

Traffic Evaluation Report Bluesfest 2018 at Tyagarah, NSW

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Table of Contents

Table of tables	4
1 Introduction and initial comments	5
1.1 Project brief.....	6
1.2 Relevant standards, specifications and guidelines.....	6
1.3 Event description	
1.4 Site location	
1.5 Definitions	
1.6 Summary of Key Performance Indicators...	
2 Presence at event	
2.1 Classified counters	
3 Implementation of traffic control plans.....	
4 Wednesday: 28 March 2018.....	
4.1 External traffic.....	
4.2 Internal traffic	
4.3 KPI and Data summary.....	
5 Thursday: 29 March 2018.....	
5.1 External traffic.....	
5.2 Internal Traffic.....	
5.3 KPI and Data summary.....	
6 Friday: 30 March 2018.....	
6.1 External traffic.....	
6.2 Internal traffic	
6.3 KPI and Data summary.....	
7 Saturday: 31 st March 2018	
7.1 External traffic.....	
7.2 Internal traffic	
7.3 KPI and Data summary.....	
8 Sunday: 1 st April 2018.....	
8.1 External traffic.....	
8.2 Internal traffic	
8.3 Data summary	
9 Monday: 2 nd April 2018	
9.1 External Traffic.....	
9.2 KPI and Data summary.....	
10 Traffic counter data overview – 2015 data	

11	Bus Surveys.....	30
12	Recommendations from this report	33
13	Conclusions	33
14	REFERENCES	34

Table of tables

Table 1 - Wednesday KPI summary.....	13
Table 2 - Thursday KPI summary.....	16
Table 3 - Friday KPI summary.....	20
Table 4 - Saturday KPI summary	22
Table 5 - Sunday KPI summary.....	26
Table 6 - Monday KPI summary.....	27

1 Introduction and initial comments

Greg Alderson and Associates have been engaged by Bluesfest to prepare a Traffic Evaluation Report (TER) for the Bluesfest 2017 event at The Bluesfest Farm Tyagarah. This report is prepared in response to DA Consent Conditions, which requires performance reports on the traffic and submission of traffic data collected

In preparation for this festival, a Traffic Management Plan, incorporating Traffic Control Plans for the local road network, was prepared by Bluesfest and The Lack Group. The TER is to be read in conjunction with the TMP report and associated Traffic Control Plans.

Our staff attended the site and drove the neighbouring road network during the Festival

Previous TER Reports included traffic counter data collected during the festival. No traffic counters were installed this year, however manual observation counts were undertaken around peak times to estimate vehicle flow rates, and to observe various traffic behaviour.

In summary, overall the traffic worked well and without incident and is a credit to the traffic and parking teams as well as the Bluesfest teams.

The only blemish on the performance of traffic was on Easter Sunday at Bluesfest 2018, there was queueing in the afternoon that extended from the northbound off-ramp along the Pacific Motorway to the south. Contingency measures were implemented by RMS and Bluesfest and we understand that no end of queue or other related incidents have been reported.

Figure 1 - Bluesfest Saturday 31 March 2018, photo: Air Swing Media

1.1 Project brief

The aim of the Traffic Evaluation Report is to describe the 2018 Bluesfest event from a traffic management point of view, as observed by our staff during the event, and as commented upon by others.

The assessment report will also provide indicative figures to allow assessment of the success of this event and in the planning for future events at the site.

1.2 Relevant standards, specifications and guidelines

This TER has been prepared in general accordance with the following standards, specifications and guidelines:

- Guide to Traffic and Transport Management for Special Events Version 3.4
- RMS Traffic Control at Worksites manual v4
- Australian Standards (in particular AS1742)
- Quality Assurance specifications
- Austroads Guide to Traffic Management.

1.3 Event description

Bluesfest is a music festival that was held at The Farm Tyagarah from Thursday 29 March 2018 to Monday 2 April 2018. Although the actual festival with live bands was held from Thursday to Monday, campers were allowed to arrive on Wednesday and Thursday. Campers are also allowed to leave the site on Tuesday.

1.4 Site location

The subject site is formally known as Lots 103, 104, 105 DP 1023126, Tanner Lane Tyagarah. The southernmost entry to the site is located at approximately 300 m south of the Tyagarah Service Station, and the North entrance from an off ramp on Tanner Lane constructed by Bluesfest to facilitate access to the north of the Festival site.

Figure 2 below depicts the location of the site with respect to its locality.

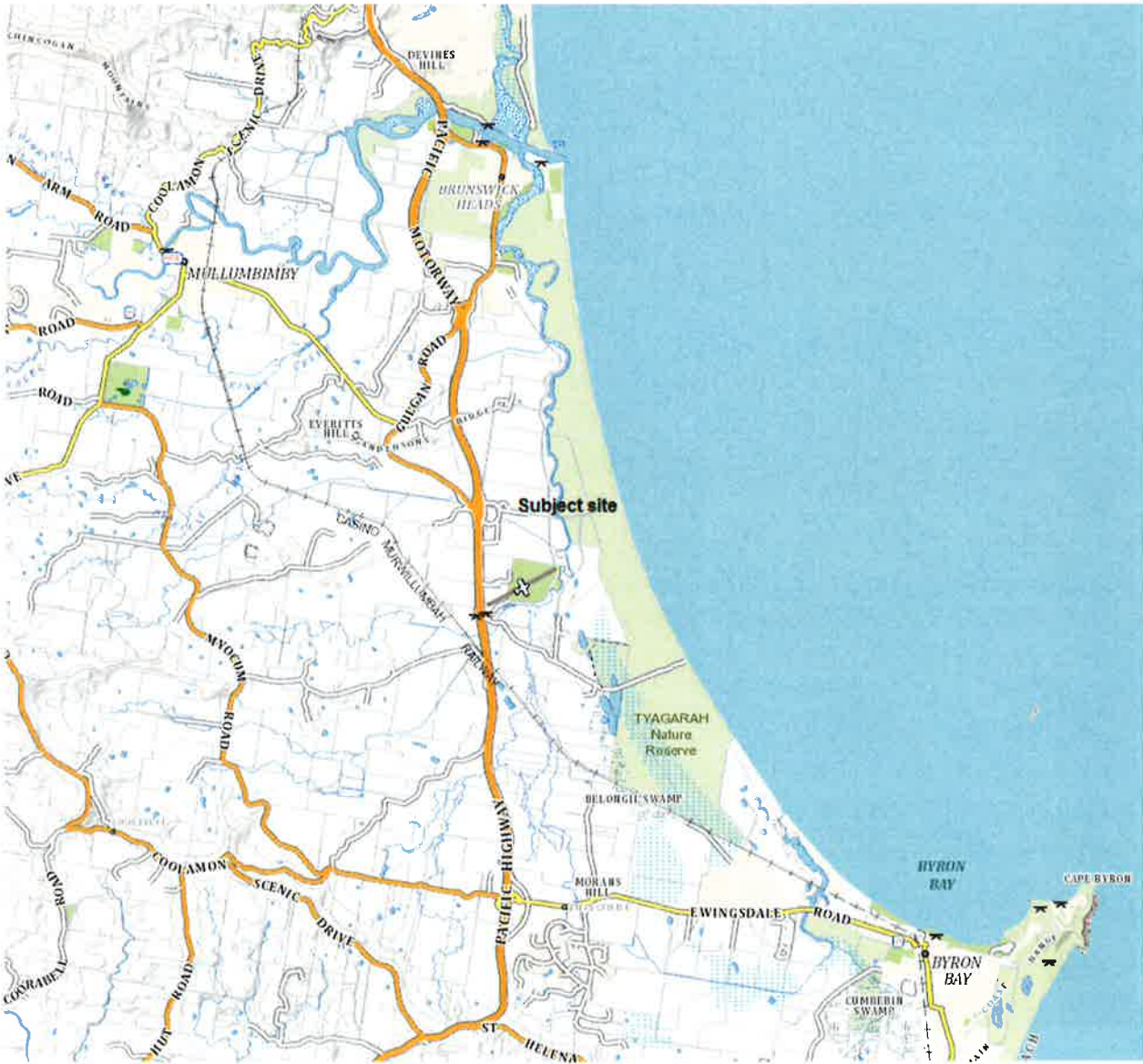


Figure 2 - Site locality, Source of map: NSW LPI SIX Maps

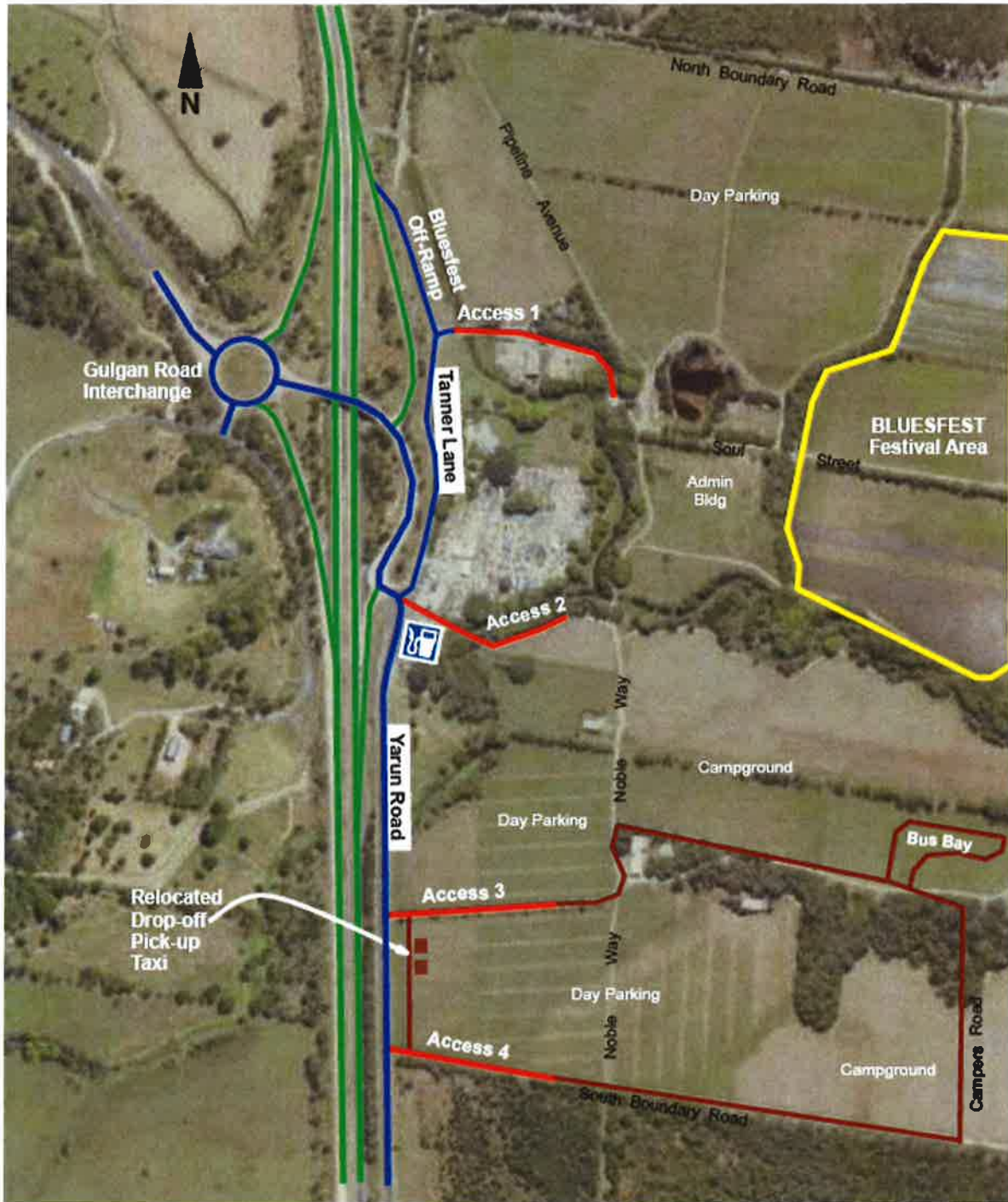


Figure 3 - Site Plan, Source of map: NSW LPI SIX Maps

1.5 Definitions

AADT	Average Annual Daily Traffic; average traffic volume per day after application of correction factors
ADT	Average Daily Traffic; average traffic volume per day, based on a limited survey period, typically 1 week.
Peak Flow Rate	Hourly volume of vehicles during busiest part of assessment period
Background Traffic	Traffic composition as would typically exist without superposition of event traffic
Heavy Vehicle	For the purposes of this report: anything other than a pedestrian, cyclist, motorbike or car

1.6 Summary of Key Performance Indicators

The Development Consent (DA10.2013.128.1) provided a set of Key Performance Indicators (KPI's) that were created to ensure acceptable traffic conditions on the public road during the event. These KPI's were as follows:

1. The local roads adjoining the Bluesfest site must have a Level of Service (LoS) of D or better between 8am and 8pm event days. This can be measured by ensuring flow rates do not exceed 800 vehicles per hour per lane when 40 km/h special event speed limits apply, and not exceed 1260 vehicles per hour per lane when 60 km/h special event speed limits apply. Reference is made to Figure 3.1, Levels of Service and Flow Rates, Austroads Guide to Traffic Management Part 3.
2. The on-ramps of the Gulgan interchange with the Pacific Highway operate at LoS C or better at event times. This would be assessed by calculating average delay on the on ramps. LoS C would be exceeded when average ramp delay exceeds 42 seconds, with ramp traffic gap acceptance of 2.5 seconds and a follow up headway of 2 seconds. Micro simulation packages such as SIDRA can be used to determine LoS at maximum traffic flow rates during the event.
3. Traffic queuing on the Gulgan Road interchange off ramps must not exceed stopping sight distance fore 110 km/h speeds. Stopping sight distance is to be measured from the highway at the start of the diverge taper for the off-ramp. Reference is made to RTA supplement to the Austroads guide to Road Design Part 3 Section 4.3.1 for stopping sight distances.

The Development Consent (10.2014.753.1) includes similar requirements in the following conditions:

Condition 61

v. There is to be no impact on through travel times on the pacific Highway

vi. The TCP must incorporate a monitoring program to assess the traffic volumes and peak parking numbers associated with each event. Twenty four hour traffic counts are to be undertaken before, during and after the first two medium and large events (and as further required by Council or the Roads and Maritime Service) for the traffic on the frontage and surrounding roadways. Such report must include details demonstrating compliance with the conditions of consent relating to traffic management including the requirements of the RMS provided below. From time to time aerial photography of the site and surrounds at regular intervals before during and after the event, including peak traffic and parking periods should be undertaken to support the traffic monitoring report.

xiii The TCP to factor in that local roads operate a Level of Service D or better between the hours of 8am and 8pm on event days. The ramps of the Gulgan Road Interchange with the Pacific Highway to operate at Level of Service C or better at event times (See Figure 3.1 Levels of Service Flow rates Austroads Guide to Traffic Management Part 3 and Highway Capacity Manual)

xiv The TCP to include provision so that Traffic queuing on the Gulgan road off ramps does not exceed stopping sight distances for 110 km/h speeds. (See RMS supplements and Austroads Guide to road Design Part 3 Section 5.3.1 for stopping sight distances)

Based on the above KPI's defined by Council, the following site specific KPI's can be defined:

1. Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,
2. Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,
3. Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm
4. Maximum flow rate 800 vehicles per hour per lane on Tanner Lane and Yarun Road, between 8am and 8pm.
5. No queuing on the Pacific Motorway,
6. No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,
7. No back up queue from the site onto Tanner Lane or Yarun Road,
8. Maximum on-ramp delay 42 seconds.
9. no impact on through travel times on the pacific Highway.

2 Presence at event

GAA were engaged by Bluesfest at this event to undertake passive traffic engineering observations and monitoring, generally during predicted peak traffic periods. GAA staff were not present at all times during the event.

No traffic counters were installed during the 2018 event, however manual traffic counts and observations were undertaken to assist with KPI monitoring.

2.1 Classified counters

Classified counters were placed on the following roads at previous Bluesfest events:

- North bound off ramp, Pacific Motorway.
- Tyagarah interchange, on overpass road,
- North bound on ramp.
- South bound off ramp from Pacific Motorway,
- South bound on ramp.

Counter data from previous events was used to predict/ or estimate peak traffic flow times, and then undertake manual traffic counts at similar times at this years event. It is noted that peak traffic flows are potentially also impacted by times that popular/or headline acts are performing at the festival.

3 Implementation of traffic control plans

The approved traffic control plan was installed by Lack Group staff prior to commencement of the festival camping entry. An inspection was undertaken by GAA staff on Tuesday 27 March 2018, to check the general compliance with the approved TCP.

An external traffic certificate was issued by our office on Wednesday 28 March 2018.

4 Wednesday: 28 March 2018

Wednesday is the first day that camper vehicles arrive.

2pm – Drive by VMS boards northbound and southbound, all in place with appropriate messaging.

2:15pm – Took southbound exit, to Tanner Lane and onto Yarun Road. Approximately 20 vehicles were parked in 'No Stopping' zones around the service station. All vehicles appeared to be stopped for a short break and to access the service station, with no signs of any vehicles being parked or causing obstruction to traffic.

2.25pm – Began external manual traffic counts

3.25pm – During manual traffic count at Yarun Rd, observed some confusion among arriving festival patrons about where camping vehicles were to enter or where stallholders should enter. Observed short queues of around 5 vehicles at entry to Access 3.

3.45pm Internal queues at camping registration were generally less than 6 vehicles long and moving through at an acceptable pace. No other areas had any significant traffic.

Overall traffic was observed to be relatively low and flowing freely. No issues were observed at the interchange and overpass or with through traffic on the Pacific Highway.

4.1 External traffic

External traffic flowed well during our times of observation.

It was found that on the Wednesday, there were no observed traffic problems and KPI's were not exceeded.

We observed the following external traffic rates:

1. Gulgan Rd Interchange northbound off-ramp at 2:25pm – 370vph;
2. Pacific Motorway northbound traffic – 1330vph;
3. Gulgan Rd Interchange southbound off-ramp at 2:50pm – 50vph;
4. Pacific Motorway southbound traffic – 1190vph;
5. Gulgan Rd Interchange overpass eastbound at 3:10pm – 420vph; (KPI is 1260vph/lane 8am-8pm)
6. Gulgan Rd Interchange overpass westbound at 3:10pm – 100vph; (KPI is 1260vph/lane 8am-8pm)
7. Yarun Rd (in the area of access 3) at 3:25pm – 430vph. (KPI is 800vph/lane 8am-8pm)

4.2 Internal traffic

Internal traffic operated well during our times of observation as indicated above.

4.3 KPI and Data summary

A summary of KPI compliance for our observations this day is provided in Table 1

KPI	Data / observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	Maximum back of queue >250m from taper	Y
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	No queue observed	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Highest flow rate measured: 420 vph (eastbound)	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Highest flow rate measured: 430 vph (both directions)	Y
No queuing on the Pacific Motorway,	No queue observed	Y
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	No queue observed	Y
No back up queue from the site onto Tanner Lane or Yarun Road,	No queue observed	Y
Maximum on-ramp delay 42 seconds.	Not likely exceeded	Y

Table 1 - Wednesday KPI summary

5 Thursday: 29 March 2018

Our office carried out a morning inspection for the purpose of assessing the southbound off-ramp delineation. The traffic controls implemented were an improvement on last year, with some minor changes recommended to the traffic control contractor. These minor changes were implemented and the off ramp appeared to be safer for arriving vehicles throughout the event.



Figure 4 - Southbound off-ramp – Bluesfest 2018

Afternoon observations were carried out during the expected peak arrival period based on previous years data.

2:45pm - Drive by VMS boards northbound and southbound, all in place with appropriate messaging.

3pm – Began external manual traffic counts.

4:15pm – Entering southern car parks at Access 3 posed no difficulty and traffic was observed to be moving freely into the site. Small queues of 4 or 5 vehicles would form temporarily when a vehicle would stop just inside Access 3 while the driver spoke to traffic attendants at the entrance.

4:30pm – Observed 2 lane internal queue from camping registration tent on Narracott Way, back along Campers Road and approximately 200m along South Boundary Rd, for a total length of approximately 500m. Queue time was observed to be approximately 45 minutes from the back of queue to the registration tent.

7pm – Undertook car parking survey with the following observations:

Car parks A, B, E and G approximately 5% utilisation

Car park H approximately 50% utilisation

Car parks C, D and F approximately 95% utilisation

Through the evening, utilisation of car parks B, G and H increased moderately.

Overall, the afternoon and evening arrival period was observed to have good traffic flow with minimal issues.

Night traffic departures were observed intermittently from 7:30pm, with low traffic volumes and no apparent problems through until 9:30pm.

9:50pm – Parked at service station to observe increasing departure traffic and the function of traffic control at the intersection of Yarun Rd and Tanner Lane. Gradually increase traffic leaving the site was observed, with short bursts of traffic forming queues of up to 12 vehicles, as traffic controllers used stop/slow signs to direct different streams of traffic. This was prior to implementation of the “forced departure” TCP.

10:25 – Entry to Tanner Lane from the south was closed off by traffic controllers using traffic cone delineation. Truck with directional arrows was then parked to identify left only from Yarun Rd and right only from Tanner Lane. The forced departure TCP was now implemented.

Initially, many vehicles were observed disobeying signage, delineation and traffic controllers. Drivers departing from Yarun Rd in particular appeared determined to head north at the link road and repeatedly ignored traffic controllers and signage. Police assistance was not in place at the time of observation. Note that with Police presence during later event nights the driver behaviour improved.

11:20pm – The vast majority of traffic at this point was obeying traffic control. Steady traffic flow was observed, with queues on the interchange being emptied periodically. Queues on Yarun Rd and Tanner Lane were constant with steady flow out onto the southbound ramp and interchange overpass.

5.1 External traffic

External traffic flowed generally well during our times of observation, with some opportunities for improvement during the peak departure period. Options for improvements to traffic control arrangements are provided in the Recommendations section of this report.

It was found that on the Thursday, there were no observed traffic volume or queueing problems and KPI's were not exceeded.

We observed the following external traffic rates:

1. Gulgan Rd Interchange northbound off-ramp at 3pm – 600vph;
2. Gulgan Rd Interchange southbound off-ramp at 3:30pm – 370vph;
3. Gulgan Rd Interchange overpass eastbound at 3:40pm – 740vph; (KPI is 1260vph/lane 8am-8pm)
4. Gulgan Rd Interchange overpass westbound at 3:40pm – 150vph; (KPI is 1260vph/lane 8am-8pm)
5. Yarun Rd (in the area of access 3, both directions) at 4pm – 860vph. (KPI is 800vph/lane 8am-8pm)

5.2 Internal Traffic

Internal traffic was observed to generally be flowing freely without confusion. Parking attendants were effective in directing vehicles to appropriate parking areas and achieving sufficient density within parking areas.

Queueing for camping access was fairly slow and long in the afternoon peak period but cleared up later in the evening and never threatened to impact other traffic flows.

5.3 KPI and Data summary

A summary of KPI compliance for Thursday is provided in Table 2.

KPI	Data / observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	Maximum back of queue >250m from taper	Y
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	No queue observed	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Highest flow rate measured: 740vph (eastbound)	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Highest flow rate measured: 860vph (both directions)	Y
No queuing on the Pacific Motorway,	No queue observed	Y
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	No queue observed	Y
No back up queue from the site onto Tanner Lane or Yarun Road	No queue observed	Y
Maximum on-ramp delay 42 seconds.	Not likely exceeded	Y

Table 2 - Thursday KPI summary

6 Friday: 30 March 2018

Arrived at festival via northbound off-ramp from motorway at 3:40pm. Approximately 50m moving queue on the northbound off-ramp at the roundabout, however vehicles still moving without queue building at this time. Similar minor traffic delays on Gulgan Road overpass heading towards the festival. Traffic appeared to be moving well during this afternoon arrival period.

Noted that Prepare to Stop & Flagman signs have been installed in addition to the TCP while traffic controllers are in place. This was good to see and as discussed with the traffic control supervisor during the TCP implementation and certification.

There was minor delay at the service station intersection as traffic controllers were controlling movements at the time hence controlling priority of movements. Traffic speed southbound along Yarun Road was approximately 10km/h while approaching the southern access 3 at this time. Access 4 was not in operation as an overflow entry at the time.

We observed during the festival that some drivers appeared to hesitate about where to turn at the service station intersection, particularly vehicles arriving at night to undertake pick-up. This would occasionally cause short delays during peak departure times. The traffic control plan includes a festival direction sign that is implemented during bump-in at the intersection, however there is no sign shown for the departure period. *It is recommended that night-time directional signage is implemented in the future at the service station intersection to guide "pick-up" vehicles to the site.*

4:30pm – completed entry into the north of the site. At this time drivers could choose to drive into the site to park at areas A-D, or to park at Area E.

5pm – inspected operation of the bluesfest off-ramp from the south bound off-ramp. The off-ramp operation was improved compared to the observed driver behaviour issues in 2017.



Figure 5: Bluesfest off-ramp – Friday 30 March 2018



Figure 6: Parking in northern site area on Friday 30 March 2018, source: Air Swing Media



Figure 7: Festival area on Friday 30 March 2018, source: Air Swing Media

7:50 – Nighttime TCP inspection undertaken by drive-by. Undertook site observations at service station intersection and spoke to Traffic Control staff who were planning on implementing the forced departure TCP by 10pm.

It was observed that small numbers of patrons were arranging to be picked up at the service station including some UBER passengers. We did not observe any significant issues at the service station and it was a further improvement compared to 2017.

With the Service Station now operating as a self-serve fuel stop at nighttime, festival related traffic has to keep clear of the access to and from the fuel pumps.

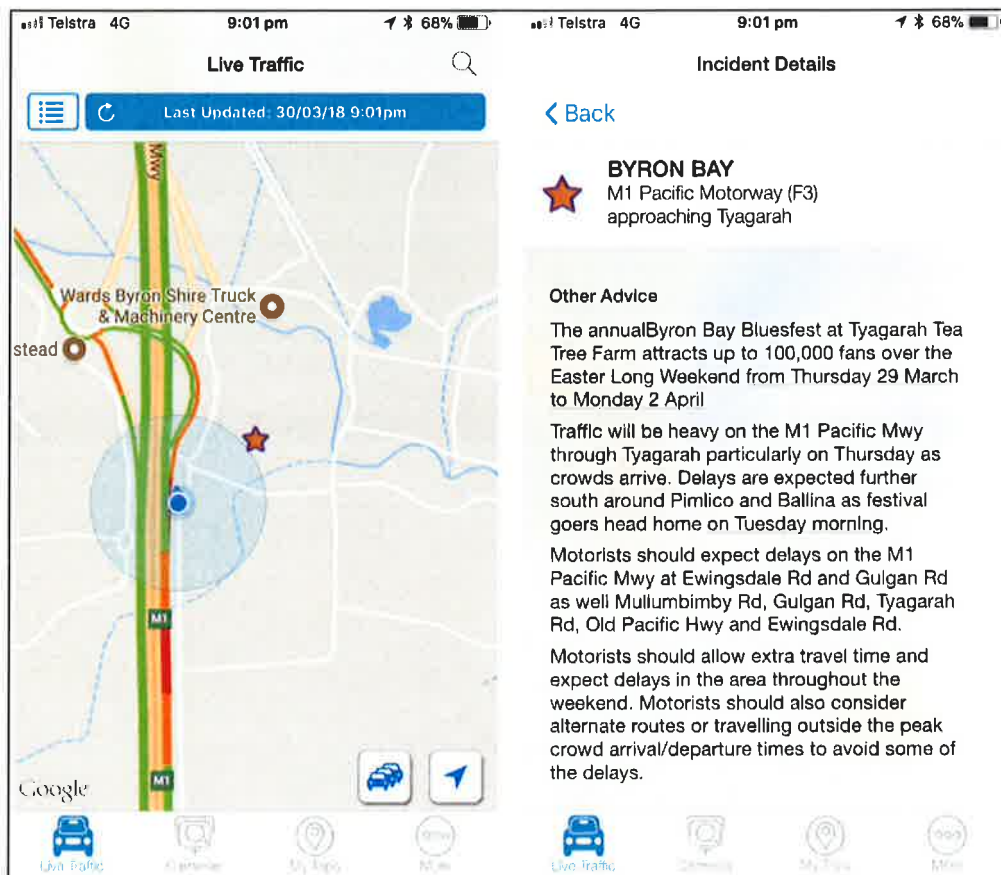


Figure 8: Live Traffic NSW traffic advice on Easter Friday from phone APP at 9:01pm

6.1 External traffic

External traffic flowed well during our times of observation.

It was found that on the Friday, there were no observed traffic volume or queueing problems and KPI's were not exceeded.

6.2 Internal traffic

We carried out some bus movement counts and this is presented in Section 11 of this report. The operation of buses was shown to be efficient at our times of observation.

6.3 KPI and Data summary

A summary of KPI compliance for this day is provided in Table 3.

KPI	Data / observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	Minor queue observed significantly below KPI	Y
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	No queue observed	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Highest flow rate measured: 810 vph (eastbound)	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Highest flow rate measured: 690 vph (both directions)	Y
No queuing on the Pacific Motorway,	No queue observed	Y
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	No queue observed	Y
No back up queue from the site onto Tanner Lane or Yarun Road	No back-up queue observed. Observed traffic speeds down to 10km/h for arriving patrons.	Y
Maximum on-ramp delay 42 seconds.	Not likely exceeded	Y

Table 3 - Friday KPI summary

7 Saturday: 31st March 2018

On Saturday the vast majority of campers are on site and only day patrons arrive during the day and early evening and depart later at night.

Did not do internal drive-through on Saturday. We did not observe traffic on Saturday night.

We were advised on Sunday night by traffic control staff that the traffic controllers completed controlling departing traffic well before 1pm.



Figure 9: Saturday 31 March – Aerial photo supplied by Air Swing Media.

7.1 External traffic

No traffic counts were undertaken on Saturday.

7.2 Internal traffic

No Internal observations or data was collected.

7.3 KPI and Data summary

A summary of KPI compliance for this day is provided in Table 4.

KPI	Data/Observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	No queue observed	Y
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	No queue observed	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Not likely exceeded	Y
No queuing on the Pacific Motorway,	No queue observed	Y
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	No queue observed	Y
No back up queue from the site onto Tanner Lane or Yarun Road,	Not likely exceeded	Y
Maximum on-ramp delay 42 seconds.	Not likely exceeded	Y

Table 4 - Saturday KPI summary

8 Sunday: 1st April 2018

GAA staff were advised at approximately 3:20pm that traffic was queueing on the Pacific Motorway. We were advised that the queue was from the northbound off-ramp heading south towards Ewingsdale. At this time we were not on site undertaking observations.

At 4:15pm, we observed the RMS electronic message board on Ewingsdale Road, with the following alternating messages displayed:

"Heavy Traffic at Tyagarah – Use Caution"; and

"Heavy Traffic Blues Festival – Use Caution"

We subsequently contacted the RMS Regional Traffic Operations Centre (located at the St Helena tunnel), and they provided advice regarding the congestion management that was implemented on Sunday afternoon: *"The traffic congestion was reported by the police at 15:11hrs through to the State Traffic Management Center in Sydney. They then contacted St Helena's Tunnel Control Room and caution messages advising motorists of the congestion were displayed and the speed limits dropped. The St Helena Tunnel control room continued to monitor the traffic and traffic control at Blues Fest was sent to the highway to provide additional warning to motorists about the congestion. The congestion was clear by 17:53"*

Note that GAA staff arrived at the Gulgan Road Interchange at 4:25pm after travelling the motorway, and there was no northbound traffic queueing or moving slowly on the motorway at this time. The congestion was cleared earlier than as advised by RMS. On arrival at Bluesfest, traffic was being directed into Access 4 which had been implemented during the peak traffic arrivals earlier.

RMS has permanent electronic message signs in place on Ewingsdale Road (near Byron Bay Hospital) and on the Pacific Motorway (one exists for northbound motorists between the Ewingsdale Interchange and St Helena tunnel). These were utilised to help manage the congestion on the highway experienced above and to warn motorists of the traffic conditions.



Figure 10: Ewingsdale Road electronic message sign, Sunday 16 April 2018

The Road Occupancy Licence issued by RMS for the Festival, ROL 920556, Licence Condition 7 reads as follows:

“THE LICENSEE MUST ENSURE THE WORK SITE PROVIDES SUFFICIENT ROADWAY CAPACITY TO ACCOMMODATE THE EXPECTED HOURLY TRAFFIC VOLUMES.

•QUEUE LENGTHS MUST NOT EXCEED 500 METRES, MEASURED ALONG A SINGLE LANE IN ANY DIRECTION AND;

•TRAFFIC DELAYS MUST NOT EXCEED 5 MINUTES.

IF EITHER OF THE ABOVE IS EXCEEDED, THE ONSITE CONTACT MUST:

•IMMEDIATELY REPORT THE DELAY AND THE REMEDIAL ACTION TAKEN TO THE TRAFFIC MANAGER AND/OR THE TMC.

•MONITOR AND RECORD MAXIMUM QUEUE LENGTHS, DELAY TIME AND THE TIME TAKEN FOR THE TRAFFIC TO RETURN TO FREE FLOW CONDITIONS.

IF FOR ANY REASON TRAFFIC DELAYS REACH 10 MINUTES AND/OR QUEUE LENGTHS REACH 1000M ALL RESTRICTIONS MUST BE REMOVED IMMEDIATELY UNTIL TRAFFIC RETURNS TO FREE FLOW CONDITIONS”

Bluesfest staff inspected the motorway at approximately 3:20pm and indicated that the queuing had disappeared by this time. It was estimated that the queuing may have started at about 2:45pm and was in place for 20-30 minutes. The length of queue is estimated to have extended to the Tyagarah Rest Area, or approximately 1 to 1.2km in length.

The traffic delays and queue length on the Pacific Motorway at this time triggered the above ROL condition requirement to report the delays to the Traffic Operations Centre. This was done and traffic staff at the event site implemented contingency measures to increase traffic flow into the Bluesfest site to clear the congestion as quickly as possible.

RMS staff at the Traffic Operations Centre advised us verbally that there are also Pacific Motorway delays on almost a daily basis to southbound traffic approaching the Ewingsdale Interchange southbound off-ramp.

Although this traffic queueing issue contravenes one of the events traffic KPI's, it was managed in accordance with the RMS Licence conditions and there were no incidents reported.

As we were not on site observing traffic during the time that traffic was queueing we have not estimated the volume of traffic arriving and whether KPI's for vehicle flow rates were exceeded on the overpass and local roads at the time.

On Sunday Night the traffic departures were observed with no issues to report.

8.1 External traffic

External traffic flowed well during our times of observation.

It was found that on the Sunday, however, that there were significant traffic issues during the afternoon arrival period as discussed above (albeit for a short 20-30 minute period). These issues were managed in accordance with the RMS ROL requirements and no incidents were reported.

Bluesfest have advised that the Sunday this year was the biggest ticket selling day. This was not expected as the artists performing were not necessarily the headline performers. It has been noted that daylight savings ended at 2am on Sunday morning, hence patrons may have turned up early on Sunday with the time change. Daylight savings will not change during the 2019 event.

We carried out some bus movement counts during the evening which is presented in Section 11 of this report.

8.2 Internal traffic

General observations of internal carparks were undertaken, however no data was collected. No parking issues were noted.

8.3 Data summary

A summary of KPI compliance for this day is provided in Table 4.

KPI	Data / observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	Queuing occurred onto the Pacific Motorway, and was managed in accordance with approved ROL	N
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	No queue observed	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Not likely exceeded	Y
No queuing on the Pacific Motorway,	Queuing occurred onto the Pacific Motorway from northbound off-ramp, and was managed in accordance with approved ROL	N
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	No queue observed	Y
No back up queue from the site onto Tanner Lane or Yarun Road,	It is possible that there was a back up queue from the site during the above motorway queuing	Y or N
Maximum on-ramp delay 42 seconds.	Not likely exceeded	

Table 5 - Sunday KPI summary

9 Monday: 2nd April 2018

4:20pm Monday – completed drive from south to festival entry. Traffic on Monday was observed to be significantly lower than on Sunday.

Noted generally that there are the following intersections that may cause traffic to slow on arrival to the event:

- Intersection of north-bound off-ramp with Gulgan Road roundabout (could consider contingency TCP at roundabout for future event arrivals to give priority to event traffic exiting the motorway);
- Approach to service station intersection - could consider improving the TCP including directional signage to improve flow rate for event arrival traffic;
- Access 3 driveway into site (consider improving driveway geometry to assist efficient vehicle movements into the site particularly for larger turning path vehicles).

It seems likely however that the traffic issues that occurred on Sunday were simply an abnormal increase in event arrival traffic flow for a short time period.

9.1 External Traffic

No traffic observations were undertaken on Monday apart from the drive thru as indicated above.

9.2 KPI and Data summary

A summary of KPI compliance for this day is provided in Table 4.

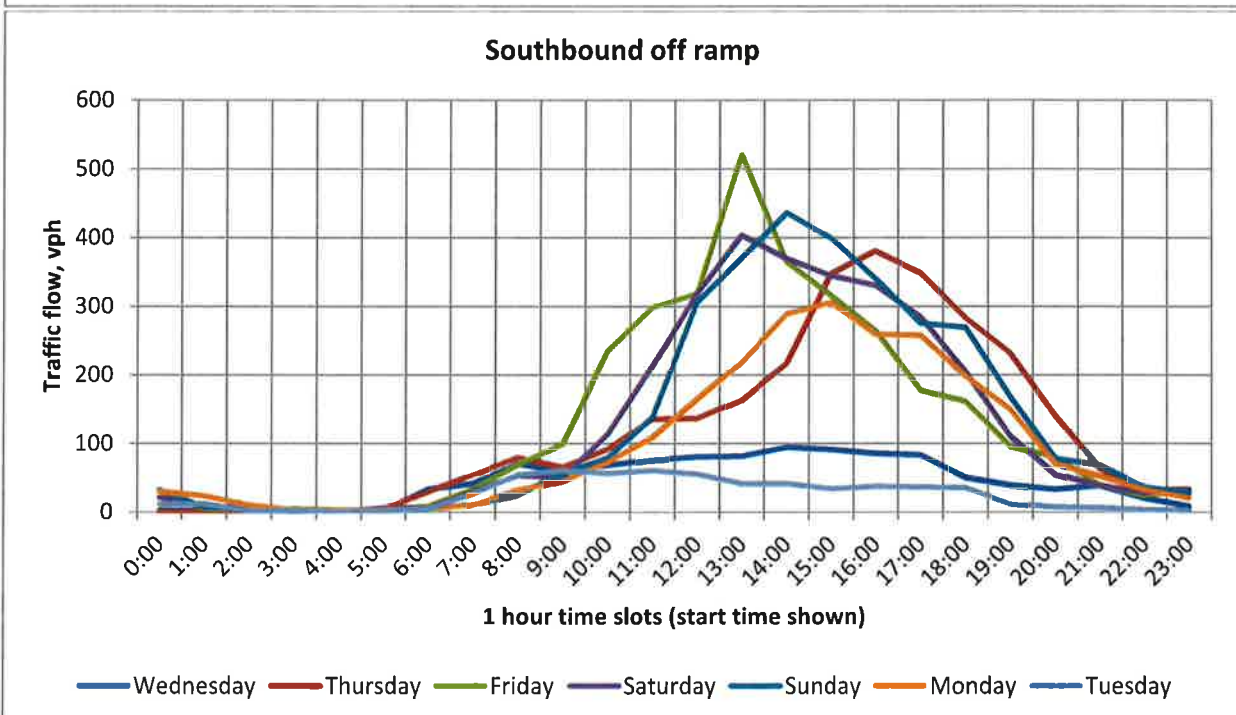
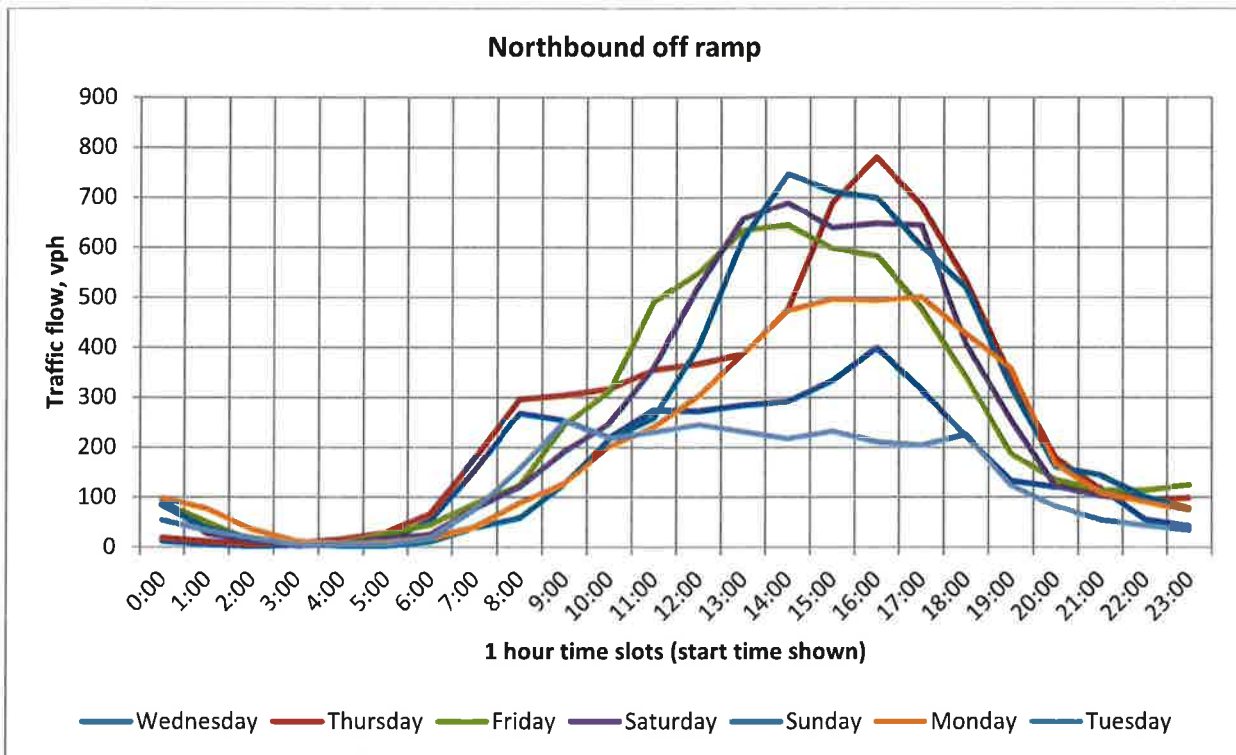
KPI	Data / observation	Complied (Y/N)
Maximum back of queue location on northbound off ramp: 200 metres from start of diverge taper,	Not likely exceeded	Y
Maximum queue length on new southbound off ramp: 210 metres from start of diverge taper,	Not likely exceeded	Y
Maximum flow rate 1260 vehicles per hour per lane on overpass, between 8am and 8pm	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Tanner Lane, between 8am and 8pm.	Not likely exceeded	Y
Maximum flow rate 800 vehicles per hour per lane on Yarun Road, between 8am and 8pm.	Not likely exceeded	Y
No queuing on the Pacific Motorway,	Not likely exceeded	Y
No queuing, other than in the turning bays on Tanner Lane into the site, for through traffic,	Not likely exceeded	Y
No back up queue from the site onto Tanner Lane or Yarun Road	Not likely exceeded	Y
Maximum on-ramp delay 42 seconds.	Not likely exceeded	Y

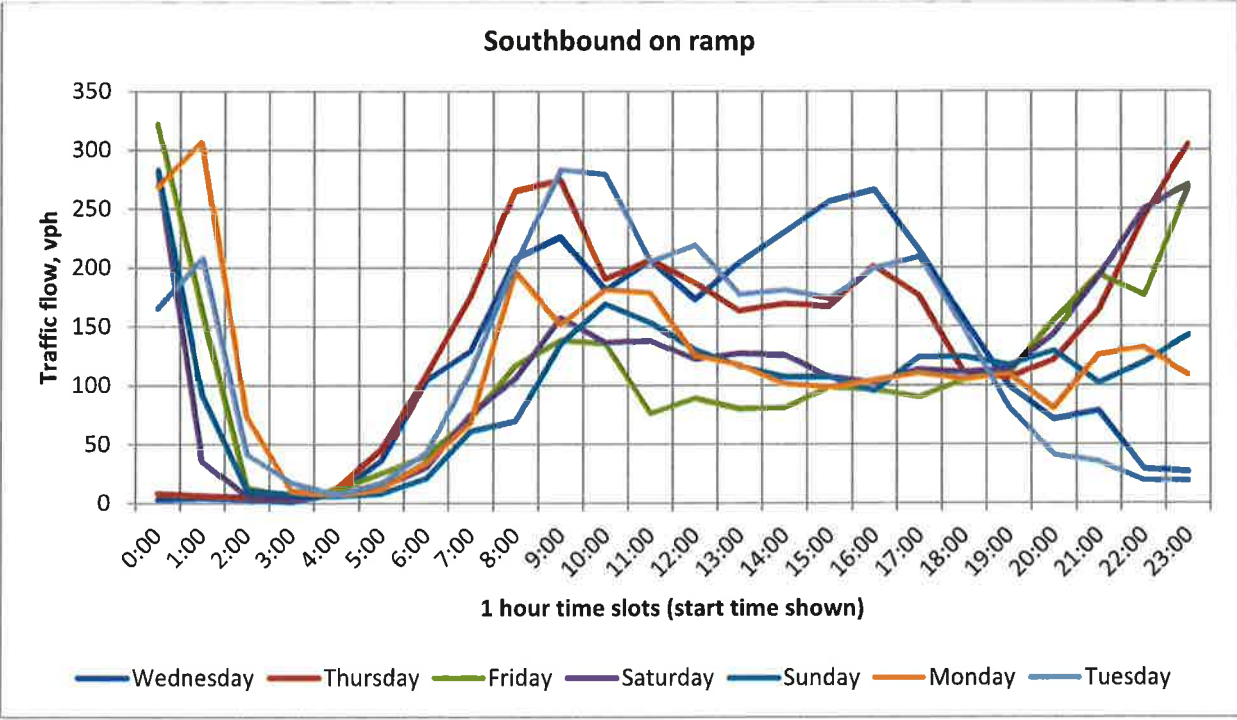
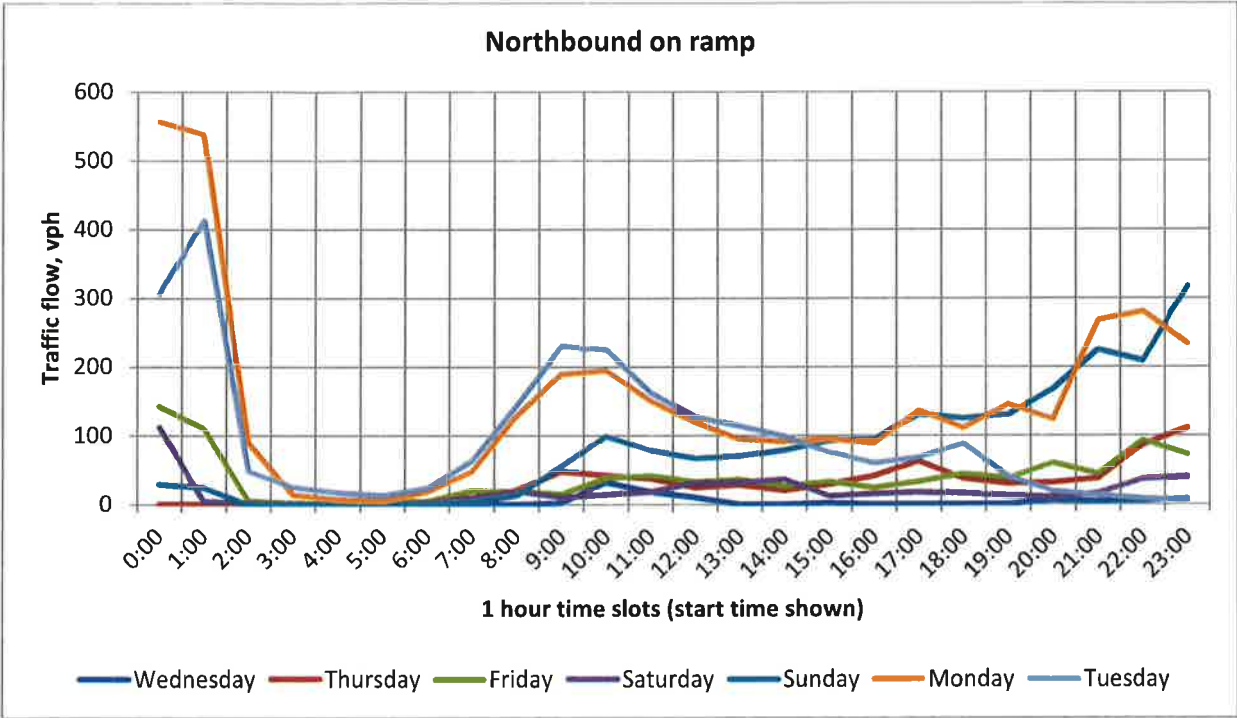
Table 6 - Monday KPI summary

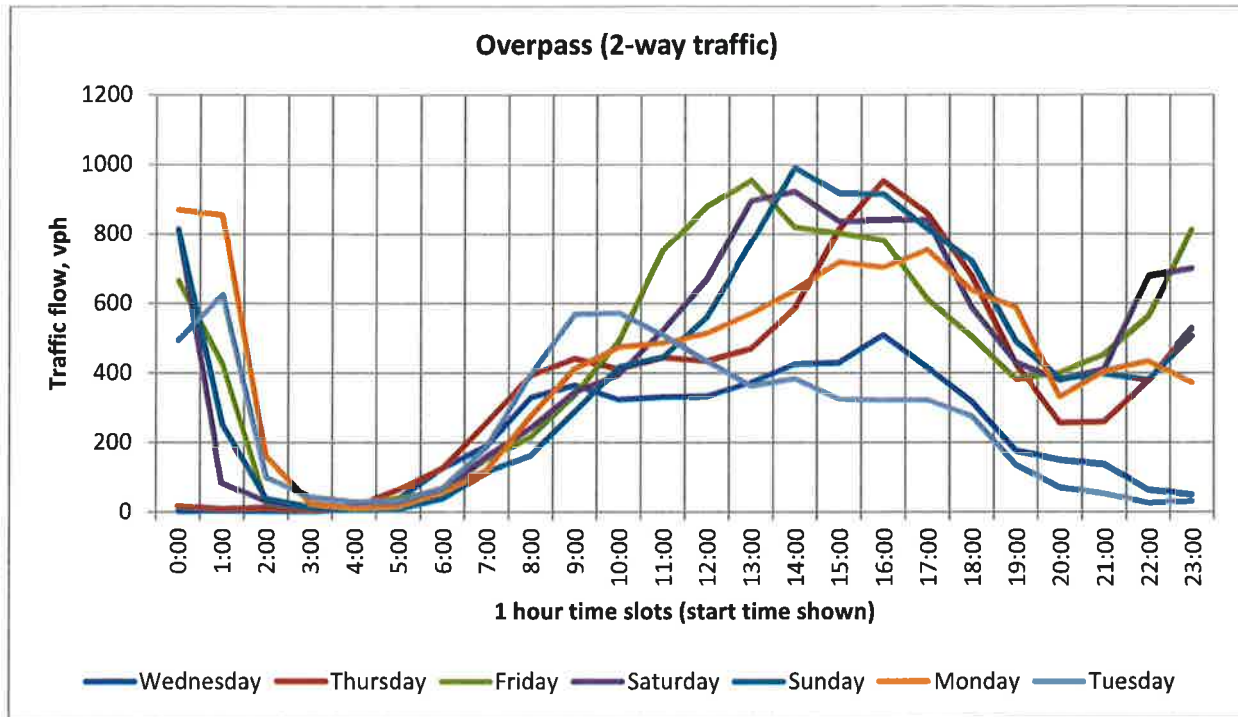
10 Traffic counter data overview – 2015 data

This chapter provides an overview of the data obtained during the 2015 festival for each of the classified counters. The data is presented for each day, with traffic flow in vehicles per hour.

Our times of observation and manual counting was planned around similar peak times to this previous festival.







11 Bus Surveys

We carried out some bus surveys during this years festival, observing arrival and departure times for a selected number of the festival shuttle buses from the Service Station intersection. Note that this survey has not included all bus movements.

Friday 30 March 2018

Survey carried out from 9:25pm to 10:30pm

Blanch's 3430MO

In at 9:25, Out at 9:51 – 26 minute turnaround on site

Blanch's 3107MO – Brunswick Heads

In at 9:33, Out at 9:45 – 12 minute turnaround on site

Out again at 10:18 – 33 minute round trip

Blanch's 3455MO – Mullumbimby

In at 9:40, Out at 10:03 – 23 minute turnaround on site

In at 10:20 – 40 minute round trip

Sunday 1 April 2018

Survey carried out 9:40pm to 11:15pm

Blanch's 3455MO – Brunswick Heads

Out at 9:41

In at 10:01, Out at 10:17 – 16 minute turnaround on site

In at 10:37, Out at 10:59 – 22 minute turnaround on site

Approximate 40 minute round trip

Blanch's 6263MO – Ocean Shores

In at 9:55, Out at 10:09 – 14 minute turnaround on site

In at 10:56, Out at 11:07 – 11 minute turnaround on site

Approximate 1 hour round trip

Some Byron Bay shuttle buses were observed to have a round trip time of approximately 1 hour.

Discussions with some patrons indicated that waiting times to catch some buses from the festival were lengthy at the end of the night following the last music acts. This is typical of festivals and other events as there is a rush of people at the end of the night wanting to leave the event site that exceeds the loading capacity of the available buses.

From our observations, it seems clear that the shuttle bus services are being operated efficiently considering the short turn-around times and round trip times, indicating that the buses are being moved in and out of the site without significant delay.



Figure 11: Bluesfest bus interchange



Figure 12: Bluefest bus interchange

12 Recommendations from this report

Recommendations included in this report that should be considered for future events include:

1. Improve event directional signage at the service station intersection, particularly for vehicles picking up patrons at night-time (consider electronic signage);

The above recommendation may also improve afternoon arrival traffic flows reducing potential queueing across the Gulgan Road Overpass.

13 Conclusions

We conclude that the traffic control measures external to the site, were appropriate for the event and were capable of dealing with the patronage and traffic flows.

The main traffic issue that occurred was the queuing of vehicles on the motorway that occurred on Sunday afternoon. This was managed in accordance with the RMS Road Occupancy Licence conditions.

14 REFERENCES

Traffic Control at Work Sites, RTA, 4th ed, June 2010

Guide to Traffic and Transport Management for Special Events, RTA Transport Management Centre, August 2006

Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, Austroads Inc., Sydney, August 2009