13. Traffic

13.1 Construction Traffic

Section 13.4 of the Supplementary EIS presents the estimated heavy vehicle generation during the construction stage. The likely duration of this traffic is also included in Table 13-3 of the Supplementary EIS.

Transportation of rock to the site has been included in calculations of traffic generation during construction, as have trucks carrying fill.

Transport of materials for construction of buildings on the filled land will take place over a period of 5 years, following completion of construction of the marina/land areas. It is not possible to estimate the quantities of building materials to be transported over this period as designs of buildings have not been completed. However, the quantity is not expected to be large and will be similar to that already experienced in the township due to other hotel construction projects that have taken place.

13.1.1 Construction Car Parking

The Supplementary EIS notes that 15 car parks will be provided for construction workers. While this is expected to be adequate, additional on-site car parking will be provided if necessary.

Construction workers will be prevented from utilising public car parks adjacent to the project site during any busy times where this may prevent residents or visitors from using these car parks. Construction workers will be specifically excluded from using the Airlie Beach Hotel car park during working hours.

13.1.2 Final Car Parking

There are two types of parking proposed for the development:

- Parking to be provided as part of the project – **"Project Parking"**
- Parking which may be provided as general public parking – **"Public Parking"**.

Ultimately, parking arrangements for the project must be agreed with Whitsunday Shire Council.

Project Parking

There are a number of areas within the development which generate parking.

Project Parking associated with the transport interchange is for about 170 cars, 6 interstate, 2 local "bendy-buses", minibuses and 6 taxis. As described above, it is proposed that the car park spaces will be perpetually leased to Council, whilst those spaces set aside for buses, mini-buses and taxis will be dedicated to the Crown as roadway as part of the interchange facility.

In addition, approximately 200 Project Parking car spaces will be available to the public under the retail areas, plus around 80 Project Parking carparks adjacent to the marina. We expect a further number of Project Parking carparks associated with the

tourist residential complexes will be included in the parking rental pool and also be available for public parking. This will bring the total Project Parking car spaces available for public use to over 500, and continued access to them will form part of future development permit approvals.

Public Parking

Subject to agreement by Whitsunday Shire Council, the proponent will construct an additional parking station and make it available to Council to purchase in freehold tenure.

Tenure

The tenure proposed for all parking is freehold with some leased to Council as described above and some contained within a Body Corporate structure due to the multi level form of construction and the nature of the use (residential). Windward will be responsible for the operation and maintenance of all car parking.

13.2 Site Access

13.2.1 Access to Boat Ramp

Department of Main Roads wishes to limit the number of access points from Shute Harbour Road, hence a separate access point for the boat ramp traffic will not be provided.

13.2.2 Pedestrian Access

It is likely that initially non-signalised pedestrian crossings will be used to allow pedestrians and cyclists to access the site across Coconut Grove and Shute Harbour Road. In the future, as traffic counts on these roads increases and roads are widened to meet demand, traffic signals or other mechanisms may be introduced to facilitate safe pedestrian crossings. It is noted that there is a preference to avoid signalised pedestrian crossings and any decision to install signals would need to be assessed based on actual and predicted pedestrian and vehicle traffic movements, bearing in mind the signalisation warrants presented in the *Manual of Uniform Traffic Control Devices* at the time of the decision. Such a decision would also need to be made in consultation with Department of Main Roads and Council.

A change in pedestrian access arrangements has been made in response to a Streetscape Master Plan developed by Whitsunday Shire Council. This entails the movement of the town square and main pedestrian access point from the Coconut Grove/Shute Harbour Road intersection to the Coconut Grove/Esplanade intersection (see **Figure 1.1**).

13.2.3 Construction Access

Construction access is described in Section 2.7.10 of the Supplementary EIS. Contract conditions will be used to ensure that construction contractors adhere to the agreed construction access plan.

Negotiations will be undertaken with DMR and Whitsunday Shire Council regarding contributions by the proponent to offset any damage to pavements as a result of construction traffic.

13.2.4 Access from Shute Harbour Road

Access to the project from Shute Harbour Road as well as Coconut Grove is integral to the management of internal traffic to the project for a number of reasons:

- Department of Emergency Services has advised Department of State Development that it requires two access points to the development in case access within the site is constrained by an emergency event. Department of Emergency Services has also indicated that it is inappropriate for fuel trucks to enter the site at Coconut Grove and traverse the length of the site on internal access roads to reach the refuelling facility.
- Department of Emergency Services has also advised that fuel tankers cannot use underground road/carpark networks to move about the site. It would also be inappropriate for other large vehicles such as long distance buses and boat/trailer combinations to access the transport terminal and eastern end of the site by such means.
- Most heavy vehicles (including long distance buses), trade vehicles and boat/trailer combinations entering the site are destined for the eastern end of the site. It would be inappropriate for these vehicles to traverse the site from the Coconut Grove access point (at the western end of the site) as this would require them to pass through the key community access areas of the site, including areas set aside for community interaction.
- Whitsunday Shire Council has indicated that it requires access to the site from Shute Harbour Road.

Following discussions with Department of Main Roads, the following access arrangements from Shute Harbour Road have been identified as acceptable to both DMR and Whitsunday Shire Council:

- Limited access to the site from Shute Harbour Road at the original intersection midway between Hermitage Drive and Coconut Grove. This will allow vehicles to make a left turn into the site at this point. There will be no egress from the site to Shute Harbour Road from this point.
- Full access to the site from a point opposite Hermitage Drive.

Figure 1.1 shows this arrangement.

It is noted that this arrangement will prevent preservation of 0.75ha of mangroves inshore of the spoil disposal area. This is also discussed in Section 8.1.

13.2.5 Traffic Congestion

Traffic modelling for the proposal does incorporate trips made by residents to access shops and other services.

The results of traffic modelling presented in Section 13 of the Supplementary EIS indicates that the proposed Port of Airlie is not expected to lead to unacceptable levels of congestion in Airlie Beach. The proposal is also not expected to significantly affect hazard levels danger for pedestrians in Airlie Beach township or walking to and from Port of Airlie.

The proposal will require widening of Shute Harbour Road east of the development and some other works to be brought forward by one to two years (see Section 13.7 of the Supplementary EIS). With these upgrades, the road network can continue to function without unacceptable delays or safety risks to vehicles or pedestrians.

13.2.6 Public Transport

Initial advice from Queensland Transport is that it would be difficult to relocate existing local bus stops on Shute Harbour Road as this would necessitate changes to the bus timetables. However, should Queensland Transport or others consider it appropriate to provide a bus stop on Shute Harbour Road adjacent to the transport terminal, this can be incorporated.

13.3 Impact of Site Drainage on Shute Harbour Road

As noted in Section 2.6 of the Supplementary EIS, a reinforced concrete culvert drain, sized to carry all runoff from the catchment along Shute Harbour Road, will be constructed along the site frontage west of Access A. East of this point, drainage will discharge through existing mangroves into the tidal channel. The dimensions of drainage elements will be determined during the detailed design process. Drainage elements will be designed in accordance with Department of Main Roads' *Drainage Manual* and will be designed to accommodate all runoff from the catchment, thus preventing adverse impacts on Shute Harbour Road.

Preliminary calculations of the runoff from catchment area above Shute Harbour Road indicate peak flow rates for 1, 5, 50 and 100 ARI events are 5, 10, 18 and 22 m^3. A reinforced concrete open channel will be constructed along the development boundary and will be sized to accept the appropriate ARI flows from the catchment. Outfalls for the drain will be provided in the following positions:

- Though a culvert under the pedestrian plaza adjacent to Coconut Grove.
- Through a culvert in a drainage easement between development areas C and F.
- Through an outlet at the end of the development behind the maintenance dredge spoil storage area.

Overland flow paths for extreme events will be provided through the development along the pedestrian plaza adjacent to Coconut Grove and along the access road to development site A.

13.4 Peak Hour Traffic Generation

The number of users of the ferry terminal and hotel uses has been calculated based on the physical facilities to be provided, while the marine hardstand and repair area has been assessed as a stand alone 'light industry' development which is significantly conservative in terms of implied number of employees as well as traffic generation. While these land uses contribute a significant proportion of the total traffic generation of the development, there is no special uncertainty over the level of activity involved. Sensitivity testing is not considered necessary.

The peak hour percentages applied to daily traffic generation, as discussed in Section 13.5.1 of the Supplementary EIS, are primarily based on the rates agreed with DMR during the previous impact assessment process, as described in the 1998 Draft EIS (reference 100/1/102.12 RJL:LL:153), and on standard industry sources, including

Queensland Transport's draft *Transport Assessment Guide* (TAG) – the trip generation section of which has now been incorporated into Chapter 2 of DMR's *Road Planning and Design Manual* (RPDM).

Specifically, the sources for percentages of peak hour traffic used for each land use are:

(1) Tourist Accommodation (Hotel and Serviced Apartments)

Guests (cars and buses) 10%, Staff 12 %, Service Vehicles 10%

These percentages are taken directly from the Draft EIS rates previously agreed to by DMR. The percentage used for guest traffic is also standard for residential areas and is reflected in the recommended generation rates in, for example, the RPDM.

It is also noted that these percentages are slightly different from those presented in Eppell Consulting's *Resort Traffic Surveys*, from which other trip generation factors for this land use are drawn. However, use of that study's recommended rates for a resort of this class would result in a marginally lower total peak hour generation (down by 5 trips per hour) for the accommodation components of the development than the Supplementary EIS adopts.

(2) Transport Terminal

Ferry Terminal 30%, Long Distance Coach Terminal 7 %, Local Buses 20%

The Ferry Terminal percentages are taken directly from the Draft EIS rates previously agreed to by DMR. They are considered quite conservative when compared to the experience of the current ferry operator at Shute Harbour who advises that at present approximately half of the total daily passenger numbers are carried in the 1 ½ hour morning and evening peak periods combined.

The peak hour percentages for the trips generated by the long distance coaches and the local buses have been taken from the current timetables for the existing services. Particularly in the case of local buses this is somewhat conservative as an increase in total daily bus services is likely to involve more frequent bus services throughout the day, given that the local bus service in peak hours already provides a high level of access with 14 services (in both directions) in each peak.

(3) Tourist Retail, Commercial and Restaurant Uses

Tourist Retail 8 %, Commercial 20 %, Restaurant 8%

These percentages are also taken directly from the Draft EIS rates previously agreed to by DMR. These Commercial and Restaurant percentages are also reflected in the peak hour and daily generation rates given in the RPDM for these land uses (this document does not give a daily rate for retail developments so there is no equivalent percentage for comparison).

(4) Residential Units

Residential Units 10 %

This percentage is taken directly from the Draft EIS rates previously agreed to by DMR. It is standard for residential areas and is reflected in the recommended generation rates in, for example, the RPDM.

(5) Marine Hardstand and Repair

Light Industry 10 %

This land use was not included in the Draft EIS proposal. The peak hour percentage used here is taken from the recommended rates in the RPDM.

(6) Boat Ramp

Boat Ramp 13 %

This factor has been derived from the 'activity ratio' of peak hour movements to daily boat launches for the proposed category of launching facility, as recommended by SKM's *Public Boat Ramps North Queensland Strategic Plan, Volume 1 Demand Forecasting*.

(7) Marina Berths

Marina Berths 13 %

Although a 10% factor was previously used in the Draft EIS, in the Supplementary EIS this has been conservatively increased to match the peak hour percentage calculated for the Boat Ramp.

(8) Marine Academy

Students 50 %, Staff 40%

This factor has been conservatively calculated assuming a worst-case scenario with both classes having all-day sessions and all students arriving and departing in a short timeframe around class times. The staff percentage assumes a low level of pre- and post-class work on site.

13.5 Future Upgrading of Shute Harbour Road

The Supplementary EIS identifies that within the timescale of the assessment, the demand on Shute Harbour Road without the proposed Port of Airlie development is expected to considerably exceed its practical capacity in its current configuration. To achieve the rate of growth DMR recommended prior to the Traffic Study for the Supplementary EIS over the timescale of the assessment, it would clearly be necessary to upgrade Shute Harbour Road as discussed in Section 13.3 of that report.

It is recognised that Department of Main Roads' Roads Implementation Program (RIP) does not currently include these improvements to Shute Harbour Road. The Supplementary EIS does not seek to make any statements about the actual timing or funding of these works in practice.

However, in accordance with normal traffic engineering practice, the analysis to show the impact of the proposed development in future years takes a road network which is adequate for the expected traffic without the development as a basis for comparisons.

To reanalyse Shute Harbour Road in a configuration which would have calculated background demands considerably higher than the practical capacity would not give realistic or physically meaningful results.

13.6 Impact of Alternative Access Arrangements

The proposed Access A on Shute Harbour Road, which serves the Transport Interchange, Harbourfront mixed use precinct, Marine Industry and Boat Ramp areas is considered an appropriate location for access to these activities. In fact, a separate site access point on Shute Harbour Road serving these elements is considered integral to the development. The reasons for this conclusion are discussed in **Section 13.2.4**.

However, it is noted that the impact of the development on the State Road Network would be unchanged under the scenario of access only via Coconut Grove Road, except for the part of the site frontage between Coconut Grove and Access A. In this section traffic volumes would be reduced.

The alternative access arrangements now proposed, which include a left in – left out access at Access A and a four-leg roundabout at Hermitage Drive, will also not change the impact of the development on the State Road Network except for part of the site frontage. In this case the section between Access A and Hermitage Drive would experience increased traffic, although to a lesser extent than the already analysed section between Coconut Grove and Access A.

The effects of the changed access on traffic volumes along the frontage of the site, and the performance of the two proposed new intersections, will be analysed during the detailed design stage. However, it may be noted that under the 'roundabout' scenarios analysed in the Supplementary EIS, both Coconut Grove/Shute Harbour Road and Access A/Shute Harbour Road experienced good to excellent Levels of Service and were well within capacity (with peak hour Degrees of Saturation no higher than 0.50). No capacity issues are therefore expected at the proposed Hermitage Drive roundabout.

13.7 Boat Trailer Impact on Queue Lengths

It is agreed that the car – boat trailer combination should be analysed as a long vehicle when assessing queues at intersections, particularly where queue lengths are restricted. The number of vehicles involved, however, is small (peak generation of 17 car-trailer combinations per hour), and in practice this factor is significant only at the site access intersections and within the site.

As noted above, the performance of the site access intersections under the new proposed alternative arrangement will be analysed during the detailed design phase. The internal intersections will also be adjusted to suit the new access arrangements and reanalysed. The contribution of the car-trailer combinations will be explicitly presented in these analyses.

Electronic copies of the SIDRA files discussed in the Supplementary EIS have been supplied to the Department of Main Roads with this Addendum, as requested. Copies of analyses undertaken during detailed design will also be supplied.

13.8 Assessment of Construction Traffic Impacts

As noted by the Department of Main Roads (DMR), a pavement impact assessment following the procedures outlined in the *Guidelines for Assessment of Road Impacts of Development Proposals* is to be undertaken before construction, once more detailed information on construction operations, haulage routes and vehicles to be used is available. It is recognised that DMR approval is required prior to construction vehicles using State controlled roads, and an appropriate contribution to pavement maintenance costs will be made.

13.9 Assessment of Impacts of Each Stage of Development

It is recognised that further assessment will be required as the timing and design of each stage of the development are finalised.

However, as a preliminary indication, the analysis undertaken for the Supplementary Report indicates the following relationship between time of opening of each stage and the time of need for road upgrades in the area of influence of development:

Table 13-1 Timing of Road Improvements vs Stage Opening

Nominal Stage	Development Elements	Year of Opening	Coincident Road Improvements	Effect of Development on Time of Need
1	Transport Interchange, Marina, Marine Industry, Marine Academy, Residential / Mixed Use Stage 1	2005	❑ Upgrading Shute Harbour Rd / Airlie Esp / Waterson Rd (east) Intersection [Scenario 1 only]	❑ bring forward 1 year
2	Residential / Mixed Use Stage 2	2006	❑ 4 laning Waterson Rd (west) – Shingley Dve	❑ bring forward 2 years
3	Residential / Mixed Use Stage 3	2007	❑ 4 laning Shingley Dve – Coral Esp ❑ 4 laning Beach Rd – Tropic Rd ❑ Upgrading Shute Harbour Rd / Airlie Esp / Waterson Rd (east) Intersection [Scenario 2 only]	❑ bring forward 1 year ❑ bring forward 1 year ❑ NONE
4	Residential / Mixed Use Stage 4	2008	❑ 4 laning Coconut Gve – Airlie Esp ❑ 4 laning Island Dve – Beach Rd ❑ Upgrading Shute Harbour Rd / Beach Rd intersection ❑ Upgrading Shute Harbour Rd / Island Dve intersection from existing	❑ bring forward 2 years ❑ bring forward 1 year ❑ bring forward 1 year ❑ ❑ bring forward 1 year
5	Residential / Mixed Use Stage 5	2009	❑ Upgrading Shute Harbour Rd / Waterson Rd (west) intersection	❑ NONE
6	Hotel	2010	❑ 4 laning Island Dve – Coral Esp ❑ Upgrading Shute Harbour Rd / Island Dve intersection from one lane roundabout [if used]	❑ bring forward 2 years ❑ bring forward 1 year

Road upgrades not required until one year or more after the completion of all stages of the development are not listed in this table, but are identified and discussed in Sections 13.3 and 13.7 of the Supplementary EIS. In particular, refer to Figure 13.6 and Table 13.8 for summaries of the upgrades and development effects on time of need for the overall development.

13.10 Impacts on Council Controlled Roads

During construction, as noted in Section 13.6 of the Supplementary EIS, it is envisaged that all heavy vehicles will access the site via a new access point on Shute Harbour Road. All heavy vehicle traffic is expected to travel to and from materials sources to the west of the site, and will travel along Shute Harbour Road for most of its route, bypassing central Airlie Beach using the newly completed Waterson Road Loop Road. This Loop Road, assuming it continues to be controlled by the Whitsunday Shire Council, is the only section of the haulage routes identified which affects a Council road.

Of the construction heavy vehicle impacts identified in Section 13.6 of the Supplementary EIS, travel on the Waterson Road Loop Road represents approximately 29,000 ESA-km. Using the preliminary cost calculations discussed in that section, haulage on Waterson Road would involve indicative pavement costs of approximately $2,100.

This should be considered an order of magnitude estimate only. As noted in Section 13.8 above, a pavement impact assessment is to be undertaken prior to construction, when more detailed information is available, and this will include a more accurate assessment of the impacts on Council controlled roads.

Once the exact sources of construction materials to be transported are known, it may be identified that haulage will also impact on other sections of Council controlled roads near the materials sources. The impact on any such links and the appropriate maintenance contribution resulting from such impacts will also be included in the pavement impact assessment which will be undertaken prior to construction.

Once the Port of Airlie development is fully operational, it is expected to have only a minor impact on traffic volumes and operating conditions on Council controlled roads. The effects on streets expected to carry approximately 100 additional vehicle trips per day (the equivalent of ten typical detached houses) or more as a result of the development are summarised in **Tables 13.2** and **13.3** below.

■ **Table 13-2 Traffic Impacts on Council Controlled Streets - 2010**

Street	Section	Background Volume [vpd]	Level of Service Background Only	Development Generated Volume [vpd]	Volume with Development [vpd]	Level of Service With Development
Coconut Grove	N of Shute Harbour Rd	3 070	❑ A	❑ 0 (1)	❑ 3 070	❑ A
Airlie Esplanade	N of Shute Harbour Rd	3 220	❑ A	❑ 1 200	❑ 4 400	❑ A
Waterson Road	S of Shute Harbour Rd at Airlie Esp	3 830 (Scenario 1) 5 840 (Scenario 2)	❑ A (Scen. 1) ❑ A (Scen. 2)	❑ 450 (Scen. 1) ❑ 860 (Scen. 2)	4 280 (Scen. 1) 6 700 (Scen. 2)	❑ A (Scen. 1) ❑ B (Scen. 2)
Broadwater Avenue	N of Shute Harbour Rd	1 650	❑ A	❑ 100	❑ 1 750	❑ A
Island Drive	S of Shute Harbour Rd	10 380	❑ C	❑ 340	❑ 10 720	❑ C

Street	Section	Background Volume [vpd]	Level of Service Background Only	Development Generated Volume [vpd]	Volume with Development [vpd]	Level of Service With Development
	at Cannonvale					
Beach Road	N of Shute Harbour Rd	3 920	❑ A	❑ 340	❑ 4 260	❑ A
Manooka Drive	S of Shute Harbour Rd	1 010 (3)	❑ A	❑ 150	❑ 1 160	❑ C

Note : (1) Net change in traffic volume on Coconut Grove is zero due to transfer of coaches and passenger collection activity to Transit Centre on site.
(2) Scenario 1 and Scenario 2 refer to the proportion of through traffic assumed to use Waterson Road Loop Road rather than Shute Harbour Road through central Airlie – see Supplementary EIS, Section 13.4 for more information.
(3) Manooka Drive (North) background traffic estimated from catchment analysis.

■ Table 13-3 Traffic Impacts on Council Controlled Streets - 2020

Street	Section	Background Volume [vpd]	Level of Service Background Only	Development Generated Volume [vpd]	Volume with Development [vpd]	Level of Service With Development
Coconut Grove	N of Shute Harbour Rd	6 410	❑ B	❑ 1 000	❑ 7 410	❑ B
Airlie Esplanade	N of Shute Harbour Rd	8 330	❑ C	❑ 100	❑ 8 430	❑ C
Shute Harbour Road(1)	W of Airlie Esp	8 330	❑ C	❑ 100	❑ 8 430	❑ C
Broadwater Avenue	N of Shute Harbour Rd	2 940	❑ A	❑ 100	❑ 3 040	❑ A
Island Drive	S of Shute Harbour Rd at Cannonvale	18 590	❑ E	❑ 340	❑ 18 930	❑ F
Beach Road	N of Shute Harbour Rd	7 020	❑ B	❑ 340	❑ 7 360	❑ B
Manooka Drive	S of Shute Harbour Rd	1 810 (2)	❑ A	❑ 150	❑ 1 960	❑ A

Note: (1) Shute Harbour Road assumed to transfer to Council control and Waterson Road to State control after diagonal closure of Shute Harbour Rd / Airlie Esp / Waterson Rd redirects all through traffic via the Loop Road.
(2) Manooka Drive (North) background traffic estimated from catchment analysis.

As these results show, for most streets the proposed development does not affect the Level of Service. An exception is Island Drive south of Shute Harbour Road at Cannonvale, where the small volume contributed by the development results in the practical capacity of the road link being reached one year earlier than would otherwise be the case. This is reflected in the change of upgrade timing identified for the intersection of Shute Harbour Road and Island Drive in Section 13.7.2 of the Supplementary Report.

The development generated traffic on Waterson Road in 2010 (for Scenario 2 only) has a minor effect on the Level of Service on that section of road, however the link is still well within its practical capacity. This link's performance is still expected to be 'good' with minimal changes in travelling time.

The effects of increased traffic on Coconut Grove and Airlie Esplanade will be mitigated by the construction of roundabouts at Coconut Grove/Airlie Esplanade and Coconut Grove/Shute Harbour Road to provide a high level of service to side street traffic as well as to control travel speed, particularly on Coconut Grove. These treatments are compatible with Council's planned streetscape enhancements on Coconut Grove. These combined measures will reinforce its status as a local street to drivers, encouraging slower driving and more awareness of other road users.

13.11 Intersection Treatments During Construction

Temporary traffic management during construction will be designed to maximise safety and minimise impacts on other traffic, and will be in accordance with relevant standards. The specific treatment to be used at individual affected intersections will be

developed during the detailed design and construction planning phases, in consultation with the Department of Main Roads and Whitsunday Shire Council. These agencies' experience with other construction projects in the area, including the Airlie Lagoon, and the effectiveness of treatments used in those projects will be valuable and will be canvassed during that process.

13.12 Carpark on Coconut Grove

The proposed Port of Airlie does not require the carpark on Coconut Grove to be removed, however it is understood that Council has developed a Streetscape Masterplan for Airlie Beach which may remove this carparking.

13.13 Additional Commitments to DMR

The following commitments are made to Department of Main Roads:

- Agreement will be sought from DMR on detailed design for road upgrades and associated works
- Lighting measures will have regard to light spill onto Shute Harbour Road
- No landscaping or advertising signage will occur within the Shute Harbour Road reserve
- All works on Shute Harbour Road will be performed by DMR pre-qualified contractors wherever possible.

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