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Chartered Professional Engineers and Scientists

Traffic Monitoring Program (TMoP)
Falls Festival 2018/19, North Byron Parklands, Yelgun

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1. Introduction

Greg Alderson and Associates have been engaged by *Look Up And Live Pty Ltd* to prepare a traffic monitoring program for the Falls Festival Byron 2018/19 event at North Byron Parklands (NBP) in Yelgun. This Traffic Monitoring Program (TMoP) follows on from the Traffic Management Plan (TMP) and Traffic Management Brief prepared by Greg Alderson and Associates for the 2018/19 festival at this site. This TMoP is to be read in conjunction with the TMP for the 2018/19 festival.

This TMoP is based on TMoP's prepared for previous events at NBP. Consultation with RMS was carried out for each of those. In particular, extensive consultation with the Department of Planning was carried out prior to the various Splendour in the Grass and Falls Festival Events approvals. The TMoP for Falls Festival Byron 2018/19 is based on the discussions held for these events.

1.1. Project brief

The aim of the traffic monitoring program is to prescribe traffic monitoring procedures for the FFB18 event at Yelgun, in order to satisfy condition C12 of the consent as set out in Project Approval by the Minister for Planning and Infrastructure, dated 24th April 2012.

The monitoring is designed to assist in assessment of the future and potential use of the site for larger events.

The thresholds for the size of future events will be confirmed as a result of the continued monitoring that will be undertaken, as described through this TMoP.

The performance of the TCP's adopted for this event will be monitored, and potential changes identified.

1.2. Relevant standards, specifications and guidelines

This TMoP has been be prepared in 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
- Australian Standards (in particular AS1742)
- Quality Assurance specifications
- Austroads Guide to Traffic Management.

1.3. Consultation

During the preparation of the TMP and TCP and documentation for previous events at the site, consultation was carried out with NSW RMS, Byron Shire Council staff and festival management. This consultation reviewed the performance of the traffic and parking at the previous festivals. This review was helpful in arriving at a balanced Traffic Management Plan.

During those consultations the methodology for the monitoring plan was also described and comments received. These inputs have been used to develop this TMoP.

1.4. Site location

The subject site is formally known as Lots 46, 402-404, 410 DP 755687; Lots 10, 12, 14 DP 875112; Lots 2, 12 DP 848618; Lot 101 DP 856767; Lots 30-31 DP 880376; Lots 101-102, 107 DP 1001878; Lot 1 DP 1145020, Tweed Valley Way and Jones Road, Yelgun. The southernmost entry to the site is located at approximately 1km to the North from the Yelgun Interchange.

Figure 1 below depicts the location of the site with respect to its locality.

Figure 1 - Site locality, *Source: Six Viewer*

1.5. Event description

Falls Festival Byron 2018/19 is a music and arts festival that will be held at North Byron Parklands from 31 December 2018 to 2 January 2019. The camping areas will close on 3 January 2018. The Falls Festival has been held at NBP during previous years, with a patronage of 15,000 the first event. The fifth event last year was approved for 25,000 patrons.

This event will function as the sixth approved 'medium trial event' with patronage of 25,000 persons with an additional 3,000 staff, stallholders, contractors and guests. This event is the same scale as last year.

1.6. 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
Traffic manager	Suitably qualified traffic manager with RMS qualifications to design and audit traffic management plans
Traffic managing Assistant	Person deemed suitable by traffic manager to performed defined tasks

1.7. Condition C12

The following is an extract of the contents of condition C12 regarding the traffic monitoring program.

"A Traffic Monitoring Program is to be prepared by a suitably qualified traffic manager, in consultation with the Council and the RMS to measure the impact of increased traffic generation on the amenity of the area. The Program for each event is to be submitted for the approval of the Director-General at least 60 days prior to the commencement of the event. The Program is to be prepared having regard to the proponent's Environmental Health and Safety Management Manual and is to include, but not necessarily be limited to:
(a) details of patron numbers for the event;
(b) data collection relating to vehicle arrival and departure times, occupancy rates and directions of travel for staff, campers and day patrons:
(c) patronage of bus services, including bus occupancy rates, arrival and departure times and direction of bus travel
(d) queue monitoring, background travel counts on the Pacific Highway and Tweed Valley Way and vehicle volumes on the Yelgun interchange
(e) data on the impact of the event on the Yelgun rest area, in particular from unauthorised parking and unauthorised camping:
(f) locations (identified on a map) at which monitoring will be undertaken;
(g) monitoring of such other performance standards required by the Department in consultation with the RMS;
(h) procedures and protocols for the monitoring, including frequency;
(i) Aerial photography of the site and surrounds at regular intervals before, during, and after the event; including peak traffic and parking periods must be undertaken (where possible); and,
(j) procedures for the reporting of monitoring results to enable an assessment of the traffic performance of the event."

1.8. Monitoring Strategy

In response to the condition C12, the strategy and purpose of the monitoring program has been divided into two main components.

The first component of the monitoring is evaluation of the impact of the FFB18 event on the local road network and the Pacific Motorway.

The second component of the monitoring program is to aid the traffic manager during the FFB18 event in assessing the traffic conditions and in obtaining instantaneous data and/or observations required to make informed decisions with respect to the traffic management during peak event traffic flow periods.

As a result of the above two components, traffic and parking information will be available for future strategic planning of more and potentially larger events at the subject site.

2. Data collection

This chapter provides an overview of the various traffic monitoring activities proposed and the rationale behind the activities.

2.1. Evaluation of Performance

As described in section 1.8, part of the purpose of performing traffic monitoring activities during the FFB18 event is to evaluate traffic and parking performance against specifications developed with RMS and Council, which are incorporated in the TMP.

As described in the TMP and the associated traffic control plans, it is the aim of these documents to ensure acceptable operation of the various intersections involved, and avoid queuing onto any of the main roads.

The Key Performance Indicators (KPI's) following from the approval conditions are summarized as follows:

- The end of traffic queues on interchange ramps must not be within 210 metres of the start of the ramp;
- Minimum Level of Service C at the Yelgun Interchange
- Minimum Level of Service C along Tweed Valley Way
- Maximum queue length on Link Road: 70 metres
- No queuing on the Pacific Motorway
- No queuing other than in the turning bays on Tweed Valley Way into the site, for through traffic, and no back up queue from the site onto TVW.

Based on experience with previous festivals at this site, the following "aspirational targets" are added voluntarily to give a better management control to Falls staff and contractors, and to provide stricter control of the traffic operations:

- No queuing from camping car parks past the production camping ground intersection with GP camping, thus allowing the east west spine road to operate more efficiently, effectively keeping the east west spine road clear.
- No queuing from the northern car park onto the spine road, to keep the north south spine road clear,
- No queuing on the Spine Road south of the tunnel. Spine Road to be kept clear at all times and southern car parks to be used as emergency storage of vehicles to increase queue lengths if needed.

Below is a list of the additional data that will be collected to assist in a more complete monitoring of the traffic and parking performance:

- Patron origin distribution,
- Arrival and departure temporal distribution graphs.

2.2. Classified counter installation

It is proposed to install traffic counters at the locations listed below, at least two weeks before the Festival, and the retrieve the counters two weeks after the festival. These counters will be used to gain confirmation of the background traffic levels, and then the increase that can be attributed to the Festival. Thus the impact of the festival can be quantified. The survey data can also be used for establishing what event size could be supported by the road network without (temporary or permanent) alterations to the road network.

Traffic counter locations have been selected in close liaison with festival management, to ensure sufficient locations are included to calculate origin distribution percentages, register exceedance of off ramp queue length kpi's and calculate Level of Service on critical locations.

As such, the following counter locations have been selected. All coordinates are in UTM. The corresponding locations are mapped in Figure 2.

1. Tweed Valley Way, North of Jones Road, 56 J 552012 m E; 6849952 m S – to capture arriving traffic from north along Tweed Valley Way;
2. Tweed Valley Way, South of Yelgun Road, 56 J 550474 m E; 6845683 m S – To monitor Level of Service on Tweed Valley Way and to provide contingency in data collection;
3. Brunswick Valley Way, opposite Yelgun rest area, 56 J 551187 m E; 6848258 m S – to capture arriving traffic from south along Brunswick Valley Way;
4. Yelgun southbound off ramp, 210m from start of diverge, 56 J 550745 m E; 6848370 m S – to capture arriving traffic from north using Yelgun off ramp;
5. Yelgun northbound off ramp, 210m from start of diverge, 56 J 551133 m E; 6847871 m S – to capture arriving traffic from south using Yelgun off ramp;
6. Crest on Spine Road, 56 J 550521 m E; 6849424 m S – to monitor traffic profiles and record on-site congestion.
7. Yelgun southbound on ramp, 56 J 550979 m E; 6848111 m S – to address impact of departing camping traffic on Pacific Motorway performance;
8. Yelgun northbound on ramp, 56 J 550912 m E; 6848187 m S;

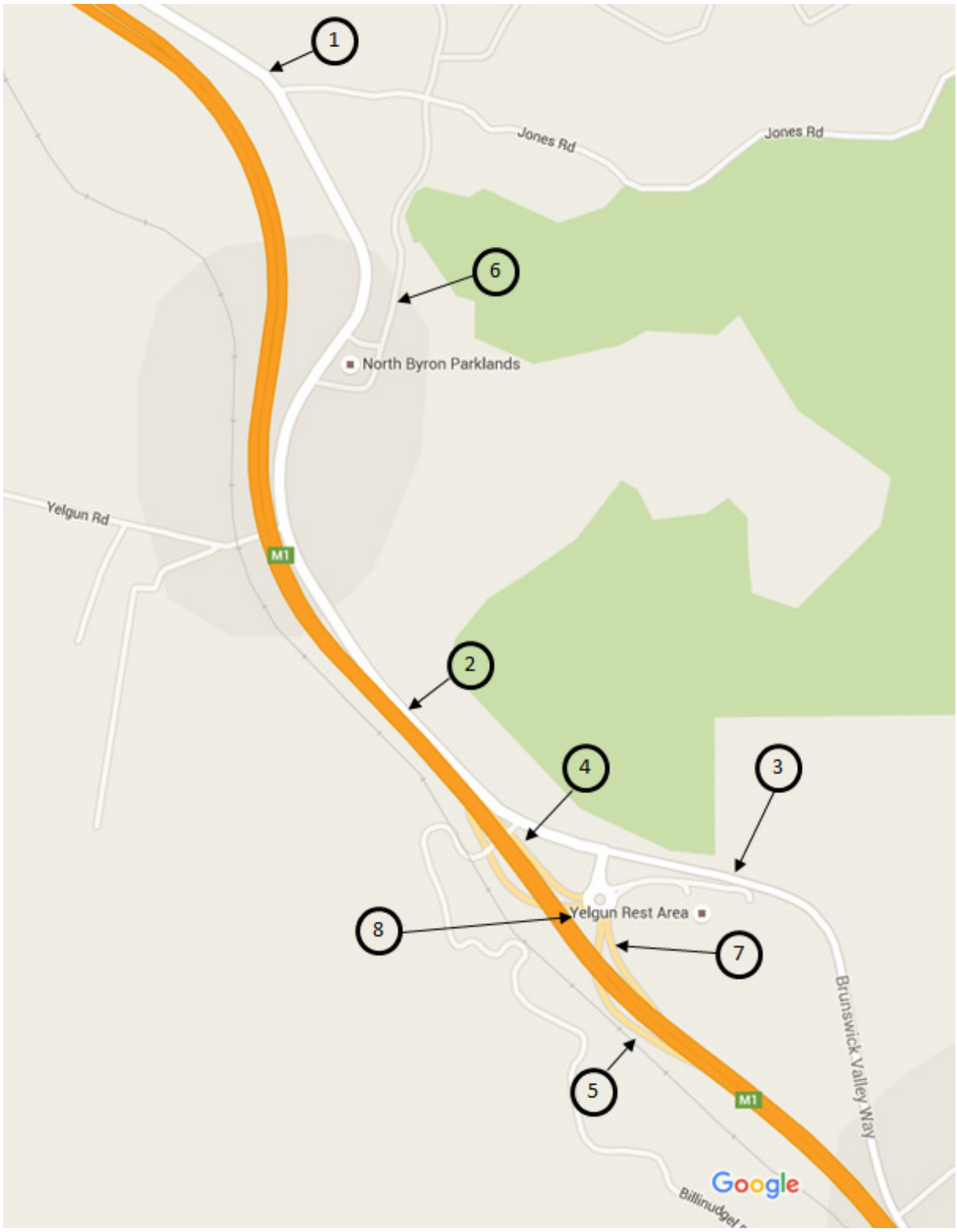

Figure 2 - Map with counter locations, *source of map: Google Maps 2015*

During the weeks leading up to and following the event, the counters will be checked and their data downloaded weekly.

During the FFB18 event, the counters are to be checked and downloaded regularly.

In conjunction with the Yelgun on ramp classified counters, Pacific Motorway traffic will be monitored with either the Weight-In-Motion counter at Brunswick Heads. A sample data set for 2014, showing hourly traffic per lane for each hour of each day of 2014, has been provided by RMS. Additional data will be requested after the event depicting data for the event period. The WIM data will be used to assess on ramp performance and impact on the through traffic using the method outlined in Chapter 13 of the 2010 Highway Capacity Manual.

2.3. Bus occupancy

The number of patrons that use the bus transport system to and from the event has been an assumption of the TMP. In order to evaluate the bus usage the number of buses and their occupancy needs to be measured. The bus numbers in use per hour will vary throughout the day, as the patron movements demand.

To monitor the bus performance it will be necessary to monitor the bus schedules and record patron numbers per bus. Ideally bus drivers are to be requested to perform a head count and fill in a standard sheet provided in this report during every bus trip.

The following details are to be recorded by festival management:

- Bus occupancy upon arrival at or departure from event site,
- Route,
- Departure time,
- Arrival time,

2.4. Car occupancy

In order to establish car occupancy rates of both campers and day patrons, daily occupancy surveys are to be undertaken by either volunteers or paid staff. During peak arrival periods, occupancy surveyors are to be placed at strategic locations to count the number of occupants per car. To that purpose, they will be provided with a sheet, clipboard and pen/pencil as per the attached template.

Copies of the occupancy surveys are to be provided to the traffic engineer preparing the Traffic Evaluation Report following the survey.

2.5. Origin distribution

A postcode analysis of ticket sales should be performed to estimate origin distribution rates. The results will be used to improve the expectation of the origin of traffic. It is known from previous events that this data can be skewed as for example some guests come from their homes for the first day of the event and then travel to local accommodation for that night, and then arrive at the event the next day from a different direction. Notwithstanding this the data is part of a useful combination of data that can be used to improve the overall traffic management.

2.6. Gate entry distributions

After the FFB18 event, ticketing data is to be provided to the traffic engineer in digital format where possible, for analysis.

The data sought will include date and time of wrist banding for each event patron to aid in establishing arrival distribution graphs.

2.7. Car parking demand

After car passes have gone on sale, car pass sales data is to be provided to the traffic manager in, digital format where possible, to analyse the potential parking demand for the event. After the event, car pass redemption figures are to be provided to estimate number of camping cars with 3 occupants or more and the number of day patron cars with 4 occupants or more.

2.8. Air Photography

Aerial photography of the site and surrounds at regular intervals before, during and after the event; including peak traffic and parking periods must be undertaken (where possible).

2.9. Monitoring of Discrepancies with Adopted TCP

The traffic engineer will gather together information from traffic controllers, parking attendants, and other as to any discrepancies with the adopted TCP.

The following are some examples:

- The numbers of vehicles that leave the site, when inflow traffic is predominantly expected. Or at the end of the event the number of inflow traffic. This is always a factor as traffic going against the major flow can be an issue to efficient traffic management.
- Illegal parking/camping in the local road network or in the Yelgun Rest stop.
- Illegal stopping to drop of patrons outside the site.

2.10. Yelgun Rest Area

The impact of the festival on the Yelgun Rest Area will be monitored closely by festival management. This will be done by monitoring patron behaviour at the rest area by security personnel and by regularly counting the number of cars parked, before, during and after the festival.

It is noted that festival management have no legal or other ability to manage patrons at the Yelgun Rest Area. NSW Police are the appropriate authority to address any parking with support from RMS. Festival security staff will however monitor behaviour and contact the police if any issues should occur.

3. Post-event evaluation

3.1. Daily Traffic Report

During the event, a daily traffic report will be prepared for internal use by Festival Management. This report will include the following:

- depict the results of all occupancy surveys, and
- summarise issues that arise during the day prior to the report and any changes made.

This way, the knowledge base of the traffic consistency and volume is updated daily and changes can be made to the traffic management strategy for that day if required.

The results of this data will be discussed with the traffic and parking team at a tool box type meeting to be held on the morning, before the majority of traffic begins to arrive so that minor adjustments can be made if necessary.

The daily traffic report is to be issued in writing to the traffic engineer to enable preparation of the Traffic Evaluation Report.

Appendix D depicts a template for the daily traffic report.

3.2. Traffic Evaluation Report

Using the daily traffic reports that have been generated as well as all the traffic data obtained, a traffic evaluation report is to be prepared by the Monitoring Traffic Engineer within approximately 1 month after the event. This traffic evaluation report is to describe any traffic abnormalities during the event, data to analyse the validity of the assumptions made in preparation of the event and arrival and departure distribution diagrams based on classified counter and ticketing data.

This report will include recommendations for the next event with respect to modifications to the Traffic Management Plan or Traffic Control Plans. Recommendations will also be made with respect to traffic monitoring programs for future events.

This report is to be distributed to RMS, Council, Police and festival management.

Within 28 days of preparation of the traffic evaluation report, a debrief meeting should to be held to discuss the event and the findings of the report.

4. References

Splendour in the Grass 2013 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 3rd April 2013, Nashua

Splendour in the Grass 2013 Traffic Monitoring Program, Greg Alderson and Associates Pty Ltd, 2nd May 2013, Nashua

Splendour in the Grass 2013 Traffic Management Brief, Greg Alderson and Associates Pty Ltd, 13th May 2013, Nashua

Splendour in the Grass 2013 Traffic Evaluation Report, Greg Alderson and Associates Pty Ltd, 16th of August 2013, Nashua

Splendour in the Grass 2014 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 3rd April 2013, Nashua

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Splendour in the Grass 2014 Traffic Evaluation Report, Greg Alderson and Associates Pty Ltd, 28th August 2014, Nashua

Splendour in the Grass 2015 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 23rd April 2015, Nashua

Splendour in the Grass 2016 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 23rd April 2016, Nashua

Splendour in the Grass 2016 Traffic Evaluation Report, Greg Alderson and Associates Pty Ltd, 5th October 2016, Nashua

Falls Festival Byron 2013/14 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 26th September, Nashua

Falls Festival Byron 2013/14 Traffic Monitoring Program, Greg Alderson and Associates Pty Ltd, 20th November 2013, Nashua

Falls Festival Byron 2013/14 Traffic Management Brief, Greg Alderson and Associates Pty Ltd, 13th December 2013, Nashua

Falls Festival Byron 2013/14 Traffic Evaluation Report, Greg Alderson and Associates Pty Ltd, 5th February 2014, Nashua

Falls Festival Byron 2015/16 Traffic Management Plan, Greg Alderson and Associates Pty Ltd, 2nd October 2015, Nashua

Falls Festival Byron 2015/16 Traffic Evaluation Report, Greg Alderson and Associates Pty Ltd, 16th February 2016, Nashua

North Byron Parklands – Traffic Impact Assessment, Parsons Brinckerhoff Australia Pty Ltd, July 2010, Sydney

Traffic Control at Worksites, Roads and Traffic Authority NSW, version 4.0, June 2010

Splendour in the Grass Traffic Management Plan, Adam Pekol Consulting, April 2011

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

Highway Capacity Manual 2010, Transportation and Research Board of the National Academies, 2010

Appendix A Bus driver sheet

This is a typical sheet is to be filled in every bus trip during Falls Festival 2016-17

ROUTE *(Tick applicable box)*

- ☐ Brunswick Heads/Mullumbimby/Ocean Shores/South Golden Beach
- ☐ Byron Bay/Suffolk Park
- ☐ Ballina/Lennox Head/Bangalow
- ☐ Kingscliff/Casuarina/Cabarita/Hastings Point/Pottsville/Wooyung
- ☐ Coolangatta/Tweed Heads

DIRECTION *(Tick applicable box)*

- ☐ Travelling to Yelgun
- ☐ Travelling from Yelgun

OCCUPANCY *(upon arrival at Yelgun or departure from Yelgun)*

"This trip the bus contained ..... passengers"

TIMING

Date:.....

Departure time:.....

Arrival time:.....

Appendix B Daily traffic report template

Date: .....

Time: .....

Actual number of patron vehicles arrived the day before: .....

Number of patron vehicles predicted to arrive the previous day as per the TMP: .....

Difference between actual and predicted number of patron vehicles the previous day: .....

Car occupancy summary: .....

Weather conditions previous day:.....

.....

Description of traffic during previous day:.....

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