Splendour in the Grass 2019
Traffic Evaluation Report

14 August 2019
Revision 0

Ingen Consulting Pty Ltd | ABN 18 623 948 112
Alstonville NSW 2477 | 0417 264 987
michiel@ingenconsulting.com.au
www.ingenconsulting.com.au

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Author: Michiel Kamphorst, *MSc BSc RPEng RPEQ NER*

Client name: Splendour in the Grass P/L

Client's representative: David Mullen

Approved for use by:

Name: Michiel Kamphorst **Signature:** **Date:** 14/8/19

Ingen Consulting information

Ingen Consulting Pty Ltd, ABN 18 623 948 112

Alstonville NSW 2477

+61 4 1726 4987

michiel@ingenconsulting.com.au

www.ingenconsulting.com.au

CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

1. INTRODUCTION

Ingen Consulting P/L has been engaged by Splendour in the Grass P/L to prepare a Traffic Evaluation Report (TER) for the 2018 Splendour in the Grass festival at North Byron Parklands, Yelgun, NSW. This TER builds on previous documentation prepared for this festival and is to be read in conjunction with the 2018 Traffic Management Plan and Traffic Monitoring Program for this festival.

1.1. Scope

This TER is prepared for the 2019 Splendour in the Grass festival at North Byron Parklands (NBP), in Yelgun, NSW. The TER is to address the traffic monitoring requirements as set in the Project Approval by the Minister for Planning and Environment and listed in the Traffic Monitoring Program This TER also provides a qualitative description of observations made throughout the festival period.

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

- Austroads Guide to Traffic Management
- Guide to Traffic and Transport Management for Special Events (RMS)

1.2. Certification of implementation of TMP

Implementation of the approved Traffic Control Plans was completed and certified on Tuesday the 16th of July. Campers arrival started on Wednesday the 17th of July and continued until Friday. Day patron arrival and departure occurred throughout the Friday, Saturday and Sunday of the festival, with camper departure on Monday the 22nd of July.

Traffic surveys were carried out throughout the event and our staff carried out monitoring activities on- and off-site throughout the event.

1.3. Site description

North Byron Parklands is located adjacent Tweed Valley Way and Jones Road, at Yelgun, NSW, as shown in Figure 1 and comprises of the following land parcels:

Lots 46, 402-404 and 410 DP 755687
Lots 10, 12 and 14 DP 875112
Lots 2 and 12 DP 848618
Lot 101 DP 856767
Lots 30 and 31 DP 880376
Lots 101, 102 and 107 DP 1001878
Lot 1 DP 1145020

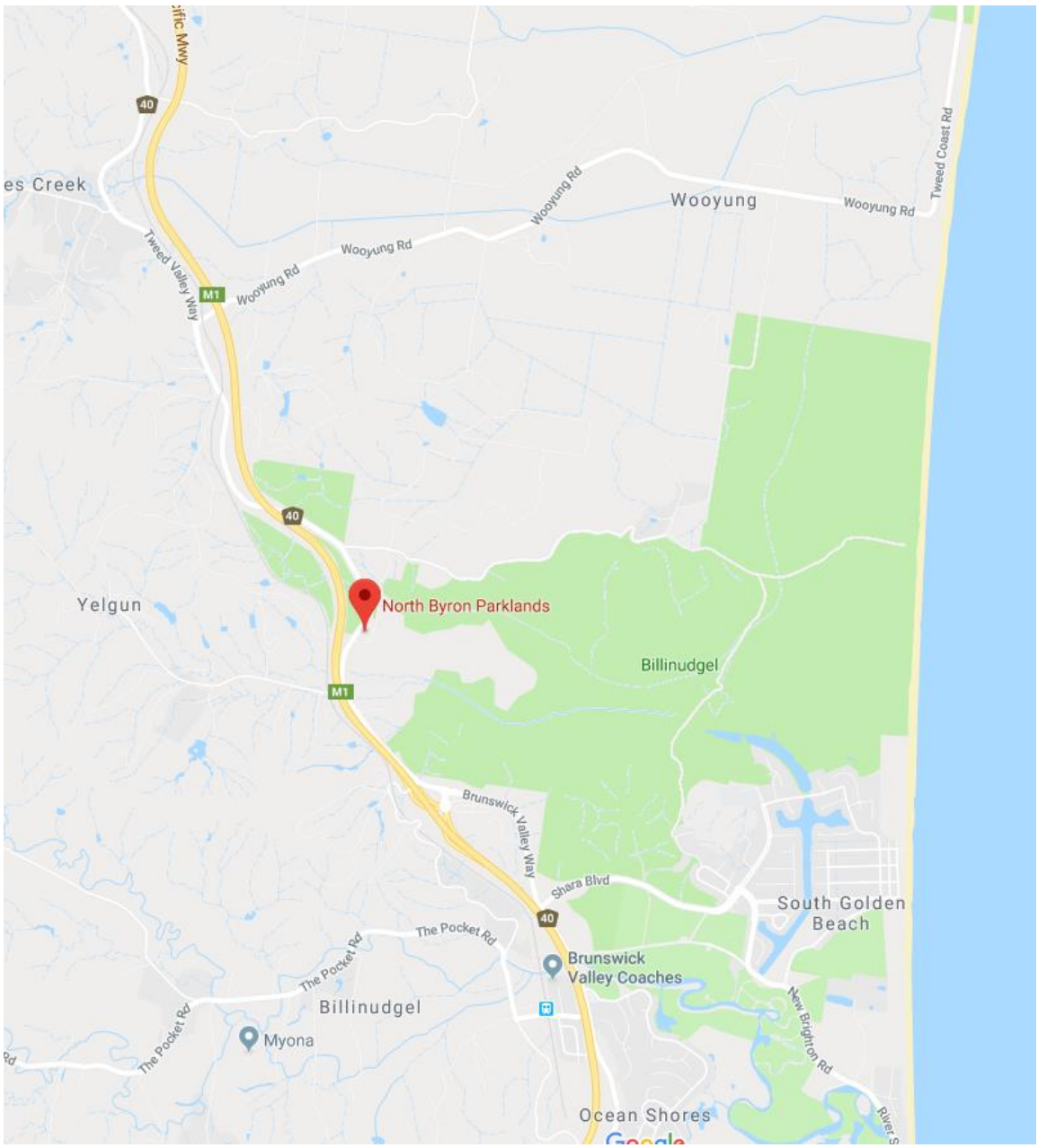


Figure 1 | Site location, *Source of map: Google Maps 2018*

1.4. Event description

The approval for this year's Splendour in the Grass festival allowed for an additional 7,500 patrons compared to last year. The approved numbers were 42,500 patrons.

1.5. Abbreviations and definitions

Commonly used abbreviations throughout this report are:

AADT – Average Annual Daily Traffic

ADT – Average Daily Traffic

BVW – Brunswick Valley Way

LOS – Level of Service, refer to table below

KPI – Key Performance Indicator

NB – northbound

NBP – North Byron Parklands

PWD – People With Disability

RWG – Regulatory Working Group

SB – Southbound

SITG – Splendour in the Grass

TCP – Traffic Control Plan

TMP – Traffic Management Plan

TVW – Tweed Valley Way

Border Control – On-site campers vehicle checkpoint, where vehicles are searched before entering the camp grounds

Meeting Point – On-site gravel area where campers can temporarily park their vehicles whilst waiting for friends, so they can all enter the campgrounds together and camp near each other.

Level of Service	Uninterrupted flow facility definition (HCM 2010)	Interrupted flow facility definition (AGTTM3)
A	A condition of free-flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.	Describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.	Describes reasonably unimpeded operation. The ability to manoeuvre within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.

C	Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.	Describes stable operation. The ability to manoeuvre and change lanes at mid segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.	Indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.	Characterised by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.	Characterised by a flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queueing. The travel speed is 30% or less of the base free-flow speed. LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.

1.6. Key Performance Indicators

The Key Performance Indicators (KPI's) that apply to this event are as follows:

- A minimum level of service (LOS) C is to be maintained at the Yelgun Interchange including merges and diverges.

- The level of service for local traffic and through traffic on the Tweed Valley Way should not fall below a LOS D, with a maximum of LOS E for no more than 4 hours a day.
- Queue lengths on the Link Road between Tweed Valley Way and the Yelgun Interchange must be limited to a maximum of 60 metres.
- Queue lengths on the interchange ramps must not be within 210 metres of the start of the ramp.
- On-site queueing is not to extend onto the Pacific Highway or Tweed Valley Way at any time.

2. MONITORING ACTIVITIES

This chapter provides an overview of the various traffic monitoring activities that were carried out by our traffic engineer throughout the event.

2.1. Evaluation of performance and compliance

Performance monitoring was carried out both actively and passively. Active monitoring was carried out by our traffic engineer throughout the festival. The purpose was to identify any queuing on the public road, monitor delays for through traffic and assess the effectiveness of the traffic management measures implemented. Passive monitoring was carried out by placing classified traffic counters in strategic locations, in order to provide data to review vehicle speeds, level of service and duration of any queuing.

2.2. Hazard identification

Whilst carrying out performance monitoring activities, the traffic engineer continually assessed the safety of the road network. Any incidents and near-misses were recorded to assist with improvements to the traffic management measures if needed. The traffic engineer was also be able to provide early warning to the traffic manager, with regards to incoming traffic, changes to anticipated traffic profiles and the build-up of queues.

2.3. Data collection

The main legislative purpose for traffic monitoring during the festival is to provide the data required to be able assess whether or not the festival performed within the approved traffic Key Performance Indicators (KPI's) set out in the project approval for the site. This framework can be summarised in the form of key performance indicators for the operation of traffic.

2.4. Car occupancy

In order to establish occupancy rates of camper cars and day patron cars, occupancy surveys were undertaken. These surveys were undertaken at strategic locations as to ensure particular traffic modes are isolated.

2.5. Origin distribution

A postcode analysis of ticket sales was undertaken to assist with the calculation of origin distribution of the traffic. Combined with the results from the traffic counters, a reasonably accurate determination of arriving and departing traffic routes can be established, to assist with the planning of future events at the site.

2.6. The monitoring of discrepancies with the adopted Traffic Control Plans

During and after the event, the traffic manager will gather information from parking attendants, traffic controllers and others to identify if there have been any deviations from the approved Traffic Control Plans. Typical discrepancies could be:

- Illegal stopping to drop off or pick up patrons outside the site, on Tweed Valley Way
- Illegal parking or camping along the public road
- Unwanted parking on North Byron Parklands internal roads where not permitted.

2.7. Yelgun rest area

Festival management closely monitored parking numbers and patron behaviour at the Yelgun Rest Area. The traffic counter installed at the rest area assists in monitoring traffic volumes and regular drive by's by security personnel stationed there provided a quick response to any unwanted behaviour.

3. DAILY REPORTS

3.1. Wednesday 17th July 2019

The camper arrival period started on Wednesday the 17th of July. The reduced speed zones on Brunswick Valley Way and the Yelgun Interchange were not implemented this day as no risk of congestion was expected. This way, the impact on through traffic was minimised. All the no-stopping zones were in place and all VMS boards were operating adequately. The delineated turning lanes at Gate D (Figure 2) were installed as per the approved drawings.

The Yelgun Rest Area was inspected at 10:40. 34 vehicles were parked in the rest area, and no issues were observed.

Mooball was inspected at 11:36. Around a dozen camper vehicles were parked in the car park on the side of the road, and no issues were observed.

Pottsville was inspected at 11:49. Traffic was reasonably busy but appeared to be regular traffic, not festival related.

Traffic at Gate D was going well at 12:49. Occasionally a car would be in the wrong lane but this was corrected safely each time with the help of the traffic controllers. There were no capacity or safety issues observed. Some of the directional signage shown on the approved drawings was not in place leading up to Gate D from the South.

Throughout Wednesday, there were no congestion issues within the public road network adjacent the subject site and no KPI's were breached.

Figure 2 | Gate D channelization, looking south

3.2. Thursday 18th July 2019

The camper arrival period continued on Thursday the 18th of July. The reduced speed zones on Brunswick Valley Way and the Yelgun Interchange were not implemented this day as no risk of congestion was expected. This way, the impact on through traffic was minimised. All the no-stopping zones were in place and all VMS boards were operating adequately. The delineated turning lanes at Gate D were re-instated after being packed up overnight.

The Yelgun Rest Area was inspected several times this day. At 8:49 the rest area was full of camper vehicles, parked also in the over 12T area. In response, festival management sent a security guard to the rest area and the rest area remained manned by security for the rest of the festival. The tasks of the security guard were to move people on if they appeared to be parking there for the day, warn people in the over 12T area that they will be fined, and generally keep an eye on patron behaviour. At reinspection at 10:47 the rest area had cleared up significantly, but still with some vehicles parked illegally. Generally the presence of the security guard was effective and ensured that the rest area was available for use for regular users other than festival patrons throughout the festival period, which is the objective.

Gate D directional signage was installed in the morning, which helped with directing road users into the correct lane on approach to Gate D (Figure 3).

In the afternoon it was identified that the Brunswick Bus Bay was not setup up as per the approved plans, resulting in cars parking in the bus area (Figure 4). Festival management was notified and this was corrected by Friday.

Mooball, Pottsville, Brunswick Heads and the Mullumbimby Leagues Club (Figure 5) were inspected several times on Thursday and no issues were observed. All the site gates were working well, and there was no congestion on the Spine Road. Border Control (Figure 6) worked well throughout the campers arrival period.

No congestion issues were observed on Tweed Valley Way and all KPI's were complied with.

Figure 3 | Gate D approach looking north

Figure 4 | Cars parked in Brunswick Bus stop area

Figure 5 | Mullumbimby Leagues Club setup

Figure 6 | Border Control in operation

3.3. Friday 19th July 2019

On Friday, both campers and day patrons arrived at the site. The approved reduced speed zones on Brunswick Valley Way and the Yelgun Interchange were implemented, as this was the first day patron arrival day, with an increased risk of congestion.

The Brunswick Bus Stop setup was much improved this day, but there continued to be issues with some vehicles parking in the bus stop area, forcing the buses to load and unload in front of the Memorial instead. This was all done safely and well managed by the staff on the ground.

The Yelgun Rest Area was calm throughout the day. At 12:13 there were only 23 vehicles parked. No issues were observed or reported in Mooball or Pottsville either. The Mullumbimby Leagues Club charter bus area worked well and was effective.

It was evident that the bus service was very effective this day. The day car park did not fill up, and the Mullumbimby Leagues Club was used very well. Also the taxi/uber pick up through Gate E off Wooyung Road worked well. There were hardly any issues with illegal drop offs observed and when it did happen it did not cause any safety or congestion issues.

As expected, the road infrastructure from Gate A via Jones Road to Tweed Valley Way was not quite adequate to cater for simultaneous 2-way bus traffic. This was managed well by traffic controllers and security guards. All buses would enter Gate A, but if the outbound bus queue became too long, departing buses were diverted to Gate C, which worked well.

All KPI's were complied with this day.

At night, no parked cars were observed along Wooyung Road, and only a few along Tweed Valley Way. Emptying of the south car park commenced in waves around 23:43 and picked up somewhat after midnight. By 1:30am the departure flow reduced significantly. Everything worked well, no KPI's were breached.

3.4. Saturday 20th July 2019

Due to the success of Friday, it was decided to remove the reduced speed zones from Brunswick Valley Way and the Yelgun Interchange, as the risk of congestion on Tweed Valley Way was deemed very low. By reinstating the posted speed limit for the rest of the festival, the delays for through traffic would be minimised.

From Saturday onwards, the Brunswick Bus Bay worked well. There were no more issues of illegal parking due to the additional cones placed between the bitumen and the gravel bus area (Figure 7).

Pottsville, Mooball, the Yelgun Rest Area, Brunswick Heads and Mullumbimby Leagues Club were inspected several times this day and no issues were observed. At 16:57 there were only 33 vehicles parked in the Yelgun Rest Area.

There was no congestion along the Spine Road, Tweed Valley Way operated well, and all KPI's were complied with during the day.

At 22:54 it was noticed that several Uber vehicles were parked illegally along Wooyung Road at the Gate E entrance intersection. This was due to the fact that Taxi's and Ubers were not allowed on site until later in order to prevent them from parking in the pick-up area whilst waiting for the day patron departure to commence.

At 23:09 it was noticed that buses were parked in the Yelgun Rest Area also waiting for the festival to finish up for the day. The police was active and the rest area was full.

Full buses were noticed leaving the site from 23:26 and the gates were working well. It was noticed that there were significantly fewer pedestrians along Tweed Valley Way than previous years.

By 1:39am the day patron departure was completed.

All KPI's were complied with at night.

Figure 7 | Brunswick bus bay

3.5. Sunday 21st July 2019

Everything went well on Sunday the 21st of July. During several inspections of Brunswick Heads, Mullumbimby Leagues Club, Pottsville, Mooball and Yelgun no issues were observed. At 15:36 there were 36 vehicles parked in the Yelgun Rest Area.

At night time there were also no issues. The south car park crew finished up by 1am as the car park was managing itself well and the departure was completed by 1:30am.

3.6. Monday 23rd July 2018

Monday was the campers departure day. Gate D was closed and campers exited along the Spine Road out of Gate C in two lanes, with the left lane turning left and the right lane turning right. Campers were also exited through Gate E onto Wooyung Road, with campers turning left towards Tweed Valley Way and to the right towards Pottsville.

The Tweed Valley Way intersection with Wooyung Road was the critical intersection for this day, as it was the intersection of two streams of departing campers. With the single lane railway bridge on Wooyung Road and the steep terrain on the Tweed Valley Way approaches to this intersection, managing this safely and efficiently was essential for the success of this day.

At 11am a long queue of traffic on Wooyung Road westbound was identified, stretching from Tweed Valley Way nearly back to Gate E. In response, traffic controllers sent more people to the right out of Gate E towards Pottsville, which in turn was congested several times. The delay time of traffic through Pottsville around midday was observed to be around 10 minutes. AM peak traffic in Pottsville was not affected.

The worst LOS on Tweed Valley Way at the Wooyung Road intersection during this period is estimated to be LOS D, with potentially short periods of LOS E, which is permitted under the consent.

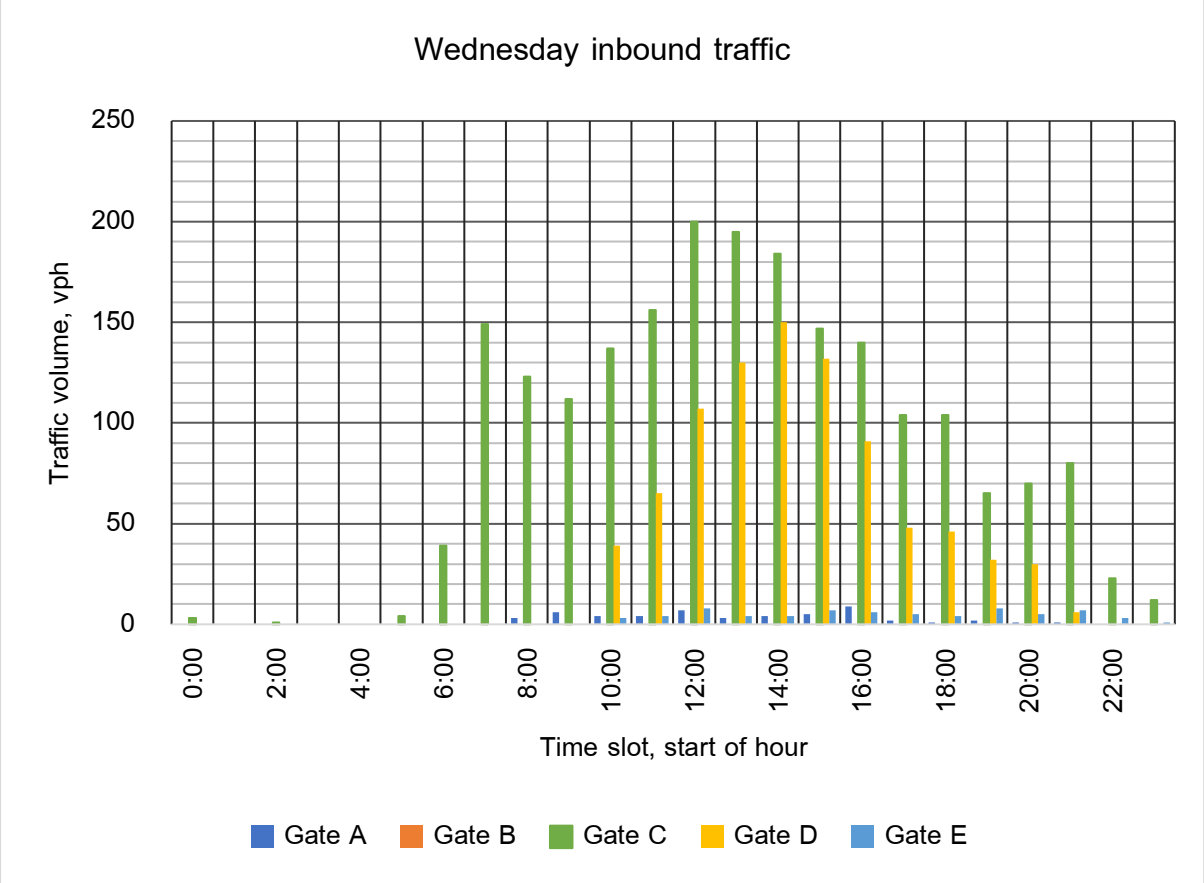
Similarly, there was some congestion at Gate C due to campers who had left Gate E travelling south along Tweed Valley Way, and this affected the departure flow out of Gate C.

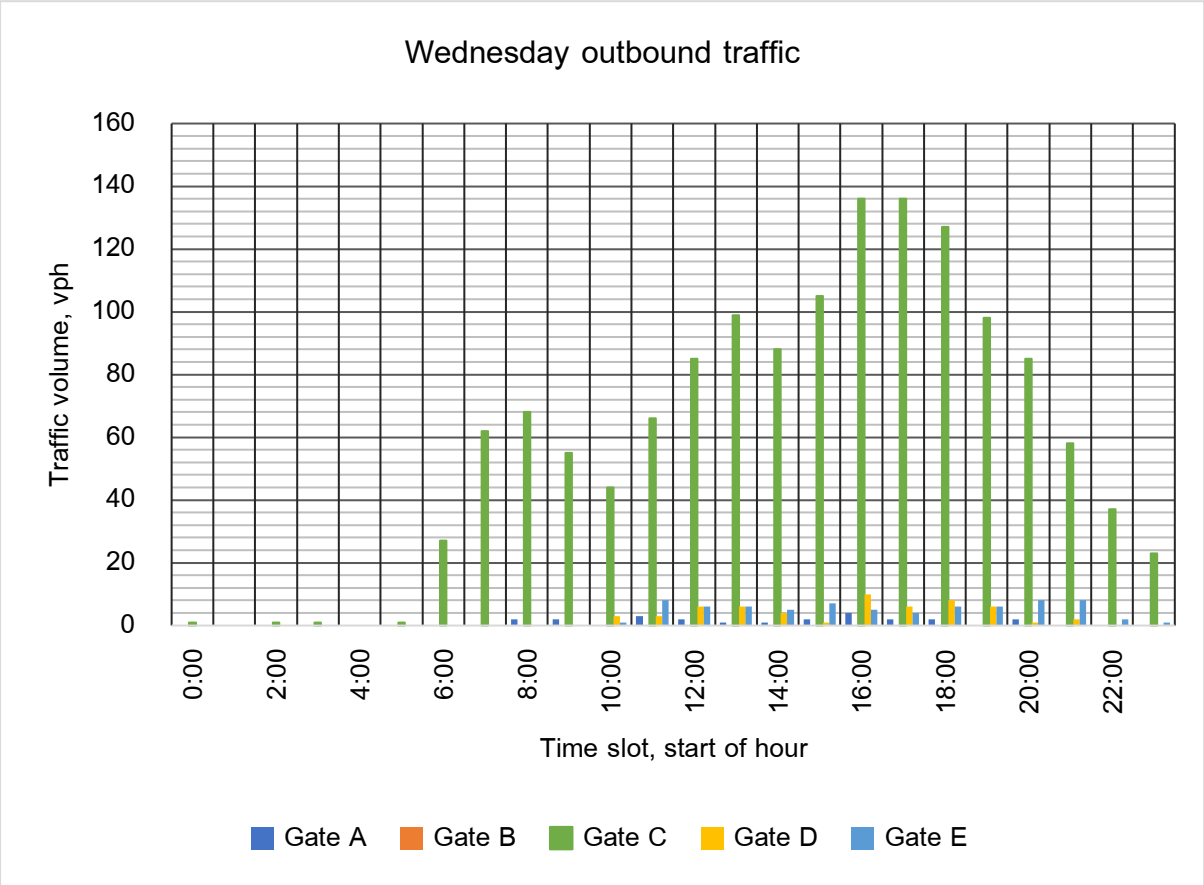
From our observations, all KPI's were complied with on Monday.

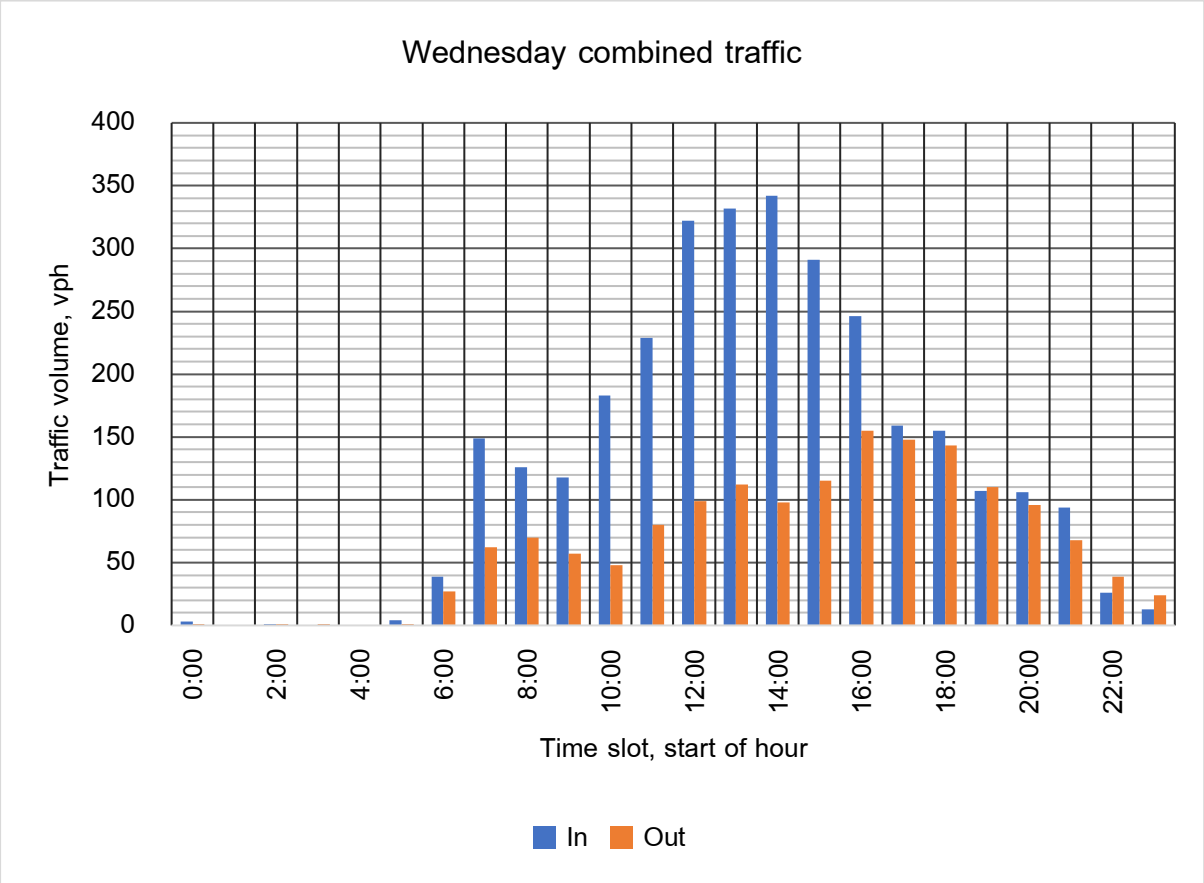
4. DATA SUMMARY

4.1. Arrival and departure profiles

The graphs below depict the arrival and departure profiles per day, gate and direction as well as combined for all gates per day.




Wednesday outbound traffic
Traffic volume, vph
160
140
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Time slot, start of hour
Gate A
Gate B
Gate C
Gate D
Gate E


Wednesday combined traffic
Traffic volume, vph
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350
300
250
200
150
100
50
0
0:00
2:00
4:00
6:00
8:00
10:00
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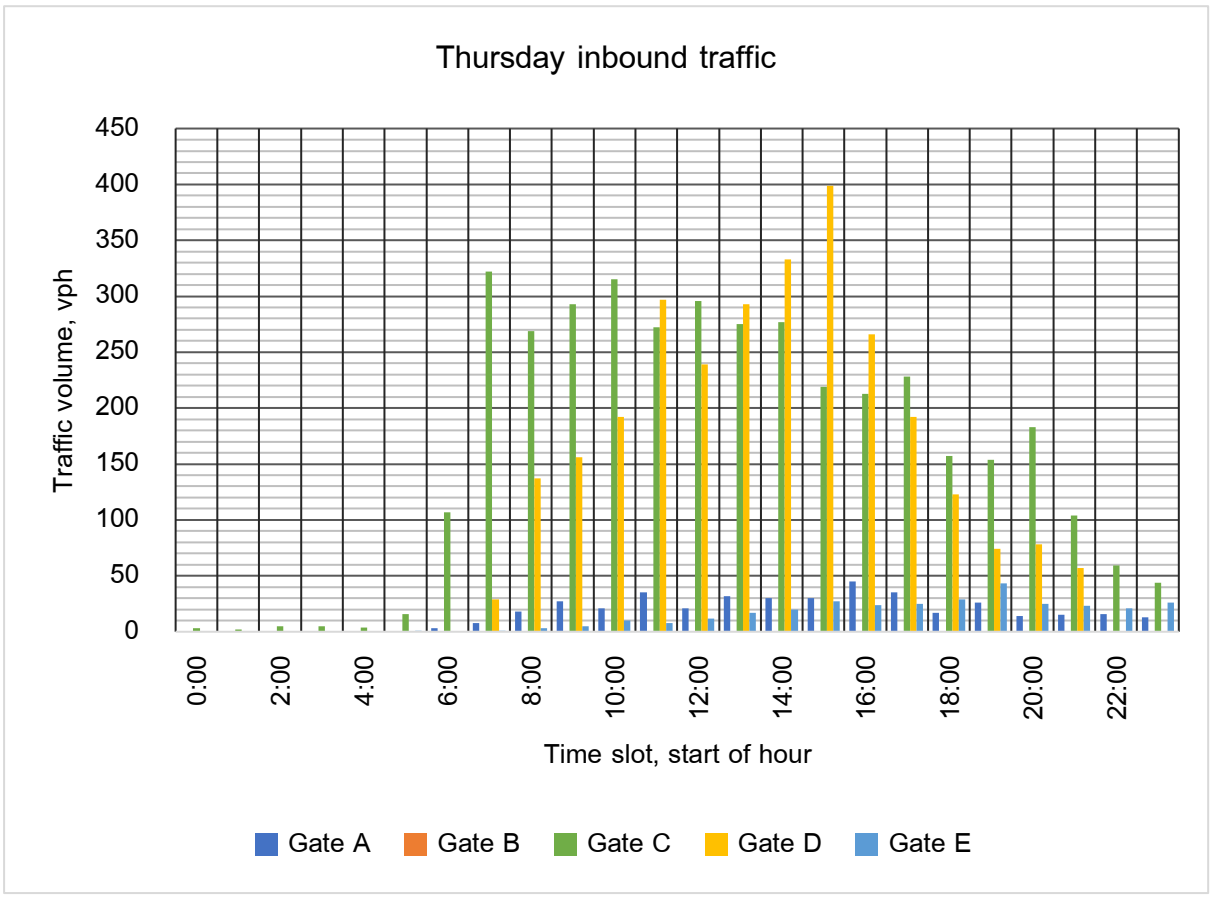
16:00
18:00
20:00
22:00
Time slot, start of hour
In
Out


Thursday inbound traffic
Traffic volume, vph
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400
350
300
250
200
150
100
50
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
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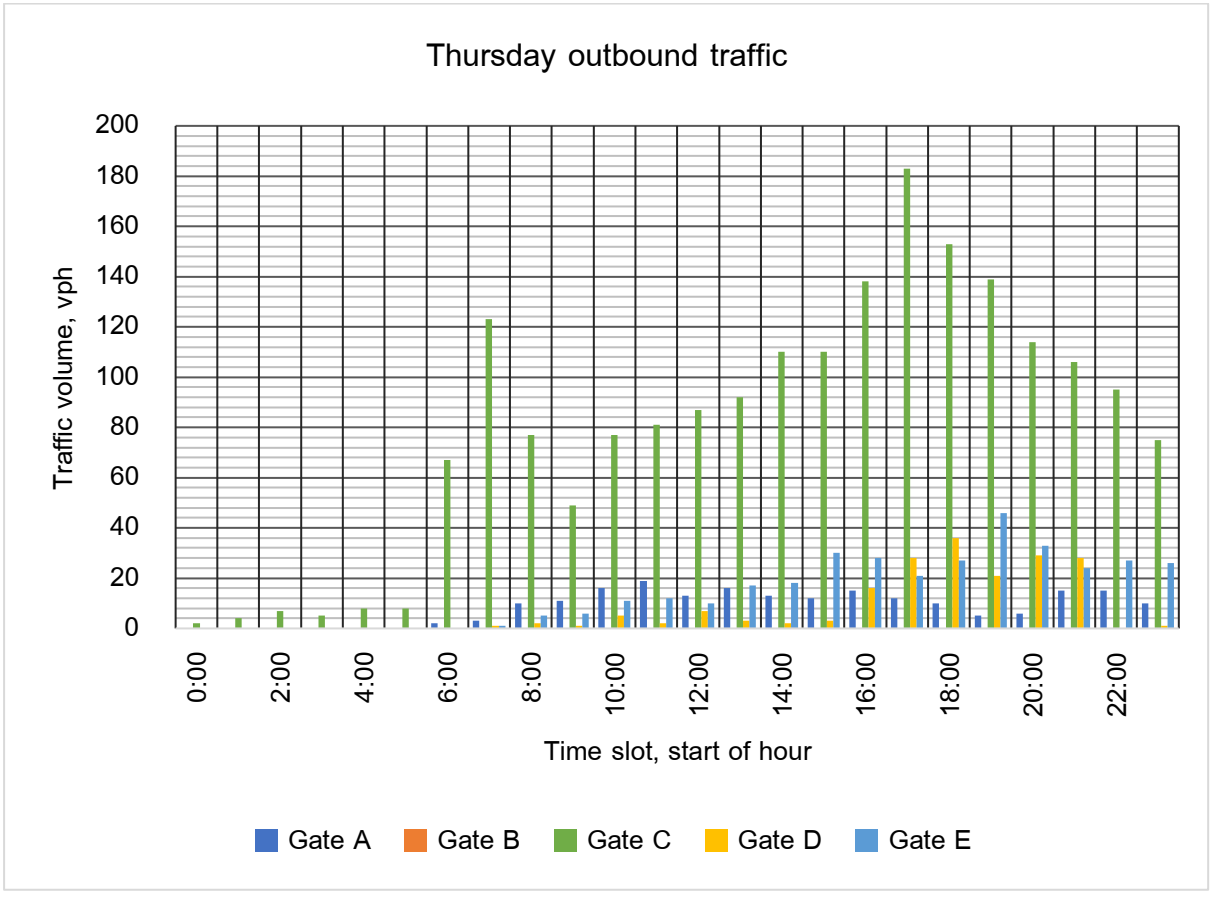
20:00
22:00
Time slot, start of hour
Gate A
Gate B
Gate C
Gate D
Gate E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Traffic volume, vph
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180
160
140
120
100
80
60
40
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6:00
8:00
10:00
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Time slot, start of hour
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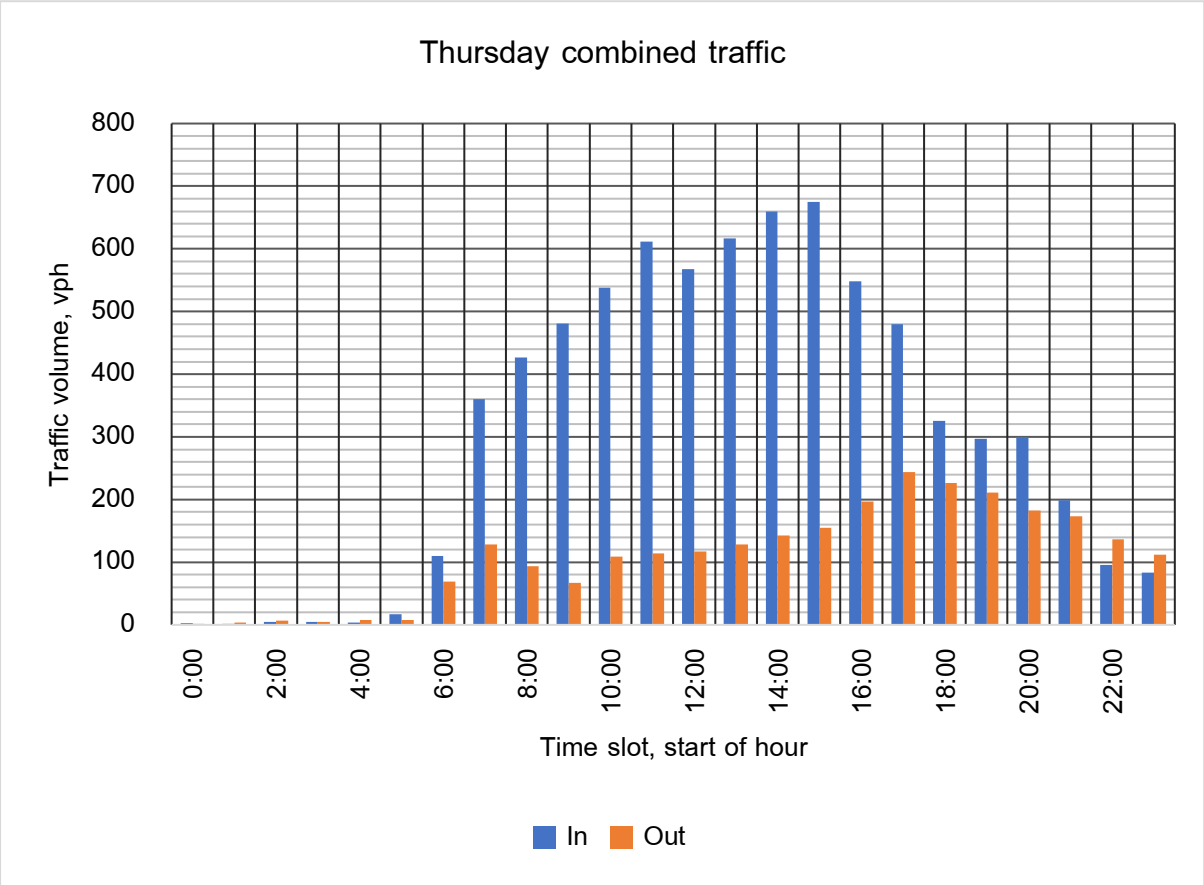
Gate E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Traffic volume, vph
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700
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500
400
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Time slot, start of hour
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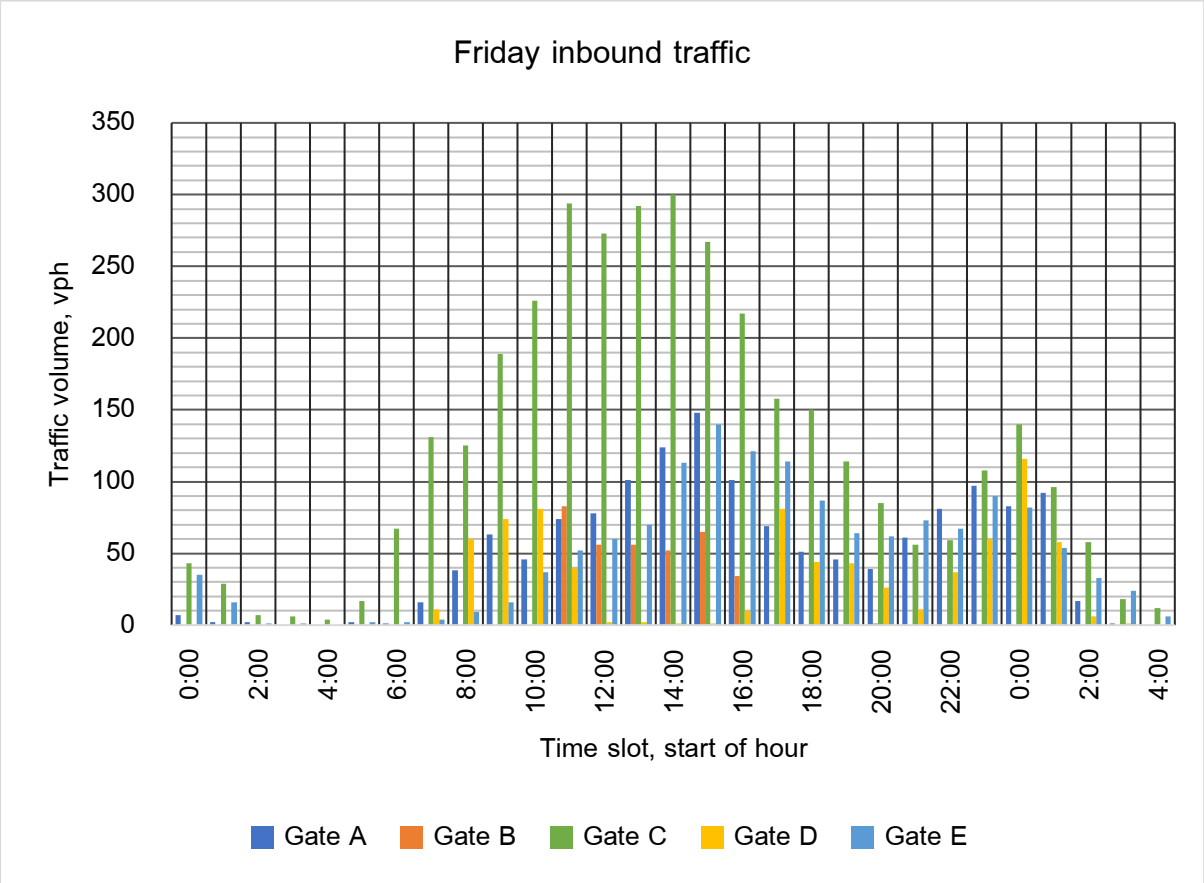
Friday inbound traffic
Traffic volume, vph
350
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Time slot, start of hour
Gate A
Gate B
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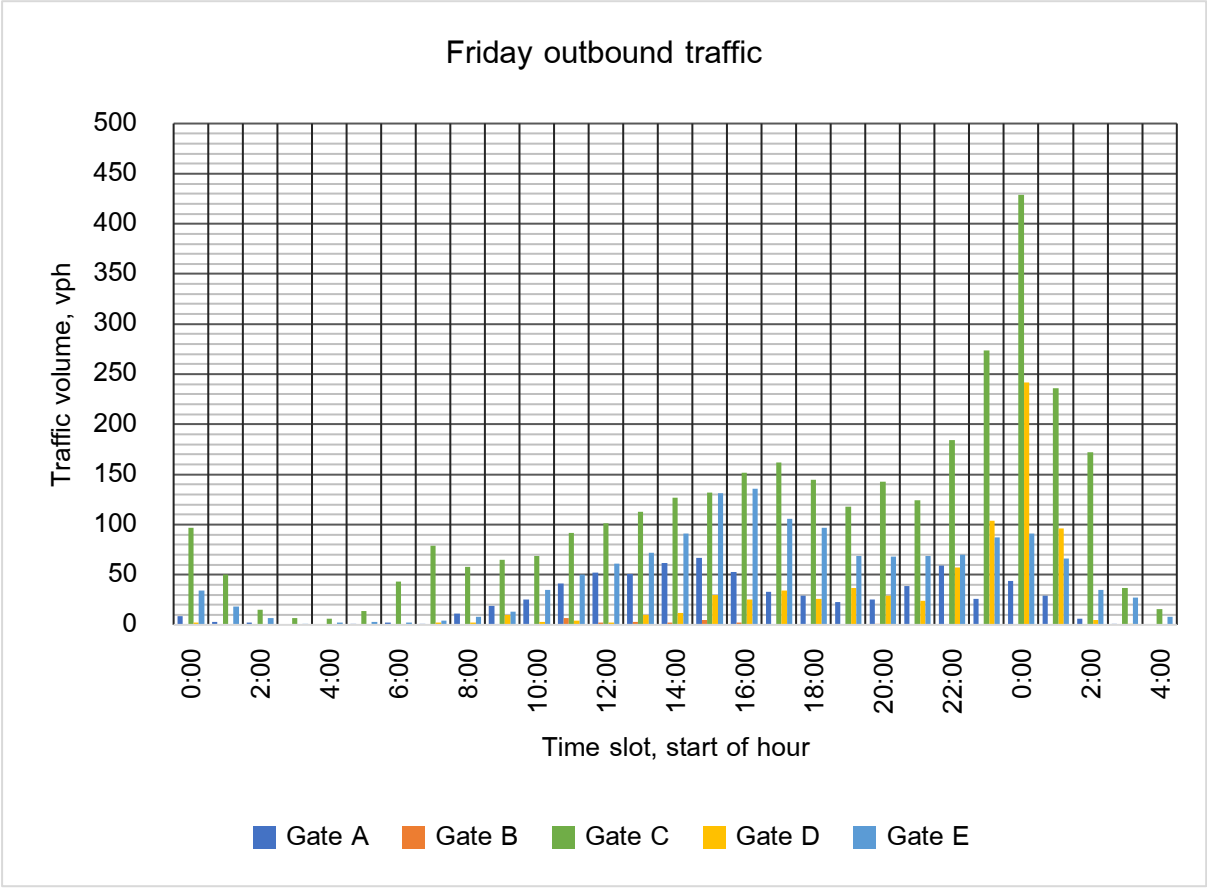
Gate E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Traffic volume, vph
500
450
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Time slot, start of hour
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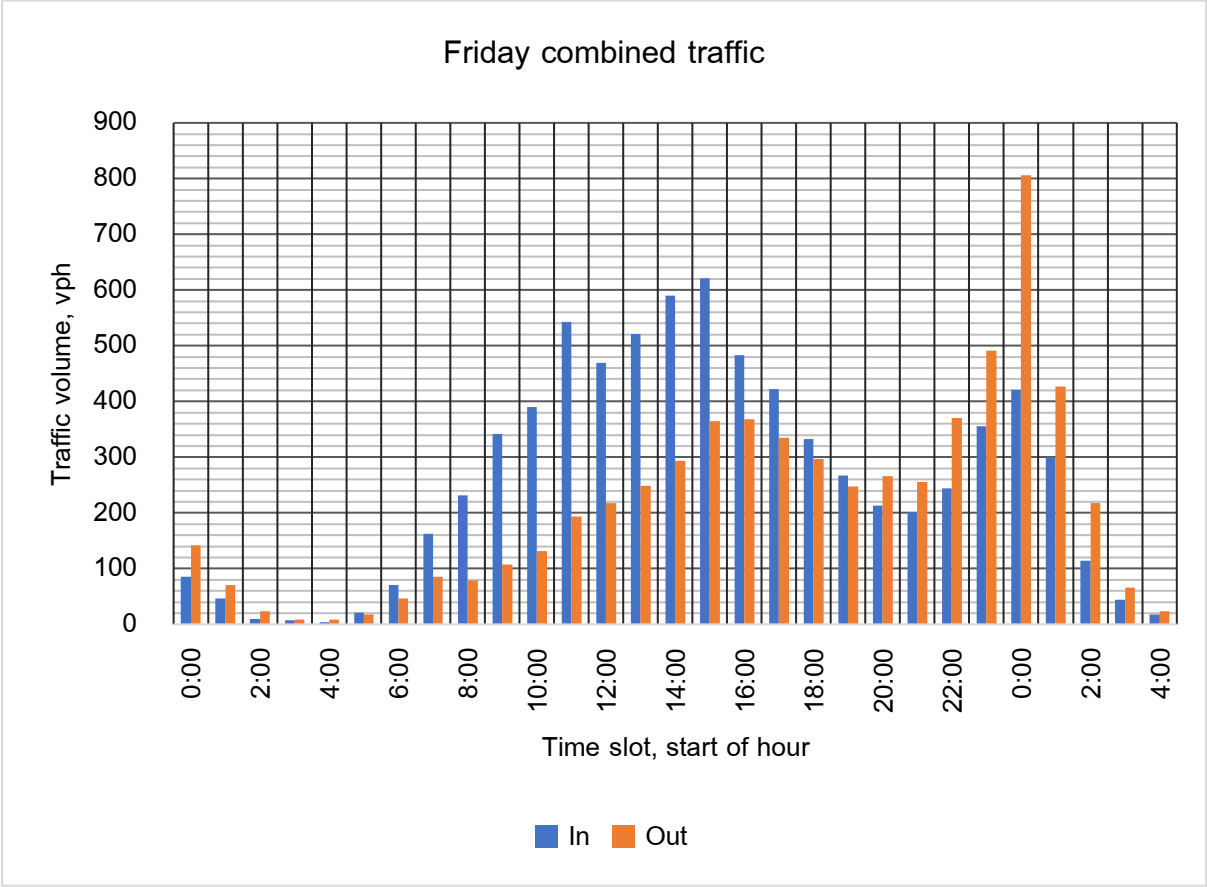
Gate E


Friday combined traffic
Traffic volume, vph
900
800
700
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Time slot, start of hour
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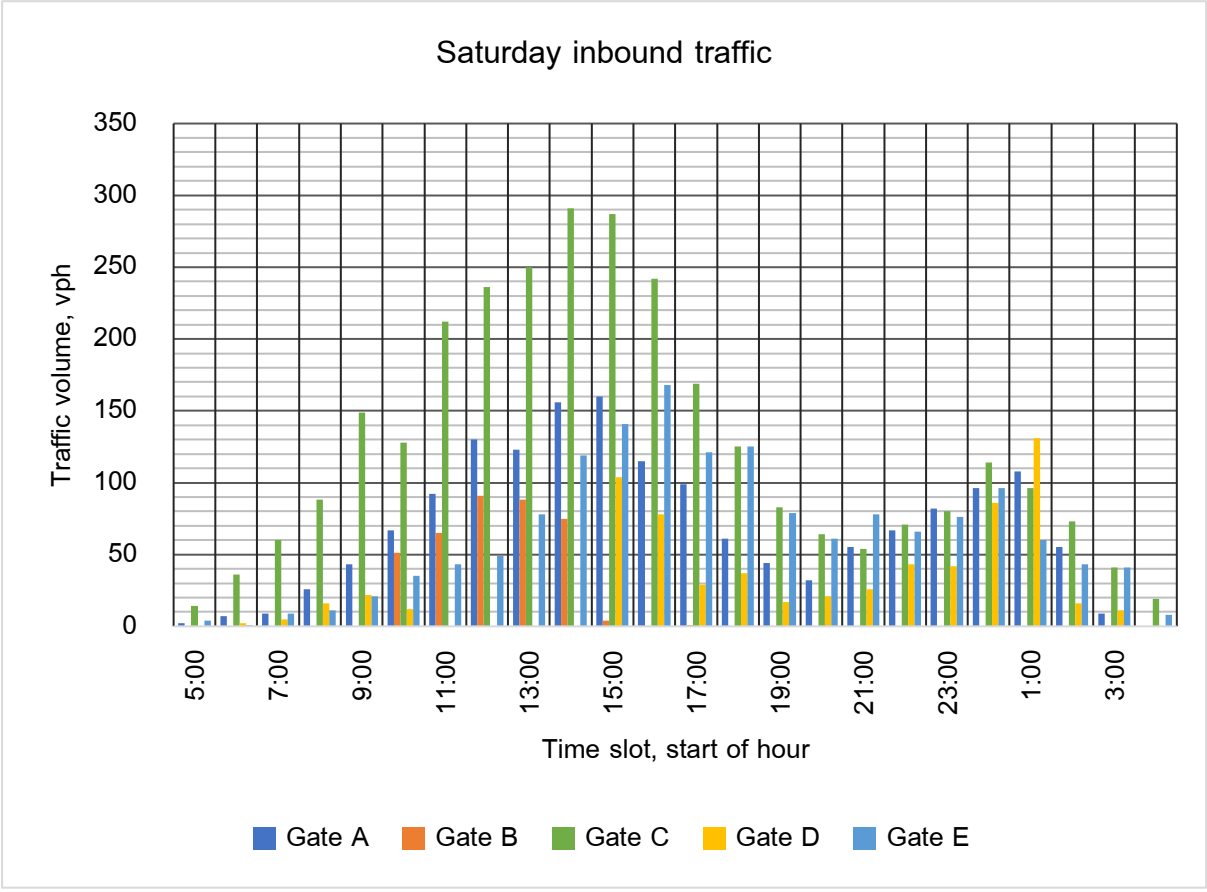
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Traffic volume, vph
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300
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150
100
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5:00
7:00
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Time slot, start of hour
Gate A
Gate B
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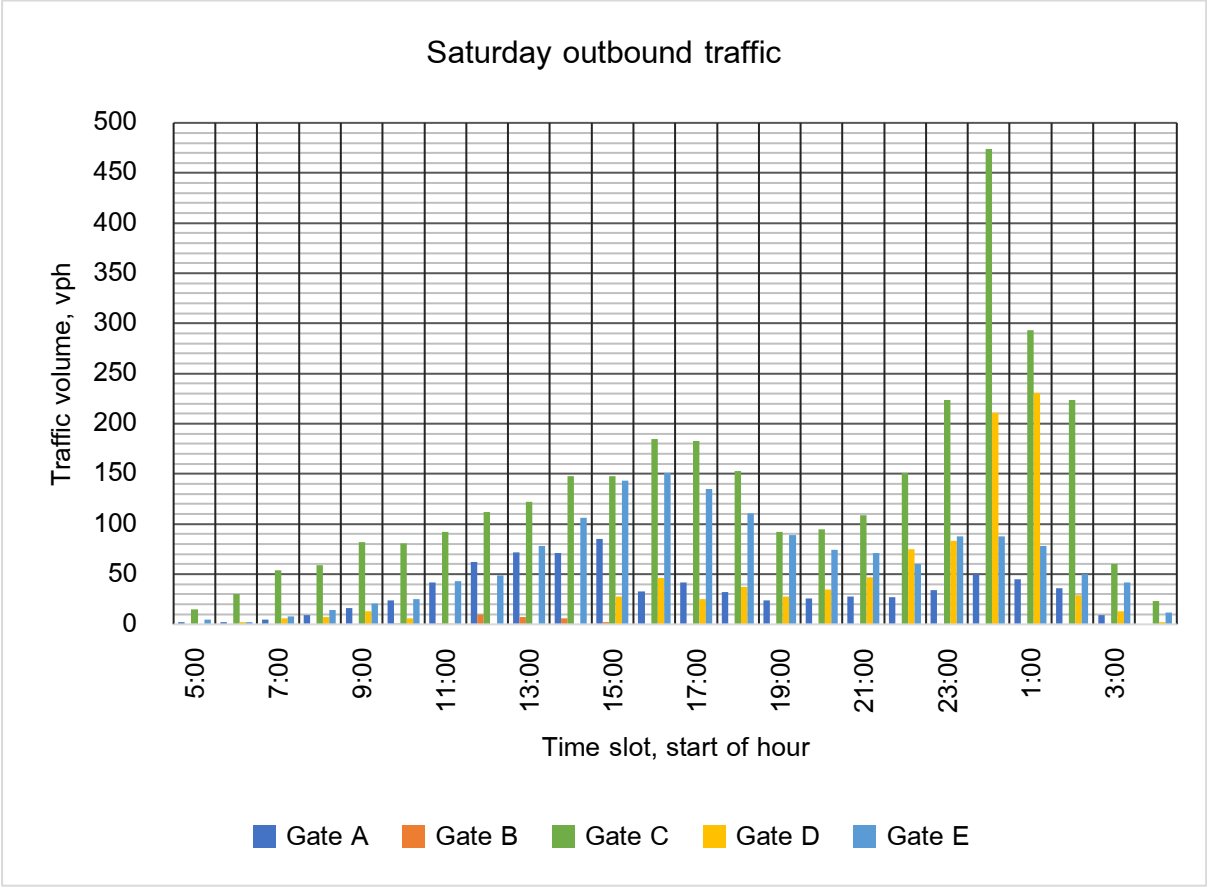
Gate D
Gate E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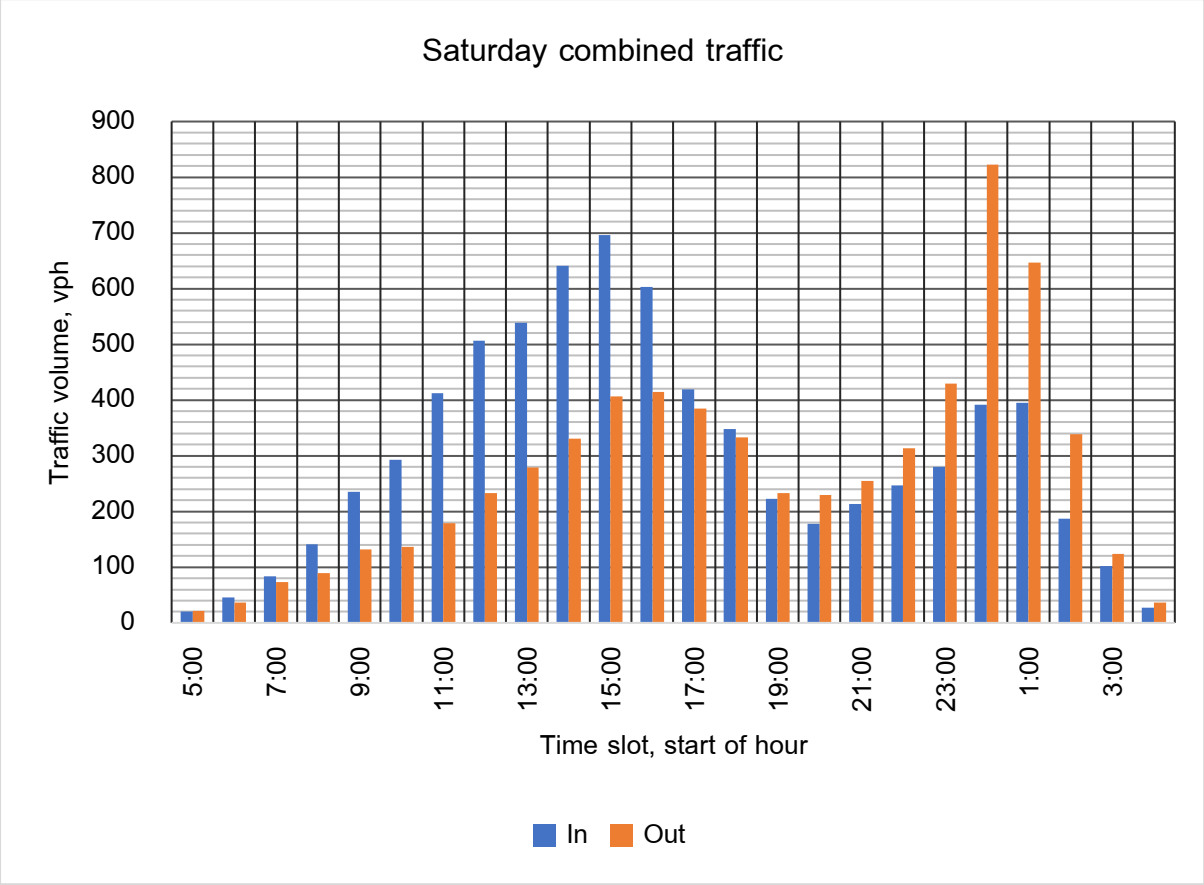
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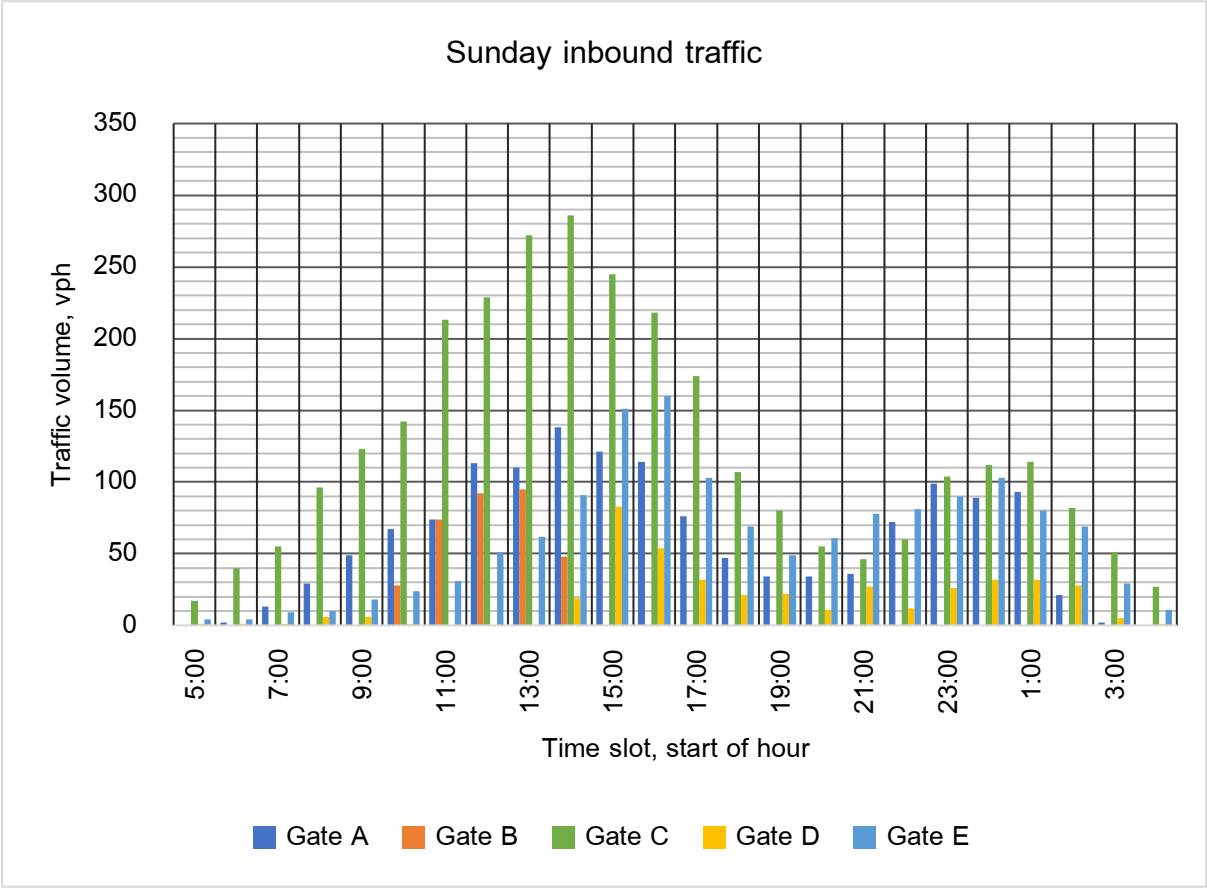
Sunday inbound traffic
Traffic volume, vph
350
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Time slot, start of hour
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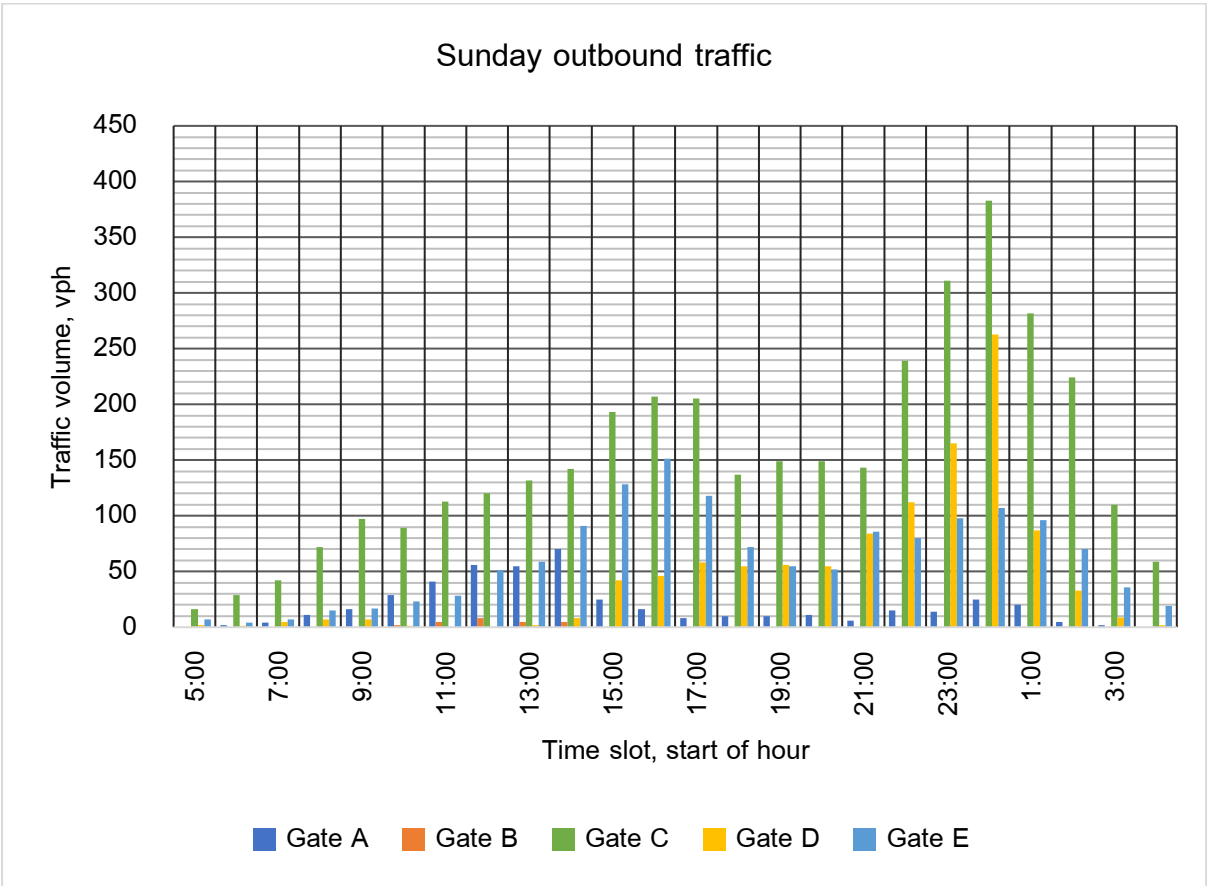
Sunday outbound traffic
Traffic volume, vph
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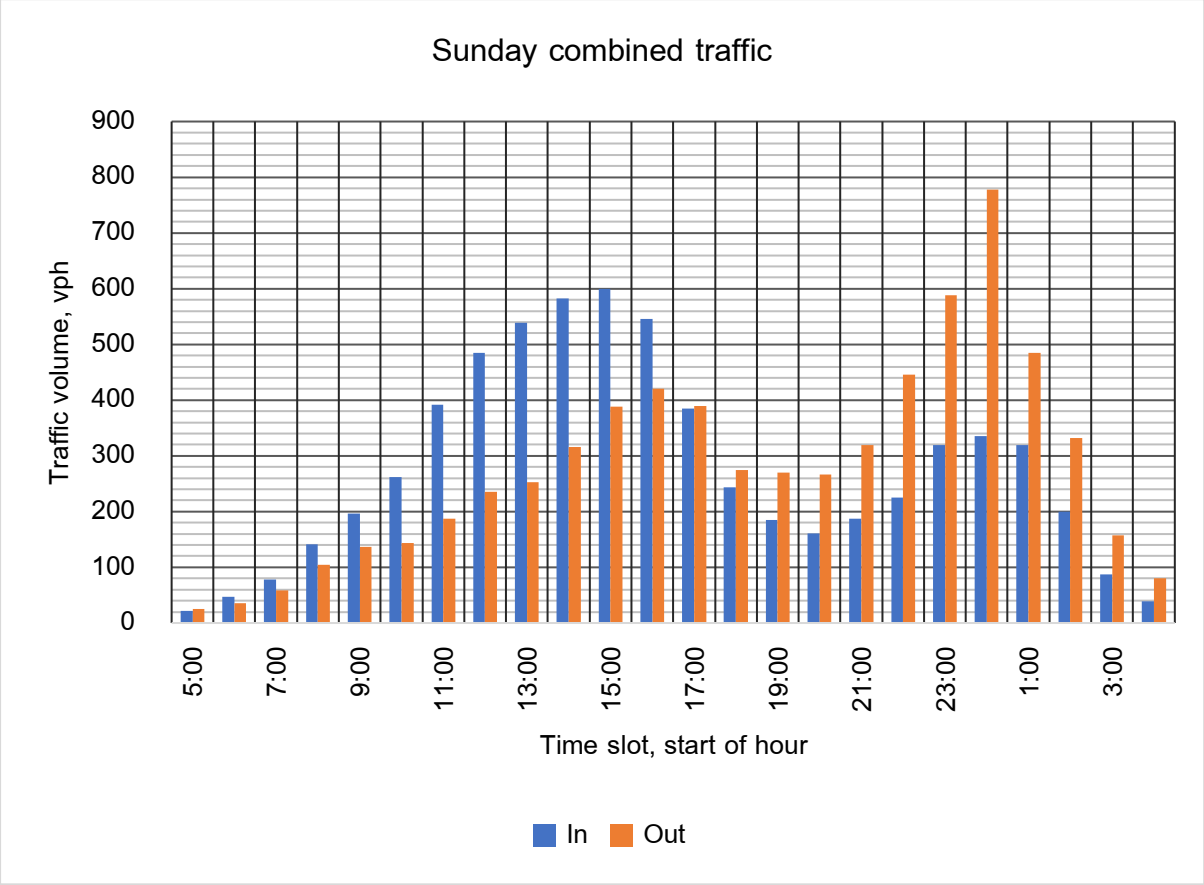
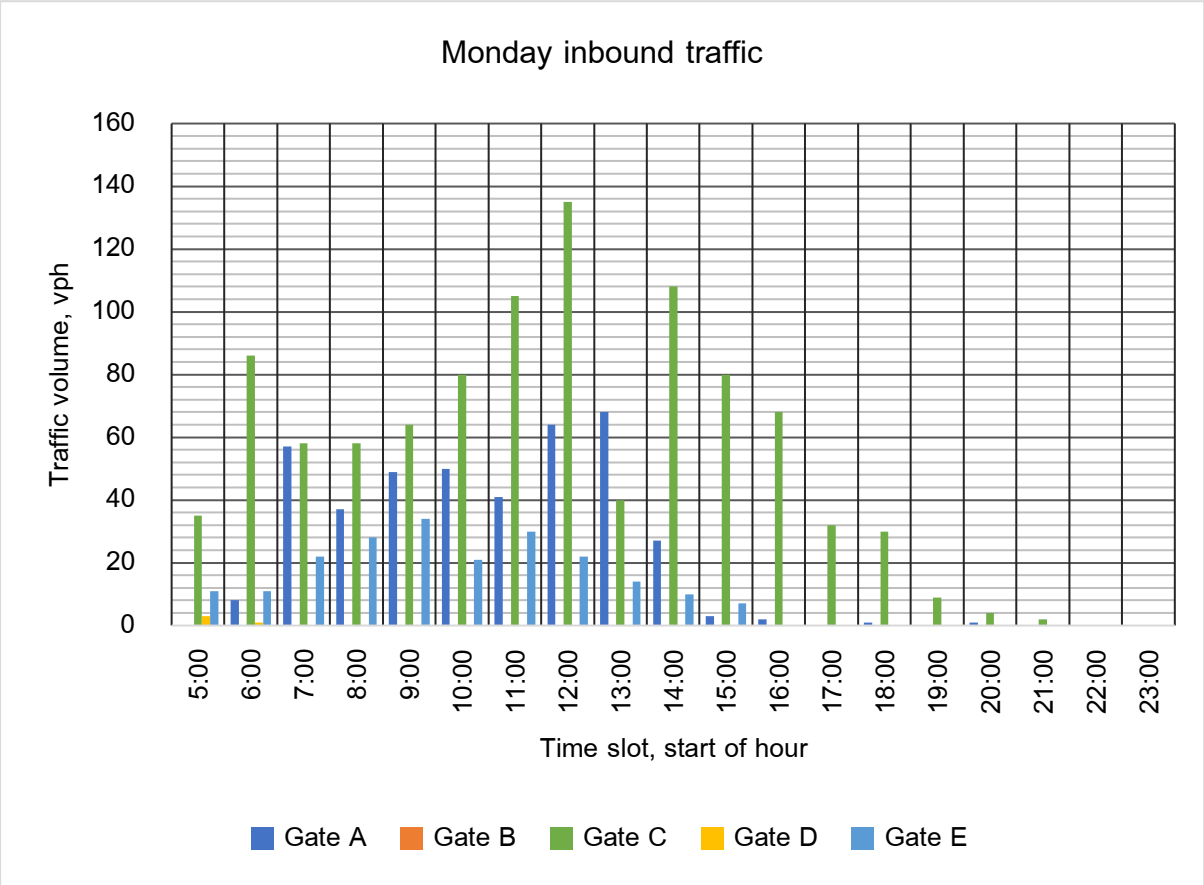
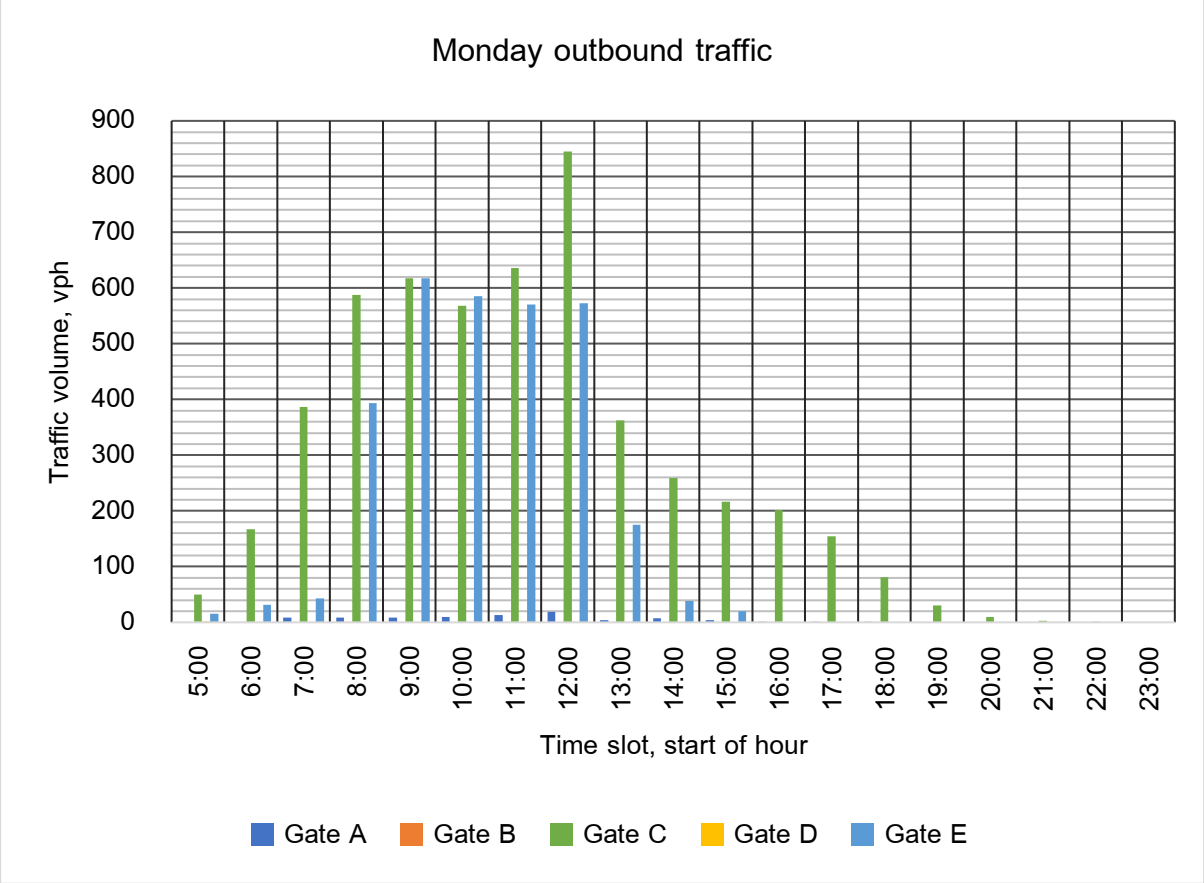
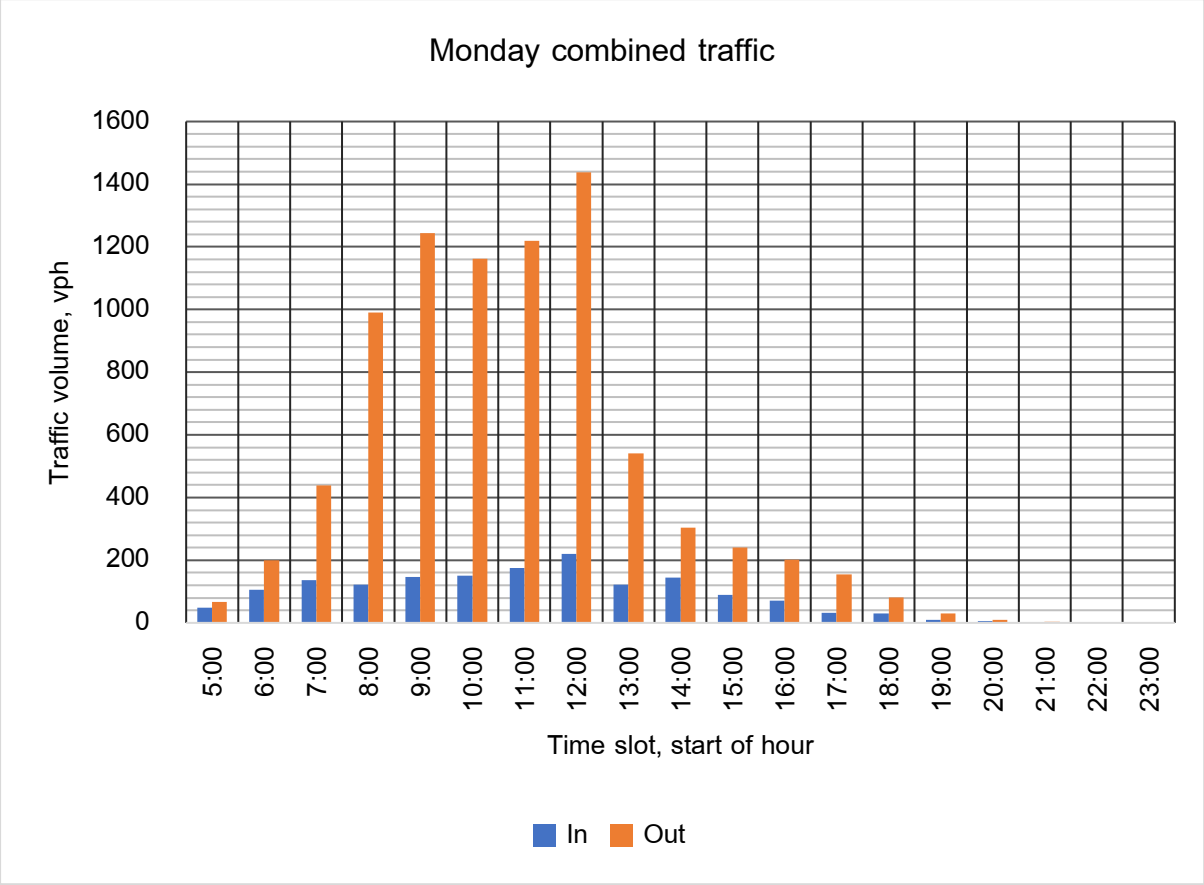
3:00
Time slot, start of hour
Gate A
Gate B
Gate C
Gate D
Gate E


Sunday combined traffic
Traffic volume, vph
900
800
700
600
500
400
300
200
100
0
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
Time slot, start of hour
In
Out


Monday inbound traffic
Traffic volume, vph
160
140
120
100
80
60
40
20
0
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Time slot, start of hour
Gate A
Gate B
Gate C
Gate D
Gate E


Monday outbound traffic
Traffic volume, vph
900
800
700
600
500
400
300
200
100
0
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Time slot, start of hour
Gate A
Gate B
Gate C
Gate D
Gate E



4.2. Daily traffic volumes

A summary of daily volumes for Yelgun locations external to the site is provided in Table 1.

Table 1 | Daily traffic volume summary (Yelgun counters)

Date	1 - TVW, south of site	2 - NB on ramp	3 - NB off ramp	4 - SB on ramp	5 - SB off ramp	6 - Rest area	7 - TVW, at Jones Road	8 - BVW
Mon 1 Jul	4848	1410	1803	2021	1593	723	4236	5125
Tue 2 Jul	5571	1588	1955	2183	1733	782	4931	5724
Wed 3 Jul	5777	1491	2080	2313	1610	760	5090	5694
Thu 4 Jul	5554	1665	2021	2257	1737	777	4841	5705
Fri 5 Jul	5485	1691	1943	2283	1776	813	4731	5633
Sat 6 Jul	4311	1433	1352	1573	1575	612	3772	5210
Sun 7 Jul	3545	1296	1269	1380	1279	572	3329	4348
Mon 8 Jul	5213	1479	1825	2124	1674	809	4356	5578
Tue 9 Jul	5780	1534	1930	2251	1747	811	4729	5928
Wed 10 Jul	6055	1672	2016	2323	1869	753	4956	6035
Thu 11 Jul	6166	1782	2114	2415	1885	873	4887	5975
Fri 12 Jul	6413	1820	2175	2453	1934	879	5140	6265

Sat 13 Jul	5073	1454	1504	1760	1612	655	4022	5345
Sun 14 Jul	4958	1697	1484	1588	1486	731	3975	5308
Mon 15 Jul	6232	1622	1996	2298	-	874	4446	5727
Tue 16 Jul	6946	1747	2075	2603	-	858	4760	6075
Wed 17 Jul	8397	1692	2344	2608	2333	1267	5907	6970
Thu 18 Jul	11905	1926	2622	2900	3666	2657	8063	9355
Fri 19 Jul	13645	2427	3284	3862	3419	1535	8098	8938
Sat 20 Jul	14563	2825	3257	4254	2845	1331	7607	8275
Sun 21 Jul	15254	3896	3208	4688	2687	1373	7357	8387
Mon 22 Jul	13497	4695	2277	6223	1965	1157	9140	7803
Tue 23 Jul	6422	1738	2055	2585	1790	711	4921	5839
Wed 24 Jul	5941	1677	2033	2410	1731	782	4921	5768
Thu 25 Jul	5662	1713	1939	2421	1862	781	4675	5706
Fri 26 Jul	5833	1664	1987	2480	1843	738	4994	5983
Sat 27 Jul	4501	1382	1304	1652	1634	506	4031	5294
Sun 28 Jul	4255	1365	1345	1568	1285	490	4080	4862
Mon 29 Jul	5160	1464	1795	2247	1612	767	4622	5434
Tue 30 Jul	5335	1498	1849	2375	1611	733	4862	5449
Wed 31 Jul	5149	1399	1831	2339	1608	786	4697	5354
Thu 1 Aug	5069	1424	1831	2423	1556	644	4810	5455
Fri 2 Aug	5140	1494	1836	2351	1656	657	4889	5613
Sat 3 Aug	-	1320	1279	1686	1505	500	4092	5178
Sun 4 Aug	-	1385	1354	1649	1326	561	4072	4889
Mon 5 Aug	-	1319	1660	2126	1495	690	4458	5237

4.3. Mode share and occupancies

In order to analyse mode share and occupancy rates, various surveys were undertaken throughout the event. An overview of these surveys is provided in this report.

Vehicle occupancies

The results of the vehicle occupancy surveys are presented in Table 2. These results show little change to the day parking and camper vehicle occupancies compared to last year.

Table 2 | Vehicle occupancy survey summary

Type	When	Sample size	Average	Standard Deviation
Car park vehicle occupancy	Saturday and Sunday	369	3.04	1.36
Camper vehicle occupancy	Monday morning	442	2.38	1.64

Mode share

Mode share estimates have been carried out using a combination of the traffic counter data, vehicle occupancy survey data and data provided by festival management.

A total of 7938 camper car passes were sold. Using the surveyed occupancy of 2.38 ppv, that results in a total of 18,892 persons. Allowing for a limited accuracy of the occupancy survey data, and given 18,500 camper tickets were available for sale, it can be concluded that the mode share for campers is near enough to 100%.

A total of 53,164 return bus tickets were sold for the festival. Given the bus use by campers is negligible, these tickets would relate to day patrons only. Over the three days, a total of 72,000 day patrons were approved on site, from which it can be calculated that 73.8% of day patrons used the paid bus service.

A total of 3,510 day parking passes were sold over the three event days. Using an occupancy of 3.04ppv, this would equate to 10,670 day patrons travelling by private car to site. This is a total of 14.8% of total day patrons.

The remaining 11.4% of day patrons used the free shuttle service from Mullumbimby and the taxi and ride share services. Insufficient data is available to accurately estimate the split between the shuttle service and the ride share services.

The mode share estimates are depicted in Table 3.

Table 3 | Mode share estimates

Mode share	Day patrons	Campers
Parking	15%	100%
Pick up / drop off / free shuttle	11%	0%
Buses	74%	0%

4.4. Directional distribution

There are five main routes to and from the festival site. These are:

1. For traffic from the North: Pacific Motorway, access at Yelgun Interchange
2. For traffic from the North: Pacific Motorway access at Cudgera Creek Road, then via Mooball and Tweed Valley Way
3. For traffic from the South: Pacific Motorway, access at Yelgun Interchange
4. For traffic from the South: Pacific Motorway access at Brunswick Heads North, then via Ocean Shores on the Brunswick Valley Way.
5. For traffic from the North: Pottsville and the Tweed Coast Road

In order to reduce the traffic load on the Yelgun Interchange, festival traffic is encouraged to use the Tweed Valley Way and Brunswick Valley Way routes. This strategy had a higher effectiveness with campers than with day patrons.

The resulting directional traffic distributions for various peak times throughout the festival period are summarised in Table 4. It is noted that the campers departure directional distribution is partially forced by the camping exit strategy and directions by traffic controllers and is therefore not a true representation of people's intended travel route. A similar comment is valid for the day patron departure. These values are therefore displayed in italics.

Table 4 | Directional distribution

Type	To/from the North			To/from the South	
	Pacific Motorway at Yelgun	Tweed Valley Way	Pottsville	Pacific Motorway at Yelgun	Brunswick Valley Way
Campers arrival	26%	50%	0%	9%	15%
Campers departure	*21%*	*28%*	*17%*	*28%*	*7%*
Day patron arrival	24%	16%	10%	30%	20%
Day patron departure	*30%*	*5%*	*6%*	*41%*	*18%*

5. CONCLUSIONS AND RECOMMENDATIONS

The performance of the 2019 Splendour in the Grass event was excellent from a traffic engineering perspective. All KPI's were complied with and a high day patron bus mode share of 74% was achieved. The KPI compliance summary table is provided in Table 5.

Table 5 | KPI compliance summary table

	Description	Maximum queue length on Pacific Motorway off ramps	Minimum level of service along Yelgun Interchange	Minimum Level of Service along Tweed Valley Way	Maximum queue length on Link Road	On-site queuing not to extend onto public road
	Criterion	210m from start of diverge	LOS C	LOS D, E for maximum of 4 hrs a day	60m	-
Wed	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y
Thu	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y
Fri	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y
Sat	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y
Sun	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y
Mon	**Day time**	Y	Y	Y	Y	Y
	Night time	Y	Y	Y	Y	Y

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Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, Austroads Inc., Sydney, November 2017

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