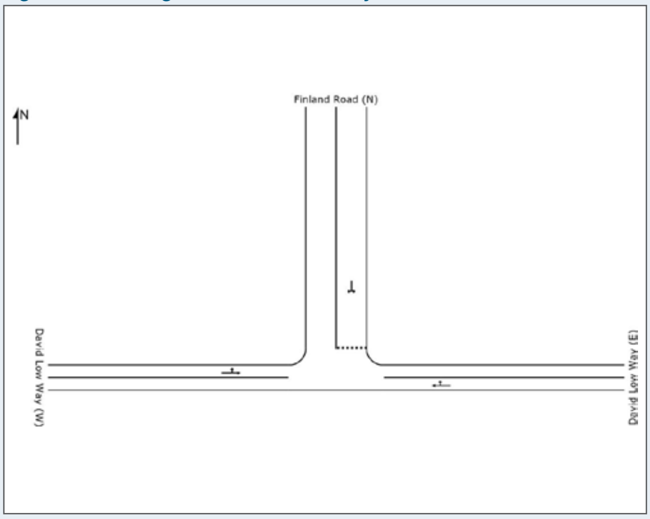
The David Low Way/Finland Road intersection is a three-leg priority-controlled intersection with no turn or acceleration/deceleration lanes. As shown in **Figure 14.5i**, the Finland Road intersection marks the transition between speed limits along David Low Way. East of this intersection, David Low Way has a posted speed limit of 60 km/h while to the west it has a posted speed limit of 80 km/h.

Based on visual observation in September 2012, the sight distance from Finland Road was adequate when looking east from the David Low Way/Finland Road intersection. However, the presence of a sharp corner and vegetation along the northern edge of David Low Way results in reduced sight distance (approximately 70 m) when looking west from the intersection. Reduced sight distances could compromise the safe operation of traffic movements at this intersection.

The David Low Way/Finland Road intersection provides access for approximately 16 residential properties, with the closest property located immediately west of the intersection and directly accessing Finland Road (refer to **Figure 14.5i**). This access point is located at an unsafe distance from the intersection and the entrance is difficult to identify due to the angle of the access point in relation to Finland Road and the existing intersection geometry. This access point and the intersection geometry could also compromise the safety of pedestrians and cyclists using the shared walk and cycle path located along the northern side of David Low Way at this intersection.

As shown in **Figure 14.5i**, an on-street bus stop is currently located immediately east of the intersection along David Low Way. The presence of a bus at this stop could obstruct the vision of drivers exiting Finland Road, hinder the through movement of eastbound vehicles along David Low Way and also limit a driver's ability to recognise people crossing Finland Road.

Figure 14.5i: Images of David Low Way/Finland Road intersection



Top left: Conceptual layout of the David Low Way/Finland Road intersection

Top right: Image looking south along Finland Road towards the David Low Way/Finland Road intersection

Bottom left: Image looking east along David Low Way from the David Low Way/Finland Road intersection showing the nearby bus stop and the posted change of speed from 80 km/h to 60 km/h for eastbound traffic

Bottom right: Image looking west along David Low Way from the David Low Way/Finland Road intersection showing the limited sight distance and property access next to the intersection

Source: GHD, 2012

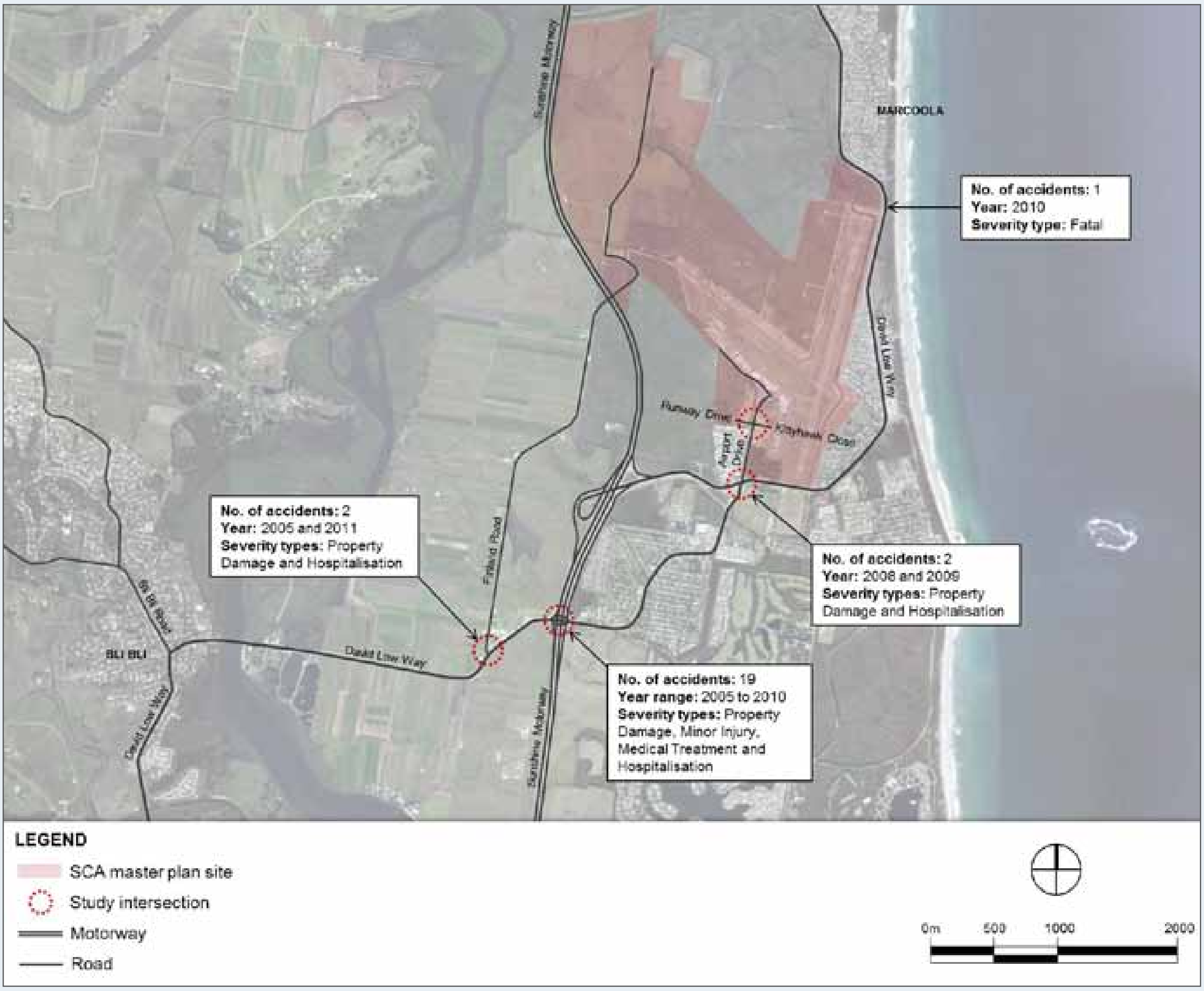
14.6 ACCIDENT ANALYSIS

An analysis of available accident data at the study intersections indicate that the Sunshine Motorway/David Low Way intersection experienced the highest number of accidents, with 'rear-ending' identified as a common cause of accidents at this intersection. As shown in **Figure 14.6a**, two accidents each were recorded at the David Low Way/Airport Drive and the David Low Way/Finland Road intersections. While a low number of accidents were recorded at the David Low Way/Finland Road intersection, site observations of the existing intersection geometry and alignment suggests that there is potential for significant vehicle accidents, especially if the number of vehicles using this intersection was to increase.

In addition to accidents at the study intersections, a fatal accident was recorded along David Low Way close to the north-east corner of the airport (refer to **Figure 14.6a**). This portion of David Low Way is a two-lane, two-way road and is close to a right-angle bend in the road. The location of this fatality is close to the site of a pipeline which is proposed to be installed across David Low Way in order to facilitate the movement of dredged sand from a barge to the site. Temporary traffic management may be required to ensure safe traffic operations during pipeline installation.

This high-level accident analysis has been based on limited available data as provided by DTMR and the potential for under-reporting of accidents should be considered.

Figure 14.6a: Accident analysis



Source: David Low Way Accident Data, 2012

14.7 EXISTING TRAFFIC VOLUMES AND GROWTH

14.7.1 Design peak hours

In order to gain an understanding of the existing (2012) traffic situation in the immediate vicinity of the airport and on the surrounding road network, the following traffic volume information has been analysed:

- David Low Way/Airport Drive intersection counts undertaken on 15 March 2012
- Airport Drive/Kittyhawk Close intersection counts undertaken on 18 September 2012
- Sunshine Motorway/David Low Way intersection counts undertaken on 18 September 2012
- Traffic Analysis and Reporting System (TARS) Daily Volume Report at various locations along David Low Way during August 2012
- TARS Weekly Volume Report at various locations along David Low Way during April 2012
- TARS Annual Volume Report at various locations along David Low Way for the year 2011. The TARS report also provided an indication of historical traffic growth for the preceding 5 and 10 year periods
- TARS Average Annual Daily Traffic Segment Report at various locations along David Low Way for the year 2011.

Analysis of the intersection count data reveals two distinct traffic profiles (refer to **Figure 14.7a**). The first profile, as evidenced in the graph for the David Low Way/Airport Drive and the Sunshine Motorway/David Low Way intersections, indicates three peak periods throughout the day, namely:

- AM peak period
- Midday peak period
- PM peak period.

The second profile, as shown in the graph for the Airport Drive/Kittyhawk Close intersection (refer to **Figure 14.7a**), also indicate three peak periods, however with a dominant Midday and an earlier PM peak (2:00 pm to 3:00 pm). The peaking characteristics at the Airport Drive/Kittyhawk Close intersection may be influenced by existing airport related construction activity, movement of airport personnel and the presence of nearby industrial and commercial activities on either side of Airport Drive.

For the purpose of assessing the current traffic situation in and around the study area, the profile exhibited at the David Low Way/Airport Drive intersection has been adopted as representative of peak passenger and visitor movements at the airport and has been utilised.

Therefore the adopted design peak hours are as follows:

- AM peak– 8:00 am to 9:00 am
- Midday peak – 11:30 am to 12:30 pm
- PM peak – 4:45 pm to 5:45 pm.

The David Low Way/Airport Drive intersection is the key intersection between the primary road entrance to the airport and the SCR network. It would capture a realistic mix of general and airport-related traffic and would be more appropriate for indicating the design peaks.

14.7.2 Traffic growth

The 2012 Daily Volume Report data suggests that traffic movement along David Low Way corresponds to commuter flow patterns, with weekday traffic moving from the northern communities of Noosa, Peregian and Marcoola to Maroochydore in the south in the AM peak and from Maroochydore to the northern communities in the PM peak. According to 2011 Annual Volume Report data, traffic volumes immediately west of the David Low Way/Finland Road intersection grew by 7.4 per cent from 2010-2011. At this same location, traffic grew by between 1.2 per cent per annum (p.a.) and 2.8 per cent p.a. in the five and 10 years (to 2011), respectively.

Strategic transport and land use planning is likely to provide a more accurate source of information regarding potential future growth in the region and its effect on traffic operations. This is discussed in greater detail in **Section 14.9**.

14.8 EXISTING ACTIVE AND PUBLIC TRANSPORT

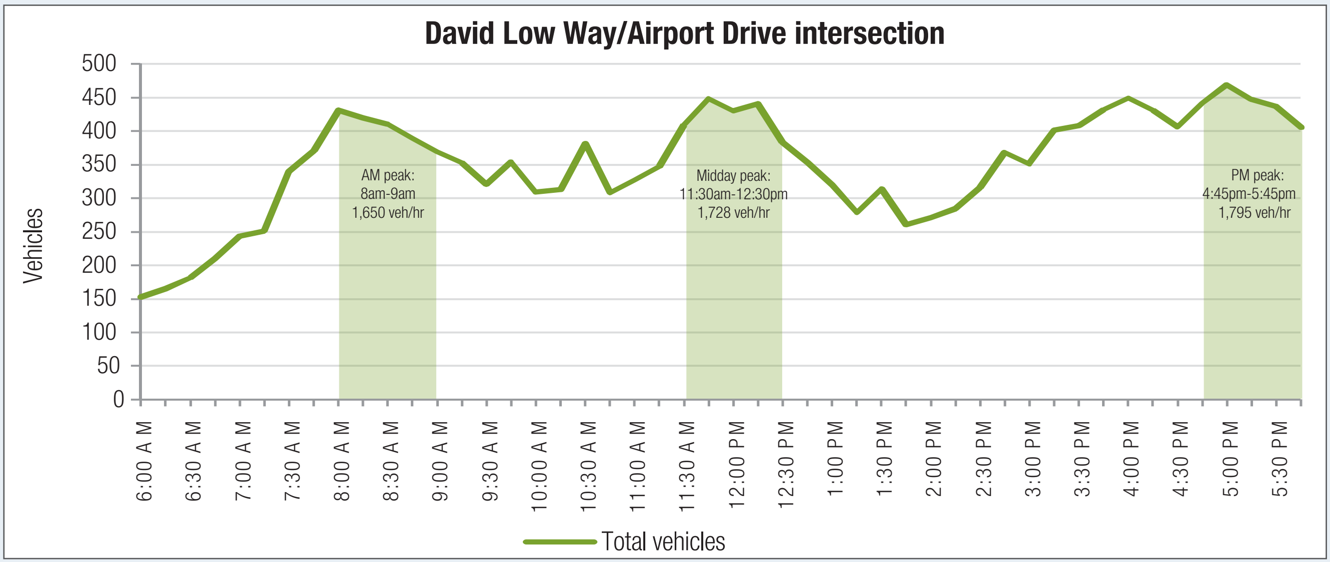
A discussion on the current active and public transport networks with respect to the airport is provided under the respective sub-headings.

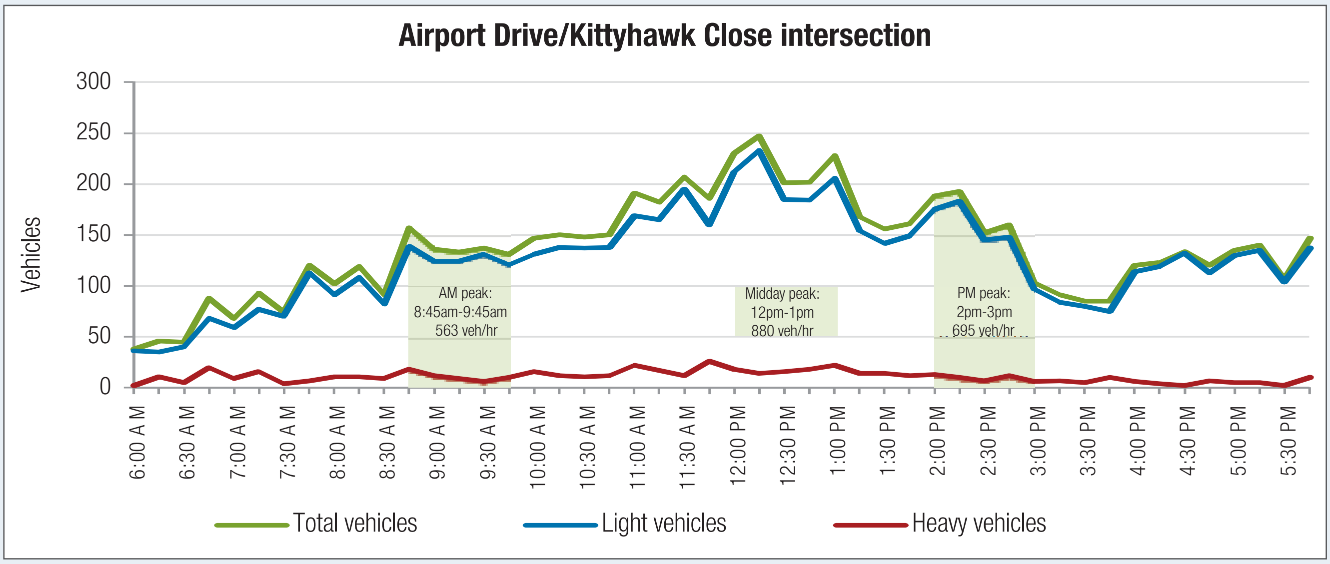
14.8.1 Existing active transport

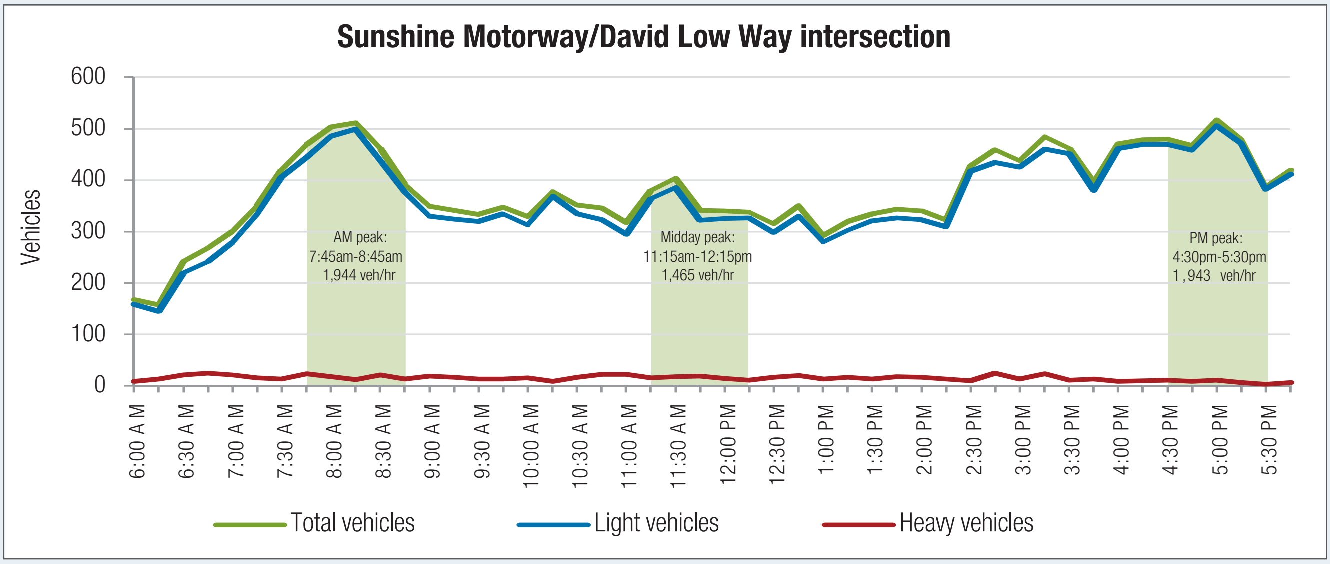
The airport can currently be accessed by walking and cycling. A recently completed off-road shared walking and cycling connection along the eastern side of Airport Drive provides a direct connection between David Low Way and the existing airport terminal. From the David Low Way/Airport Drive intersection, pedestrian links are available south and west to Godfreys Road (west of Finland Road) intermittently on both sides of David Low Way and east, along the northern side of David Low Way to Boundary Crescent. According to the Sunshine Coast Active Transport Plan 2011-2031, these pedestrian links currently have a width of 2 m or less.

In addition, on-road cycle lanes are also provided on the western, eastern and southern approaches, and eastern and southern departure lanes at the David Low Way/Airport Drive intersection. Beyond the intersection, non-standard on-road cycle routes continue east and north along David Low Way to Noosa Heads, south to Mudjimba Beach Road and west to the Sunshine Motorway.

Figure 14.7a: 12-hour traffic volume profiles – baseline situation







Note: To improve accuracy, traffic counts at the Sunshine Motorway/David Low Way intersection exclude the through movement along the Sunshine Motorway.

The number of walking trips to the airport is expected to be low. Limited cycling trips are expected from nearby residential catchments of Marcoola, Mudjimba, Pacific Paradise and Maroochydore (north). The current use of active transport modes to access the airport is not considered to be significant.

14.8.2 Existing bus public transport

Sunbus, in partnership with TransLink, currently provide two direct bus transport connections to the airport. These are:

- Route 622 – Noosa Heads to Maroochydore (via Peregian, Coolum and Marcoola)
- Route 623 – Coolum to Nambour (trial service).

Both Routes 622 and 623 stop adjacent to the existing airport terminal on Friendship Avenue (refer to **Figure 14.8a**). The weekday frequency of bus services during the identified AM, Midday and PM peak hours at this stop is presented in **Table 14.8a**.

Two additional bus services (Route 613 and Route 620) also operate in the vicinity of the airport, along portions of David Low Way. These services, however, do not access the airport or utilise the David Low Way/Airport Drive intersection. As both services utilise the Kowonga Street stop, the weekday frequency of these bus services during the identified AM, Midday and PM peak hours at this stop is shown in **Table 14.8b**.

Both employees and visitors are expected to utilise these public and private bus connections to varying degrees to access the airport. Due to the low frequency in the peak (2-3 buses per hour), existing bus transport services are not expected to significantly impact on the operation of the road network.

In addition to public bus services, private coaches and airport shuttle buses provide flexible transport connections to and from the airport. These connections are provided by Bay2Dore, Cooloola Connections, Henry's Airport Shuttle, Storeyline Tours, and Sun Air Bus Services and can be accessed via a designated bus pick-up/set-down area immediately south of the existing terminal building (refer to **Figure 14.8a**). While the number of bus services may vary depending on passenger demand, these private services generally correspond with aircraft timetabling.

Table 14.8a: SCA peak hour bus frequency – existing (2012)

Routes	AM (8:00 am to 9:00 am)		Midday (11:30 am to 12:30 pm)		PM (4:45 pm to -5:45 pm)	
	In*	Out	In	Out	In	Out
622	1	1	1	1	1	1
623	0	1	0	1	0	0
TOTAL	1	2	1	2	1	1

Note:

(*) 'In' movements for Route 622 denotes bus movements from Noosa to Maroochydore. 'In' movements for Route 623 denotes bus movements from Coolum to Nambour. 'Out' movements represent bus movements in the opposing direction.

Table 14.8b: David Low Way peak hour bus frequency – existing (2012)

	AM (8:00 am to 9:00 am)		Midday (11:30 am to 12:30 pm)		PM (4:45 pm to -5:45 pm)	
Routes	In*	Out	In	Out	In	Out
613	1	0	0	0	0	1
620	2	2	2	2	2	2
TOTAL	3	2	2	2	2	3

Note:

(*) 'In' movements for Route 613 denotes bus movements from Twin Waters to Maroochydore. 'In' movements for Route 620 denotes bus movements from Tewantin to Maroochydore. 'Out' movements represent bus movements in the opposing direction.

Figure 14.8a: Images of bus stop infrastructure in and around SCA

Top left: Image looking east towards the SCA bus stop outside the existing terminal

Top right: Image looking north along Friendship Avenue towards the SCA bus stop

Bottom left: Image looking south towards the existing coach and shuttle pick-up/set-down areas at the airport

Bottom right: Image looking north towards the existing bus stop along David Low Way, with Friendship Avenue (closed) shown in the background

Source: GHD, 2012

14.9 PLANNING AND FUTURE TRANSPORT INFRASTRUCTURE UPGRADES

Current strategic and transport planning identifies potential upgrades and improvements to the transport network which may impact upon the airport site in the future. These potential improvements are summarised below:

14.9.1 South East Queensland Regional Plan 2009-2031

The South East Queensland Regional Plan 2009-2031 aims to sustainably manage regional growth and change until 2031 by providing a vision and strategic directions for the 11 regional and city councils within the South East Queensland (SEQ) region. The Regional Plan provides indicative 2031 planning populations, identifies potential growth areas and also proposes transport infrastructure to facilitate the movement of residents and visitors to, from and within the Sunshine Coast.

According to the Regional Plan, 98,000 new dwellings will be required by 2031 in order to meet the expected 2031 population of 497,000. It is expected that this growth will be comprised of a mix of infill and broadhectare development, largely focused south of the Maroochy River at Maroochydore, Caloundra, Sippy Downs, Palmview, Kawana, Nambour and Beerwah.

Due to the spatial distribution of these future development areas and the completion of the strategic Sunshine Motorway, David Low Way is not expected to experience significant traffic growth as a result of these developments in the medium to longer term. This was reinforced by discussions with DTMR, where the desire to reduce the significance of David Low Way in the future and to also transfer ownership and maintenance responsibilities to SCRC was highlighted.

Additionally, the designation of Caloundra South (approximately 25 km south of the airport) as a Development Area is likely to lead to increases in population numbers in this area. As a result, the Caloundra South Development Area has the potential to act as a key catchment for air passengers using the airport in the future.

14.9.2 Connecting SEQ 2031

As SEQ's official Integrated Regional Transport Plan, Connecting SEQ 2031 establishes a long-term plan to develop a sustainable transport system in the region. In Connecting SEQ 2031, the airport and associated aeronautical support industry and office park has been identified as a district hub i.e. a local interchange located on corridors connecting them to regional or sub-regional hubs, in the transit hierarchy. Connecting SEQ 2031 suggests the airport will fulfil the role of district hub through the generation of public transport demand and the provision of transport connections to the Maroochydore regional hub/principal activity centre. In support of this transport connection is the proposed TransitWay corridor which is expected to provide a direct public bus link between the airport and Noosa to the north and Caloundra (via CoastConnect) to the south. TransitWay prioritises buses in an attempt to provide frequent, fast, efficient and reliable services along the identified corridor/s.

Additionally, Connecting SEQ 2031 suggests that a new passenger heavy rail line linking Maroochydore to the existing Sunshine Coast rail line at Beerwah will be part of the 2031 network. This is discussed in greater detail below.

14.9.2.1 Passenger rail initiatives

A heavy passenger rail line was proposed in the Caboolture to Maroochydore Corridor Study (CAMCOS), ultimately linking SCA to the existing passenger rail network north of Brisbane. In support of this, the Queensland Government has upgraded and duplicated existing tracks, eliminated dangerous open level crossings, and also taken steps to protect the preferred future public transport corridor through land acquisitions. While timeframes for construction and completion of the Sunshine Coast rail line are unknown, Connecting SEQ 2031 indicates that the line, terminating at Maroochydore, will be part of the 2031 network. Ultimately, this rail line is expected to extend north to the airport where a rail station has been proposed and subsequently included in conceptual drawings for the new airport terminal.

In addition, approval has recently been acquired to develop a business case for the potential implementation of light rail on the Sunshine Coast. In the event that light rail is approved and progressed, construction of the first stage is expected to commence in 2020. While this stage is expected to provide a connection between Caloundra and Maroochydore, the possibility to extend the network to provide a connection to the airport has been identified in the longer term. Initial estimates, however, suggest that a connection to the airport is not expected until late 2020-early 2030.

Given the uncertainty around the timing and funding of CAMCOS and the Sunshine Coast light rail, they have been excluded from the impact assessment.

14.9.2.2 Queensland Transport and Roads Investment Program 2013-14 to 2016-17

The Queensland Transport and Roads Investment Program 2013-14 to 2016-17 (QTRIP) details the program of roadworks DTMR plans to deliver throughout Queensland over a four year period. In the immediate vicinity of the airport, QTRIP specifically identifies the following short to medium term transport infrastructure upgrades:

- Improve intersections at various locations along David Low Way at an indicative total cost of $2,200,000
- Construct an interchange along the Sunshine Motorway (Mooloolaba-Peregian) at the Sunshine Motorway/ David Low Way intersection at an indicative total cost of $110,831,000
- Construct cycleways along David Low Way (Chainage 6.10 km to 10.74 km) at a combined indicative total cost of $6,250,000.

14.10 EXISTING NETWORK PERFORMANCE

The existing performance of the road network is assessed in terms of the link and intersection performance.

14.10.1 Existing road link capacity

An assessment of the existing V/C ratio along David Low Way and Airport Drive has been conducted to provide an indication of current performance of the key road links. The locations where the V/C has been calculated are shown in **Figure 14.10a**.

The road link capacity analysis has been conducted in accordance with Austroads' *Guide to Traffic Engineering Practice: Part 2 – Roadway Capacity* and takes into account existing road characteristics and geometry.

14.10.1.1 David Low Way

The calculated V/C ratio at select locations along David Low Way for the AM, midday and PM peak hours are provided in **Table 14.10a**, **Table 14.10b**, **Table 14.10c**, **Table 14.10d** and **Table 14.10e**.

Analysis of the current traffic volumes and capacities on David Low Way indicates that there is capacity on this road link to accommodate existing peak hour traffic demand. The calculated V/C ratios range from 0.12 to 0.59, which is acceptable.

Figure 14.10a: Link capacity analysis locations

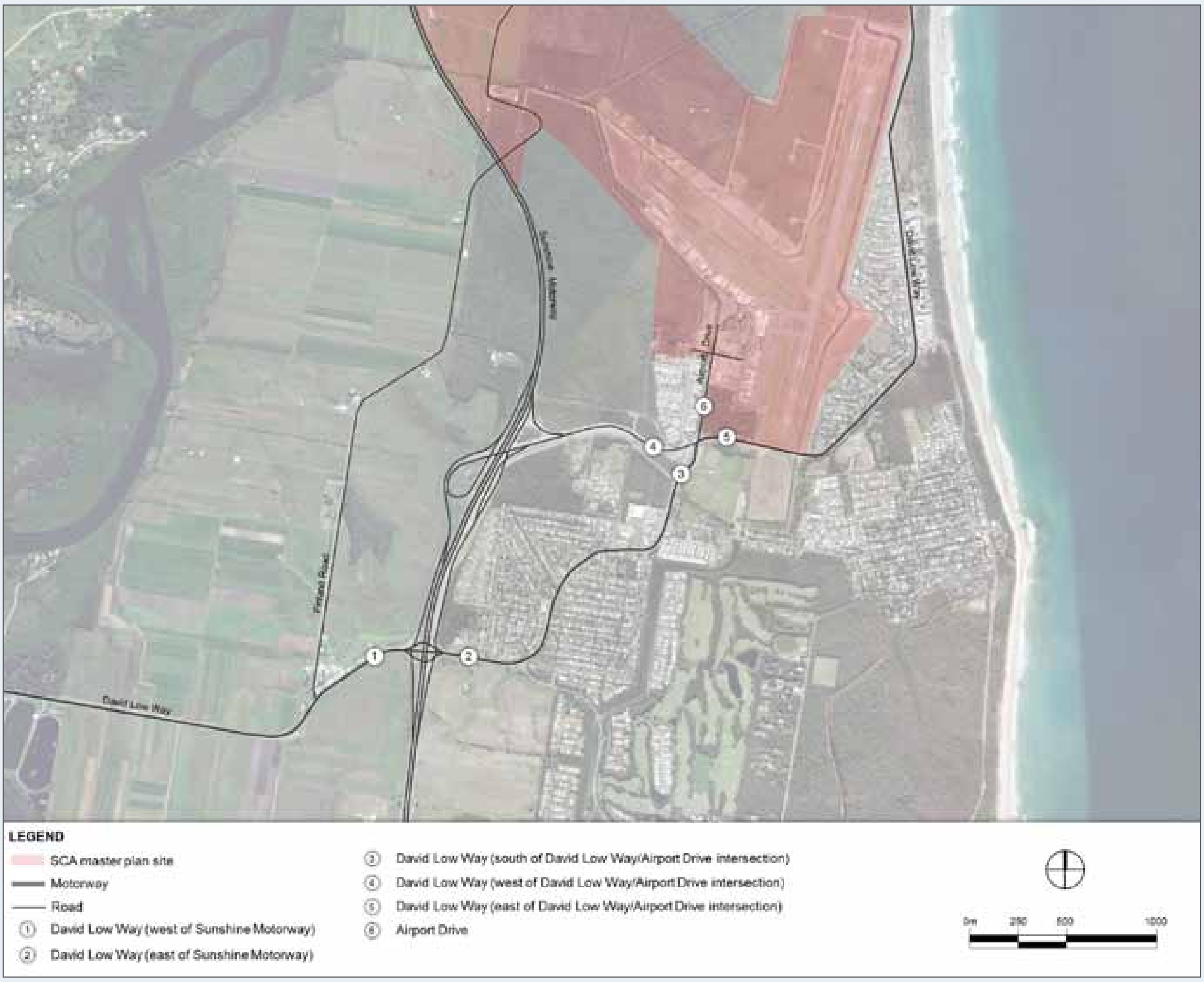


Table 14.10a: David Low Way link capacity (Location 1) – west of Sunshine Motorway

Peak hour	2-Way		
	Volume (vph)	Capacity (vph)	V/C
AM	875	2290	0.38
Midday	679	2290	0.30
PM	959	2290	0.42

Table 14.10b: David Low Way link capacity (Location 2) – east of Sunshine Motorway

Peak hour	2-Way		
	Volume (vph)	Capacity (vph)	V/C
AM	1345	2290	0.59
Midday	1062	2290	0.46
PM	1294	2290	0.57

Table 14.10c: David Low Way link capacity (Location 3) – south of David Low Way/Airport Drive intersection

Peak hour	2-Way		
	Volume (vph)	Capacity (vph)	V/C
AM	491	2290	0.21
Midday	494	2290	0.22
PM	564	2290	0.25

Table 14.10d: David Low Way link capacity (Location 4) – west of David Low Way/Airport Drive intersection

Peak hour	Eastbound			Westbound		
	Volume	Capacity	V/C	Volume	Capacity	V/C
AM	422	3593	0.12	707	3605	0.20
Midday	547	3593	0.15	593	3605	0.16
PM	725	3593	0.20	491	3605	0.14

Table 14.10e: David Low Way link capacity (Location 5) – east of David Low Way/Airport Drive intersection

Peak hour	2-Way		
	Volume (vph)	Capacity (vph)	V/C
AM	1208	2290	0.53
Midday	958	2290	0.42
PM	1230	2290	0.54

14.10.1.2 Airport Drive

The calculated V/C ratio at Airport Drive for the AM, Midday and PM peak hours are provided in **Table 14.10f**. Analysis of the current traffic volumes and capacities on Airport Drive indicates that there is capacity on this road link to accommodate existing peak hour traffic demand.

14.10.2 Existing intersection performance

14.10.2.1 Airport Drive/Kittyhawk Close intersection (2012)

The Airport Drive/Kittyhawk Close intersection is a four-leg roundabout which currently provides access to both the airport and the existing industrial developments on either side of Airport Drive. A conceptual layout of the intersection is provided in **Figure 14.10b**. A summary of the existing performance of the intersection in the design peaks is tabulated in **Table 14.10g**.

Analysis of the Airport Drive/Kittyhawk Close intersection indicates that the intersection and approaches currently operate within acceptable limits for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The intersection experiences the greatest vehicular demand during the Midday peak (870 vph) but still operates within acceptable limits, with a LOS A and a DOS of 0.160. Analysis of the Airport Drive/Kittyhawk Close intersection indicates that the current intersection can meet the existing (2012) peak hour demand.

14.10.2.2 David Low Way/Airport Drive intersection (2012)

The David Low Way/Airport Drive intersection is a four-leg signalised intersection with demand-actuated phasings and timings. To account for variability in timings, the cycle

and signal phase timings have been optimised in SIDRA. A conceptual layout of the intersection is provided in **Figure 14.10c**. A summary of the existing performance of the intersection in the design peaks is tabulated in **Table 14.10h**.

Analysis of the David Low Way/Airport Drive intersection indicates that the intersection and approaches currently operate within acceptable limits for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

While the intersection experiences the greatest vehicular demand during the PM peak (1795 vph), optimisation of cycle and phase timings in SIDRA has assisted in improving the LOS (LOS C) and DOS (0.767) at the intersection. In terms of DOS, the Midday peak has been identified as the worst peak hour with a DOS of 0.873. The intersection, however, is still expected to operate within acceptable limits during this peak period with an overall intersection LOS C. Analysis of the David Low Way/Airport Drive intersection indicates that the current intersection can meet the existing (2012) peak hour demand.

Table 14.10f: Airport Drive link capacity (Location 6) – north of David Low Way/Airport Drive intersection

	Northbound			Southbound		
Peak hour	**Volume**	**Capacity**	**V/C**	**Volume**	**Capacity**	**V/C**
AM	341	2785	0.12	131	2767	0.05
Midday	417	2785	0.15	447	2767	0.16
PM	207	2785	0.07	373	2767	0.13

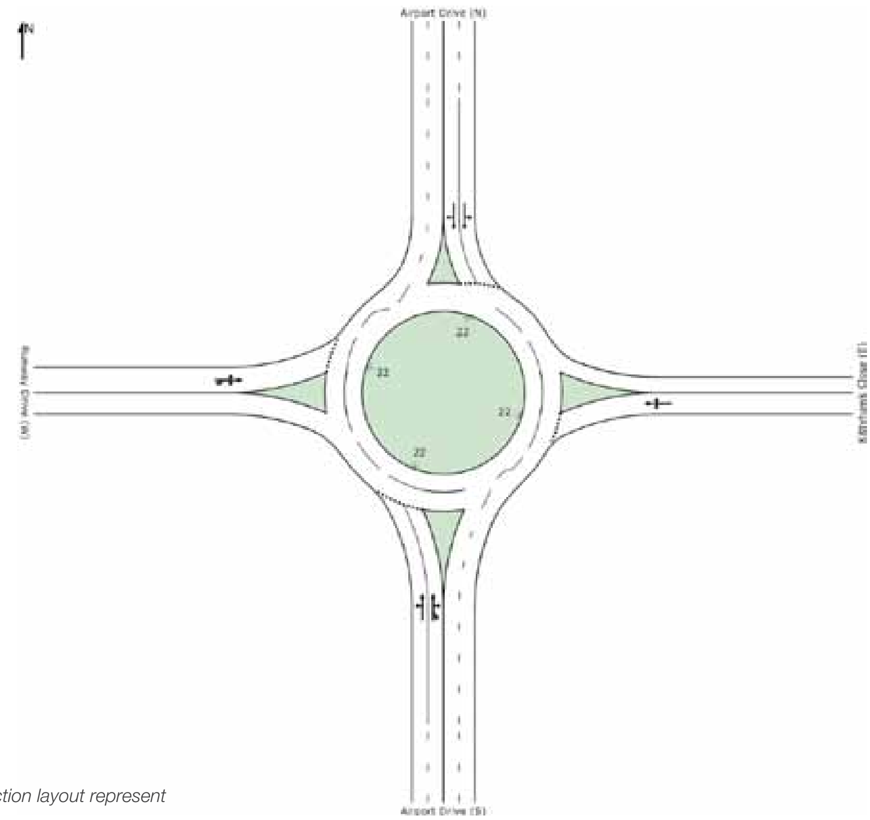
Table 14.10g: Airport Drive/Kittyhawk Close intersection performance summary (2012)

Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
AM	0.103	A	6.3 sec	3.3 m	470 vph
Midday	0.160	A	5.7 sec	4.8 m	870 vph
PM	0.110	A	5.9 sec	2.1 m	502 vph

Table 14.10h: David Low Way/Airport Drive intersection performance summary (2012)

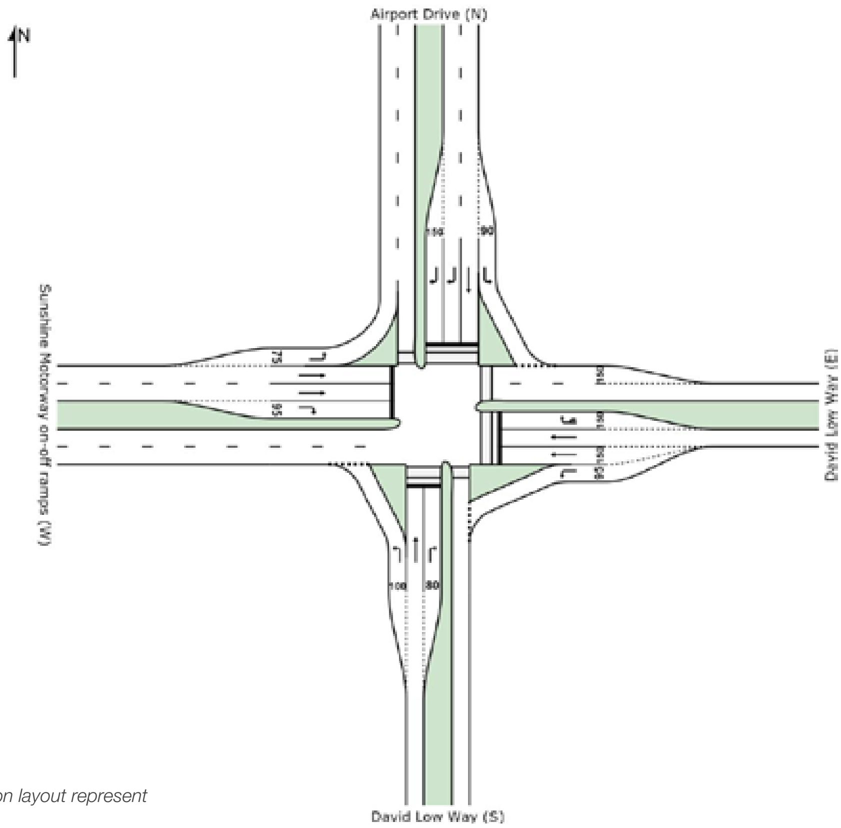
Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
AM	0.825	LOS C	28.9 sec	73.7 m	1650 vph
Midday	0.873	LOS C	28.9 sec	55.1 m	1728 vph
PM	0.767	LOS C	32.3 sec	75.3 m	1795 vph

Figure 14.10b: Airport Drive/Kittyhawk Close intersection conceptual layout



Note: Numbers on intersection layout represent measurements in metres.

Figure 14.10c: David Low Way/Airport Drive intersection conceptual layout



Note: Numbers on intersection layout represent measurements in metres.

14.10.2.3 Sunshine Motorway/David Low Way intersection (2012)

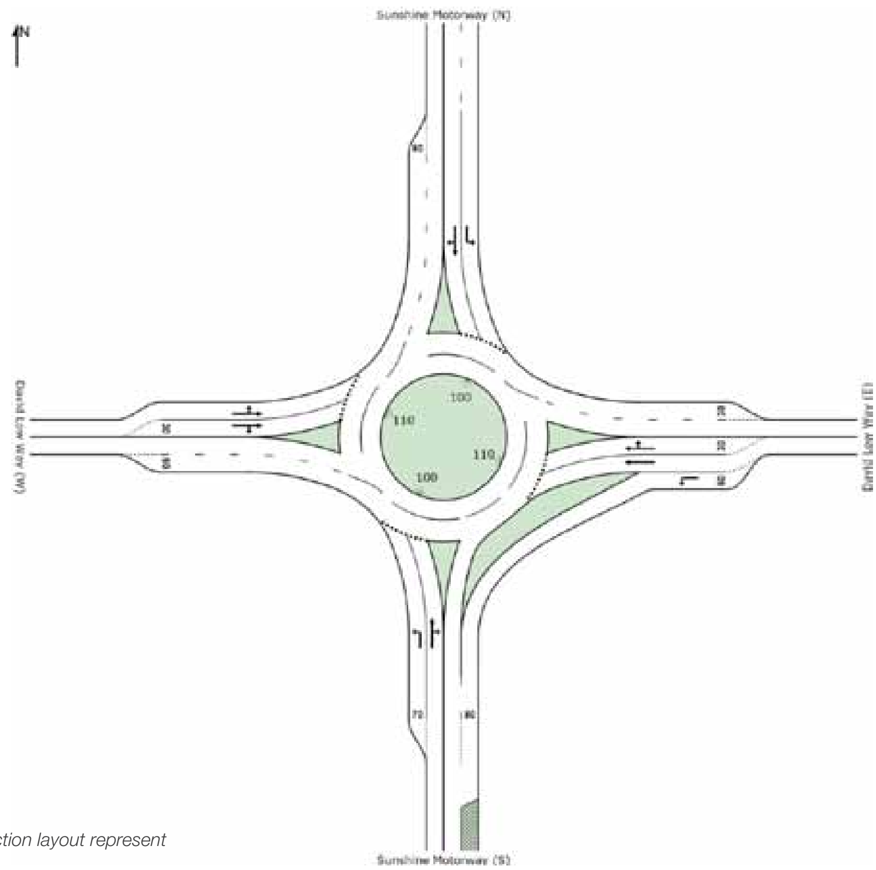
The Sunshine Motorway/David Low Way intersection is a four-leg roundabout. It should be noted that the Sunshine Motorway through movements have been excluded from analysis of this intersection. A conceptual layout of the intersection is provided in **Figure 14.10d**. A summary of the existing performance of the intersection in the design peaks is tabulated **in Table 14.10i**.

Analysis of the Sunshine Motorway/David Low Way intersection indicates that the intersection currently operates within acceptable limits for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The intersection experiences the greatest vehicular demand during the AM peak (1868 vph) but still operates within acceptable limits, with a LOS A and a DOS of 0.333.

Analysis of the Sunshine Motorway/David Low Way intersection indicates that the current intersection can meet the existing (2012) peak hour demand.

Figure 14.10d: Sunshine Motorway/David Low Way intersection conceptual layout



Note: Numbers on intersection layout represent measurements in metres.

Table 14.10i: Sunshine Motorway/David Low Way intersection performance summary (2012)

Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
AM	0.333	A	5.9 sec	8.5 m	1868 vph
Midday	0.238	A	6.4 sec	8.2 m	1425 vph
PM	0.351	A	7.1 sec	13.4 m	1850 vph

14.10.2.4 David Low Way/Finland Road intersection (2012)

The David Low Way/Finland Road intersection is a three-leg priority-controlled intersection with no turn or acceleration/deceleration lanes. A conceptual layout of the intersection is provided in **Figure 14.10e**. A summary of the existing performance of the intersection in the design peaks is tabulated in **Table 14.10j**.

Analysis of the David Low Way/Finland Road intersection indicates that the intersection currently operates within acceptable limits for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The intersection experiences the greatest vehicular demand during the PM peak (967 vph) but still operates within acceptable limits with a LOS A and a DOS of 0.265. Analysis of the David Low Way/Finland Road intersection indicates that the current intersection can meet the existing (2012) peak hour demand.

Figure 14.10e: David Low Way/Finland Road intersection conceptual layout

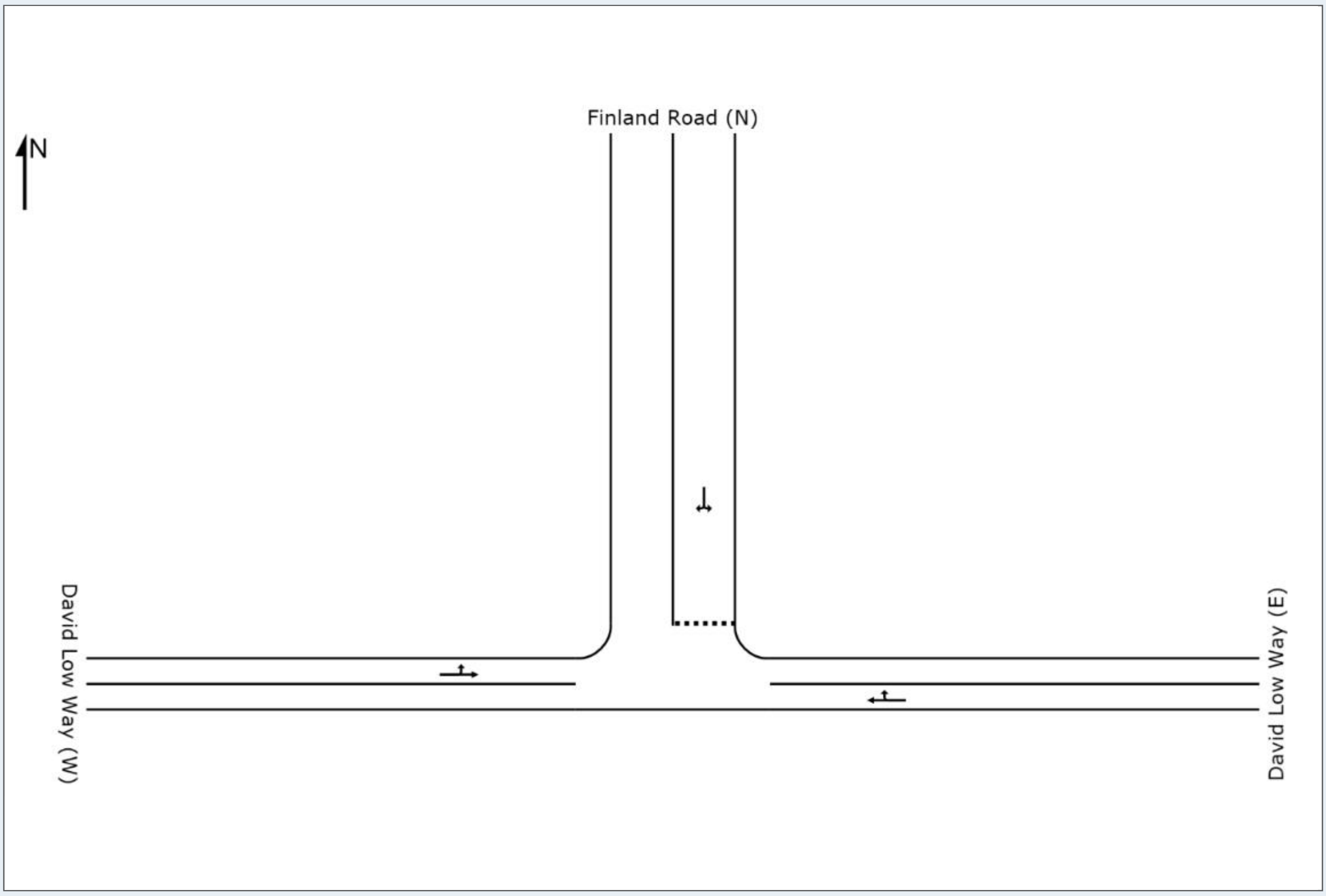


Table 14.10j: David Low Way/Finland Road intersection performance summary (2012)

Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
AM	0.261	A	4.2 sec	12.4 m	882 vph
Midday	0.192	A	3.6 sec	8.9 m	683 vph
PM	0.265	A	4.4 sec	17.5 m	967 vph

14.11 PROPOSED DEVELOPMENT

14.11.1 Description of proposed development activities

The construction of the upgraded airport has been broken down into five key works packages as shown in **Table 14.11a**.

The existing airport terminal (in either its current or future expanded form) will remain operational throughout all construction stages. Operations traffic will therefore be present during all construction packages, though in varying quantities and with fluctuating traffic movement patterns. The following vehicular access arrangements have been proposed for the construction and operations of the upgraded airport:

- All traffic associated with the construction of the runway and accompanying infrastructure will use Finland Road to access David Low Way, which is a SCR
- All traffic associated with the upgrade of the existing airport terminal will use Finland Road to access David Low Way
- All traffic associated with the ongoing operations of the airport (i.e. airport employees and passengers) will use Airport Drive to access David Low Way.

4.12 TRAFFIC GENERATION AND DISTRIBUTION

14.12.1 Assessment scenarios

In order to identify the impacts on the road network which could be expected as a result of construction of the new 13/31 runway and upgrades to the existing terminal building, three scenarios have been assessed. These three scenarios are:

1. Construction (Peak construction year – 2018)
2. Operations (Opening year – 2020)
3. Operations (10-year design horizon – 2030).

In accordance with GARID, these scenarios have been identified as the key assessment years for construction and operation.

Within each of the three scenarios identified above, 'with' and 'without' development sub-scenarios have been assessed. This has been undertaken to identify the volume of traffic which is expected to be generated solely as a result of construction and operations activities. Once these volumes have been identified, their specific impact on the road network can then be assessed.

14.12.2 Construction data

14.12.2.1 Construction hours and haulage regimes

It is expected that the movement of construction vehicles to/from the site via Finland Road will occur during daylight hours (i.e. 7:00 am to 6:00 pm) with minor night works required so as not to disrupt flight operations and also to meet the requirements of the construction program.

Table 14.11a: Proposed Project stages, tasks and timeframes

Works package	Proposed timing	Stage
Package 0: Pre-construction	Mid 2015	Relocation of 450mm diameter water main and Energex power line
Package 1: Civil works	January 2016 to February 2017	Stage 1 – Alteration of airside fencing
		Stage 2 – Upgrade Finland Road, improve access, site establishment and clearing
		Stage 3 – Open drain construction
		Stage 4 – Dredge reclamation bunds
Package 2: Dredging	March 2017 to November 2017	Stage 5 – Establish stockpile sites, drill under David Low Way, install dredge pipeline, sand dredging
Package 3: Runway and taxiway pavement construction	January 2018 to October 2019	Stage 6 – Establish compound for pavement material stockpiles, pavement construction
		Stage 7 – Construct taxiway (eastern end)
Package 4: Terminal upgrade	July 2017 to August 2019	Stage 8 – Existing terminal upgrade

Source: Project Support, 2013.

As construction plant, equipment and materials are proposed to be retained on-site during the construction phase, activities associated with night works are not expected to generate additional external traffic on the surrounding road network.

Where possible, the movement of construction plant, equipment and materials to site is proposed to avoid the design peak hours. As discussed in **Section 14.7.1**, these peak hours are:

- AM peak hour (8:00 am to 9:00 am)
- Midday peak hour (11:30 am to 12:30 pm)
- PM peak hour (4:45 pm to 5:45 pm).

It is expected that workers will arrive 30 minutes before 7:00 am and depart 30 minutes after 6:00 pm, therefore do not impact the design peak hours. Material delivery is expected to occur throughout the day between 7:00 am and 6:00 pm and is proposed to avoid the peaks where possible. For a conservative assessment, however, a proportion of this traffic is assumed to occur in the design peak periods. Additional information regarding the delivery of materials to site is provided in **Section 14.12.3**.

Based on a peak construction year of 50 weeks and an expected six-day working week, 300 construction days have been assumed for the purpose of this report.

14.12.3 Construction traffic generation

According to the proposed construction scheduling, 2018 has been identified as the peak construction year in terms of the total number of vehicle movements to/from the site. As discussed in **Section 14.11.1**, the peak construction year comprises Package 3 and Package 4 works.

In the peak construction year, daily traffic generated as a result of construction activities is expected to be comprised of the following:

- 25 site supervisors, administration and managerial personnel
- 45 workforce employees
- Delivery of plant, equipment and quarry material.

The breakdown of total vehicle movements into light vehicles (LV) and heavy vehicles (HV) is provided in the respective sub-headings below.

14.12.3.1 Light vehicles

For the purpose of this assessment, all of the 70 employees per day (i.e. site supervisors and workforce employees) anticipated in the peak construction year have been assumed to drive individually to/from the site. This provides a worst-case scenario as it does not account for potential reductions in daily LV trips due to carpooling and public transport use. Therefore, 70 LV trips per day (one-way) (140 two-way/day) are anticipated in the peak construction year.

As discussed in **Section 14.11.1**, all construction-related vehicles have been assumed to use Finland Road to access the site. To facilitate safe and efficient road operation, Finland Road will be upgraded prior to the peak construction year, as part of 'Package 1' (January 2016 to February 2017) construction works (refer to **Table 14.11a**). It is anticipated that due to the proposed construction hours (7:00 am to 6:00 pm), a large proportion of construction LV trips will be outside of the identified AM, Midday and PM peak hour periods. For the purpose of this study, however, and to account for amendments in shift structure and/or irregular arrivals to site it has been assumed that the following percentage of LV would arrive during each peak hour:

- 20 per cent of LV arriving during the AM peak
- 0 per cent of LV arriving/departing during the Midday peak
- 100 per cent of LV departing during the PM peak.

Table 14.12a shows the assumed in/out splits for the movement of construction LV to/from the site during the peak hours and daily time periods.

Table 14.12a: Construction light vehicle peak hour generation – peak construction year (2018)

Design peak hour	In	Out
AM	14	0
Midday	0	0
PM	0	70
Daily	70	70

14.12.3.2 Heavy vehicles

The classification and quantity of heavy vehicles expected to access the site via Finland Road during the peak construction year are presented in **Table 14.12b**. This includes vehicles required for the haulage of quarried materials to site, for transport of plant and equipment and for ongoing fuel and water deliveries.

In order to provide a worst-case assessment scenario, all of the heavy vehicles identified in **Table 14.12b** have been assumed to access the site on a daily basis. This is not expected to occur in practice.

In addition, **Table 14.12c** provides a further breakdown of the total anticipated HV traffic according to the identified AM, Midday and PM peak hour periods. It has been assumed that 30 per cent of daily heavy vehicles will arrive and depart the site during each of these peak hour periods.

14.12.3.3 Construction traffic generation – peak construction year (2018)

Table 14.12d shows the daily in/out splits for the combined (i.e. light and heavy vehicle) traffic generation for the 2018 peak construction year.

Table 14.12b: Construction heavy vehicle traffic generation (one-way trips) – peak construction year (2018)

Classification	Trips/day	Trips/year
Class 3	5	1,500
Class 4	4	1,200
Class 5	1	300
Class 6	5	1,500
Class 9	35	10,500
Class 10	5	1,500
TOTAL	55	16,500

Table 14.12c: Construction heavy vehicle peak hour generation – peak construction year (2018)

Design peak hour	In	Out
AM	16	16
Midday	16	16
PM	16	16
Daily	55	55

Table 14.12d: Total construction traffic generation (2018)

	In		Out	
Design peak hour	LV	HV	LV	HV
AM	14	16	0	16
Midday	0	16	0	16
PM	0	16	70	16
Daily	70	55	70	55

14.12.4 Construction traffic distribution

Table 14.12e shows the assumed traffic distribution for construction workers (i.e. LV) and construction plant, equipment and materials (i.e. HV) during construction works in 2018. The directional distribution of construction traffic which has been proposed for the purpose of this study is represented graphically in **Figure 14.12a**.

It should be noted that 100 per cent of the quarried material to be brought to site in the peak construction year has been assessed as being sourced from Moy Pocket Quarry, located approximately 25 km west of the site. This is shown in **Table 14.12e** and **Figure 14.12a**.

Haulage of quarry material is expected to use the following roads to access the site:

- Moy Pocket Road
- Eumundi-Kenilworth Road
- Bruce Highway
- Bli Bli Road
- David Low Way
- Finland Road.

Consideration of the impact of haulage vehicles on bridges and structures has been limited to the study area/intersections surrounding the SCA master plan area. The Finland Road bridge, which provides a connection over the Sunshine Motorway, will be used by HVs to access the site. As previously discussed, this structure was designed to T44 and HP 320 standard and is considered acceptable for HV use. The movement of HVs which do not exceed the standard dimensions of 23 or 25 metre B-doubles are expected to be able to travel on the Sunshine Motorway and the Bruce Highway without consideration for vulnerable bridges and height limitations. This is because these key road links are approved 23 and 25 metre B-double routes. Heavy vehicle haulage on roads in addition to these approved routes is subject to approvals submitted by the operator. The impact of HVs on bridges beyond the study area/intersections will be assessed in the detailed design stage.

Heavy vehicle movements are also expected for the haulage of pipeline segments to a worksite adjacent to David Low Way, east of SCA. These segments are expected to be delivered to the worksite on 19 m semi-trailers (Class 9 vehicles) and are required to facilitate the construction of a dredge pipeline from the airport, under David Low Way, to an off-shore location. The proposed haul route from the Sunshine Motorway to the worksite, via David Low Way, requires haulage vehicles to perform a U-turn manoeuvre at the David Low Way/Boardwalk Boulevard roundabout.

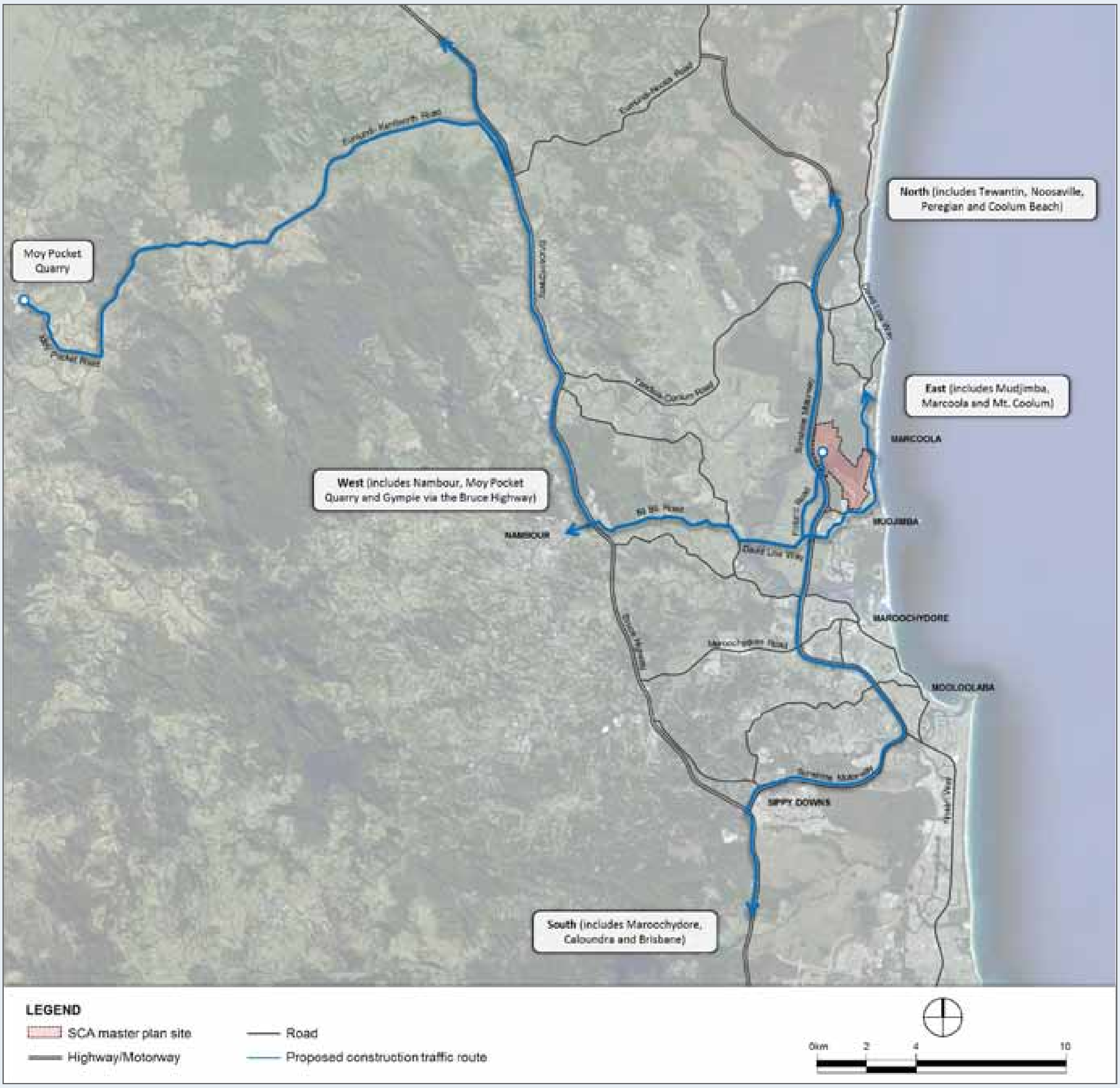
Table 14.12e: Directional distribution of construction traffic (2018)

		Directional distribution			
Vehicle type	**Task**	**North***	**South***	**East***	**West***
Light vehicles	Construction workers	15%	60%	5%	20%
Heavy vehicles	Quarry materials	0%	0%	0%	100%
	Plant and equipment	15%	70%	0%	15%

Note:

(*) 'North' includes travel between the Finland Road site access and northern settlements such as Tewantin, Noosaville, Peregian and Coolum Beach. This includes the use of Sunshine Motorway. 'South' includes travel between the Finland Road site access and southern settlements such as Maroochydore, Caloundra and Brisbane. This includes the use of Sunshine Motorway and the Bruce Highway. 'East' includes travel between the Finland Road site access and eastern settlements such as Mudjimba, Marcoola and Mt. Coolum. 'West' includes travel between the Finland Road site access and western settlements such as Nambour, Mapleton and Moy Pocket. This also includes the use of the Bruce Highway to Gympie.

Figure 14.12a: Proposed construction traffic distribution (2018)



An initial assessment of the intersection indicates that these haulage vehicles are expected to be able to successfully perform a U-turn manoeuvre at the intersection without significant interference with existing structures or other road users.

14.12.5 Operations data

14.12.5.1 Operations hours and traffic peaks

The timing and movement patterns of operations traffic (comprised of airport employees and passengers) on the road network is largely dependent on the scheduling of flights at the airport. According to the draft *Long Term Forecasts of Aviation Activity at Sunshine Coast Airport for 2013-2050*, the earliest arrival in 2012 was a 9:00 am arrival from Sydney while the latest departure movement was a 7:45 pm departure for Sydney. By 2040, the timing of flight movements is expected to extend to 6:00 am in the morning and 10:00 pm in the evening. It is expected that airport operations traffic will align with this extension of flight schedules over time.

Assessment of the future arrival/departure profiles indicate that the peak periods align with the design peak hours as identified in **Section 14.7.1**.

Therefore, the assumed design peak hours were used for the analysis of all scenarios for this Impact Assessment Report. This includes an assessment of the peak construction year (2018), opening year (2020) and 10-year design horizon (2030) scenarios.

14.12.5.2 Domestic and international airport passengers

The effect of both domestic and international airport passengers on the road network for each operations year (i.e. 2020 and 2030) has been assessed in this report. The impact of vehicle movements on the network as a result of airport passengers has been based on passenger forecasts and flight scheduling.

14.12.5.3 Airport employees

For the purpose of this assessment, it has been assumed that 70 per cent of airport employees are terminal staff and outdoor ground crew, responsible for activities including customer service, check-in, security, baggage handling and aircraft maintenance and refuelling. To account for flight scheduling, two work shifts have been assumed. The morning shift is expected to be from 4:00 am to 2:00 pm with the afternoon shift from 1:00 pm to 11:00 pm.

The remaining 30 per cent of airport employees are assumed to be comprised of administration and management personnel. This may also include additional security personnel. It has been assumed that these employees will work one shift from 8:00 am to 5:00 pm.

14.12.6 Operations traffic generation

14.12.6.1 Operations traffic generation – opening year (2020)

Current Project scheduling indicates that the new 13/31 runway is expected to open for regular passenger use in 2020. This is expected to coincide with the completion of upgrades to the existing airport terminal building and facilities.

The breakdown of total traffic expected to be generated as a result of opening year airport operations has been split into light vehicles and heavy vehicles, as discussed in the respective sub-headings below.

Light vehicles

In the opening year of operations (2020), a total of 1,160 LV trips per day (two-way) are expected to be generated as a result of the completion of the new runway and upgraded terminal building. These LV trips, comprised of both airport employees and passengers, will access the airport via Airport Drive. To be consistent with Urbis economic assumptions the number of airport employees has been estimated based on a ratio of 25 employees per 100,000 annual passengers. As a worst-case, no provision has been made for the use of public transport by airport employees.

In the opening year, daily traffic generated as a result of completed works and upgrades is expected to be comprised of the following:

- 116 airport employees
  - 81 terminal staff and outdoor ground crew (70 per cent)
  - 35 administration and management personnel (30 per cent)
- Airport passengers.

The anticipated volume of vehicles due to passengers travelling ‘in’ and ‘out’ of the airport, as presented in **Table 14.12f**, takes into account the effect of variations between the number of scheduled flight departures (i.e. ‘in’ traffic movements) and flight arrivals (i.e. ‘out’ traffic movements) at the airport.

Table 14.12f: Operations light vehicle peak hour traffic generation – opening year (2020)

	Airport employees		Airport passengers		
Time period	In	Out	In	Out	Total (two-way)
AM	7	0	20	43	70
Midday	40	0	2	93	135
PM	0	34	0	16	50
Daily	116	116	394	534	1,160

Heavy vehicles

A total of 7 HV trips per day (two-way) are expected to be generated as a result of the completion of the new runway and upgraded terminal building in 2020. These HV movements are expected to be due to the movement of a proportion of airport passengers before flight departure and after flight arrival. It is expected that these HV movements will be in the form of 25-seat buses and will primarily cater to the tourist market, rather than being provided by the regular TransLink commuter bus service.

Table 14.12g provides a breakdown of the total anticipated HV traffic according to the identified AM, Midday and PM peak hour periods. Determination of the volume of HV traffic expected in the peak periods was based on passenger number forecasts during the busiest day (i.e. 24 hours) at the airport.

Table 14.12g: Operations heavy vehicle peak hour generation – opening year (2020)

Design peak hour	In	Out
AM	1	1
Midday	1	1
PM	1	1
Daily	3	4

Combined operations traffic generation

Table 14.12h shows the daily in/out splits for the combined (i.e. light and heavy vehicle) traffic generation for the opening year of operations in 2020.

14.12.6.2 Operations traffic generation – 10 year design (2030)

To determine longer term traffic impacts and to satisfy GARID requirements, an assessment of the impact of airport operations traffic on the road network 10 years after the 2020 opening year has been undertaken. This is the 10-year design horizon (2030) scenario.

The breakdown of total traffic expected to be generated as a result of airport operations for the 10-year design horizon has been split into LV and HV, as discussed in the respective sub-headings below.

Light vehicles

By 2030, a total of 3,479 LV trips per day (two-way) are expected to be generated as a result of increases in passenger and terminal employee numbers. This increase is associated with the increased potential for passenger traffic growth due to the completion of the new runway and airport terminal upgrades.

Estimated daily traffic generation is expected to be comprised of the following:

- 355 airport employees
  - 249 terminal staff and outdoor ground crew (70 per cent)
  - 106 administration and management personnel (30 per cent)
- Airport passengers.

Similar to the opening year scenario, the entirety of LV trips, comprised of both airport employees and passengers, will access the airport via Airport Drive. As a worst-case, no provision has been made for the use of public transport by airport employees. The anticipated volume of vehicles travelling ‘in’ and ‘out’ of the airport is presented in **Table 14.12i**.

Table 14.12h: Total operations traffic generation – opening year (2020)

Design peak hour	In		Out	
	LV	HV	LV	HV
AM	27	1	43	1
Midday	42	1	93	1
PM	0	1	50	1
Daily	510	3	650	4

Table 14.12i: Operations light vehicle peak hour generation – 10-year design horizon (2030)

	Airport employees		Airport passengers		
Time period	In	Out	In	Out	Total (two-way)
AM	21	0	108	0	129
Midday	125	0	27	228	380
PM	0	107	67	40	214
Daily	355	355	1,338	1,431	3,479

Heavy vehicles

A total of 21 HV trips per day (two-way) are expected to be generated as a result of increases in passenger and terminal employee numbers due to completion of the runway and terminal upgrades. Similar to the opening year scenario, these HV movements are expected to be due to the movement of a proportion of airport passengers on 25-seat buses before flight departure and after flight arrival.

Table 14.12j provides a breakdown of the total anticipated HV traffic according to the identified AM, Midday and PM peak hour periods.

Table 14.12j: Operations heavy vehicle peak hour movements – 10-year design horizon (2030)

Design peak hour	In	Out
AM	1	1
Midday	1	1
PM	1	1
Daily	10	11

Combined operations traffic generation

Table 14.12k shows the daily in/out splits for the combined (i.e. light and heavy vehicle) traffic generation for the 10-year design horizon in 2030.

14.12.6.3 Operations traffic distribution

Table 14.12l shows the assumed traffic distribution for airport employees and airport passengers during airport operations. The traffic distribution is expected to remain unchanged for the operations phase of the completed runway during both opening year (2020) and 10-year design horizon (2030) scenarios. A graphical representation of the proposed directional distribution of operations traffic is shown in **Figure 14.12b**.

14.13 ROAD AND TRAFFIC IMPACT ASSESSMENT

14.13.1 Construction

The impact of traffic generated by the construction of the 13/31 runway and upgraded terminal building has been assessed in terms of the percentage contribution of ESAs and AADTs in the peak construction year (2018). This has been undertaken to identify the need for a more detailed PIA and a traffic operations assessment as per GARID.

14.13.1.1 Pavement impact assessment – construction peak year (2018)

According to GARID, a PIA is required if the traffic (in ESAs) generated by the development equals or exceeds 5 per cent of the existing ESAs on the road network. The assessment has been conducted along the main haulage routes including:

- Finland Road
- David Low Way
- Airport Drive.

The addition of construction traffic is not expected to exceed the 5 per cent threshold except at the following locations:

- David Low Way/Finland Road intersection
- David Low Way (east of Finland Road – eastbound) – 12.39 per cent
- David Low Way (east of Finland Road – westbound) – 15.02 per cent
- David Low Way (west of Finland Road – eastbound) – 40.73 per cent
- David Low Way (west of Finland Road – westbound) – 49.39 per cent
- Finland Road will also exceed the 5 per cent threshold due to the existing low background traffic volumes on the road link. Therefore, an assessment has not been conducted along this road.

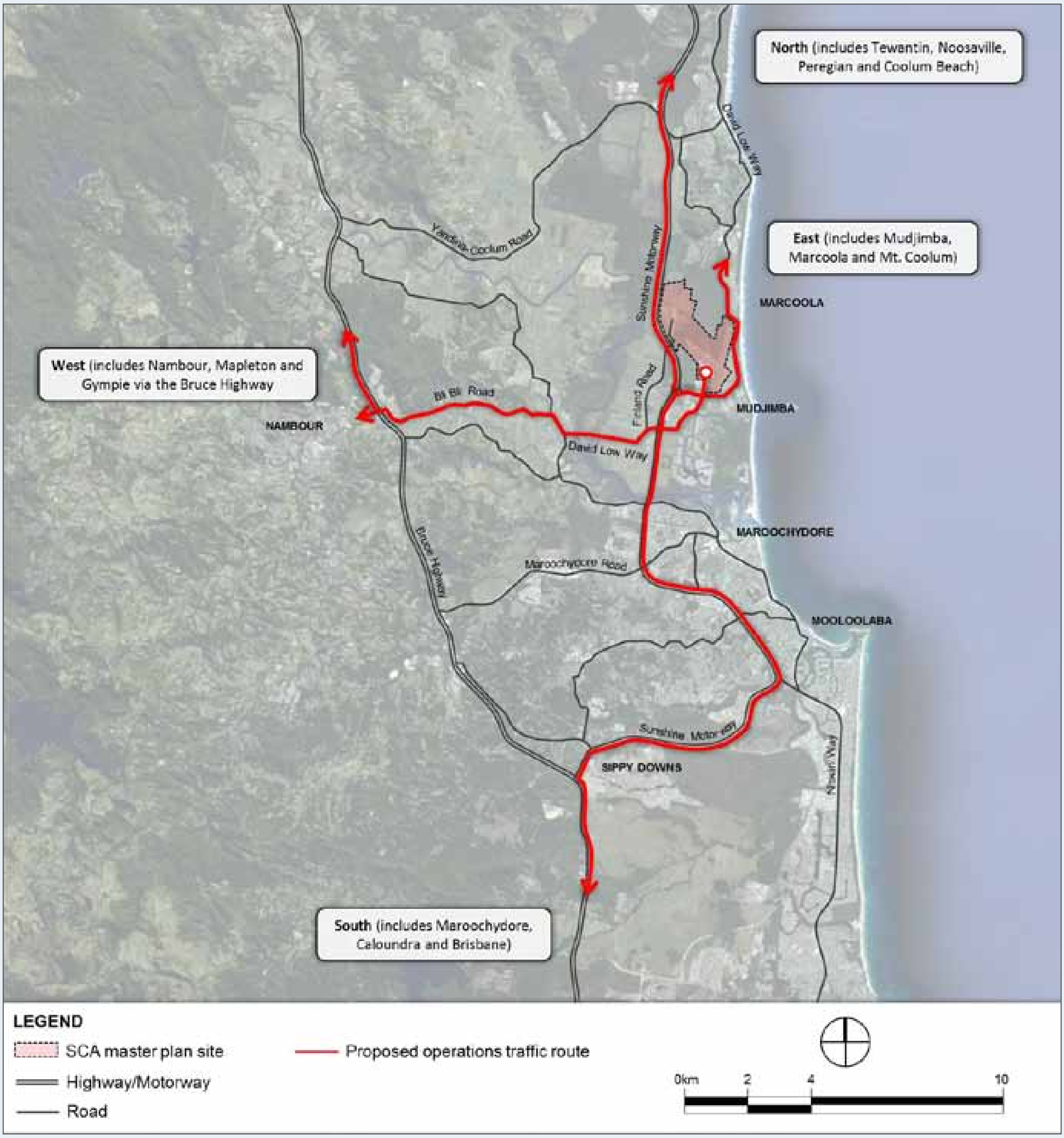
Table 14.12k: Total operations traffic generation – 10-year design horizon (2030)

	In		Out	
Design peak hour	LV	HV	LV	HV
AM	129	1	0	1
Midday	152	1	228	1
PM	67	1	147	1
Daily	1,693	10	1,786	11

Table 14.12l: Directional distribution of operations traffic – 2020 and 2030

Road user	Vehicle type	Directional distribution			
		North*	South*	East*	West*
Airport employees	LV and HV	15%	60%	5%	20%
Airport passengers	LV and HV	20%	60%	10%	10%

Figure 14.12b: Proposed operations traffic distribution – 2020 and 2030



A detailed PIA is required at the David Low Way and Finland Road approaches and will be undertaken as part of detailed design.

14.13.1.2 Traffic impact assessment – construction peak year (2018)

A traffic operations assessment is required if the traffic (in AADT) generated by the development equals or exceeds 5 per cent of the existing AADT on the road network. The 5 per cent threshold was exceeded at the following location:

- David Low Way/Finland Road intersection
- Finland Road southbound (left-turn movement) – 580.60 per cent
- Finland Road southbound (right-turn movement) – 581.00 per cent
- David Low Way eastbound (left-turn movement) – 495.93 per cent
- David Low Way westbound (right-turn movement) – 631.95 per cent.

A traffic operations assessment of the David Low Way/Finland Road intersection is required and is presented overleaf. It should be noted that no assessment has been undertaken for the Airport Drive/Kittyhawk Close intersection in the peak construction year due to the absence of construction traffic at this location. An assessment of the remaining study intersections has been conducted to demonstrate the impact of construction traffic on their performance.

David Low Way/Airport Drive intersection performance assessment (2018)

An assessment of the operational performance of the David Low Way/Airport Drive intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10c** with the results of the assessment summarised in **Table 14.13a**.

Analysis of the performance of the David Low Way/Airport Drive intersection indicates that the intersection is expected to operate within acceptable limits (as defined in **Section 14.4.4**) with construction traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of construction traffic (1 vehicle in the AM, 0 vehicles in the Midday and 3 vehicles in the PM) has minimal impact on the performance of the intersection. This is due to the minimal construction-related movements at the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (1905 vph) but is still expected to operate within acceptable limits, with a LOS C and DOS of 0.874. Comparison of the 'without' and 'with' development scenarios suggests that the majority of vehicles at the intersection are due to growth in background traffic rather than the addition of construction vehicles.

While the overall intersection is expected to operate within acceptable limits, the analysis suggested that the following intersection movements could experience operational issues for both 'without' and 'with' scenarios:

- David Low Way (south approach) right-turn movement is expected to operate at LOS E in the PM peak hour. SIDRA analysis indicated that in 2012 this movement was operating at LOS D in the PM peak hour. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic (i.e. not development traffic)
- 95th percentile queues at the David Low Way (south approach) right-turn lane are expected to exceed available storage capacity in the PM peak hour
- Sunshine Motorway on-off ramps (west approach) right-turn movement is expected to operate at LOS E in the PM peak hour. SIDRA analysis indicated that in 2012 this movement was operating at LOS E in the PM peak hour. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic.

Table 14.13a: David Low Way/Airport Drive intersection performance summary (2018)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.825	C	28.9 sec	73.7 m	1650 vph
	Midday	0.873	C	28.9 sec	55.1 m	1728 vph
	PM	0.767	C	32.3 sec	75.3 m	1795 vph
Peak construction year (2018) – without development	AM	0.673	C	30.2 sec	91.3 m	1762 vph
	Midday	0.641	C	29.6 sec	56.3 m	1807 vph
	PM	0.863	C	33.4 sec	87.5 m	1902 vph
Peak construction year (2018) – with development	AM	0.673	C	30.2 sec	91.3 m	1763 vph
	Midday	0.641	C	29.6 sec	56.3 m	1807 vph
	PM	0.874	C	33.6 sec	87.5 m	1905 vph

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of construction traffic in the peak construction year. No intersection improvements are required to accommodate construction traffic in 2018.

Sunshine Motorway/David Low Way intersection performance assessment (2018)

An assessment of the operational performance of the Sunshine Motorway/David Low Way intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10d** with the results of the assessment summarised in **Table 14.13b**.

Analysis of the performance of the Sunshine Motorway/David Low Way intersection indicates that the intersection is expected to operate within acceptable limits with construction traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of construction traffic (20 vehicles in the AM, 9 vehicles in the Midday and 67 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (2143 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.401.

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of construction traffic in the peak construction year. No intersection improvements are required to accommodate construction traffic in 2018.

David Low Way/Finland Road intersection performance assessment (2018)

An assessment of the operational performance of the David Low Way/Finland Road intersection in its current layout has been undertaken. It should be noted that the intersection is sub-standard in its current layout. The intersection layout is shown in **Figure 14.10e** with the results of the assessment summarised in **Table 14.13c**.

Analysis of the performance of the David Low Way/Finland Road intersection indicates that the intersection is expected to operate within acceptable limits with construction traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

Table 14.13b: Sunshine Motorway/David Low Way intersection performance summary (2018)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.333	A	5.9 sec	8.5 m	1868 vph
	Midday	0.238	A	6.4 sec	8.2 m	1425 vph
	PM	0.351	A	7.1 sec	13.4 m	1850 vph
Peak construction year (2018) – without development	AM	0.376	A	6.0 sec	11.5 m	2104 vph
	Midday	0.272	A	6.5 sec	9.7 m	1608 vph
	PM	0.400	A	7.4 sec	16.2 m	2076 vph
Peak construction year (2018) – with development	AM	0.376	A	6.0 sec	11.7 m	2124 vph
	Midday	0.272	A	6.5 sec	9.7 m	1617 vph
	PM	0.401	A	7.6 sec	16.7 m	2143 vph

Table 14.13c: David Low Way/Finland Road intersection performance summary (2018)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.261	A	4.2 sec	12.4 m	882 vph
	Midday	0.192	A	3.6 sec	8.9 m	683 vph
	PM	0.265	A	4.4 sec	17.5 m	967 vph
Peak construction year (2018) – without development	AM	0.295	A	4.5 sec	15.4 m	993 vph
	Midday	0.217	A	3.7 sec	10.8 m	771 vph
	PM	0.297	A	4.8 sec	23.0 m	1085 vph
Peak construction year (2018) – with development	AM	0.307	A	6.2 sec	22.2 m	1039 vph
	Midday	0.227	A	5.6 sec	19.6 m	803 vph
	PM	0.332	A	7.6 sec	34.7 m	1187 vph

The addition of construction traffic (46 vehicles in the AM, 32 vehicles in the Midday and 102 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (1187 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.332.

It should be noted that the SIDRA model is unable to account for safety deficiencies at the intersection including, reduced sight distances, location of property access at the intersection and sub-standard configurations. Improvements are required at the intersection to address these issues.

14.13.2 Operations

The impact of traffic generated by the operation of the 13/31 runway and upgraded terminal building has been assessed in terms of the percentage contribution of ESAs and AADTs in the opening (2020) and 10-year design horizon (2030) years.

14.13.2.1 Pavement impact assessment – opening year (2020)

According to GARID, a PIA is required if the traffic (in ESAs) generated by the development equals or exceeds 5 per cent of the existing ESAs on the road network. The addition of operations traffic in the opening year (2020) is not expected to exceed the 5 per cent threshold on the access routes assessed. This is because of the minimal expected increase in heavy vehicle movements due to traffic generated by the new runway and upgraded airport terminal building. A PIA is therefore not required on the access routes.

14.13.2.2 Traffic impact assessment – opening year (2020)

An assessment of the impact of operations traffic on the performance of the study intersections has been conducted and is presented next.

Airport Drive/Kittyhawk Close intersection performance assessment (2020)

An assessment of the operational performance of the Airport Drive/Kittyhawk Close intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10b** with the results of the assessment summarised in **Table 14.13d**.

Analysis of the performance of the Airport Drive/Kittyhawk Close intersection indicates that the intersection is expected to operate within acceptable limits with opening year operations traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of operations traffic in the opening year (2020) (69 vehicles in the AM, 137 vehicles in the Midday and 47 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the Midday peak (1109 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.166.

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of operations traffic in the opening year. No intersection improvements are required to accommodate development traffic in the opening year (2020).

David Low Way/Airport Drive intersection performance assessment (2020)

An assessment of the operational performance of the David Low Way/Airport Drive intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10c** with the results of the assessment summarised in **Table 14.13e**.

Analysis of the performance of the David Low Way/Airport Drive intersection indicates that the intersection is expected to operate within acceptable limits with opening year operations traffic in the AM and Midday peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

Table 14.13d: Airport Drive/Kittyhawk Close intersection performance summary (2020)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.103	A	6.3 sec	3.3 m	470 vph
	Midday	0.160	A	5.7 sec	4.8 m	870 vph
	PM	0.110	A	5.9 sec	2.1 m	502 vph
Opening year (2020) – without development	AM	0.112	A	6.2 sec	3.6 m	498 vph
	Midday	0.163	A	5.5 sec	5.4 m	972 vph
	PM	0.109	A	5.5 sec	2.6 m	570 vph
Opening year (2020) – with development	AM	0.120	A	5.9 sec	3.9 m	567 vph
	Midday	0.166	A	5.3 sec	6.1 m	1109 vph
	PM	0.109	A	5.3 sec	3.2 m	617 vph

The addition of operations traffic in the opening year (2020) (69 vehicles in the AM, 138 vehicles in the Midday and 47 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (2002 vph) but is still expected to operate with a LOS C. Comparison of the 'without' and 'with' development scenarios suggests that the majority of vehicles at the intersection are due to growth in background traffic rather than the addition of operations vehicles.

While the overall intersection is generally expected to operate within acceptable limits, the analysis suggested that the following intersection movements could experience operational issues for both 'without' and 'with' scenarios:

- David Low Way (south approach) right-turn movement is expected to operate at LOS E in the PM peak hour. SIDRA analysis indicated that in 2012 this movement was operating at LOS D in the PM peak hour. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic
- 95th percentile queues at the David Low Way (south approach) right-turn lane are expected to exceed available storage capacity in the PM peak hour
- Sunshine Motorway on-off ramps (west approach) right-turn movement is expected to operate at LOS E in the PM peak hour. SIDRA analysis indicated that in 2012 this movement was operating at LOS E in the PM peak hour. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic.

The analysis indicates that the addition of development traffic in the opening year (2020) does not have a significant impact on the performance of the intersection. No intersection improvements are required to accommodate development traffic in the opening year (2020).

Sunshine Motorway/David Low Way (2020)

An assessment of the operational performance of the Sunshine Motorway/David Low Way intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10d** with the results of the assessment summarised in **Table 14.13f**.

Analysis of the performance of the Sunshine Motorway/David Low Way intersection indicates that the intersection is expected to operate within acceptable limits with opening year operations traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of operations traffic in the opening year (2020) (7 vehicles in the AM, 18 vehicles in the Midday and 8 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (2172 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.421.

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of operations traffic in the opening year. No intersection improvements are required to accommodate development traffic in the opening year (2020).

David Low Way/Finland Road intersection performance assessment (2020)

An assessment of the operational performance of the David Low Way/Finland Road intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10e** with the results of the assessment summarised in **Table 14.13g**.

Analysis of the performance of the David Low Way/Finland Road intersection indicates that the intersection is expected to operate within acceptable limits with opening year operations traffic for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

Table 14.13e: David Low Way/Airport Drive intersection performance summary (2020)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.825	C	28.9 sec	73.7 m	1650 vph
	Midday	0.873	C	28.9 sec	55.1 m	1728 vph
	PM	0.767	C	32.3 sec	75.3 m	1795 vph
Opening year (2020) – without development	AM	0.698	C	30.4 sec	96.5 m	1831 vph
	Midday	0.666	C	29.7 sec	58.9 m	1859 vph
	PM	0.901	C	34.3 sec	93.4 m	1955 vph
Opening year (2020) – with development	AM	0.698	C	30.4 sec	96.5 m	1900 vph
	Midday	0.666	C	29.9 sec	58.4 m	1997 vph
	PM	0.901	C	34.4 sec	93.4 m	2002 vph

Table 14.13f: Sunshine Motorway/David Low Way intersection performance summary (2020)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.333	A	5.9 sec	8.5 m	1868 vph
	Midday	0.238	A	6.4 sec	8.2 m	1425 vph
	PM	0.351	A	7.1 sec	13.4 m	1850 vph
Opening year (2020) – without development	AM	0.391	A	6.1 sec	12.4 m	2191 vph
	Midday	0.285	A	6.6 sec	10.3 m	1672 vph
	PM	0.420	A	7.5 sec	17.4 m	2164 vph
Opening year (2020) – with development	AM	0.391	A	6.1 sec	12.6 m	2198 vph
	Midday	0.285	A	6.5 sec	10.3 m	1690 vph
	PM	0.421	A	7.5 sec	17.4 m	2172 vph

Table 14.13g: David Low Way/Finland Road intersection performance summary (2020)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.261	A	4.2 sec	12.4 m	882 vph
	Midday	0.192	A	3.6 sec	8.9 m	683 vph
	PM	0.265	A	4.4 sec	17.5 m	967 vph
Opening year (2020) – without development	AM	0.308	A	4.6 sec	16.6 m	1035 vph
	Midday	0.226	A	3.8 sec	11.5 m	802 vph
	PM	0.309	A	5.0 sec	25.6 m	1128 vph
Opening year (2020) – with development	AM	0.310	A	4.6 sec	16.9 m	1042 vph
	Midday	0.230	A	3.8 sec	11.9 m	819 vph
	PM	0.308	A	5.0 sec	26.3 m	1135 vph

The addition of operations traffic in the opening year (2020) (7 vehicles in the AM, 17 vehicles in the Midday and 7 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (1135 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.308. As Finland Road has been assumed as the sole access road for construction vehicles to the construction site, the proposed conclusion of construction activities by the 2020 opening year is expected to reduce the anticipated volume of traffic at the David Low Way/Finland Road intersection. This reduction in traffic volumes at the intersection is most evident in the PM peak hour.

It should be noted that the SIDRA model is unable to account for safety deficiencies at the intersection including, reduced sight distances, location of property access at the intersection and sub-standard configurations. Improvements are required at the intersection to address these issues.

14.13.2.3 Pavement impact assessment – 10-year design horizon (2030)

According to GARID, a PIA is required if the traffic (in ESAs) generated by the development equals or exceeds 5 per cent of the existing ESAs on the road network. The addition of operations traffic in the 10-year design horizon (2030) is not expected to exceed the 5 per cent threshold on the access routes assessed. This is because of the minimal expected increase in heavy vehicle movements due to traffic generated by the completion of the new runway and upgraded airport terminal building. A PIA is therefore not required on the access routes.

14.13.2.4 Traffic impact assessment – 10-year design horizon (2030)

An assessment of the impact of operations traffic on the performance of the study intersections has been conducted and is presented next.

<u>Airport Drive/Kittyhawk Close intersection performance assessment (2030)</u>

An assessment of the operational performance of the Airport Drive/Kittyhawk Close intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10b** with the results of the assessment summarised in **Table 14.13h**.

Analysis of the performance of the Airport Drive/Kittyhawk Close intersection indicates that the intersection is expected to operate within acceptable limits for the 10-year design horizon for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of operations traffic in the 10-year design horizon (2030) (130 vehicles in the AM, 381 vehicles in the Midday and 211 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the Midday peak (1419 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.216.

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of operations traffic at the time of the 10-year design horizon. No intersection improvements are required to accommodate development traffic in the 10-year design horizon (2030).

<u>David Low Way/Airport Drive intersection performance assessment (2030)</u>

An assessment of the operational performance of the David Low Way/Airport Drive intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10c** with the results of the assessment summarised in **Table 14.13i**.

Analysis of the performance of the David Low Way/Airport Drive intersection indicates that the intersection is expected to operate within acceptable limits for the 10-year design horizon for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

Table 14.13h: Airport Drive/Kittyhawk Close intersection performance summary (2030)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.103	A	6.3 sec	3.3 m	470 vph
	Midday	0.160	A	5.7 sec	4.8 m	870 vph
	PM	0.110	A	5.9 sec	2.1 m	502 vph
10-year design horizon (2030) – without development	AM	0.115	A	6.2 sec	3.7 m	508 vph
	Midday	0.166	A	5.4 sec	5.9 m	1038 vph
	PM	0.111	A	5.2 sec	3.3 m	673 vph
10-year design horizon (2030) – with development	AM	0.156	A	5.8 sec	5.2 m	638 vph
	Midday	0.216	A	5.0 sec	8.7 m	1419 vph
	PM	0.141	A	4.8 sec	5.4 m	884 vph

Table 14.13i: David Low Way/Airport Drive intersection performance summary (2030)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.825	C	28.9 sec	73.7 m	1650 vph
	Midday	0.873	C	28.9 sec	55.1 m	1728 vph
	PM	0.767	C	32.3 sec	75.3 m	1795 vph
10-year design horizon (2030) – without development	AM	0.749	C	32.6 sec	132.4 m	2148 vph
	Midday	0.809	C	30.4 sec	77.1 m	2145 vph
	PM	0.840	D	37.8 sec	141.3 m	2368 vph
10-year design horizon (2030) – with development	AM	0.753	C	32.1 sec	132.4 m	2280 vph
	Midday	0.809	C	30.8 sec	75.4 m	2525 vph
	PM	0.889	D	37.8 sec	140.8 m	2586 vph

The addition of operations traffic in the 10-year design horizon (2030) (132 vehicles in the AM, 380 vehicles in the Midday and 218 vehicles in the PM) has minimal impact on the performance of the intersection. This is due to the optimisation of phase and cycle times in SIDRA in order to achieve the lowest delay at the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (2586 vph) but still operate with acceptable LOS D and DOS of 0.889.

While the overall intersection is generally expected to operate within acceptable limits, the analysis suggested that the following intersection movements could experience operational issues for both 'without' and 'with' scenarios:

- David Low Way (south approach) right-turn movement is expected to operate at LOS E in the PM peak hour. SIDRA analysis indicated that in 2012 this movement was operating at LOS D in the PM peak hour. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic
- David Low Way (east approach) right-turn movement is expected to operate at LOS E during all peak hours (excluding 'without' development Midday peak only). SIDRA analysis indicated that in 2012 this movement was operating at LOS D during all peak hours. The assessment indicated that the key contributor to the reduced operational performance of this movement was the growth in background traffic
- 95th percentile queues at the David Low Way (south approach) right-turn lane are expected to exceed available storage capacity in the PM peak hour
- Sunshine Motorway on-off ramps (west approach) right-turn movement is expected to operate at LOS E during all peak hours. SIDRA analysis indicated that in 2012 this movement was operating at LOS E in the PM peak hour.

The analysis indicates that the addition of development traffic in 2030 does not have a significant impact on the performance of the intersection. No intersection improvements are required to accommodate development traffic in the 10-year design horizon (2030).

Sunshine Motorway/David Low Way intersection performance assessment (2030)

An assessment of the operational performance of the Sunshine Motorway/David Low Way intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10d** with the results of the assessment summarised in **Table 14.13j**.

Analysis of the performance of the Sunshine Motorway/David Low Way intersection indicates that the intersection is expected to operate within acceptable limits for the 10-year design horizon for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of operations traffic in the 10-year design horizon (2030) (15 vehicles in the AM, 50 vehicles in the Midday and 32 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (2671 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.532.

The analysis indicates that the intersection is expected to have spare operational capacity despite the addition of operations traffic for the 10-year design horizon. No intersection improvements are required to accommodate development traffic in the 10-year design horizon (2030).

Table 14.13j: Sunshine Motorway/David Low Way intersection performance summary (2030)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.333	A	5.9 sec	8.5 m	1868 vph
	Midday	0.238	A	6.4 sec	8.2 m	1425 vph
	PM	0.351	A	7.1 sec	13.4 m	1850 vph
10-year design horizon (2030) – without development	AM	0.476	A	6.4 sec	18.0 m	2671 vph
	Midday	0.355	A	6.9 sec	13.9 m	2033 vph
	PM	0.529	A	8.4 sec	26.6 m	2639 vph
10-year design horizon (2030) – with development	AM	0.476	A	6.4 sec	18.7 m	2686 vph
	Midday	0.357	A	6.9 sec	14.2 m	2083 vph
	PM	0.532	A	8.4 sec	27.3 m	2671 vph

David Low Way/Finland Road intersection performance assessment (2030)

An assessment of the operational performance of the David Low Way/Finland Road intersection in its current layout has been undertaken. The intersection layout is shown in **Figure 14.10e** with the results of the assessment summarised in **Table 14.13k**.

Analysis of the David Low Way/Finland Road intersection indicates that the intersection is expected to operate within acceptable limits for the 10-year design horizon for all peak hour periods in terms of DOS, LOS and 95th percentile queue lengths.

The addition of operations traffic in the 10-year design horizon (2030) (16 vehicles in the AM, 50 vehicles in the Midday and 32 vehicles in the PM) has minimal impact on the performance of the intersection.

The intersection is expected to experience the greatest vehicular demand in the PM peak (1408 vph) but is still expected to operate within acceptable limits, with a LOS A and DOS of 0.380.

It should be noted that the SIDRA model is unable to account for safety deficiencies at the intersection including, reduced sight distances, location of property access at the intersection and sub-standard configurations. Improvements are required at the intersection to address these issues.

14.14 IMPACT SIGNIFICANCE ASSESSMENT

An assessment of the significance of impacts associated with the proposed development has been undertaken. The findings of this assessment are presented in **Table 14.14a**.

14.15 OTHER TRAFFIC AND TRANSPORT ISSUES

14.15.1 Safety

In addition to performance, the operational safety of the study intersections has also been considered as part of this assessment. Safety concerns primarily relate to the operation of the David Low Way/Finland Road intersection during construction activities in the peak construction year. While the intersection is expected to perform within acceptable limits with the addition of construction traffic, safety issues may arise as a result of sight distance limitations imposed by current intersection geometry and vegetation. This is discussed in greater detail in **Section 14.5.1.1**. The absence of suitable acceleration/deceleration lanes along David Low Way and a designated right-turn lane into Finland Road from David Low Way (east) could also increase the potential for rear-end accidents at the intersection.

Additional traffic issues include:

- Use of identified road segments on the network for access by heavy vehicles for delivery of materials, equipment and machinery
- Disruption to traffic due to road/lane closures brought about by construction activities at road crossings
- Increase in travel time to existing road users
- Ability of the roads to handle the volume of construction traffic, particularly in regard to over-size and over-mass vehicles
- General road safety.

Measures to mitigate these additional traffic issues have been provided in **Section 14.17**.

Table 14.13k: David Low Way/Finland Road intersection performance summary (2030)

Scenario	Peak hour	DOS	LOS	Average delay	95% Queue Length	Demand
Baseline (2012)	AM	0.261	A	4.2 sec	12.4 m	882 vph
	Midday	0.192	A	3.6 sec	8.9 m	683 vph
	PM	0.265	A	4.4 sec	17.5 m	967 vph
10-year design horizon (2030) – without development	AM	0.375	A	5.5 sec	27.7 m	1258 vph
	Midday	0.275	A	4.2 sec	16.1 m	973 vph
	PM	0.377	A	6.5 sec	44.4 m	1376 vph
10-year design horizon (2030) – with development	AM	0.384	A	5.6 sec	28.4 m	1274 vph
	Midday	0.289	A	4.3 sec	17.6 m	1023 vph
	PM	0.380	A	6.7 sec	48.0 m	1408 vph

Table 14.14a: Impact significance assessment

Traffic and transport	Initial assessment with mitigation inherent in the Preliminary Design in place				Residual assessment with additional mitigation in place				
Primary impacting processes	**Mitigation inherent in the design**	**Signifi-cance of impact**	**Likeli-hood of impact**	**Risk rating**	**Additional mitigation measures proposed***	**Signifi-cance of impact**	**Likeli-hood of impact**	**Resi-dual risk rating**	**Impact statement summary**
Reduced performance (LOS) of roads and intersections	• Proposed upgrade of Finland Road and David Low Way/Finland Road intersection • Manage transportation of construction materials to maximise loads and minimise HV movements • Use of internal and haulage access roads instead of public roads, where practical	Minor	Unlikely	Low	• As upgrade measures have been proposed, no additional mitigation measures are required. This is dependent, however, on the type, scale and effectiveness of proposed upgrades	Minor	Unlikely	Low	Agreement with TMR and SCRC concerning the appropriate type and scale of intersection upgrades is required to maintain this level of residual risk
Reduced traffic safety (potential for crashes)	• Proposed upgrade of Finland Road and David Low Way/Finland Road intersection to improve safety of access to properties along Finland Road and to improve vehicular safety at the intersection • Implementation of warning signage associated with construction vehicle movements and traffic/road layout and/or speed limit amendments	Moderate	Unlikely	Medium	• As upgrade measures have been proposed, no additional mitigation measures are required. This is dependent, however, on the type, scale and effectiveness of proposed upgrades	Moderate	Unlikely	Medium	Agreement with TMR and SCRC concerning the amount of mitigation measures is required to maintain this level of residual risk

Note:
(*) All mitigation measures, including responsibilities and timeframes, proposed for the Project are provided in Section 14.17 Mitigation measures

14.15.2 Access for mobility impaired

It is envisaged that accessibility for the mobility impaired will be provided to and from the site. Details of this provision are included in the Road Use Management Plan (RUMP).

14.16 CONCLUSIONS AND RECOMMENDATIONS

This Traffic and Road Impact Assessment Report presents the findings of the assessment of the impacts on the road network of the traffic which is expected to be generated as a result of the construction and operation of the new 13/31 runway and upgraded airport terminal building.

As part of this assessment the necessity for a more detailed PIA was determined. The results of these assessments are presented in the respective sub-headings.

14.16.1 Pavement impact assessment

An assessment of the pavement impacts of construction and operations traffic along the haul/access routes to the site and airport terminal building has been conducted.

Traffic generated as a result of construction activities in the peak construction year (2018) exceeded the 5 per cent ESA threshold (as specified in GARID) along David Low Way and Finland Road. A more detailed PIA is therefore required to assess the impacts of construction traffic on the existing pavement, primarily west of Sunshine Motorway in the vicinity of the David Low Way/Finland Road intersection. In addition, due to the existing poor pavement condition of Finland Road pavement improvements will be required prior to the commencement of construction activities.

While the study found that a more detailed PIA is required during the peak construction year (2018), it is not required in either the opening year (2020) or 10-year design horizon (2030).

14.16.2 Traffic impact assessment

A traffic impact assessment was conducted at the study intersections to examine the impact of construction and operations traffic on their performance. SIDRA intersection modelling was conducted for the AM, Midday and PM peaks for the peak construction year (2018), opening year (2020) and 10-year design horizon (2030). The findings of the analysis indicate that the traffic generated by the development for all scenarios (peak construction year, opening year and 10-year design horizon) has minimal impact on the performance of the study intersections. No intersection improvements are required to mitigate the development traffic with the exception of the David Low Way/Finland Road intersection, which is sub-standard in its current configuration (details of proposed mitigation measures are discussed next).

The traffic impact assessment indicated that the key contributor to the reduced operational performance of the study intersections was the growth in background traffic (i.e. not development traffic). The traffic generated as a result of the construction and operation of the new runway and upgraded airport terminal building is therefore expected to have minimal impact on the operational performance of the surrounding road network.

14.17 MITIGATION MEASURES

14.17.1 Traffic operations

Reduced operational performance is likely to be most evident at the David Low Way/Finland Road intersection due to its existing configuration, which is sub-standard. While it is acknowledged that Finland Road will be upgraded as part of ‘Package 1’ construction works, the following mitigation measures have been proposed to improve traffic operations at this intersection:

- Install signs on approach to the David Low Way/Finland Road intersection informing motorists of the presence of construction vehicles
- Investigate the performance of the David Low Way/Finland Road intersection from a safety perspective. In particular, determine 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
- Signalise David Low Way/Finland Road intersection to improve the safety of vehicles at the David low Way/ Finland Road intersection.

As discussed in **Section 14.13**, reduced operational performance may also be experienced at the David Low Way/Airport Drive intersection in the AM, Midday and PM peak hour periods during both construction (2018) and operations (2020 and 2030). While the overall intersection is generally expected to operate within acceptable limits, analyses suggested that some intersection movements could experience reduced operational performance for both ‘without’ and ‘with’ scenarios. The reduced operational performance of these intersection movements was due to growth in background rather than development traffic.

14.17.2 Access beneath Sunshine Motorway

It will be necessary to establish a formal service road connecting Finland Road and the cane underpass and the main construction compound; it is not proposed to provide direct access to the Sunshine Motorway. An unsealed access road currently provides access along this route, and would need to be upgraded to accommodate the proposed construction vehicles. To ensure there is no direct access from the Motorway to the access road, a perimeter fence will be installed between the road and Motorway. This fence may be left in place, or removed at the completion of works, depending on landowner and DTMR preference.

As the service road will be at existing ground levels, which are lower than the embankment of the Motorway, the upgrade to the access road is not expected to affect drainage of the Sunshine Motorway. Regardless, the access road would be designed to ensure appropriate stormwater drainage for the access road and Motorway.

14.17.3 Initial road use management plan (RUMP)

A RUMP will be developed in conjunction with the Contractor and submitted to DTMR/SCRC prior to construction commencing on site. A RUMP will be required by DTMR/SCRC prior to granting a Works Permit to haul materials and equipment.

The RUMP will identify appropriate protection objectives and associated implementation strategies together with monitoring, auditing, reporting and corrective actions to be adopted should an undesirable level of impacts be experienced.

The RUMP will consider the construction and operational phases of the Project. The RUMP will serve as the umbrella document for the construction contractors in developing the Traffic Management Plan (TMP) to ensure that the impact of construction traffic on the external road network is mitigated or minimised where possible.

Development of the RUMP will include consultation with DTMR to identify mitigation measures to address the relative increase in traffic levels on affected road sections of the SCR network.

Consultation with DTMR and SCRC will be undertaken in relation to the specific requirements of the RUMP and will also include requirements by the Queensland Police Service with regard to the safe movement of over-sized/indivisible vehicles. While a swept path analysis has not been conducted as part of this study, 19 m long (maximum) Class 9 heavy vehicles are expected to be the largest vehicles to access the site during the peak construction year. These vehicles are expected to use approved heavy vehicles routes (e.g. Sunshine Motorway, Bruce Highway, etc.) or have obtained approval as part of their use e.g. Quarry operators. The existing Sunshine Motorway/ David Low Way and David Low Way/Boardwalk Boulevard roundabouts are relatively large and these HVs are expected to be able to negotiate these intersections.

The movement of over-sized vehicles will require permits from the National Heavy Vehicle Regulator (Heavy Vehicle National Law Act 2012). This will be addressed in the final RUMP.

An initial RUMP has been prepared in response to the findings and conclusions of this report (refer to **Table 14.17a**).

Table 14.17a: Initial Road Use Management Plan

Objective:		
Management action	**Responsibility**	**Timing**
Identify and agree mitigation measures to address the relative increase in traffic levels on affected road sections of the SCR network	SCA (in consultation with DTMR)	On approval of EIS
Install appropriate heavy vehicle and construction warning signs on the access road to the site, warning existing road users of entering and exiting traffic	SCA (in consultation with DTMR)	Pre-construction
Review of speed restrictions along David Low Way in the vicinity of the David Low Way/Finland Road intersection	SCA (in consultation with DTMR)	Pre-construction
Distribution of day warning notices to advise local road users of scheduled construction activities	SCA/Contractor (in consultation with DTMR)	As required during construction
Advanced notice of road/lane closures and advice on alternative routes	SCA/Contractor (in consultation with DTMR)	As required during construction
Installation of appropriate traffic control and warning signs for areas identified where potential safety risk issues exist	SCA (in consultation with DTMR)	Pre-construction where issues have been identified
Manage the transportation of construction materials to maximise vehicle loads and therefore minimise vehicle movements	SCA (in consultation with Contractor)	As required during construction
Ensure vehicle loads for delivery scheduling adhere to specific load limits on the haul/access routes to be used and avoid travel during peak periods	SCA/Contractor (in consultation with DTMR)	Throughout construction
Whenever practical, vehicles associated with the construction works should use internal and haulage access roads instead of public roads	SCA/Contractor (in consultation with DTMR)	Throughout construction
Induct truck and vehicle operators on the requirements of the RUMP	SCA/Contractor (in consultation with DTMR)	Throughout construction
Provision for mobility impaired access to and from the site	SCA/Contractor	Pre and during construction
Monitoring: • Monitoring of the identified actions is the responsibility of each of the parties listed in the 'Responsibility' column above		
Reporting: • SCA to report traffic concerns and issues arising from construction activities to SCRC and DTMR for discussion on potential mitigation		

In addition to the initial RUMP provided in **Table 14.17a**, it is noted that a key road impact due to the additional traffic would relate to the potential deterioration of the road pavements due to the additional heavy vehicle loads. Detailed ground investigations to ascertain existing road conditions and constraints have not been conducted as part of this study. However, this will be confirmed in the detailed design stage. A detailed PIA will be prepared and submitted to DTMR/SCRC prior to construction commencing. The detailed PIA will assess the impact of the construction traffic on the life of the affected road pavements and recommend remedial measures. The extent of the remedial measures and compensation will be discussed and agreed with DTMR/SCRC.

The generation of construction traffic will create short-term increases in traffic volumes on the road network. Based on the nominal capacity of the road network, the additional construction traffic due to the Project can be adequately accommodated at acceptable levels of service. The delivery of materials and equipment will be spread over the total 4 year construction period and the movement of these vehicles can be arranged to minimise impacts on the local community, who need to be kept informed of the progress of the construction works, other potential impacts and any safeguards to be incorporated.

Traffic during construction will be managed through a detailed TMP. The TMP will address specific items of construction work and issues related to the safe and efficient movement of construction vehicles and haulage of material including the movement of site staff. A TMP will be required by DTMR/SCRC prior to granting a Works Permit to haul material and equipment.

Consultation with DTMR and SCRC will also be undertaken in relation to the specific requirements of the TMP.

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