

Oran Park High School and Oran Park Public School Traffic Report

30 March 2017 | 16-158

Contents

Contents	2
Document control	3
1. Introduction	4
2. Existing conditions	5
2.1 The site and existing roads.....	5
2.2 Public Transport.....	7
2.3 Parking	7
2.4 Existing traffic.....	8
2.5 Existing cyclists and pedestrians	9
3. The development and impact.....	11
3.1 Proposed works	11
3.2 Public transport and bus zones	11
3.3 Drop off / pick up.....	13
3.4 Parking	15
3.5 Access	16
3.6 Traffic generation and modal split.....	17
3.7 Pedestrians and cyclists	19
4 Construction traffic	21
5 Conclusion	22
Appendix A Traffic Count Data	23
Appendix B Drawings	24
Appendix C Green Travel Plan	25

Document control

Rev No	Date	Revision details	Approved	Verified	Prepared
01	17.2.2017	Approved issue	CMW	SETB	CMW
02	20.2.2017	Drawing CR! amended	CMW	SETB	CMW
03	2.3.17	Minor updates	CMW	SETB	CMW
04	30.3.17	Green Travel Plan added	CMW	KEC	CMW
05	31.1.17	Green Travel Plan amended	CMW	KEC	CMW

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1. Introduction

The new Oran Park High School is proposed to be located at the corner of South Circuit and Holden Drive, adjacent to the existing public school. Refer to Figure 1 for the location of the site. The new school will eventually cater for 2,000 students in Years 7 to 12 and have 158 staff.

Oran Park Public School is adjacent to the proposed high school. As part of the proposed works, the school will be extended to cater for 1,000 students and will have 76 staff, increasing from the current maximum of 704 students and 46 staff.

This report has been prepared to address traffic issues associated with the proposed high school and additions to the public school, including parking, bus zones and traffic generated by the site.

Traffic requirements for the site have been determined using the RMS *Guide to Traffic Generating Developments*. Where this does not provide data or guidance, reference is made to similar developments. In particular, we make reference to surveys undertaken in 2005 at a private boys school in Summer Hill, which had a student population of 1,400 at the time. The data was collected to support the Master Plan for the site and included how students and staff travelled to and from the site. In addition, the Principal of Elizabeth Macarthur High School provided information on modal split at the school.

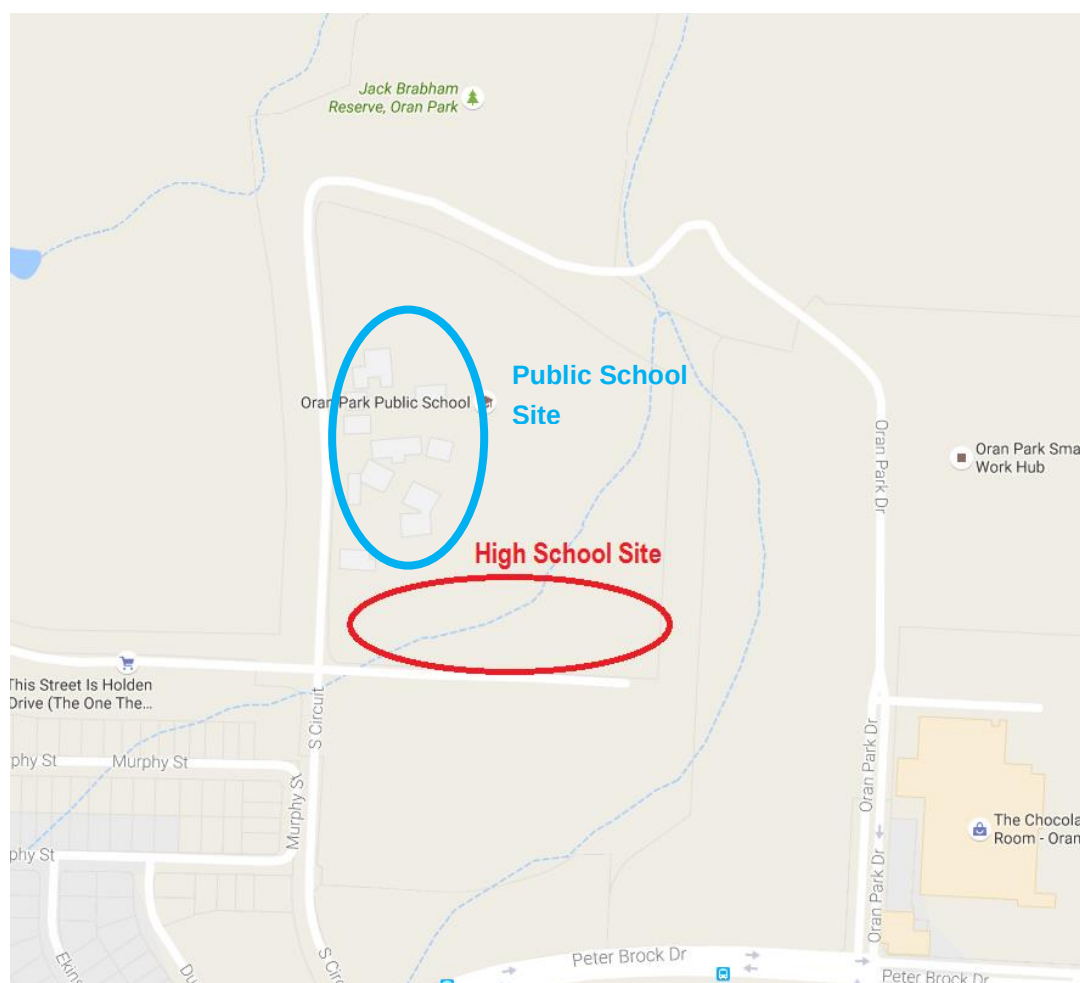


Figure 1 – Site Location

2. Existing conditions

2.1 The site and existing roads

The proposed high school will be located adjacent to the existing public school. The part of the site in which the high school is to be located is currently undeveloped. Refer to Figure 2 below for an aerial photo of the site. Extensions to the public school will be located at the south-east corner of the existing public school and will link the public school with the new high school.



Figure 2 – The site (image Google)

The high school will be located off Holden Drive, which is currently a local access road. While it will provide a link to the town centre, even with further development of the area, it will remain a local road. It is currently a dead end, but a link through to Oran Park Drive is under construction and will be completed in the short term, prior to the school opening.

The high school also has a frontage to South Circuit, with the public school located to the north of the high school on South Circuit. This road is a local access road. It currently bends 90 degrees at the northern end of the site (where it becomes Dick Johnson Drive) and dead ends at Jack Brabham Reserve. At present, it is only providing access to the public school and the sports fields, but ultimately, prior to the opening of the school, Dick Johnson Drive will be extended to connect to the Town Centre and The Northern Road

Dick Johnson Drive is currently acting as a local access road. With extension of the road, as proposed in the Master Plan, it will become a collector road, joining The Northern Road to the Oran Park Town Centre. For further details of the future road network refer to Figure 3 for the Oran Park Master Plan.



Figure 3 – Oran Park Master Plan

(Refer to Appendix B for a full size copy)

2.2 Public Transport

The current bus routes serving Oran Park are:

- Route 896 – Campbelltown Station to Oran Park via Narellan and Gregory Hills
- Route 850- Narellan to Minto via Oran Park, Gregory Hills and Catherine Fields
- Route 858 – Oran Park Town Centre to Leppington Station.

The 896 bus travels along Peter Brock Drive, approximately 350m to the south of the site before terminating near The Northern Road. The bus takes approximately 40-45minutes from Campbelltown Station to Peter Brock Drive. It operates 7 days a week. During weekdays it operates on an hourly frequency, increasing to a 30minute frequency during the morning and evening peaks.

The 850 bus terminates at the Oran Park Town Centre, at the intersection of Peter Brock Drive and Oran Park Drive, approximately 300-400m from the school site. It takes approximately 35 minutes to travel from Minto to Oran Park Town Centre and operates 7 days a week. During weekdays it operates on an hourly frequency, increasing to a 30 minute frequency during the morning and evening peaks.

The 858 bus terminates at the Oran Park Town Centre, at the intersection of Peter Brock Drive and Oran Park Drive, approximately 300-400m from the school site. It takes approximately 25 minutes to travel from Leppington Station to Oran Park Town Centre and operates 7 days a week. During weekdays it has a service at 30 minute intervals

Oran Park Public School has school services transporting students to and from the site. There are three services in the morning and three in the afternoon. The buses currently reach the site by travelling north along South Circuit, performing a U-turn at the end of Dick Johnson Drive and returning back to South Circuit and the school.

There is currently no railway line in the area. However, in the medium term there are plans to extend the south-west rail line (T2) to Oran Park. The station location is not yet finalised, but will be in the vicinity of the town centre, 300-500m from the site.

2.3 Parking

There is no existing parking on the high school site as it is undeveloped. The public school has off-street parking for 49 vehicles, 36 in the main car park and 13 adjacent to the special education area. It also has a 49m long drop off zone, with space for approximately 8 vehicles, located within the school site near the main school buildings. The special education area has a second drop off zone of approximately 30m length, located within the school site adjacent to the special education buildings.

On street parking is available along part of Holden Drive. Approximately 120m is currently available in front of the high school site, giving room for around 20 vehicles. Some additional parking will be available on the opposite side of the road. However, the exact amount will depend on the development of sites to the south of Holden Drive. It is unlikely that the extent will exceed 60m, which will allow a maximum of 10 vehicles.

In the section of South Circuit fronting the high school, no on-street parking is available due to the pedestrian refuge. In front of the public school, there is a mix of parking, bus bay for the school and

no parking zones. This area provides space for 6 cars and 2-3 buses. On the western side of South Circuit, around 150m is available for parking, which gives space for approximately 25 cars.

Jack Brabham Reserve, to the north of the site, has 113 off-street parking spaces, of which 4 are designated for disabled persons.

2.4 Existing traffic

At present, both South Circuit and Holden Drive are dead ends, with the only traffic being that generated by the public school and, for South Circuit, by Jack Brabham Reserve to the north of the school site.

Traffic counts were undertaken on each leg of the intersection of South Circuit and Holden Drive between 28 November 2016 and 4 December 2016. The counters were installed approximately 10-20m from the intersection. This counts gave the following traffic volumes:

Location	Direction	AM Peak		PM Peak		Average Weekday Traffic
		Peak flow	Time	Peak Flow	Time	
Holden Drive (west of South Circuit)	Eastbound	70	9-10	80	3-4	516
	Westbound	80	9-10	83	3-4	666
Holden Drive (east of South Circuit)	Eastbound	12	8-9	23	3-4	50
	Westbound	13	9-10	25	3-4	50
South Circuit (north of Holden Drive)	Northbound	154	9-10	150	5-6	737
	Southbound	182	9-10	152	3-4	739
South Circuit (south of Holden Drive)	Northbound	206	9-10	169	5-6	1331
	Southbound	230	9-10	231	3-4	1202

Holden Drive east of South Circuit is currently a dead end, with the only areas accessed off the road being the future development site to the south. Current traffic generated by the area is minimal. Consequently, the majority of traffic within the street is that associated with the school. This is confirmed by the times at which the movements occur. The majority occur at school start and finish times and are associated with drop off or pick up of students.

Holden Drive west of South Circuit has more even traffic flows throughout the day. However, there are peaks at school start and finish times, which indicate parents and staff do use the road to access the school.

South Circuit north of Holden Drive currently dead ends at the sports fields beyond the school, and is only used by school and sports field traffic. Traffic volumes on this leg of the intersection have significant peaks around school start and finish times. A later peak occurred on the Wednesday, with a northbound peak occurring at 5-6pm and a southbound peak at 6-7pm. As Jack Brabham Reserve is used by the local cricket and football clubs, this second peak will be associated with training.

South Circuit south of Holden Drive has the highest traffic volumes of the intersection, as it is currently the main road for the school and adjacent areas. Typically, the peak flows are at school start and finish times, however, there is a later peak on the Wednesday which will be associated with the sports field.

For further details on existing traffic volumes, refer to Appendix A for data from the traffic counts.

From the data, the following details have been extracted:

- Between 8am and 10am, approximately 15 vehicles drive in and out of Holden Drive east.
- Between 2pm and 4pm, approximately 22 vehicles drive in and out of Holden Drive east.
- During the remainder of the day, traffic movements in Holden Drive east are minimal (0-2 movement per hour). Hence we believe that the above movements are all associated with parents dropping off or picking up students.
- Between 8am and 10am, approximately 266 vehicles drive northbound on South Circuit north and 245 drive south.
- Between 2pm and 4pm, approximately 149 vehicles drive northbound on South Circuit north and 161 drive south.
- During the rest of the day, traffic movements in South Circuit north are typically 15-20 vehicles per hour. Allowing for similar rates during school start and finish times, the number of vehicles used to drop students at school in the morning is 240, with 150 used in the afternoon at finish time. Further movements indicate that around 65 vehicles pick-ups occur later in the afternoon, from after school care.

From the above, 40-45% of students are dropped off at school in the morning, while 30% are picked up at the end of the school day and an additional 10-15% from after school care, which is outside the main peak pick up period.

2.5 Existing cyclists and pedestrians

Currently Holden Circuit is a dead end, with no development on either side. A pedestrian track is available through to the Oran Park Town Centre, however it is not paved.

South Circuit currently dead ends at Jack Brabham Reserve, to the north of the Public School. Consequently, at present the only pedestrian and cycle traffic on the road is that generated by the public school and the sports ground.

Plans for the Oran Park Precinct include a network of bike and shared paths, which will provide a high level of local connectivity throughout the precinct. See Figure 4 and Appendix B for plans of the path network for the area. A major cycle path will be constructed along Julia Creek, to the east of the site, resulting in a high level of access for cyclists and pedestrians to and from the site.



Figure 4 - Proposed network of bike and shared paths

3. The development and impact

3.1 Proposed works

The development proposed for the site consists of

- a public high school catering for up to 2,000 students, of which nominally 600 will be in Years 11 and 12. Staff numbers at the school will be nominally 158.
- expansion of the public school, to cater for a total of 1,000 students. Staff numbers at the expanded school will be nominally 76.

The major use of the site will occur on weekdays, during normal school hours of approximately 8:30am to 3:30pm. Extracurricular activities will occur after school and on weekends. The public school has after school care, which will continue when the school is expanded.

3.2 Public transport and bus zones

The current bus routes serving Oran Park are:

- Route 896 – Cambelltown Station to Oran Park via Narellan and Gregory Hills
- Route 850- Narellan to Minto via Oran Park, Grefory Hills and Catherine Fields
- Route 858 – Oran Park Town Centre to Leppington Station.

These routes all go via or terminate at Oran Park Town Centre – a 10minute walk from the site. While there are no regular routes currently past the site, with the ongoing development in the area the location of routes will change, and new routes are likely to pass the site. Staff at the school will be able to utilise these regular services.

There is currently no railway line servicing Oran Park. However, there are plans to extend the South-West Rail line to Oran Park in the future. When the line opens, in the medium term, it will be available for use by students and staff.

The regular bus routes will be able to be used by students. However, dedicated school services will be required, to transport students within the school's catchment zone.

The public school currently has 3 school services in the morning and afternoon, which use a bus bay on South Circuit. While the number of school bus services will increase with the increase in services, the size of the bus bay will not change, as the bus companies do not have more that 3 services departing a school at one time.

The high school will also have school bus services and will require a bus zone. As guidance is not available, the size required needs to be determined on the number of buses and on experience at similar schools.

In 2005, Woolacotts traffic survey at a private school in Summer Hill recorded that approximately 1,000 students (70%) travelled to school by bus and that in addition to regular route services, 15 School Special buses were required for the 1,400 student population. As the school in Summer Hill is a private school with a large catchment area, the usage of public transport is expected to be higher

than for a public school, where the catchment area is smaller and a greater number of students are able to walk or ride to school.

The principal of Elizabeth Macarthur High School supplied information on bus usage of students at that public school. Of the 1,100 students at the school, 558 have a school opal card, of which approximately 400 or 36% of the school population use the bus on a regular basis.

To determine a typical rate for a public high school in the Western Sydney area, the following table presents student numbers and the number of school buses serving each school.

School	Student numbers	Number of buses		Comment
		AM	PM	
Mt Annan High School	650	3	4	
Airds High School	480	3	3	
Ambarvale High School	800	5	6	
Glenwood High School	1,490	4	4	Also use public services
The Ponds High School	450	2	2	
Camden High School	1,070	16	15	Large rural catchment and located on a road with no safe pedestrian access.
Elizabeth Macarthur High School	1,100	6	8	

(Information in the table is based on 2016 school bus timetables available from bus company websites)

From the schools listed in the above table, Ambarvale and Airds High Schools would be more typical of the catchment of Oran Park, as they are non-selective schools that draw their student population from the local area. Extrapolating the number of buses for these two school results in around 13-15 buses being required for Oran Park High School. Based on 36% of students travelling by bus (720 students) and a capacity of each bus of 47, 15 buses will be required.

While in the morning, the buses will not all arrive at the same time, during the afternoon, the preference will be for the buses to leave as soon as possible after school finishes. From review of timetables, typically the routes are set so there are 2-4 buses on site at one time, with 3-5minutes between the departures of a group of buses. Therefore, space should be provided for a minimum of 4 buses.

From State Transit's *Bus Infrastructure Guide*, for a long rigid bus (typical of the new buses on the system) and nose to tail operation at the bus bay, a total bus bay length of 96.5m is required for 4 buses, including draw in and draw out zones. This length reduces to 85.5m for 4 "standard" buses and to 76m for 3 "long-rigid" buses.

It is proposed to provide a bus zone along Holden Drive, at the eastern end of the site. Refer to Figure 5 for the location of the bus zone. This provides 96.5m of space for buses, which will allow for the operation of 4 services at once.

Road suitability for school buses

The main roads used to access the school will be South Circuit, Holden Drive, Dick Johnson Drive, Peter Brock Drive and Oran Park Drive. Some of these roads are not currently complete, but will be by the time the high school and extensions to the public school are complete. While South Circuit and Holden Drive are generally local roads, the remainder are collector roads and sized to carry bus traffic. In the vicinity of the school site, South Circuit and Holden Drive have been sized to allow for bus traffic as the school location is as detailed in the Master Plan for the precinct, which determined the road hierarchy. As a result, these roads are suitable for school buses.

3.3 Drop off / pick up

Drop off / pick up zones are required at schools to provide a safe location where students can be dropped off and picked up and minimise traffic congestion in the area. The space required is dependent on the number of vehicles dropping off or picking up students.

From our experience at other schools and the data obtained from the traffic counts for the existing public school, the following rates have been adopted as typical rates for drop off / pick up:

- 45% of primary school students are dropped off by car in the morning
- 30% of primary school students are picked up by car in the afternoon, at the finish of classes
- 10-15% of primary school students are picked up from after school care, after the peak period
- 20% of high school students are dropped off by car in the morning
- 15% of high schools students are picked up by car in the afternoon

Sustainable transport measures are to be encouraged at the school, with the intent to reduce the above rates. Additionally, the co-location of the high school and the public school on the one site will allow parents with children in both school to make a single trip, thus reducing the overall number of trips. However, as it is not possible to estimate the impact of the co-located schools and the use of sustainable transport measures, the above rates will be adopted for the assessment of drop off and pick up zones for the schools.

High School

Based on the above rates, the drop off / pick up zone will need to cater for 400 vehicles before school and 300 after school.

It is proposed to provide drop off points in the following locations:

- On the northern side of Holden Drive, just to the west of the Administration area entry to the school
- On the southern side of Holden Drive, opposite the first drop off zone.
- On the northern side of Holden Drive, to the east of the bus zone.

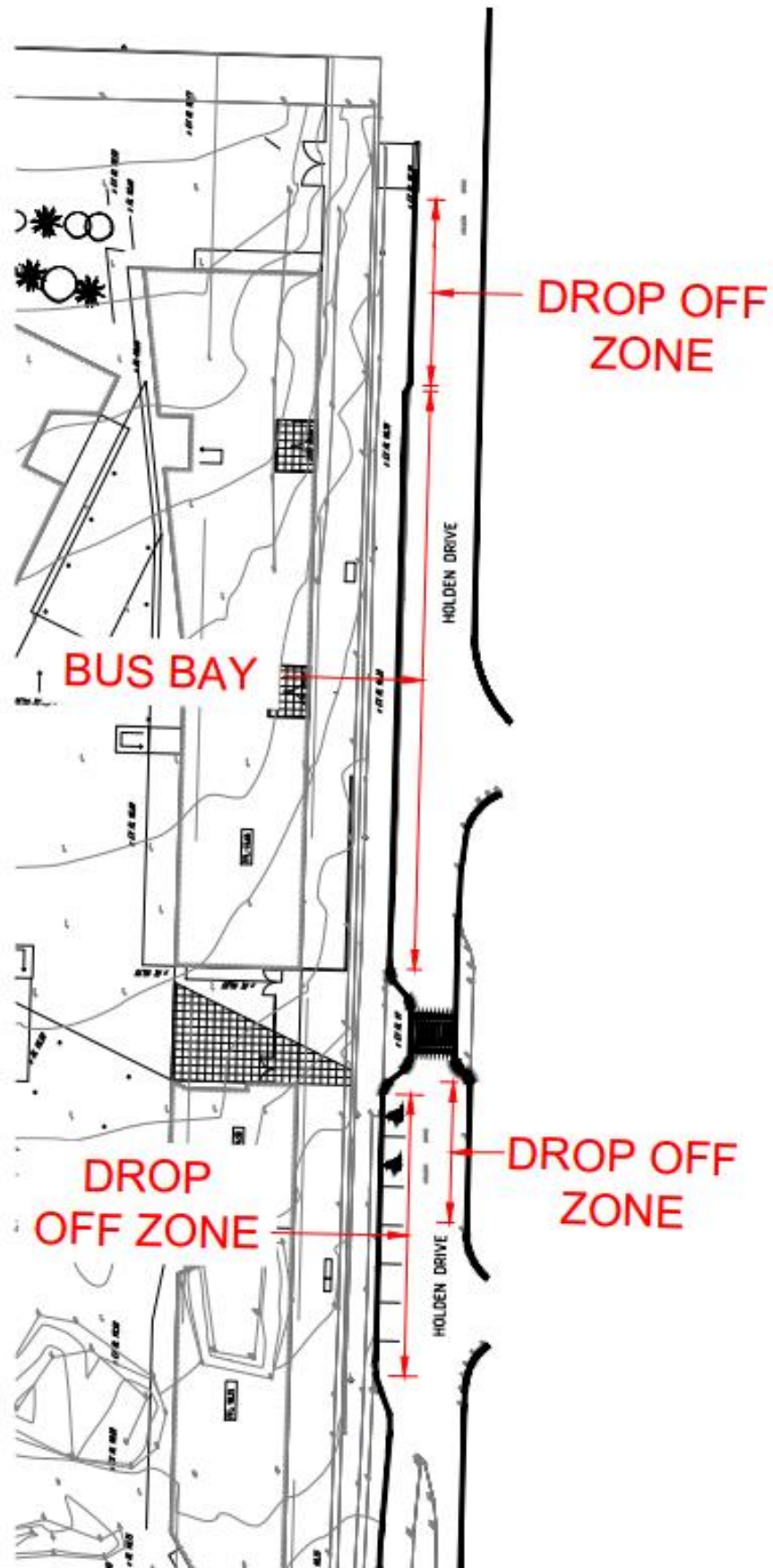


Figure 5 – Proposed Bus Zone and Drop Off Areas

A raised threshold crossing will be provided opposite the administration entry to the site, to provide a safe route across the road for students using the drop off zone on the southern side of Holden Drive.

The above locations will have space for a minimum of 12 vehicles at one time. Refer to Figure 5 for the location of the drop off zones.

Assuming that the students are dropped off over a 20 minute period before school starts, with 12 spaces available the time available for each car to unload is 36seconds. As the students are all 12 years of age or older, this is sufficient time to get out of vehicles.

During the afternoon peak, students will also be picked up over a 20 minute period. Using the proposed 12 pick up spaces allows 48 seconds per vehicle. Extending the time to 60 seconds per vehicle, to allow additional time for students to spot the vehicle and get in, it would take 25minutes for the students to be picked up.

Public School

The public school has an existing drop off zone with space for 8 vehicles. It is proposed that the zone will be used for the extended school.

3.4 Parking

The NSW Department of Education promotes the use of sustainable transport initiatives. This is supported by the Department's Educational Facility Standards and Guidelines, which encourage the use of public transport and require parking on site to be minimised. To encourage sustainable transport methods, end of trip facilities, including lockers and showers, will be provided for staff who cycle or walk to work. Refer to Section 3.7 for further details on pedestrian and cycle access to the school.

Camden Council DCP 2011 details the minimum parking requirements for developments. However, Clause 11 of the State and Regional Development SEPP provides that DCPs do not apply to State Significant Development. As such, reference needs to be made to similar developments.

The RMS *Guide to Traffic Generating Developments* does not provide details of parking for educational establishments, but requires designers to refer to details of similar developments, ie to similar educational establishments. Pursuant to this requirement, development approvals on state public and high schools have been granted with the following parking provisions:

- Hunter Sports High School
850 students and 108 staff
8 formal spaces, 26 informal spaces and 44 spaces shared with the adjacent public school
- Parramatta Public School and Arthur Philip High School
High School – 2,000 students and 108 staff
Public School – 1,000 students and 67 staff
30 parking spaces shared between the two schools
- Homebush West Public School
900 students
No staff parking provided. 1 accessible parking space

- Artarmon Public School
1,200 students and 71 staff
5 parking spaces
- Harbord Public School
71 staff
21 parking spaces

Public School

The existing public school, which was designed for 46 staff and 704 students, has 36 staff spaces at the north end of the site and 13 spaces in the central area near special education, a total of 49 spaces.

As the school is located on the cycle / pedestrian network for the area, there are good connections to the local area, to encourage cycling or walking to the school. Additionally, with the development of the area, bus services will increase, providing an alternative means of access to the school.

The number of staff on site will increase to 76 with the expansion of the school. However, in line with the Department's guidelines to encourage sustainable transport measures, no additional parking will be provided and staff will be encouraged to use public transport, walk or cycle to get to the school.

High School

Proposed staff numbers for the high school site have been estimated as 158, with 300 students in Year 12, who could potentially drive to school.

No parking will be provided on site for Year 12 students, with all encouraged to use public transport, walk or cycle, in accordance with the Department's policy of using sustainable transport measures. As detailed in Sections 3.2 and 3.7, there will be bus services available and good links to the cycle and walkway network in the area. As the school draws its population from the local area, students will have access to the path network.

Staff will also be encouraged to use sustainable means of transport to access the school. As detailed in Section 3.7, end of trip facilities will be provided for staff, to encourage the cycling and walking.

In conformance with the Department's requirements to promote sustainable development and to minimise parking on site, 10 parking spaces will be provided within the high school development. The amount of parking available between the public school and the high school is in accordance with recent government school developments. The new parking spaces to be provided will comply with the requirements of AS2890.1.

3.5 Access

Driveways

There will be two main access driveways to the high school. The first will be off South Circuit, and will provide access to the main service vehicle area. The second will be off Holden Drive, located at the eastern end of the site. It will provide access to a secondary service area. The design of the

driveways will comply with AS2890. The service area has been designed to allow for a 9.3m long garbage truck, including space to turn around so it leaves the site in a forward facing direction. The space will be out of bounds to students, to minimise the potential for a conflict between a reversing truck and a student.

The service area driveway is located adjacent to the driveway serving the special education unit on South Circuit. In this location, the sight distance available complies with the requirements of AS2890.1.

The driveway for the new parking area is located to the east of the high school buildings, on Holden Drive. In this location, sight distances in accordance with AS2890.1 are available.

The existing access driveways to the public school will not be altered.

Emergency vehicle access

Emergency vehicle access to the high school will be as follows:

- Ambulance access will be via the two driveways. Additionally, the bus zone located on Holden Drive will be available during the day, which will provide access to the main part of the school.
- Fire brigade access will be from Holden Drive and South Circuit. The service area driveway will allow brigade access onto the site if required.

Emergency vehicle access to the public school will not be altered.

3.6 Traffic generation and modal split

The *RMS Guide to Traffic Generating Developments* does not give advice on traffic generation for educational establishments. Therefore, estimates need to be made based on data from existing establishments and knowledge of the development.

As the site is a school, the following traffic movements will occur:

- Staff will arrive in the morning, typically in the 30minutes before school starts. Some staff will be in earlier, to undertake administrative tasks. Based on 90% of staff driving their own vehicles, this will result in approximately 127 vehicle movements into the vicinity of the high school site and an additional 36 to the vicinity of the public school
- Senior students driving their own vehicles will generally arrive in the 15minutes before classes begin. Based on 20% of Year 12 students driving to school, this will result in 60 vehicles travelling to the vicinity of the school in the morning.
- Parents dropping students will typically arrive and depart in the 30minutes before school begins, with the larger number of movements occurring in the 15minutes before classes start. For the high school, based on 20% of students being driven to school, this will generate 400 vehicle movements to and from the vicinity of the school in the morning. For the public school, 45% are driven in the morning, which will generate an additional 198 vehicles.

- School buses will arrive, set down students and depart. Typically these occur 15 minutes before classes begin. We have estimated that there will be 15 bus movements to and from the high school in the morning.
- Staff will depart in the afternoon, after classes finish. Leaving times will vary depending on administrative tasks required. Typically all movements will occur in the hour after classes finish. We have estimated that there will be 127 vehicles leaving the vicinity of the high school after school finishes and an additional 36 from the vicinity of the public school
- Senior students driving their own vehicles will leave after classes finish. The majority will leave straight away. The number of vehicles leaving is approximately 60.
- Parents will typically arrive just before or just after classes finish, pick up students and then depart. This results in 300 vehicle movements to and from the vicinity of the high school. The rate for the public school immediately after school finishes is 30%, which will result in an additional 132 vehicles.
- School buses will arrive around school finish time, pick up students and then depart. This generates 15 movements to and from the site.
- Visitors and deliveries will occur throughout the day.

In summary, the traffic generated during the morning and afternoon peaks is estimated as follows:

- AM peak
 - 587 vehicles to the high school or to Holden Drive
 - 400 vehicles leaving the high school or Holden Drive
 - an additional 234 vehicles to the public school or South Circuit
 - an additional 198 vehicles leaving the public school or South Circuit
- PM peak
 - 300 vehicles to the high school or to Holden Drive
 - 487 vehicles leaving the high school or Holden Drive
 - an additional 168 vehicles to the public school or South Circuit
 - an additional 198 vehicles leaving the public school or South Circuit.

The AM Peak associated with the schools will occur in the period from 50 minutes before school commences and the 10 minutes after school starts. For the combined schools, this will be from approximately 8:20 – 9:20am. The PM peak associated with the schools will occur in the period from 15 minutes before classes finish until 45 minutes after classes finish. For the combined schools, this will be approximately 3:00 – 4:00pm.

Future traffic conditions and impact of generated traffic

At present the area around the school is relatively undeveloped. However, the area to the west has been subdivided and sites are under construction and in the area to the south local roads are under construction and lots will be available for building in the short-medium term. Consequently traffic volumes throughout the area will increase as development occurs. Additionally, Holden Drive is due to be extended through to Oran Park Drive and the Town Centre by April 2018 and Dick Johnson Drive 6 months later. As a result of the additional development and the extension of the roads, traffic patterns will change and traffic volumes past the school will increase.

Traffic flows from the surrounding development areas and changes in patterns due to the extension of Holden Drive and Dick Johnson Drive were included in the overall traffic study for the precinct. This included traffic generated by the school, as the location of the school is as per the Master Plans for the area. Therefore, from the precinct traffic plans prepared by AECOM, the forecast peak traffic volumes in the roads adjacent to the school site are:

Road and direction	Peak traffic (Vehicles per hour)	
	AM	PM
South Circuit southbound (Holden Dr to Dick Johnson Dr)	176 – 378	117 - 219
South Circuit northbound (Holden Dr to Dick Johnson Dr)	286 – 389	21-55
Holden Drive eastbound (South Ct to Oran Park Dr)	268-329	7 - 103
Holden Drive westbound (South Ct to Oran Park Dr)	211 - 316	143 - 205
Dick Johnson Drive eastbound (South Ct to Oran Park Dr)	612	376
Dick Johnson Drive westbound (South Ct to Oran Park Dr)	536 - 689	656 - 699

The above traffic flows are those occurring for the peak period, which is typically 7:00-9:00am and 4:30 to 6:30pm, and will not overlap with school learning times.

While there is no overlap in the PM Peak between the peak traffic generated by the school and commuter traffic, there will be an overlap in the AM Peak between the commuter traffic peak and the school traffic peak. This overlap would be included in the precinct traffic analysis, as the location of the school is as per the precinct Master Plan. In addition, it is common for parents to drop students at school on their way to work, and the traffic volumes form part of the overall movements for the area.

The traffic plans for the Oran Park Precinct detail that the intersection of South Circuit and Holden Drive will become signalised in the future, once traffic volumes reach warrant levels required by RMS. This is likely to occur once the school is constructed and the area to the south of Holden Drive is developed. We understand that the layout of the intersection has allowed for the future signalisation.

3.7 Pedestrians and cyclists

The main pedestrian access to the high school will be from Holden Drive. Multiple entry points will be provided along the frontage, to access various parts of the school. There will also be pedestrian access from South Circuit and Julia Creek. It is proposed to provide a raised threshold pedestrian crossing on Holden Drive, directly in front of the main entry to the high school, to provide a safe crossing point, particularly for students dropped off on the opposite side of the road.

As part of the Oran Park Precinct, a network of shared paths and cycle paths are proposed. In the vicinity of the school, the following are proposed:

- An off-road shared path along the creek to the east of the school site, extending from Peter Brock Drive, past the school to Jack Brabham Reserve
- Road verge shared path along Holden Drive, from the Town Centre and beyond the school site
- Road verge shared path along South Circuit
- Road verge shared path along Dick Johnson Drive

Links will be available from the school onto these paths. These paths, and the remainder of the network throughout the Oran Park Precinct, will provide cycle and pedestrian access to the school.

To facilitate students and staff riding to school, bicycle storage racks will be provided, which allow students and staff to store and lock bicycles. At least 100 spaces will be provided at the high school, with 20 spaces located along the Holden Drive frontage and over 80 within the school site.

To facilitate staff walking or cycling to school, end of journey facilities, including lockers and showers, will be provided for staff.

4 Construction traffic

The main access to the construction site will be from Holden Drive. The recommended route for construction traffic to reach Holden Drive is via Oran Park Drive. However, the connection road between the site and the Town Centre is not due for completion until April 2018. If it is not complete when construction commences, then the route to the main access at Holden Drive will be via Peter Brock Drive and South Circuit.

The secondary access to the site is from South Circuit, adjacent to the public school. Use of this access point will be carefully managed to ensure the safety of pedestrians and other vehicles, particularly during school start and finish times.

Refer to Drawing CTM1 in Appendix B for details of the proposed construction traffic management plan. Truck movements will occur throughout construction, with delivery of materials occurring on a daily basis, throughout the day. The largest number of truck movements is typically during concrete pours, when up to 40 trucks a day could be attending the site.

Contractors' vehicles will generally arrive in the morning and leave at the end of the working day. Additional movements of these vehicles may occur at lunch, with groups of contractors driving to the town centre to purchase food and drinks. Parking for contractors' vehicles will be provided on site, with entry and exit to the parking area from the main access on Holden Drive. Based on 80 to 100 contractors on site on any one day, temporary parking will be provided for approximately 65-80 contractors' vehicles.

Pedestrian and cyclist routes past the site will be protected during construction where required. Fencing and/or hoarding in accordance with the relevant standards will be provided around the site to provide protection and prevent unauthorised access. Where works are required in the public domain, safe routes will be provided around the worksite, which will require a site specific management plan. All vehicles leaving the site and crossing a pathway will be required to be going forwards (and not reverse). At times when large pedestrian movements occur at a site access, such as at school start and finish times, a traffic controller will be provided at the gate when vehicles arrive or leave.

5 Conclusion

The proposed new High School and extension to the Public School will result in increased traffic volumes in the area compared with current volumes. However, the entire area is being progressively developed, with traffic volumes increasing throughout the area as new tranches open and houses are constructed. Additionally, the site location was planned as a school site in all the development plans for the area, which allowed for traffic volumes associated with a school.

The school will require school bus services to transport students to and from the school. Based on similar schools, a bus zone with space for up to 4 buses is required for the high school. The expansion of the public school will not require additional bus zones.

For the high school, drop off zones will be provided in three locations on Holden Drive. Two will be on the north side of the road and the third on the south side, towards South Circuit. A raised threshold crossing will be provided on Holden Circuit, to provide safe access to the zone located on the south side of the road. For the public school, the existing drop off zones will be used.

The Department of Education's guidelines encourage the use of sustainable transport measures, including public transport. Consequently the number of spaces to be provided on the high school site is 10 with no additional spaces provided at the public school. A total of 59 spaces will be provided between the public and high schools. The new parking area will be in accordance with AS2890.1.

The network of pedestrian and cycle paths provided for the Oran Park area will provide access to the school for cyclists and pedestrians. Bicycle storage facilities will be provided at the school to encourage this transport mode. End of trip facilities, including showers and lockers, will be provided within the high school for staff, to enable use of sustainable transport measures.

A Green Travel Plan has been developed for the site. Refer to Appendix C for details.

Appendix A

Traffic Count Data

Job No N2836
Client Woolacotts Consulting Engineers
Site Holden Drive (west of South Circuit)
Location ORAN PARK
Site No 1
Start Date 28-Nov-16
Description Volume Summary
Direction EB



Hour Starting	Day of Week							W'Day Ave 516	7 Day Ave 439
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	46	51	58	67	70	35	15		
PM Peak	65	62	82	80	67	25	21		
0:00	0	2	1	2	1	1	1	1	1
1:00	0	1	0	0	0	1	1	0	0
2:00	0	3	0	1	1	1	0	1	1
3:00	0	2	1	1	1	1	0	1	1
4:00	3	1	3	4	3	0	1	3	2
5:00	6	8	6	7	4	3	3	6	5
6:00	23	19	23	14	14	4	2	19	14
7:00	22	32	27	23	30	11	2	27	21
8:00	37	32	42	41	36	19	8	38	31
9:00	46	51	58	67	70	24	12	58	47
10:00	29	40	34	30	38	18	15	34	29
11:00	37	20	55	43	43	35	15	40	35
12:00	26	41	37	41	49	23	14	39	33
13:00	28	28	39	39	47	16	13	36	30
14:00	46	47	31	25	43	25	13	38	33
15:00	65	62	82	80	67	21	13	71	56
16:00	32	24	24	30	23	22	14	27	24
17:00	16	13	27	28	23	17	21	21	21
18:00	16	13	18	16	27	22	19	18	19
19:00	10	14	7	11	18	12	13	12	12
20:00	4	2	11	15	27	11	7	12	11
21:00	2	5	7	5	23	4	4	8	7
22:00	4	0	6	1	6	3	4	3	3
23:00	2	2	3	5	0	2	0	2	2
Total	454	462	542	529	594	296	195	516	439

7-19	400	403	474	463	496	253	159	447	378
6-22	439	443	522	508	578	284	185	498	423
6-24	445	445	531	514	584	289	189	504	428
0-24	454	462	542	529	594	296	195	516	439

Job No N2836
Client Woolacotts Consulting Engineers
Site Holden Drive (west of South Circuit)
Location ORAN PARK
Site No 1
Start Date 28-Nov-16
Description Volume Summary
Direction WB



Hour Starting	Day of Week							W'Day Ave 666	7 Day Ave 569
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	56	67	70	80	76	44	24		
PM Peak	69	79	71	83	80	25	32		
0:00	3	3	1	1	0	4	4	2	2
1:00	1	6	0	1	1	2	3	2	2
2:00	0	5	2	1	0	0	0	2	1
3:00	0	1	0	1	1	2	0	1	1
4:00	1	1	1	0	1	0	3	1	1
5:00	7	4	9	4	14	6	11	8	8
6:00	50	50	58	48	38	20	3	49	38
7:00	42	38	53	39	33	26	5	41	34
8:00	56	43	49	61	55	25	11	53	43
9:00	54	67	62	80	76	17	15	68	53
10:00	39	45	37	39	43	25	9	41	34
11:00	39	33	70	43	38	44	24	45	42
12:00	34	43	33	42	54	19	32	41	37
13:00	27	28	35	37	38	22	23	33	30
14:00	68	52	55	57	72	22	24	61	50
15:00	69	79	71	83	80	25	12	76	60
16:00	21	17	24	26	28	23	14	23	22
17:00	35	20	28	31	75	15	24	38	33
18:00	18	30	27	25	49	21	9	30	26
19:00	22	22	23	26	21	22	16	23	22
20:00	8	8	18	14	17	17	15	13	14
21:00	4	6	7	8	11	5	9	7	7
22:00	6	3	8	4	8	6	9	6	6
23:00	10	2	6	4	6	6	2	6	5
Total	614	606	677	675	759	374	277	666	569

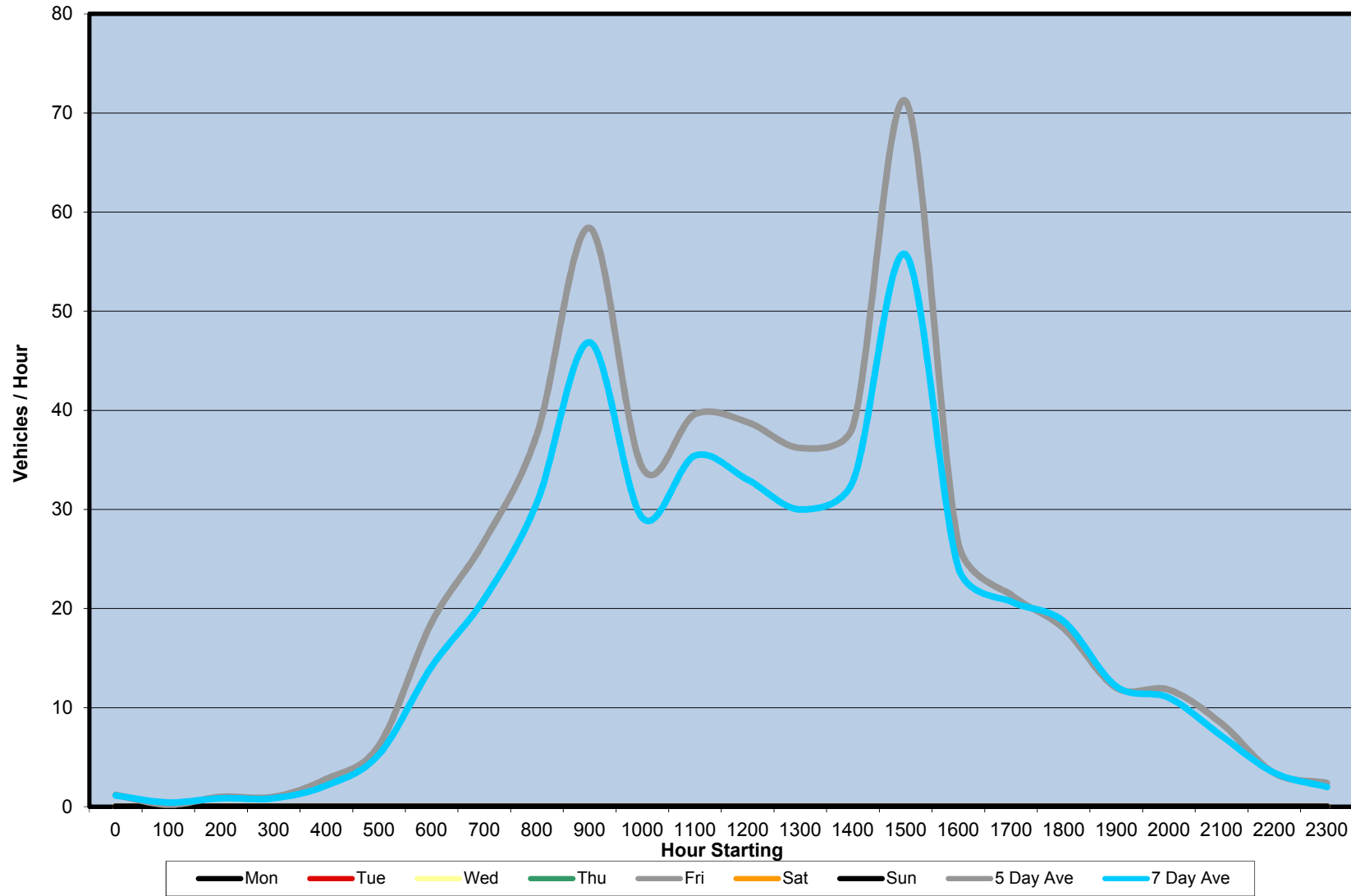
7-19	502	495	544	563	641	284	202	549	462
6-22	586	581	650	659	728	348	245	641	542
6-24	602	586	664	667	742	360	256	652	554
0-24	614	606	677	675	759	374	277	666	569

Select Site 1. Holden Drive (west of South Circuit)



Select Direction

EB

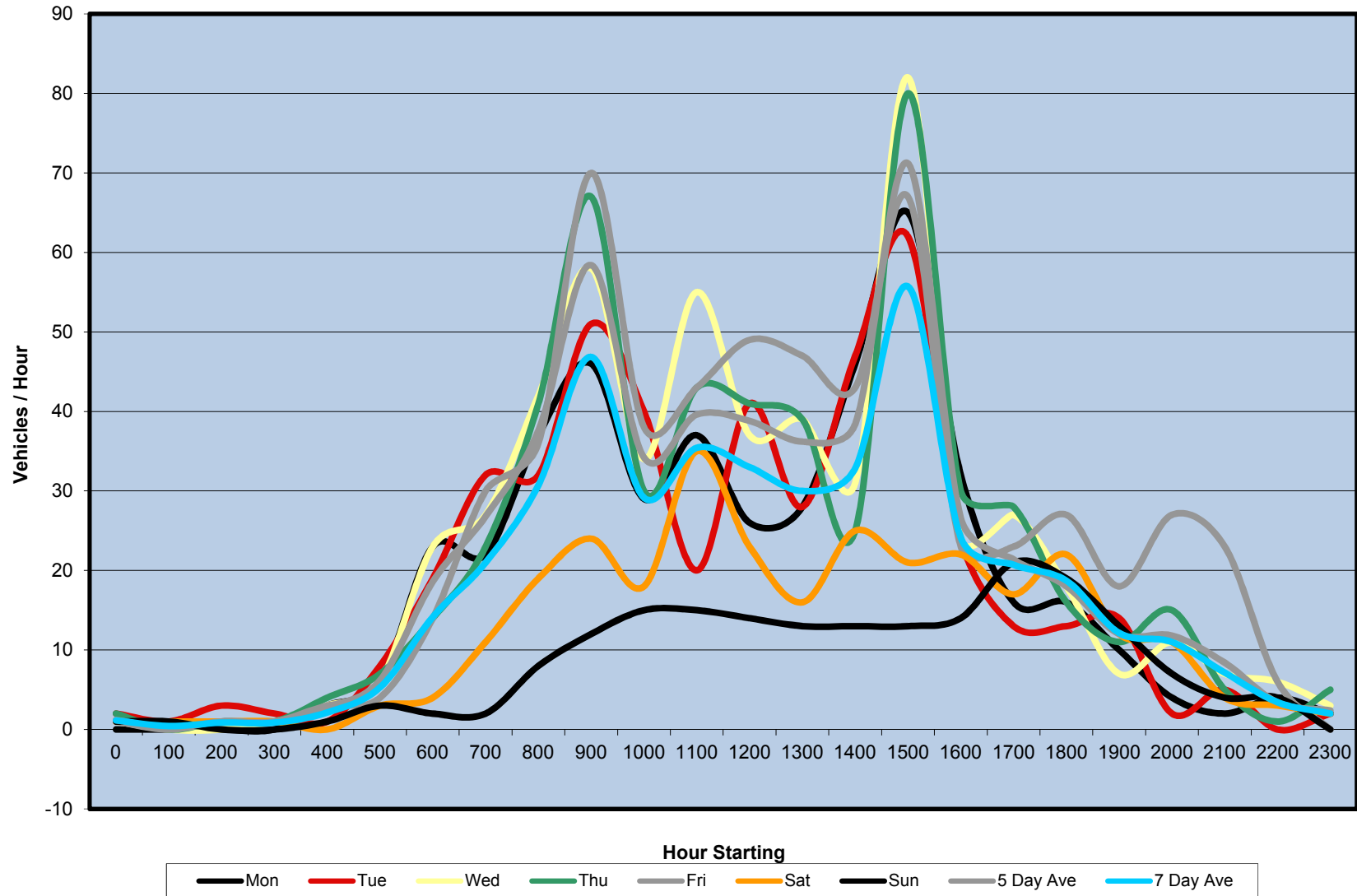


Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 1. Holden Drive (west of South Circuit)

Select Direction EB

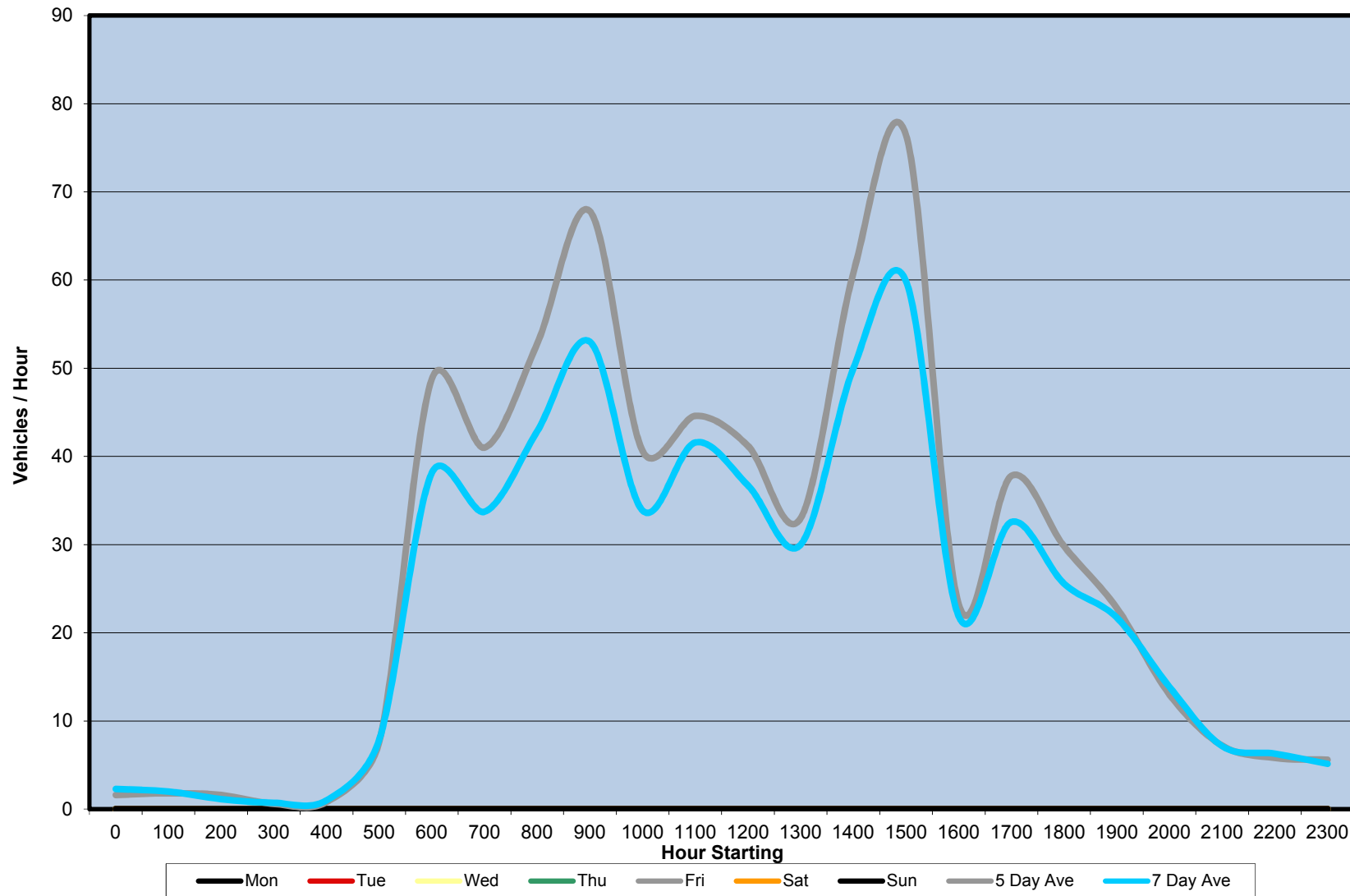


Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 1. Holden Drive (west of South Circuit)

Select Direction WB

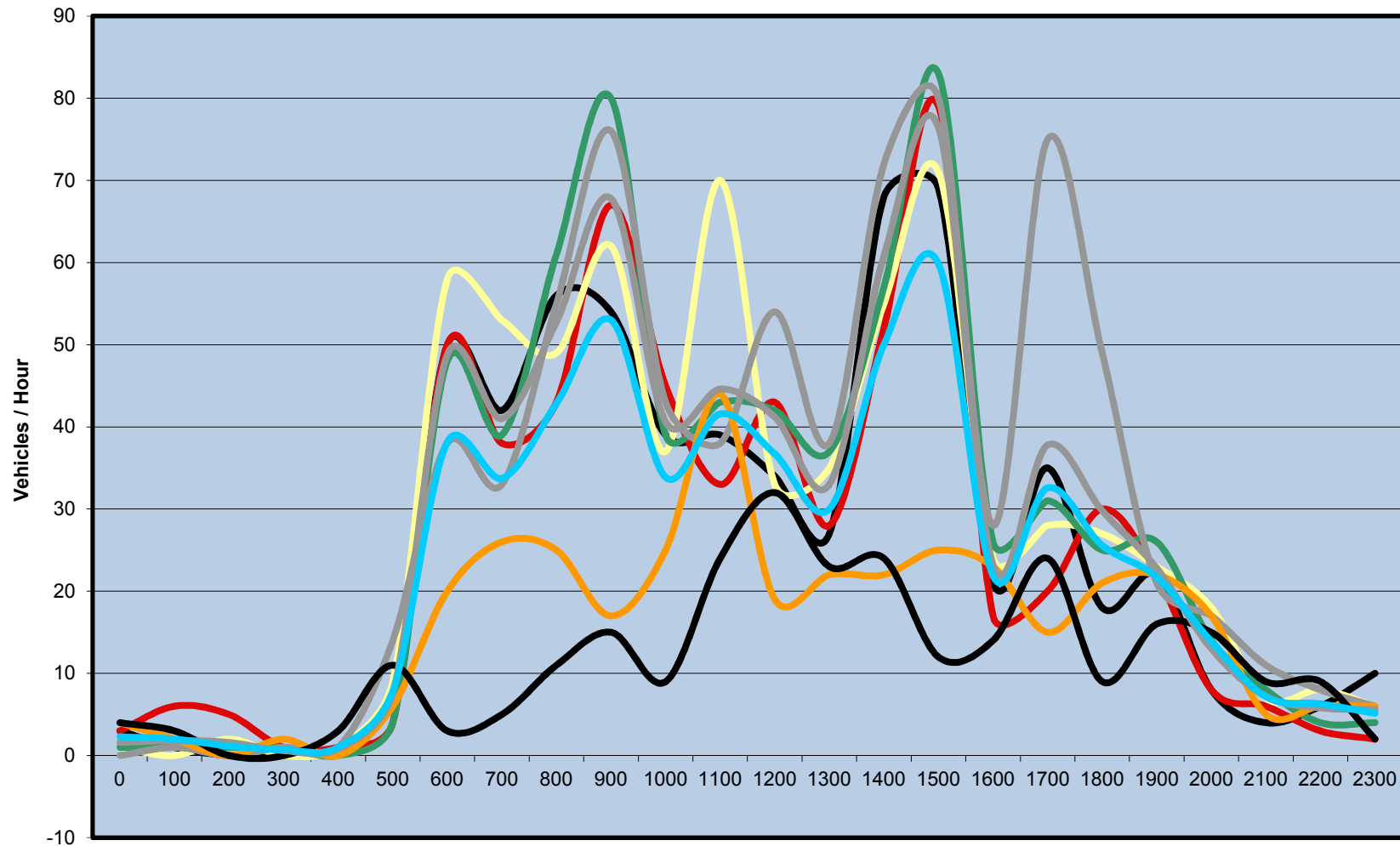


Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 1. Holden Drive (west of South Circuit)

Select Direction WB



Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Hour Starting

Mon Tue Wed Thu Fri Sat Sun 5 Day Ave 7 Day Ave

Job No N2836
Client Woolacotts Consulting Engineers
Site Holden Drive (west of South Circuit)
Location ORAN PARK
Site No 1
Start Date 28-Nov-16
Day Weekday Ave
Description Class Summary
Classification AustRoads94

Select Site

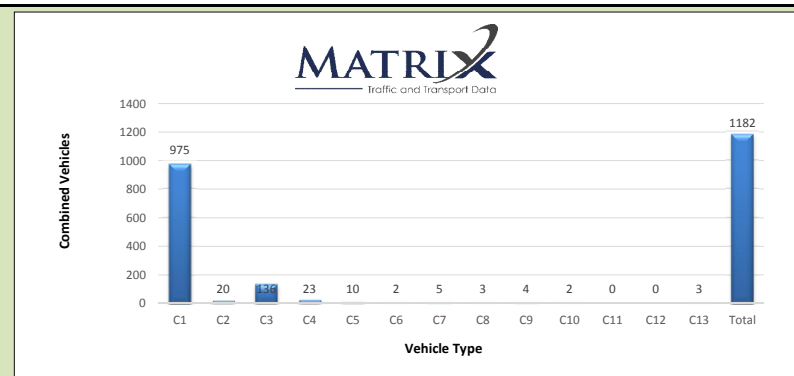
1. Holden Drive (west of South Circuit)

Select Day

Weekday Ave

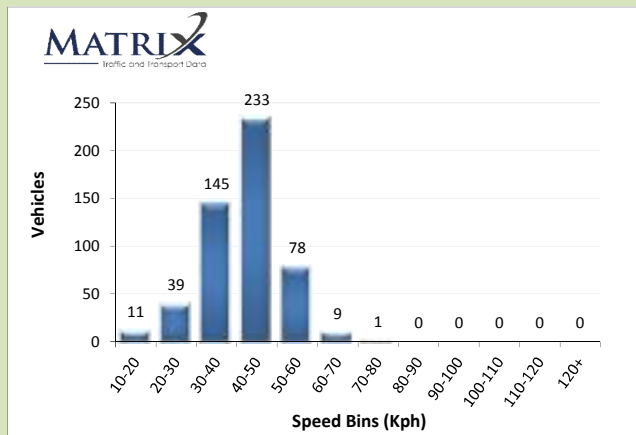
Class Summary

Light	Class 1	C	EB	WB
	Class 2	82%	79%	85%
Medium	Class 3	11%	13%	10%
	Class 4	2%	3%	1%
	Class 5	1%	1%	0%
Heavy	Class 6	0%	0%	0%
	Class 7	0%	1%	0%
	Class 8	0%	0%	0%
	Class 9	0%	1%	0%
	Class 10	0%	0%	0%
	Class 11	0%	0%	0%
	Class 12	0%	0%	0%
U/C	Class 13	0%	0%	0%



Hour Starting	EB														Total	WB														Total	COMBINED														Total
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C1		C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C1	C2		C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13				
	Short	Short towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable	Short		Short towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable	Short	Short Towing		2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable				
0:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3				
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2				
2:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	3				
3:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2				
4:00	2	0	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	0	0	0	0	0	0	0	0	0	4				
5:00	4	0	1	0	0	0	0	0	0	0	0	0	0	6	5	0	2	0	0	0	0	0	0	0	0	0	8	9	0	3	0	0	0	0	0	0	0	0	0	14					
6:00	14	0	3	1	0	0	0	0	0	0	0	0	0	19	33	3	11	1	0	0	0	0	0	0	0	0	49	47	3	15	2	0	0	0	0	0	0	0	0	67					
7:00	18	0	4	2	1	0	1	0	1	0	0	0	0	27	31	1	7	0	0	0	0	1	0	0	0	0	41	49	2	11	2	1	0	1	1	1	0	0	0	68					
8:00	29	0	6	1	1	0	0	0	0	1	0	0	0	38	45	1	6	0	0	0	0	0	0	0	0	0	53	74	1	12	1	1	0	0	0	1	0	0	1	90					
9:00	50	0	7	0	0	0	0	0	0	0	0	0	0	58	60	0	5	1	0	0	0	0	0	0	0	0	68	110	1	12	2	1	0	0	0	0	0	0	0	126					
10:00	24	0	6	1	1	0	1	0	0	0	0	0	0	34	32	0	7	0	0	0	0	0	0	0	0	0	41	56	1	13	2	1	1	1	0	1	0	0	0	75					
11:00	30	1	5	1	1	0	0	0	0	0	0	0	0	40	38	1	4	1	0	0	0	0	0	0	0	0	45	68	2	9	2	1	0	0	0	0	0	0	0	84					
12:00	28	1	7	1	0	0	0	0	0	0	0	0	0	39	32	1	8	0	0	0	0	0	0	0	0	0	41	60	2	15	2	0	0	1	0	0	1	0	0	80					
13:00	28	0	5	2	1	0	0	0	0	0	0	0	0	36	26	1	4	1	0	0	0	0	0	0	0	0	33	54	1	9	3	1	0	0	0	1	0	0	0	69					
14:00	28	0	7	1	1	0	0	0	0	0	0	0	0	38	52	1	5	2	1	0	0	0	0	0	0	0	61	80	1	12	3	1	1	0	0	0	0	0	0	99					
15:00	56	2	8	2	1	0	1	0	0	0	0	0	0	71	70	0	4	1	1	0	0	0	0	0	0	0	76	127	3	12	3	1	0	1	0	0	0	0	0	148					
16:00	21	1	3	1	0	0	0	0	0	0	0	0	0	27	20	0	2	1	0	0	0	0	0	0	0	0	23	41	1	5	2	1	0	0	0	0	0	0	0	50					
17:00	17	1	2	0	0	0	0	0	0	0	0	0	0	21	36	0	1	0	0	0	0	0	0	0	0	0	38	54	1	4	0	0	0	0	0	0	0	0	0	59					
18:00	17	0	1	0	0	0	0	0	0	0	0	0	0	18	29	0	1	0	0	0	0	0	0	0	0	0	30	46	0	2	0	0	0	0	0	0	0	0	0	48					
19:00	11	0	1	0	0	0	0	0	0	0	0	0	0	12	22	0	1	0	0	0	0	0	0	0	0	0	23	33	0	2	0	0	0	0	0	0	0	0	0	35					
20:00	12	0	0	0	0	0	0	0	0	0	0	0	0	12	13	0	0	0	0	0	0	0	0	0	0	0	13	24	0	1	0	0	0	0	0	0	0	0	0	25					
21:00	8	0	0	0	0	0	0	0	0	0	0	0	0	8	7	0	0	0	0	0	0	0	0	0	0	0	7	15	0	0	0	0	0	0	0	0	0	0	0	16					
22:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	6	9	0	0	0	0	0	0	0	0	0	0	0	9					
23:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	6	8	0	0	0	0	0	0	0	0	0	0	0	8					
Total	406	9	68	14	7	1	3	1	3	2	0	0	2	516	569	11	68	9	3	1	1	1	2	0	0	0	1	666	975	20	136	23	10	2	5	3	4	2	0	0	3	1182			

Job No	N2836	Bin Summary	
Client	Woolacotts Consulting Engineers	10-20	2.1%
Site	Holden Drive (west of South Circuit)	20-30	7.6%
Location	ORAN PARK	30-40	28.1%
Site No	1	40-50	45.2%
Start Date	28-Nov-16	50-60	15.1%
Day	Weekday Ave	60-70	1.7%
Direction	EB	70-80	0.1%
Description	Speed Summary	80-90	0.0%
Select Site	Holden Drive (west of South Circuit)	90-100	0.0%
Select Day	Weekday Ave	100-110	0.0%
Select Direction	EB	110-120	0.0%
		120+	0.0%
		41.9	50.5



Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	42.9	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	50.9	0
2:00	0	0	0	1	0	0	0	0	0	0	0	0	41.5	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	52.5	0
4:00	0	0	0	1	1	0	0	0	0	0	0	0	49.2	0
5:00	0	1	2	2	1	0	0	0	0	0	0	0	40.6	0
6:00	1	2	4	7	4	0	0	0	0	0	0	0	41.2	52.2
7:00	0	2	9	12	4	1	0	0	0	0	0	0	42.2	51.5
8:00	1	3	11	18	4	1	0	0	0	0	0	0	41.2	49.0
9:00	1	4	17	27	9	1	0	0	0	0	0	0	42.4	50.9
10:00	1	1	11	16	4	1	0	0	0	0	0	0	42.1	49.4
11:00	1	5	10	17	6	1	0	0	0	0	0	0	40.7	51.2
12:00	1	2	12	17	5	1	0	0	0	0	0	0	41.5	49.8
13:00	1	2	9	16	8	0	0	0	0	0	0	0	42.8	52.1
14:00	1	2	9	21	5	0	0	0	0	0	0	0	42.4	49.3
15:00	1	6	23	34	7	1	0	0	0	0	0	0	40.8	48.6
16:00	0	2	5	11	7	1	0	0	0	0	0	0	45.2	55.2
17:00	0	2	5	11	3	0	0	0	0	0	0	0	41.0	50.0
18:00	1	2	4	8	3	0	0	0	0	0	0	0	40.5	51.3
19:00	0	2	3	4	2	0	0	0	0	0	0	0	41.1	53.5
20:00	0	2	4	4	1	0	0	0	0	0	0	0	39.5	49.1
21:00	0	0	3	3	2	0	0	0	0	0	0	0	42.9	50.8
22:00	0	0	1	1	1	0	0	0	0	0	0	0	45.6	0
23:00	0	0	0	1	1	1	0	0	0	0	0	0	50.0	0
Total	11	39	145	233	78	9	1	0	0	0	0	0	41.9	50.5

Job No N2836
Client Woolacotts Consulting Engineers
Site Holden Drive (east of South Circuit)
Location ORAN PARK
Site No 2
Start Date 28-Nov-16
Description Volume Summary
Direction EB



Hour Starting	Day of Week							W'Day Ave 50	7 Day Ave 41
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	4	10	10	8	12	3	2		
PM Peak	19	14	11	23	15	4	1		
0:00	0	0	0	0	0	0	1	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	1	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
5:00	0	0	1	0	0	0	2	0	0
6:00	1	3	0	0	0	0	1	1	1
7:00	0	0	4	0	1	0	1	1	1
8:00	4	10	10	8	12	0	1	9	6
9:00	4	3	6	8	9	0	0	6	4
10:00	0	1	0	2	3	3	1	1	1
11:00	1	2	3	0	2	1	0	2	1
12:00	1	1	1	0	4	0	1	1	1
13:00	0	0	2	0	0	3	0	0	1
14:00	3	8	11	7	7	0	1	7	5
15:00	19	14	11	23	15	4	0	16	12
16:00	0	2	1	2	2	3	1	1	2
17:00	0	2	0	2	2	0	0	1	1
18:00	2	2	0	1	3	4	1	2	2
19:00	0	0	0	0	2	2	0	0	1
20:00	0	0	0	1	0	2	0	0	0
21:00	0	0	0	0	0	1	1	0	0
22:00	0	0	0	0	0	1	0	0	0
23:00	0	0	0	0	0	0	0	0	0
Total	35	48	50	54	63	24	12	50	41

7-19	34	45	49	53	60	18	7	48	38
6-22	35	48	49	54	62	23	9	50	40
6-24	35	48	49	54	62	24	9	50	40
0-24	35	48	50	54	63	24	12	50	41

Job No N2836
Client Woolacotts Consulting Engineers
Site Holden Drive (east of South Circuit)
Location ORAN PARK
Site No 2
Start Date 28-Nov-16
Description Volume Summary
Direction WB

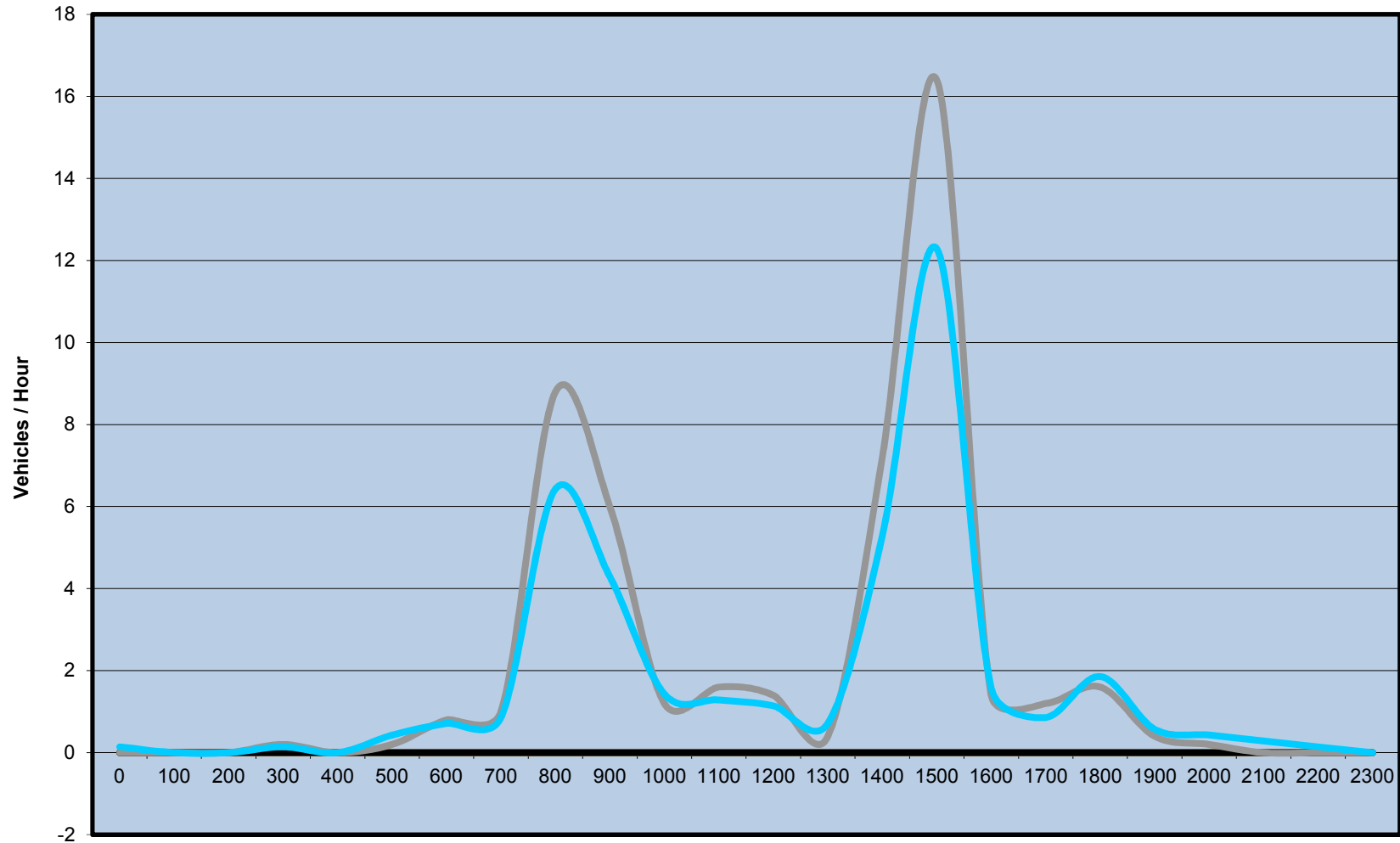


Hour Starting	Day of Week							W'Day Ave 50	7 Day Ave 40
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	6	9	8	9	13	4	2		
PM Peak	22	19	20	25	20	4	1		
0:00	0	0	0	0	0	0	1	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	1	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
5:00	0	0	1	0	0	0	2	0	0
6:00	1	1	0	0	0	0	1	0	0
7:00	0	0	2	0	1	0	1	1	1
8:00	5	9	8	9	10	0	1	8	6
9:00	6	4	7	8	13	0	0	8	5
10:00	0	2	0	2	0	4	0	1	1
11:00	1	2	2	1	5	0	0	2	2
12:00	1	0	2	0	4	0	1	1	1
13:00	0	0	2	0	0	3	0	0	1
14:00	1	0	1	2	1	0	1	1	1
15:00	22	19	20	25	20	2	0	21	15
16:00	0	3	1	2	2	3	1	2	2
17:00	0	2	0	2	2	0	0	1	1
18:00	3	2	0	1	2	4	1	2	2
19:00	0	0	0	0	1	2	0	0	0
20:00	0	1	0	1	2	2	0	1	1
21:00	0	0	0	0	0	1	1	0	0
22:00	0	0	0	0	0	1	0	0	0
23:00	0	0	0	0	0	0	0	0	0
Total	40	45	46	53	64	22	11	50	40

7-19	39	43	45	52	60	16	6	48	37
6-22	40	45	45	53	63	21	8	49	39
6-24	40	45	45	53	63	22	8	49	39
0-24	40	45	46	53	64	22	11	50	40

Select Site 2. Holden Drive (east of South Circuit)

Select Direction EB



Select Day

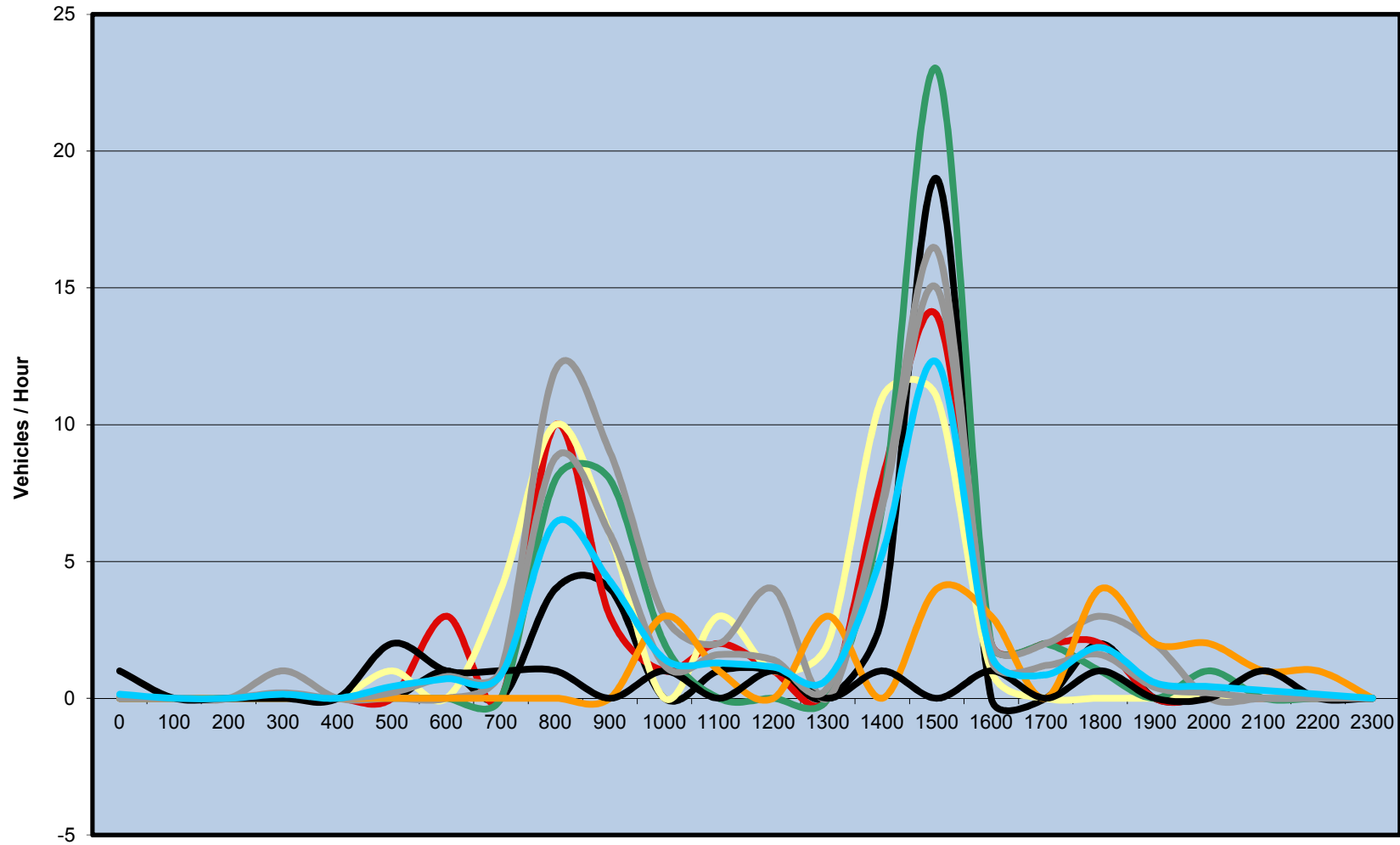
- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Hour Starting

Mon Tue Wed Thu Fri Sat Sun 5 Day Ave 7 Day Ave

Select Site 2. Holden Drive (east of South Circuit)

Select Direction EB



Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Hour Starting

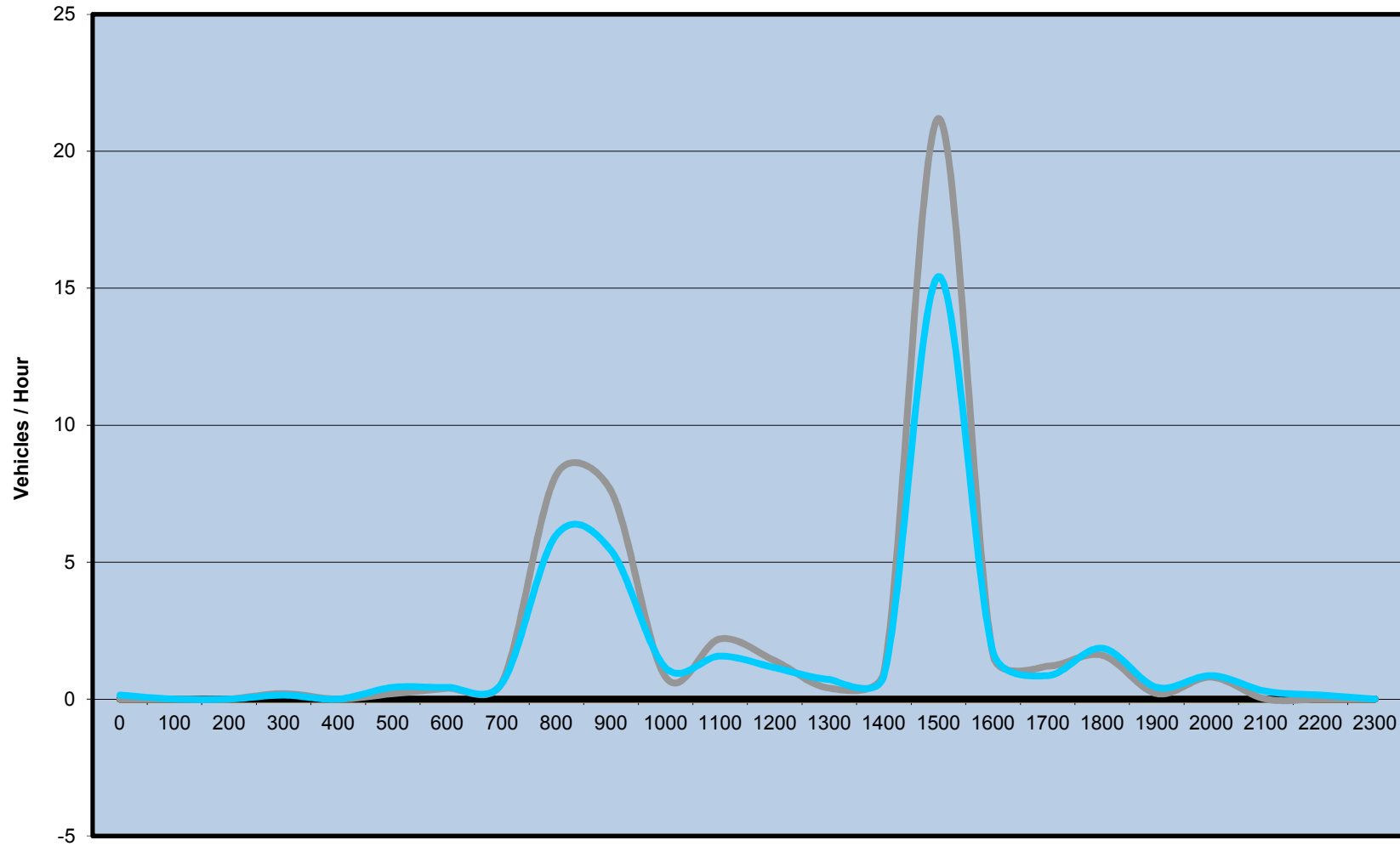
Mon Tue Wed Thu Fri Sat Sun 5 Day Ave 7 Day Ave

Select Site 2. Holden Drive (east of South Circuit)



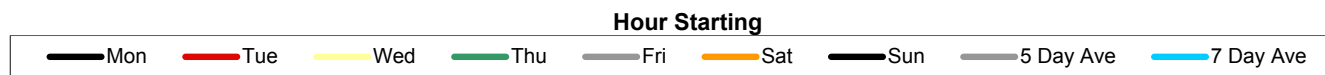
Select Direction

WB



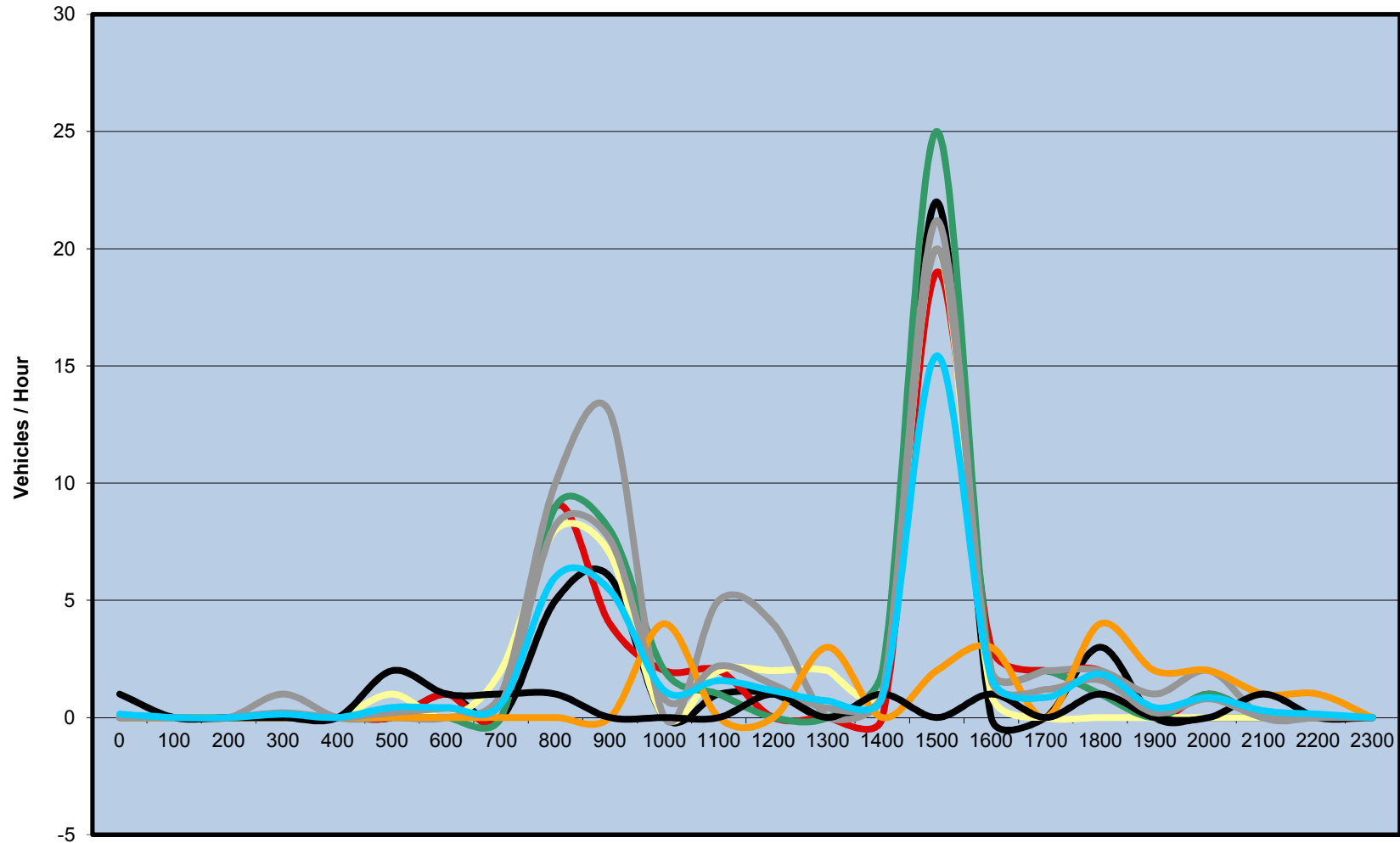
Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day



Select Site 2. Holden Drive (east of South Circuit)

Select Direction WB



Select Day

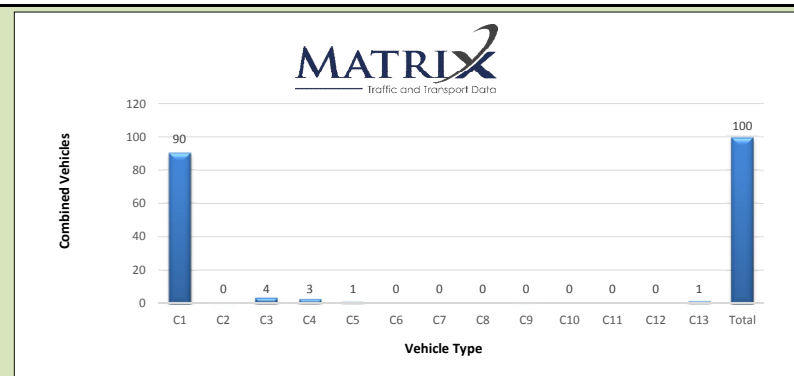
- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Hour Starting

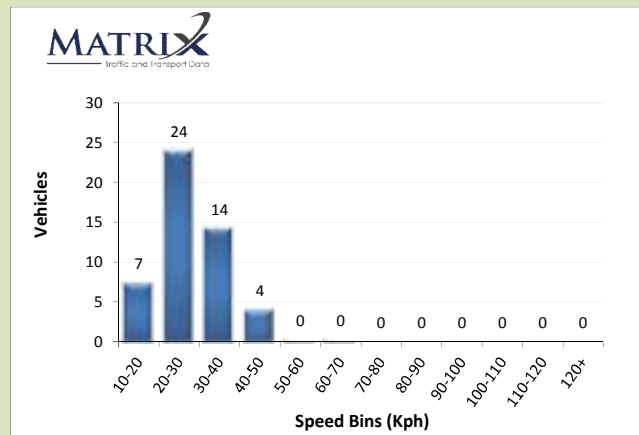
Mon Tue Wed Thu Fri Sat Sun 5 Day Ave 7 Day Ave

Select Day

Class Summary		C	EB	WB
Light	Class 1	91%	87%	95%
	Class 2	0%	0%	0%
Medium	Class 3	4%	4%	3%
	Class 4	3%	5%	1%
	Class 5	1%	2%	0%
Heavy	Class 6	0%	0%	0%
	Class 7	0%	0%	0%
	Class 8	0%	0%	0%
	Class 9	0%	0%	0%
	Class 10	0%	0%	0%
	Class 11	0%	0%	0%
U/C	Class 12	0%	0%	0%
	Class 13	1%	2%	1%

[illegible]

Job No	28236
Client	Woolacotts Consulting Engineers
Site	Holden Drive (east of South Circuit)
Location	ORAN PARK
Site No	2
Start Date	28-Nov-16
Day	Weekday Ave
Direction	EB
Description	Speed Summary
Select Site	Holden Drive (east of South Circuit)
Select Day	Weekday Ave
Select Direction	EB



Bin Summary	
10-20	14.8%
20-30	48.0%
30-40	28.4%
40-50	8.0%
50-60	0.4%
60-70	0.4%
70-80	0.0%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
28.0	35.4

[illegible]

Job No

N2836

Client

Woolacotts Consulting Engineers

Site

Holden Drive (east of South Circuit)

Location

ORAN PARK

Site No

2

Start Date

28-Nov-16

Day

Weekday Ave

Direction

WB

Description

Speed Summary

Select Site

Holden Drive (east of South Circuit)

Select Day

Weekday Ave

Select Direction

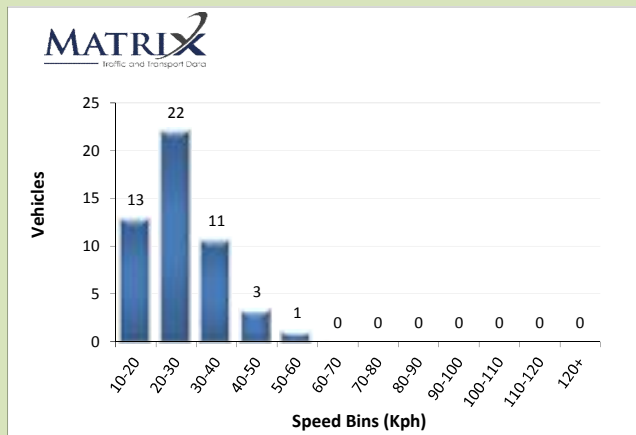
WB

MATRIX

traffic and transport data

Speed Bin (Kph)	Vehicles
10-20	13
20-30	22
30-40	11
40-50	3
50-60	1
60-70	0
70-80	0
80-90	0
90-100	0
100-110	0
110-120	0
120+	0

Bin Summary	
10-20	25.8%
20-30	44.4%
30-40	21.4%
40-50	6.5%
50-60	2.0%
60-70	0.0%
70-80	0.0%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
26.1	38.0



Bin Summary	
10-20	25.8%
20-30	44.4%
30-40	21.4%
40-50	6.5%
50-60	2.0%
60-70	0.0%
70-80	0.0%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
26.1	38.0

[illegible]

Job No N2836
Client Woolacotts Consulting Engineers
Site South Circuit (north of Holden Drive)
Location ORAN PARK
Site No 3
Start Date 28-Nov-16
Description Volume Summary
Direction NB



Hour Starting	Day of Week							W'Day Ave 737	7 Day Ave 570
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	139	128	140	154	147	37	33		
PM Peak	75	74	150	83	93	19	9		
0:00	1	0	1	1	1	0	1	1	1
1:00	1	1	0	1	1	0	1	1	1
2:00	0	0	0	1	1	0	1	0	0
3:00	1	0	0	2	2	0	0	1	1
4:00	2	4	0	1	2	0	2	2	2
5:00	1	0	4	2	6	1	3	3	2
6:00	14	12	13	12	16	3	2	13	10
7:00	54	52	45	48	31	37	1	46	38
8:00	139	128	140	137	147	9	18	138	103
9:00	125	111	115	154	132	17	33	127	98
10:00	13	17	7	42	51	8	18	26	22
11:00	17	18	16	25	23	19	8	20	18
12:00	15	33	14	13	54	19	3	26	22
13:00	8	8	16	16	15	7	7	13	11
14:00	63	64	67	75	72	10	3	68	51
15:00	75	74	80	83	93	5	3	81	59
16:00	24	25	62	30	41	8	3	36	28
17:00	30	52	150	34	83	4	5	70	51
18:00	19	18	80	23	43	9	9	37	29
19:00	3	4	29	5	41	2	7	16	13
20:00	1	2	6	5	16	5	2	6	5
21:00	1	1	1	2	8	4	3	3	3
22:00	1	0	2	1	5	2	2	2	2
23:00	1	1	2	3	2	2	0	2	2
Total	609	625	850	716	886	171	135	737	570

7-19	582	600	792	680	785	152	111	688	529
6-22	601	619	841	704	866	166	125	726	560
6-24	603	620	845	708	873	170	127	730	564
0-24	609	625	850	716	886	171	135	737	570

Job No N2836
Client Woolacotts Consulting Engineers
Site South Circuit (north of Holden Drive)
Location ORAN PARK
Site No 3
Start Date 28-Nov-16
Description Volume Summary
Direction SB



Hour Starting	Day of Week							W'Day Ave 739	7 Day Ave 573
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	145	143	144	182	177	34	55		
PM Peak	131	116	140	152	143	23	8		
0:00	1	0	1	1	1	2	1	1	1
1:00	1	1	1	1	1	0	2	1	1
2:00	1	0	0	1	1	0	1	1	1
3:00	1	0	0	2	2	1	0	1	1
4:00	1	2	0	1	1	0	2	1	1
5:00	1	1	3	1	3	0	1	2	1
6:00	5	3	4	4	5	3	2	4	4
7:00	40	35	37	37	30	9	2	36	27
8:00	90	83	85	82	94	12	1	87	64
9:00	145	143	144	182	177	18	5	158	116
10:00	15	16	7	12	20	7	15	14	13
11:00	8	12	15	55	58	34	55	30	34
12:00	12	13	12	14	23	10	5	15	13
13:00	17	32	17	17	42	7	4	25	19
14:00	24	24	23	25	29	10	7	25	20
15:00	131	116	140	152	143	9	2	136	99
16:00	36	35	42	42	29	7	4	37	28
17:00	40	55	86	41	50	23	3	54	43
18:00	12	35	101	10	23	8	4	36	28
19:00	22	4	90	22	48	3	8	37	28
20:00	1	11	39	5	50	7	7	21	17
21:00	1	1	1	2	56	4	3	12	10
22:00	1	1	2	2	11	2	2	3	3
23:00	1	1	2	3	2	2	1	2	2
Total	607	624	852	714	899	178	137	739	573

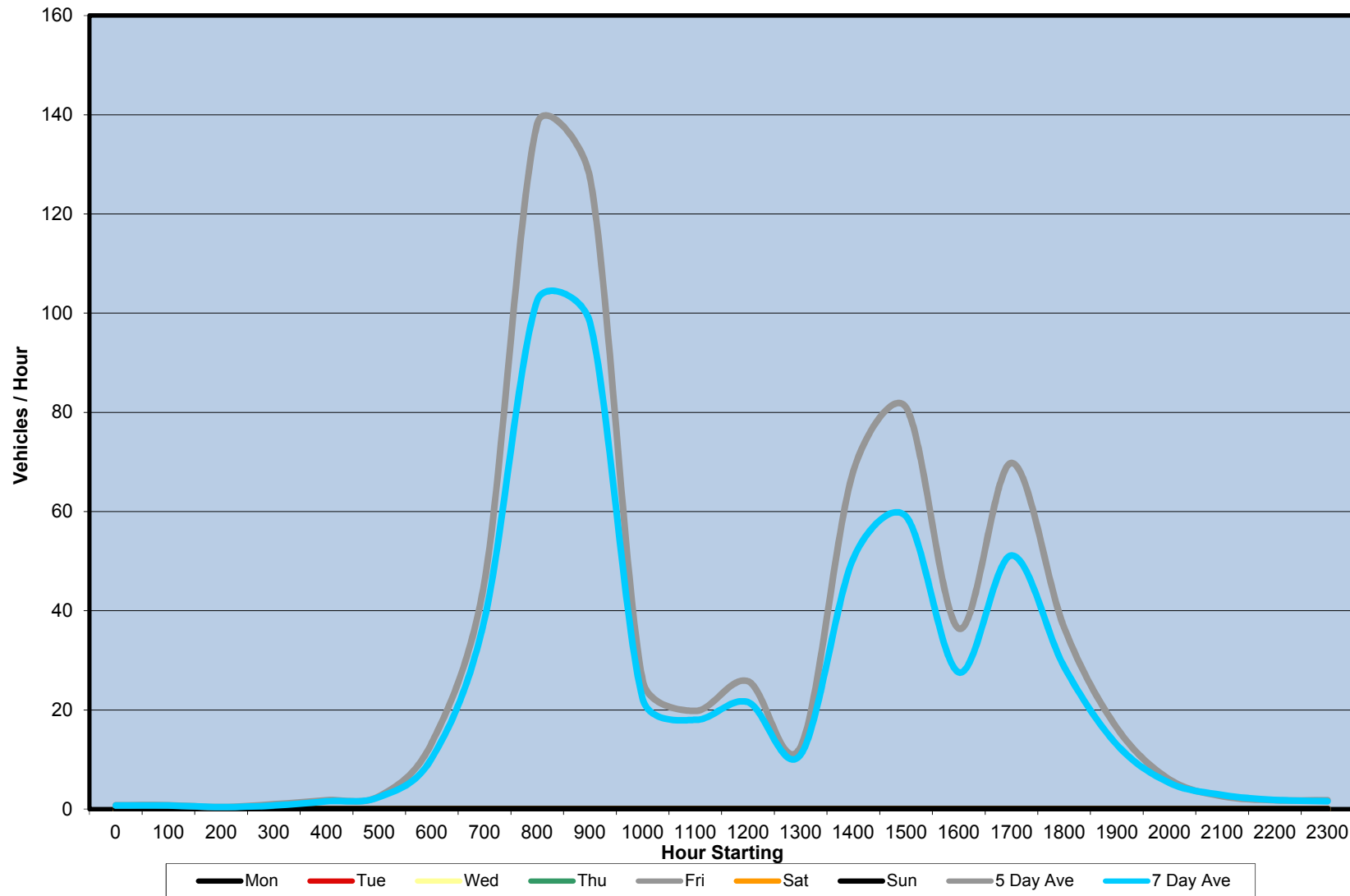
7-19	570	599	709	669	718	154	107	653	504
6-22	599	618	843	702	877	171	127	728	562
6-24	601	620	847	707	890	175	130	733	567
0-24	607	624	852	714	899	178	137	739	573

Select Site 3. South Circuit (north of Holden Drive)



Select Direction

NB

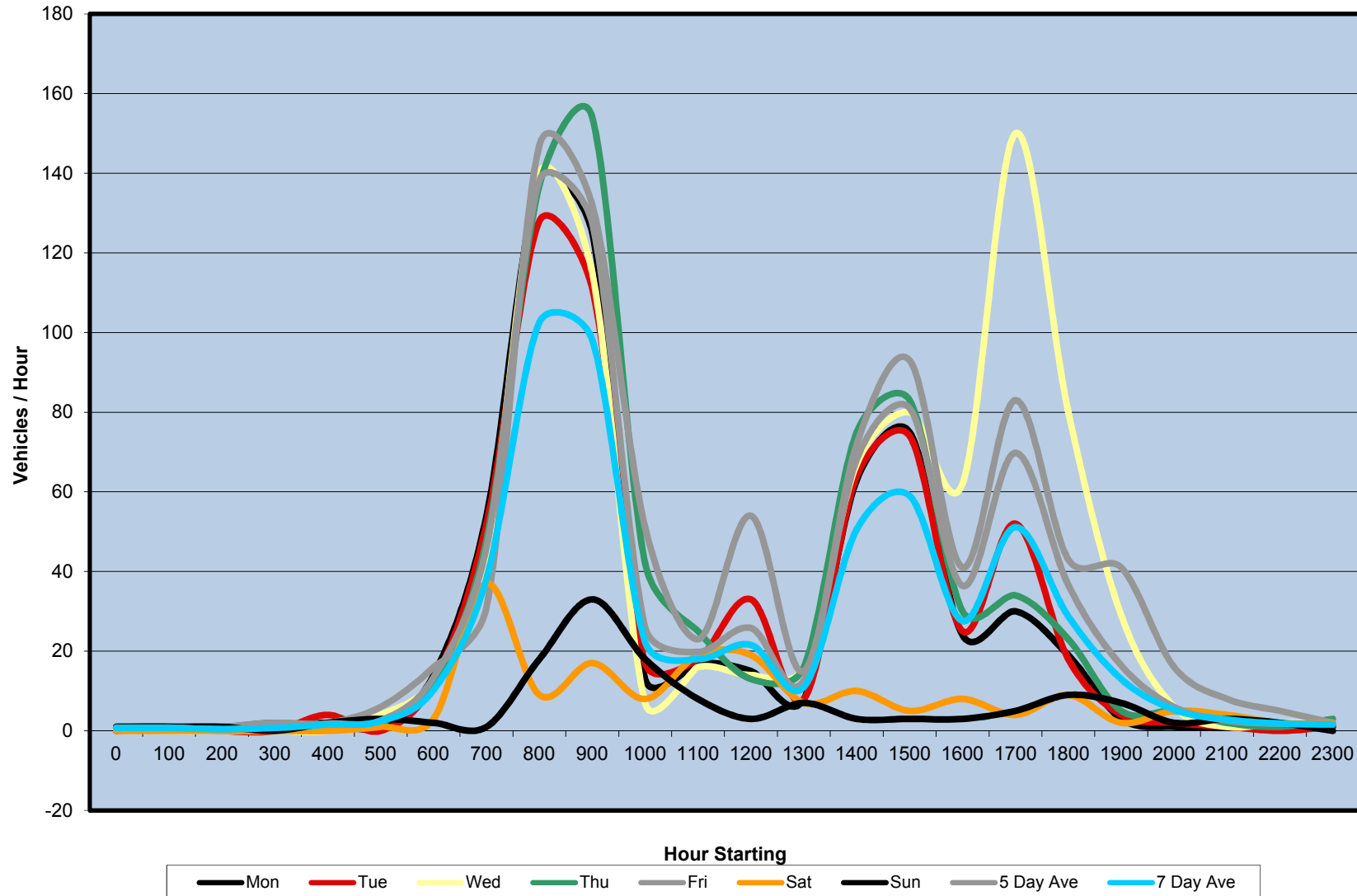


Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 3. South Circuit (north of Holden Drive)

Select Direction NB

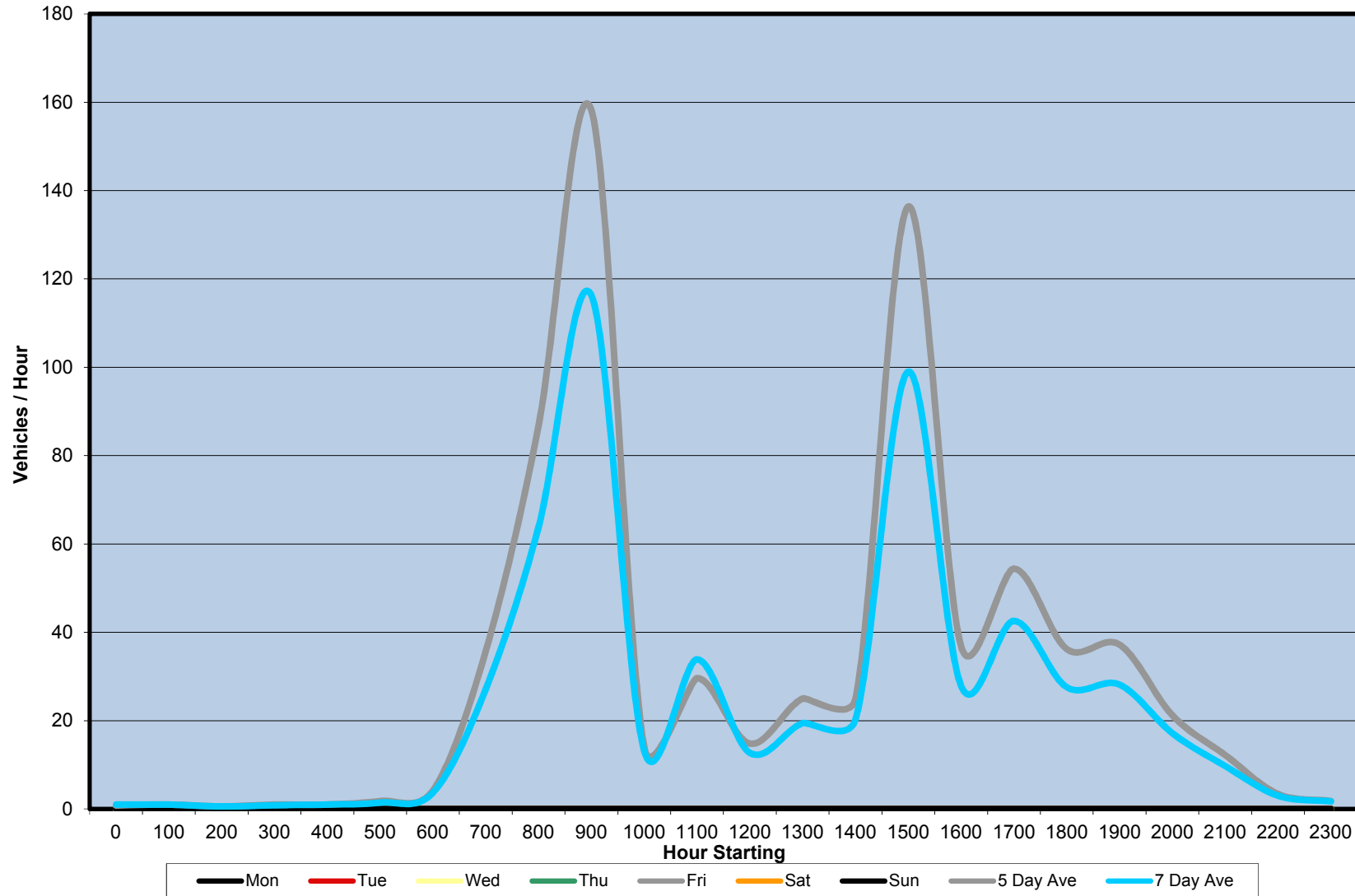


Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 3. South Circuit (north of Holden Drive)

Select Direction SB

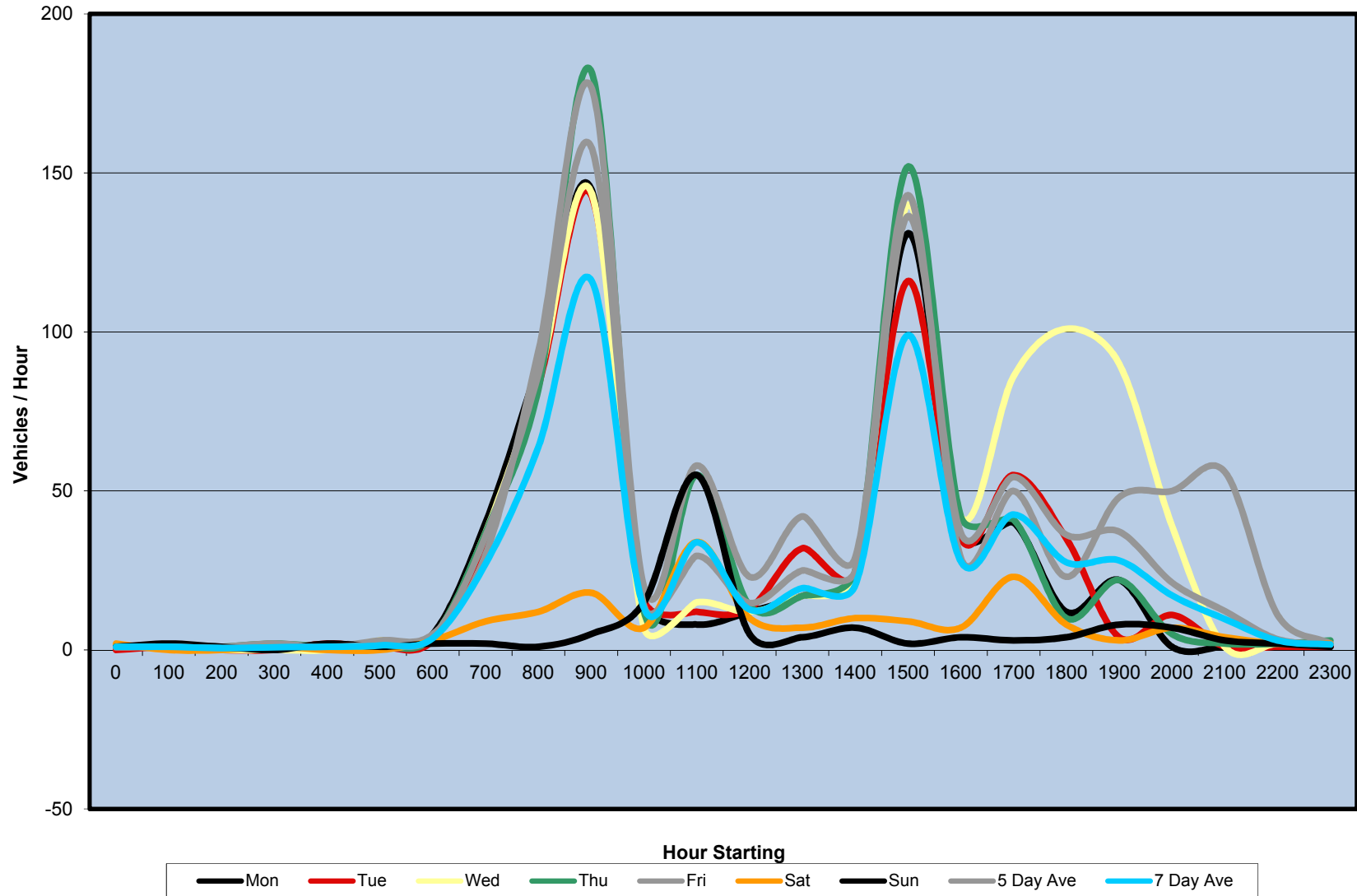


Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 3. South Circuit (north of Holden Drive)

Select Direction SB



Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Job No N2836
Client Woolacotts Consulting Engineers
Site South Circuit (north of Holden Drive)
Location ORAN PARK
Site No 3
Start Date 28-Nov-16
Day Weekday Ave
Description Class Summary
Classification AustRoads94

Select Site

3. South Circuit (north of Holden Drive) ▼

Select Day

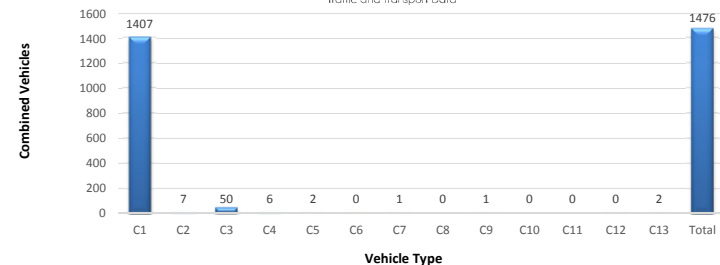
Weekday Ave ▼

Class Summary

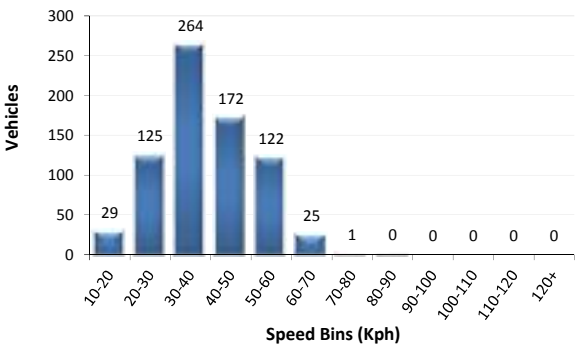
		C	NB	SB
Light	Class 1	95%	95%	96%
	Class 2	0%	1%	0%
Medium	Class 3	3%	4%	3%
	Class 4	0%	1%	0%
	Class 5	0%	0%	0%
Heavy	Class 6	0%	0%	0%
	Class 7	0%	0%	0%
	Class 8	0%	0%	0%
	Class 9	0%	0%	0%
	Class 10	0%	0%	0%
	Class 11	0%	0%	0%
	Class 12	0%	0%	0%
U/C	Class 13	0%	0%	0%



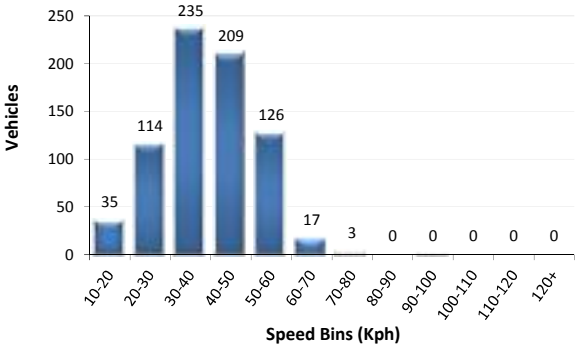
AustRoads94



Hour Starting	NB														SB													COMBINED															
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	
	Short	Short towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		Short	Short Towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		Short	Short Towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		
0:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00	2	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	1	0	0	0	0	0	0	0	0	0	0	0	4
6:00	10	1	2	0	0	0	0	0	0	0	0	0	0	13	2	1	1	0	0	0	0	0	0	0	0	0	0	4	12	1	3	1	0	0	0	0	0	0	0	0	0	0	18
7:00	44	0	1	0	0	0	0	0	0	0	0	0	0	46	32	0	3	0	0	0	0	0	0	0	0	0	0	36	76	0	5	0	0	0	0	0	0	0	0	0	0	0	82
8:00	134	0	4	0	0	0	0	0	0	0	0	0	0	138	84	0	3	0	0	0	0	0	0	0	0	0	0	87	217	0	7	0	0	0	0	0	0	0	0	0	0	1	225
9:00	121	0	3	2	0	0	0	0	0	0	0	0	0	127	156	0	2	0	0	0	0	0	0	0	0	0	0	158	276	1	4	3	0	0	0	0	0	0	0	0	0	1	286
10:00	25	0	1	0	0	0	0	0	0	0	0	0	0	26	13	0	1	0	0	0	0	0	0	0	0	0	0	14	38	0	2	0	0	0	0	0	0	0	0	0	0	0	40
11:00	18	0	1	0	0	0	0	0	0	0	0	0	0	20	28	0	1	0	0	0	0	0	0	0	0	0	0	30	46	0	2	1	0	0	0	0	0	0	0	0	0	0	49
12:00	24	0	1	0	0	0	0	0	0	0	0	0	0	26	12	0	2	0	0	0	0	0	0	0	0	0	0	15	36	1	3	0	1	0	0	0	0	0	0	0	0	0	41
13:00	11	0	2	0	0	0	0	0	0	0	0	0	0	13	24	0	1	0	0	0	0	0	0	0	0	0	0	25	34	0	3	0	0	0	0	0	0	0	0	0	0	0	38
14:00	66	0	1	0	0	0	0	0	0	0	0	0	0	68	24	0	1	0	0	0	0	0	0	0	0	0	0	25	90	1	2	0	0	0	0	0	0	0	0	0	0	0	93
15:00	75	1	5	0	0	0	0	0	0	0	0	0	0	81	131	0	4	1	0	0	0	0	0	0	0	0	0	136	206	1	9	1	0	0	0	0	0	0	0	0	0	0	217
16:00	34	1	1	0	0	0	0	0	0	0	0	0	0	36	35	0	1	0	0	0	0	0	0	0	0	0	0	37	69	1	2	0	0	0	1	0	0	0	0	0	0	0	73
17:00	68	0	2	0	0	0	0	0	0	0	0	0	0	70	53	0	0	0	0	0	0	0	0	0	0	0	0	54	121	0	2	0	0	0	0	0	0	0	0	0	0	0	124
18:00	35	0	2	0	0	0	0	0	0	0	0	0	0	37	35	0	1	0	0	0	0	0	0	0	0	0	0	36	70	0	3	0	0	0	0	0	0	0	0	0	0	0	73
19:00	15	0	1	0	0	0	0	0	0	0	0	0	0	16	36	1	1	0	0	0	0	0	0	0	0	0	0	37	51	1	2	0	0	0	0	0	0	0	0	0	0	0	54
20:00	6	0	0	0	0	0	0	0	0	0	0	0	0	6	21	0	0	0	0	0	0	0	0	0	0	0	0	21	27	0	0	0	0	0	0	0	0	0	0	0	0	27	
21:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	12	0	0	0	0	0	0	0	0	0	0	0	0	12	14	0	0	0	0	0	0	0	0	0	0	0	0	0	15
22:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
23:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	699	4	27	4	1	0	0	0	0	0	0	0	1	737	709	3	22	3	2	0	0	0	0	0	0	1	739	1407	7	50	6	2	0	1	0	1	0	0	0	0	2	1476	

Job No	N2836	 	Bin Summary		
Client	Woolacotts Consulting Engineers		10-20	4.0%	
Site	South Circuit (north of Holden Drive)		20-30	16.9%	
Location	ORAN PARK		30-40	35.8%	
Site No	3		40-50	23.3%	
Start Date	28-Nov-16		50-60	16.5%	
Day	Weekday Ave		60-70	3.3%	
Direction	NB		70-80	0.1%	
Description	Speed Summary	80-90	0.1%		
Select Site	A South Circuit north of Holden Drive		90-100	0.0%	
Select Day	Weekday Ave	Select Direction	NB	100-110	0.0%
				110-120	0.0%
				120+	0.0%
				39.5	47.0

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	44.0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	48.1	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	44.8	0
3:00	0	0	0	1	0	0	0	0	0	0	0	0	44.8	0
4:00	0	0	0	1	1	0	0	0	0	0	0	0	44.3	0
5:00	0	0	0	1	1	0	0	0	0	0	0	0	48.1	0
6:00	0	0	2	4	6	1	0	0	0	0	0	0	48.0	56.4
7:00	0	0	6	19	16	5	0	0	0	0	0	0	49.2	57.7
8:00	2	19	85	26	4	2	0	0	0	0	0	0	36.2	42.2
9:00	19	52	45	9	1	0	0	0	0	0	0	0	28.9	37.1
10:00	1	4	11	7	3	0	0	0	0	0	0	0	42.3	50.3
11:00	0	2	5	7	6	0	0	0	0	0	0	0	44.1	53.5
12:00	0	3	6	10	6	0	0	0	0	0	0	0	45.4	54.3
13:00	0	1	4	4	3	0	0	0	0	0	0	0	44.5	56.2
14:00	1	14	33	17	3	1	0	0	0	0	0	0	36.4	43.9
15:00	5	25	38	11	2	0	0	0	0	0	0	0	32.6	39.7
16:00	0	1	4	14	15	3	0	0	0	0	0	0	48.9	56.4
17:00	0	1	10	21	29	7	0	0	0	0	0	0	49.8	57.9
18:00	0	1	4	11	17	3	0	0	0	0	0	0	49.6	57.5
19:00	0	1	6	3	5	1	0	0	0	0	0	0	44.4	54.0
20:00	0	1	1	3	1	0	0	0	0	0	0	0	44.4	49.4
21:00	0	0	0	2	1	0	0	0	0	0	0	0	47.1	0
22:00	0	0	0	1	0	0	0	0	0	0	0	0	44.8	0
23:00	0	0	1	1	0	0	0	0	0	0	0	0	44.4	0
Total	29	125	264	172	122	25	1	0	0	0	0	0	39.5	47.0

Job No	N2836	 	Bin Summary		
Client	Woolacotts Consulting Engineers		10-20	4.7%	
Site	South Circuit (north of Holden Drive)		20-30	15.5%	
Location	ORAN PARK		30-40	31.8%	
Site No	3		40-50	28.3%	
Start Date	28-Nov-16		50-60	17.1%	
Day	Weekday Ave		60-70	2.2%	
Direction	SB		70-80	0.4%	
Description	Speed Summary	80-90	0.0%		
Select Site	A South Circuit north of Holden Drive		90-100	0.0%	
Select Day	Weekday Ave	Select Direction	SB	100-110	0.0%
				110-120	0.0%
				120+	0.0%
				39.5	48.0

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	47.5	0
1:00	0	0	0	1	0	0	0	0	0	0	0	0	43.2	0
2:00	0	0	0	1	0	0	0	0	0	0	0	0	44.0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	33.2	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	39.7	0
5:00	0	0	0	1	1	0	0	0	0	0	0	0	51.6	0
6:00	0	0	0	3	1	0	0	0	0	0	0	0	41.0	0
7:00	0	1	3	12	15	3	1	0	0	0	0	0	49.6	57.8
8:00	3	10	41	27	5	1	0	0	0	0	0	0	38.1	46.1
9:00	5	30	87	31	4	0	0	0	0	0	0	0	35.2	42.2
10:00	0	1	2	7	3	0	0	0	0	0	0	0	44.2	53.8
11:00	1	3	9	10	4	1	0	0	0	0	0	0	42.6	51.2
12:00	0	1	2	8	4	0	0	0	0	0	0	0	45.0	52.8
13:00	1	2	5	7	9	1	0	0	0	0	0	0	46.2	56.6
14:00	4	8	3	8	2	0	0	0	0	0	0	0	33.0	46.9
15:00	14	45	53	18	6	1	0	0	0	0	0	0	31.8	40.6
16:00	3	3	2	13	14	1	0	0	0	0	0	0	44.9	55.7
17:00	1	1	5	23	20	3	1	0	0	0	0	0	48.5	57.3
18:00	1	1	2	13	15	2	0	0	0	0	0	0	45.4	56.2
19:00	0	2	4	13	17	1	0	0	0	0	0	0	46.9	53.9
20:00	1	2	6	7	4	1	0	0	0	0	0	0	39.8	49.9
21:00	1	1	6	5	0	0	0	0	0	0	0	0	44.2	46.1
22:00	0	0	2	1	1	0	0	0	0	0	0	0	41.7	46.7
23:00	0	1	0	0	0	0	0	0	0	0	0	0	41.0	0
Total	35	114	235	209	126	17	3	0	0	0	0	0	39.5	48.0

Job No	N2836
Client	Woolacotts Consulting Engineers
Site	South Circuit (south of Holden Drive)
Location	ORAN PARK
Site No	4
Start Date	28-Nov-16
Description	Volume Summary
Direction	NB



Hour Starting	Day of Week							W'Day Ave 1331	7 Day Ave 1078
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	190	177	194	206	201	59	48		
PM Peak	148	155	169	168	164	36	33		
0:00	3	4	2	1	1	4	5	2	3
1:00	1	6	0	1	1	3	3	2	2
2:00	0	5	2	1	0	0	3	2	2
3:00	1	1	0	2	1	1	0	1	1
4:00	2	4	1	0	2	0	3	2	2
5:00	6	5	9	5	15	7	11	8	8
6:00	57	56	63	57	51	22	3	57	44
7:00	86	82	95	79	64	59	5	81	67
8:00	190	177	194	201	201	33	29	193	146
9:00	156	169	161	206	199	28	48	178	138
10:00	52	61	46	75	91	31	27	65	55
11:00	56	48	86	58	49	57	28	59	55
12:00	42	68	42	50	90	36	33	58	52
13:00	30	32	42	47	48	30	28	40	37
14:00	125	119	132	130	145	29	29	130	101
15:00	148	155	150	168	164	33	14	157	119
16:00	41	45	86	51	61	34	16	57	48
17:00	59	70	169	63	133	18	26	99	77
18:00	39	48	105	46	89	24	12	65	52
19:00	25	26	57	29	54	26	19	38	34
20:00	8	11	23	14	21	16	11	15	15
21:00	4	7	7	10	13	8	11	8	9
22:00	6	3	10	4	10	10	9	7	7
23:00	9	2	7	6	7	7	3	6	6
Total	1146	1204	1489	1304	1510	516	376	1331	1078

7-19	1024	1074	1308	1174	1334	412	295	1183	946
6-22	1118	1174	1458	1284	1473	484	339	1301	1047
6-24	1133	1179	1475	1294	1490	501	351	1314	1060
0-24	1146	1204	1489	1304	1510	516	376	1331	1078

Job No	N2836
Client	Woolacotts Consulting Engineers
Site	South Circuit (south of Holden Drive)
Location	ORAN PARK
Site No	4
Start Date	28-Nov-16
Description	Volume Summary
Direction	SB

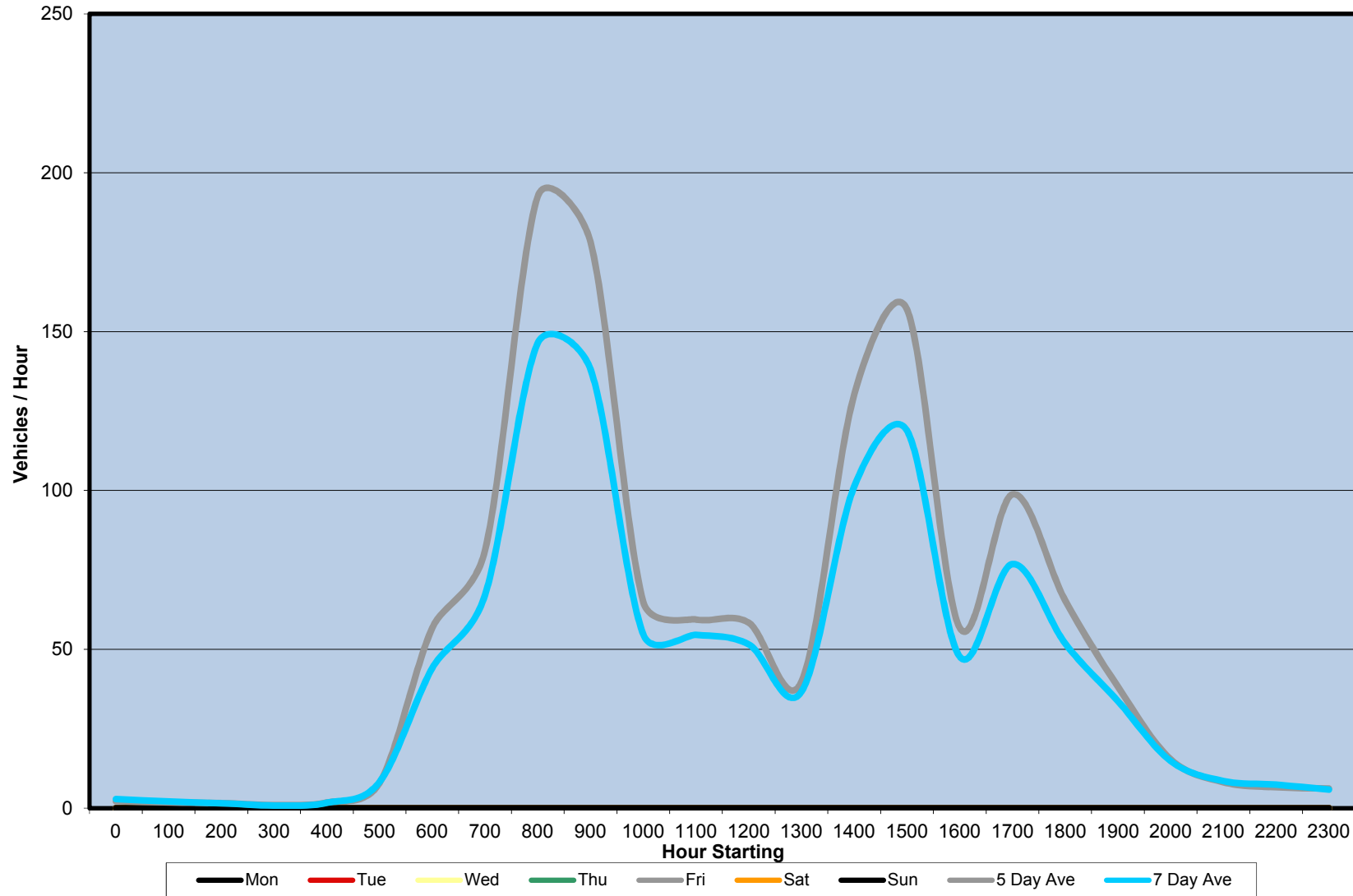


Hour Starting	Day of Week							W'Day Ave 1202	7 Day Ave 966
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Nov	29-Nov	30-Nov	1-Jan	2-Dec	3-Dec	4-Dec		
AM Peak	190	202	199	221	230	65	67		
PM Peak	195	192	231	231	207	42	21		
0:00	0	2	2	2	1	3	2	1	2
1:00	0	1	1	0	0	1	3	0	1
2:00	1	3	0	1	1	1	1	1	1
3:00	0	2	1	2	1	1	0	1	1
4:00	3	2	3	4	2	0	1	3	2
5:00	5	10	8	7	4	4	1	7	6
6:00	22	21	26	20	19	6	2	22	17
7:00	53	57	63	56	60	16	4	58	44
8:00	120	123	134	118	121	32	10	123	94
9:00	190	202	199	221	230	34	19	208	156
10:00	47	58	48	36	49	24	29	48	42
11:00	44	26	66	91	94	65	67	64	65
12:00	33	53	44	52	56	31	18	48	41
13:00	38	53	48	49	81	23	15	54	44
14:00	65	67	52	48	64	36	21	59	50
15:00	195	192	231	231	207	35	14	211	158
16:00	62	64	68	71	46	29	17	62	51
17:00	52	68	109	68	51	42	21	70	59
18:00	27	49	121	27	45	23	15	54	44
19:00	32	19	99	32	60	18	17	48	40
20:00	5	13	51	18	68	12	9	31	25
21:00	2	5	8	6	76	8	6	19	16
22:00	4	1	8	2	15	7	4	6	6
23:00	1	2	4	7	1	3	1	3	3
Total	1001	1093	1394	1169	1352	454	297	1202	966

7-19	926	1012	1183	1068	1104	390	250	1059	848
6-22	987	1070	1367	1144	1327	434	284	1179	945
6-24	992	1073	1379	1153	1343	444	289	1188	953
0-24	1001	1093	1394	1169	1352	454	297	1202	966

Select Site 4. South Circuit (south of Holden Drive)

Select Direction NB



Select Day

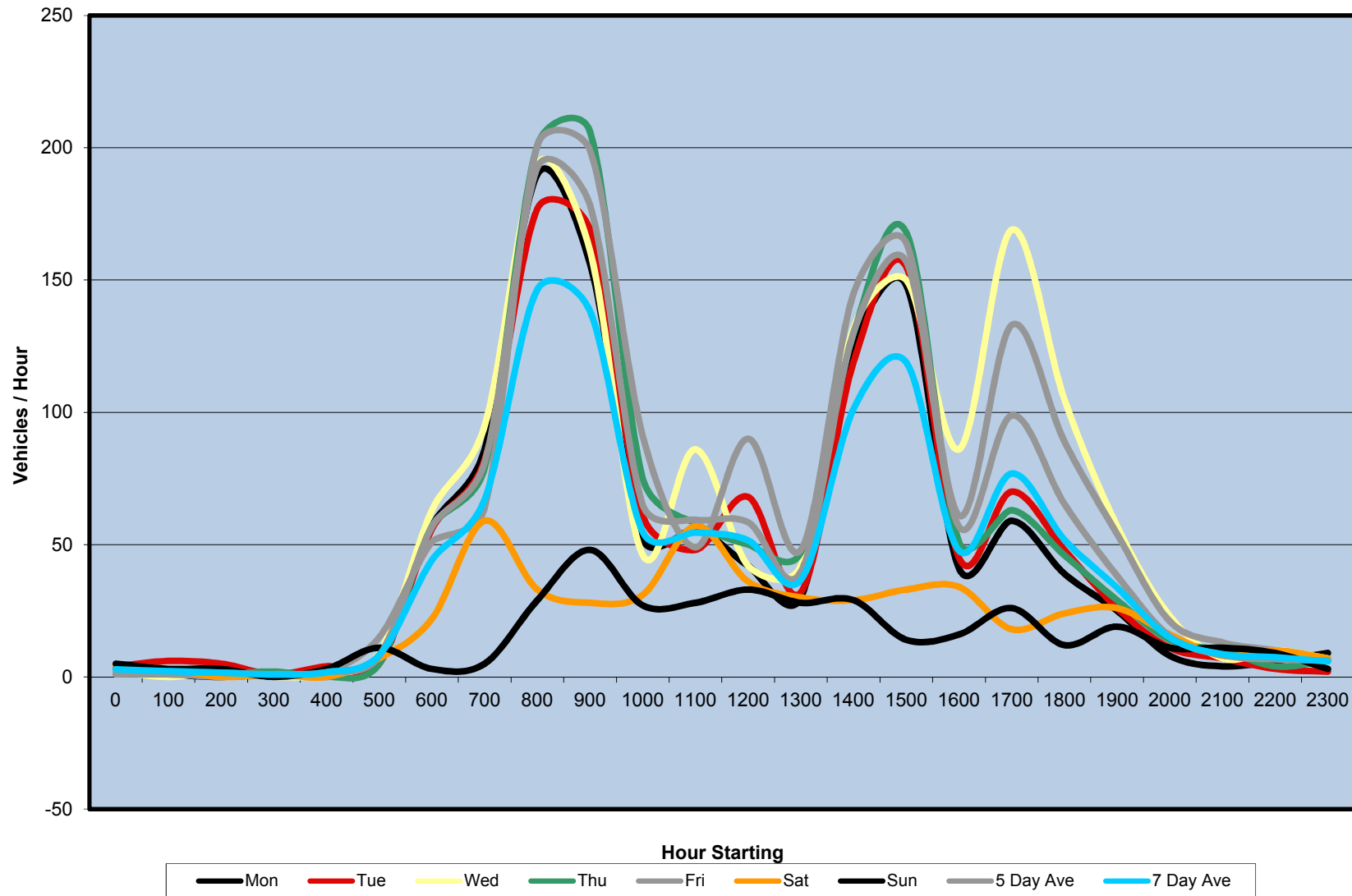
- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 4. South Circuit (south of Holden Drive)



Select Direction

NB



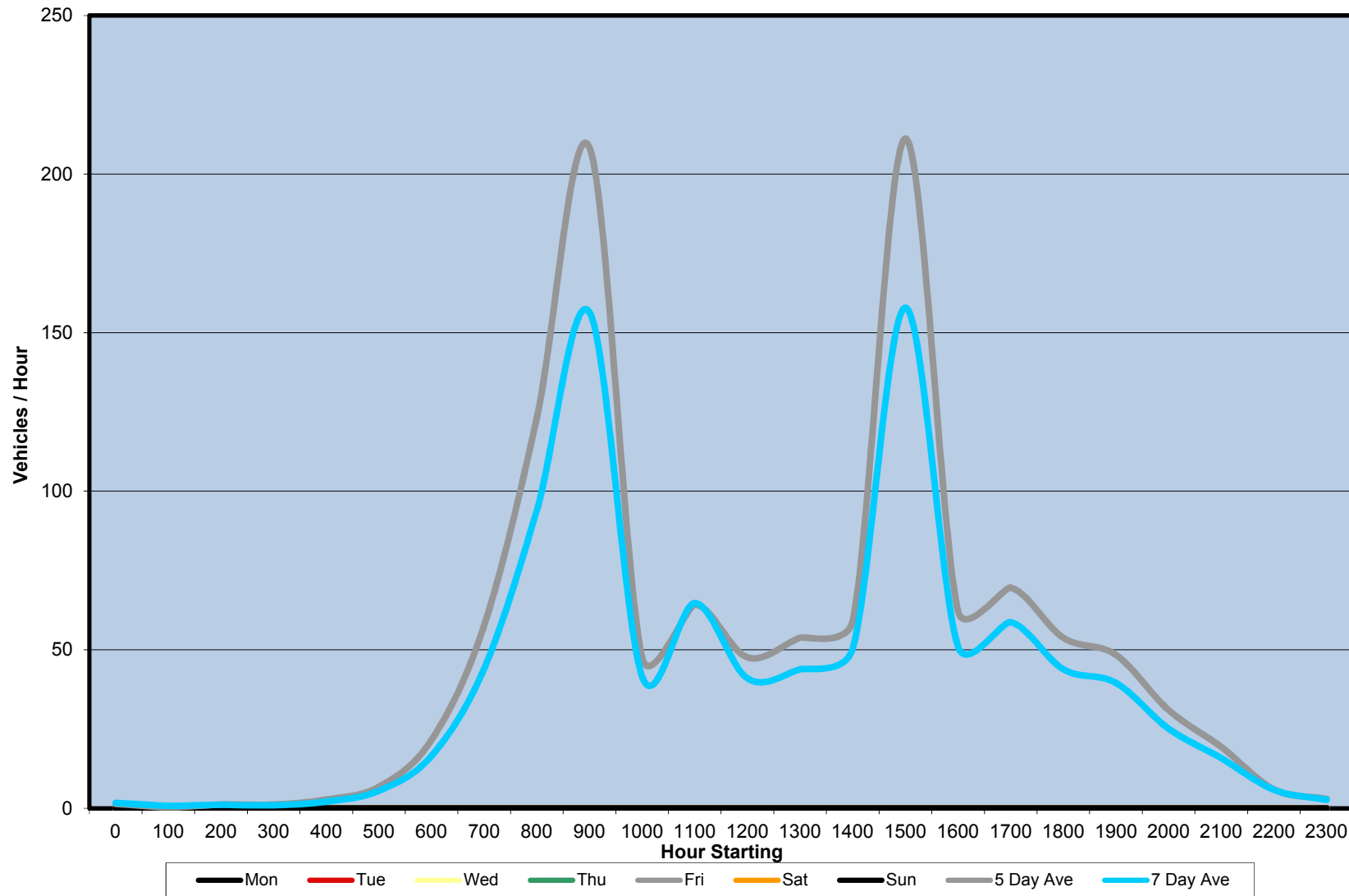
Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 4. South Circuit (south of Holden Drive)



Select Direction SB

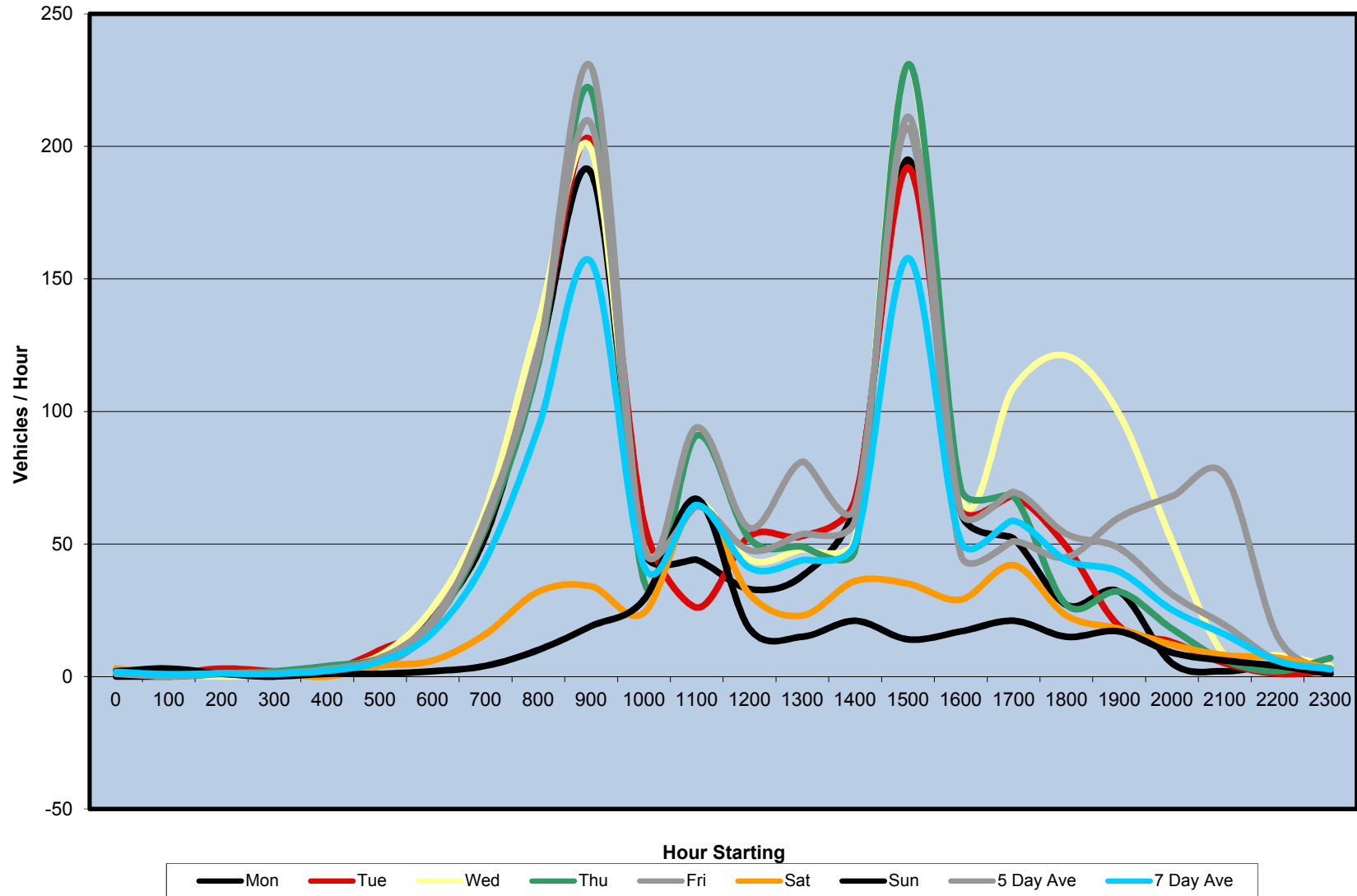


Select Day

- ☐ Mon
- ☐ Tue
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat
- ☐ Sun
- ☒ 5 Day
- ☒ 7 Day

Select Site 4. South Circuit (south of Holden Drive)

Select Direction SB



Select Day

- ☒ Mon
- ☒ Tue
- ☒ Wed
- ☒ Thu
- ☒ Fri
- ☒ Sat
- ☒ Sun
- ☒ 5 Day
- ☒ 7 Day

Job No N2836
Client Woolacotts Consulting Engineers
Site South Circuit (south of Holden Drive)
Location ORAN PARK
Site No 4
Start Date 28-Nov-16
Day Weekday Ave
Description Class Summary
Classification AustRoads94

Select Site

4. South Circuit (south of Holden Drive)

Select Day

Weekday Ave

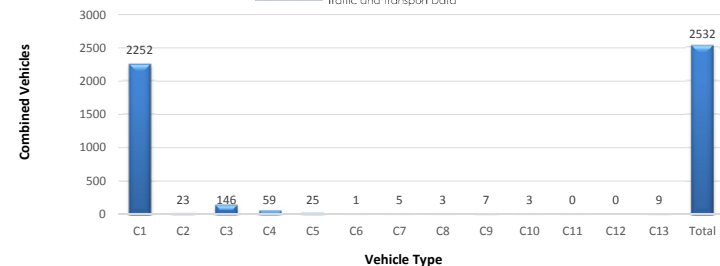
Class Summary

Light	Class 1	C	NB	SB
	Class 2	89%	88%	89%
Medium	Class 3	1%	1%	1%
	Class 4	6%	5%	6%
	Class 5	2%	3%	2%
	Class 6	1%	1%	1%
Heavy	Class 7	0%	0%	0%
	Class 8	0%	0%	0%
	Class 9	0%	0%	0%
	Class 10	0%	0%	0%
	Class 11	0%	0%	0%
	Class 12	0%	0%	0%
	Class 13	0%	1%	0%
U/C	Class 13	0%	1%	0%

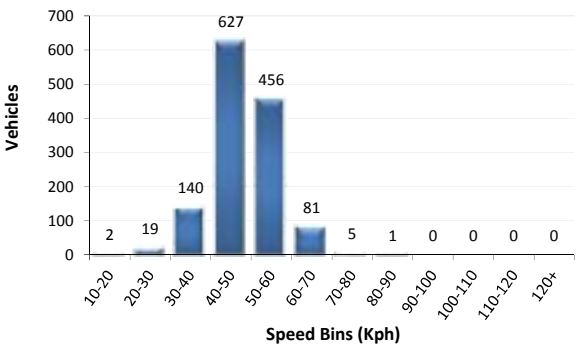


AustRoads94

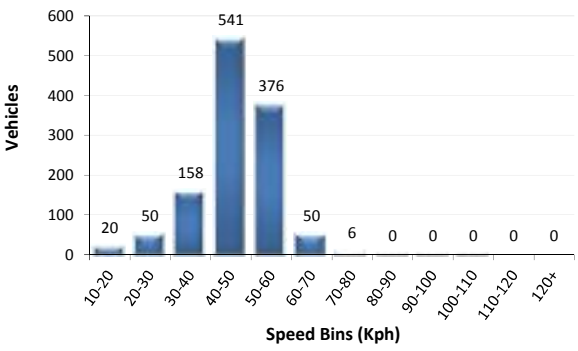
MATRIX
Traffic and Transport Data



Hour Starting	NB														SB														COMBINED														
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total	
	Short	Short towing	2 axle Truck or bus	3 axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		Short	Short Towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		Short	Short Towing	2 axle Truck or bus	3 Axle Truck or Bus	4 or 5 Axle Truck	3 axle Articulated	4 Axle Articulated	5 Axle Articulated	6 Axle Articulated	8 Double	Double Road Train	Triple Road Train	Unclassifiable		
0:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
1:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:00	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	3	4	0	1	0	0	0	0	0	0	0	0	0	0	0	5
5:00	5	0	3	0	0	0	0	0	0	0	0	0	0	8	5	0	1	1	0	0	0	0	0	0	0	0	0	7	11	0	3	1	0	0	0	0	0	0	0	0	0	0	15
6:00	40	3	9	2	1	0	1	0	0	0	0	0	0	57	17	0	3	0	0	0	0	0	0	0	0	0	0	22	58	3	13	3	1	0	1	0	0	0	0	0	0	0	78
7:00	70	1	6	1	1	0	0	0	0	0	0	0	1	81	48	0	5	2	1	0	0	1	0	1	0	0	0	58	118	1	11	3	2	0	1	1	1	0	0	0	1	139	
8:00	177	1	8	5	1	0	0	0	0	0	0	0	1	193	112	0	9	1	1	0	0	0	0	1	0	0	0	123	289	1	17	6	1	0	0	0	0	1	0	0	1	316	
9:00	158	1	4	8	3	0	0	0	0	0	0	0	3	178	197	1	7	1	1	0	0	0	0	0	0	0	0	208	356	2	12	9	4	0	0	0	1	0	0	0	3	387	
10:00	53	0	5	4	1	0	0	0	0	0	0	0	0	65	38	1	6	2	0	0	0	0	0	0	0	0	0	48	90	1	11	6	2	0	0	0	1	0	0	0	0	113	
11:00	48	1	5	3	2	0	0	0	0	0	0	0	0	59	55	1	5	1	1	0	0	0	0	0	0	0	0	64	103	2	10	4	2	0	0	0	1	0	0	0	1	124	
12:00	50	1	6	1	1	0	0	0	0	0	0	0	0	58	36	2	7	1	1	0	0	0	0	0	0	0	0	48	85	3	13	1	1	0	0	0	0	1	0	0	0	106	
13:00	30	1	5	2	1	0	0	0	0	0	0	0	0	40	45	0	5	1	1	0	0	0	1	0	0	0	0	54	76	1	10	3	2	0	0	0	1	0	0	0	0	94	
14:00	119	1	6	2	1	0	1	0	0	0	0	0	0	130	51	0	6	1	0	0	0	0	1	0	0	0	0	59	170	2	12	3	1	0	1	0	1	0	0	0	0	189	
15:00	146	1	4	2	3	0	0	0	0	0	0	0	1	157	191	3	10	4	1	0	0	0	0	0	0	0	1	211	338	3	14	6	4	0	0	0	1	0	0	0	1	368	
16:00	50	1	3	2	1	0	0	0	0	0	0	0	0	57	54	1	4	2	1	0	1	0	0	0	0	0	0	62	104	2	7	4	1	0	1	0	0	0	0	0	0	119	
17:00	90	0	2	5	1	0	0	0	0	0	0	0	1	99	64	1	3	1	0	0	0	0	0	0	0	0	0	70	154	1	5	6	1	0	0	0	0	0	0	0	1	168	
18:00	61	0	2	2	0	0	0	0	0	0	0	0	0	65	51	0	2	1	0	0	0	0	0	0	0	0	0	54	112	0	4	2	0	0	0	0	0	0	0	0	0	87	
19:00	35	0	1	1	0	0	0	0	0	0	0	0	1	38	46	1	1	0	0	0	0	0	0	0	0	0	0	48	81	1	2	2	0	0	0	0	0	0	0	0	1	119	
20:00	14	0	0	1	0	0	0	0	0	0	0	0	0	15	30	0	1	0	0	0	0	0	0	0	0	0	0	31	44	0	1	1	0	0	0	0	0	0	0	0	0	46	
21:00	8	0	0	0	0	0	0	0	0	0	0	0	0	8	19	0	0	0	0	0	0	0	0	0	0	0	0	19	27	0	0	0	0	0	0	0	0	0	0	0	0	28	
22:00	7	0	0	0	0	0	0	0	0	0	0	0	0	7	6	0	0	0	0	0	0	0	0	0	0	0	0	6	13	0	0	0	0	0	0	0	0	0	0	0	0	13	
23:00	6	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0	0	0	0	0	0	0	0	0	0	0	0	9	
Total	1177	11	69	40	18	0	3	2	2	1	0	0	7	1331	1075	11	77	19	7	1	2	1	4	2	0	0	2	1202	2252	23	146	59	25	1	5	3	7	3	0	0	9	2532	

Job No	N2836	 	Bin Summary		
Client	Woolacotts Consulting Engineers		10-20	0.2%	
Site	South Circuit (south of Holden Drive)		20-30	1.4%	
Location	ORAN PARK		30-40	10.5%	
Site No	4		40-50	47.1%	
Start Date	28-Nov-16		50-60	34.3%	
Day	Weekday Ave		60-70	6.1%	
Direction	NB		70-80	0.4%	
Description	Speed Summary	80-90	0.0%		
Select Site	South Circuit (south of Holden Drive)		90-100	0.0%	
Select Day	Weekday Ave	Select Direction	NB	100-110	0.0%
				110-120	0.0%
				120+	0.0%
				48.4	55.5

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	1	1	0	0	0	0	0	0	56.2	0
1:00	0	0	0	1	1	0	0	0	0	0	0	0	46.5	0
2:00	0	0	0	0	1	0	0	0	0	0	0	0	52.9	0
3:00	0	0	0	1	0	0	0	0	0	0	0	0	47.2	0
4:00	0	0	0	1	1	0	0	0	0	0	0	0	48.3	0
5:00	0	0	1	4	2	1	0	0	0	0	0	0	46.2	60.3
6:00	0	0	5	24	23	5	0	0	0	0	0	0	50.0	57.9
7:00	0	1	3	30	38	9	1	0	0	0	0	0	51.5	58.6
8:00	0	1	19	111	56	5	0	0	0	0	0	0	47.3	53.8
9:00	1	10	37	98	30	3	0	0	0	0	0	0	43.9	50.9
10:00	0	0	5	29	27	3	0	0	0	0	0	0	49.5	56.2
11:00	0	0	5	25	22	7	0	0	0	0	0	0	50.2	58.8
12:00	0	0	3	26	23	7	0	0	0	0	0	0	50.8	59.0
13:00	0	0	5	13	17	4	0	0	0	0	0	0	50.6	59.5
14:00	0	0	15	70	40	4	1	0	0	0	0	0	47.9	53.8
15:00	1	4	27	91	32	2	0	0	0	0	0	0	44.8	51.5
16:00	0	0	2	17	31	6	0	0	0	0	0	0	52.0	59.0
17:00	0	0	4	33	49	11	1	0	0	0	0	0	52.2	59.6
18:00	0	0	2	21	34	7	1	0	0	0	0	0	51.9	58.9
19:00	0	0	3	16	15	3	0	0	0	0	0	0	49.9	57.2
20:00	0	0	2	8	5	1	0	0	0	0	0	0	48.9	58.8
21:00	0	0	1	4	3	0	0	0	0	0	0	0	47.1	54.8
22:00	0	0	0	2	4	0	0	0	0	0	0	0	51.7	0
23:00	0	0	0	3	3	0	0	0	0	0	0	0	48.5	0
Total	2	19	140	627	456	81	5	1	0	0	0	0	48.4	55.5

Job No	N2836	 	Bin Summary		
Client	Woolacotts Consulting Engineers		10-20	1.6%	
Site	South Circuit (south of Holden Drive)		20-30	4.2%	
Location	ORAN PARK		30-40	13.1%	
Site No	4		40-50	45.0%	
Start Date	28-Nov-16		50-60	31.3%	
Day	Weekday Ave		60-70	4.2%	
Direction	SB		70-80	0.5%	
Description	Speed Summary	80-90	0.0%		
Select Site	South Circuit (south of Holden Drive)		90-100	0.0%	
Select Day	Weekday Ave	Select Direction	SB	100-110	0.0%
				110-120	0.0%
				120+	0.0%
				46.4	54.5

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	46.5	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	41.3	0
2:00	0	0	0	1	0	0	0	0	0	0	0	0	46.3	0
3:00	0	0	0	0	1	0	0	0	0	0	0	0	49.3	0
4:00	0	0	1	1	1	0	0	0	0	0	0	0	48.7	0
5:00	0	1	1	3	1	0	0	0	0	0	0	0	43.5	0
6:00	0	1	1	11	8	0	0	0	0	0	0	0	48.1	54.8
7:00	0	1	6	21	24	4	1	0	0	0	0	0	50.0	58.5
8:00	0	1	11	67	41	3	0	0	0	0	0	0	47.8	53.9
9:00	0	1	24	127	50	5	0	0	0	0	0	0	46.7	52.6
10:00	0	0	6	24	14	3	0	0	0	0	0	0	47.9	56.1
11:00	0	0	8	28	24	3	1	0	0	0	0	0	48.8	56.8
12:00	0	1	7	21	17	1	0	0	0	0	0	0	47.5	55.5
13:00	0	0	6	22	21	4	0	0	0	0	0	0	49.9	57.6
14:00	0	0	7	28	21	3	0	0	0	0	0	0	48.8	56.0
15:00	18	40	55	68	27	3	0	0	0	0	0	0	37.4	49.6
16:00	0	0	4	24	29	5	0	0	0	0	0	0	50.6	58.2
17:00	0	1	3	27	30	7	2	0	0	0	0	0	51.5	59.1
18:00	0	1	2	20	26	4	0	0	0	0	0	0	50.1	57.9
19:00	0	1	4	18	23	2	0	0	0	0	0	0	48.6	55.8
20:00	0	0	5	16	9	0	0	0	0	0	0	0	44.3	52.8
21:00	0	1	4	11	3	0	0	0	0	0	0	0	45.5	51.3
22:00	0	0	0	3	2	0	0	0	0	0	0	0	45.3	58.7
23:00	0	0	0	0	2	0	0	0	0	0	0	0	50.5	0
Total	20	50	158	541	376	50	6	0	0	0	0	0	46.4	54.5

Appendix B

Drawings