

**BEFORE DUNEDIN CITY COUNCIL
LUC-2017-319**

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application for resource consent by BP Oil New Zealand Limited for redevelopment at BP Mosgiel, 70 – 76 Gordon Road, Mosgiel, Dunedin

**STATEMENT OF EVIDENCE OF MICHAEL CHRISTOPHER ROSSITER ON
BEHALF OF BP OIL NEW ZEALAND LIMITED**

TRAFFIC

Dated: 29 November 2017



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Barristers & Solicitors

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INTRODUCTION

1. My full name is Michael Christopher Rossiter. I am a Principal Transportation Engineer with TDG (previously Traffic Design Group) and have held that position since 2014. I have eleven years of experience in traffic engineering and transportation planning within New Zealand and over 30 years of professional engineering practice.
2. Prior to moving to New Zealand, I worked for over twenty years as a Systems Engineer in England and was registered as a Chartered Engineer with the Institute of Engineering and Technology.
3. I am now a Chartered Professional Engineer and a Member of Engineering New Zealand. I hold a Bachelor of Science degree from the University of Exeter, England (1985).
4. I have been responsible for investigating and evaluating the traffic and transportation effects of a wide range of land use developments throughout New Zealand. These have included specific resource consent applications as well as subdivision and plan change applications.
5. My specific experience relevant to this evidence includes investigation of expected transportation and parking related effects for the development of:
 - (a) BP Edgware, Christchurch;
 - (b) BP Harewood, Christchurch; and
 - (c) Countdown, Mosgiel.
6. TDG was commissioned by BP Oil New Zealand Limited (**BP Oil**) to evaluate the transport related effects of the proposal to redevelop their existing facilities on Gordon Road, Mosgiel, create a BP Connect shop, and improve customer facilities. I supervised the integrated transportation assessment (ITA) report that forms part of the technical appendices to the application and have been asked by BP Oil to respond to the transport matters raised in submissions.

7. In preparing my evidence, I have reviewed:

- (a) the AEE: Application to Dunedin City Council for redevelopment at BP Mosgiel, 70 – 76 Gordon Road, Mosgiel, Dunedin. June 2017;
- (b) the Council's section 95B report, dated 20 September 2017;
- (c) all submissions received on land use application to the Council;
- (d) the Council's section 42A Officer's Report and Appendices; and
- (e) evidence prepared by **Mr John Chandler** (BP Oil), **Ms Fiona Small** (Planning), **Mr Peter Runcie** (Noise) and **Mr Paul Gilbey** (Lighting).

CODE OF CONDUCT

8. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state that I am relying on the advice of another person, this evidence is entirely within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

9. In my evidence, I will:

- (a) provide an overview of the transport environment and identify any changes from the information presented in the ITA;
- (b) describe the transport effects of the proposal;
- (c) respond to the submissions of Gwendoline Bambery, Craig Byers, Judith and Eric Kirby, Victor and Gertruda McDonald and Leon Roff; and,
- (d) comment on the transport related matters identified in the s42A report.

EXECUTIVE SUMMARY

10. BP Oil operates a service station and workshop at 72-76 Gordon Road in Mosgiel. I commissioned surveys of vehicle movements at the driveways during the morning and evening peak periods to provide a basis for assessing the traffic effects of the proposed redevelopment of the site. The surveys indicate that the traffic generation of the service station is similar to

the 85th percentile traffic generation rate of service station reported in NZTA Research Report 453 "Trips and Parking related to Land Use" (RR453).

11. My investigation of service station traffic generation rates indicates that there are two components to the traffic generation. The traffic generation associated with fuel purchases typically correlate more strongly with the volume of passing traffic rather than the number of pumps and on this basis, I expect that the increased number of pumps will reduce queuing times for customers but will not change the fuel related traffic generation.
12. The addition of the BP Connect shop will increase the traffic generation of the site by 20-30 vehicle movements per hour at peak times compared with the current situation. In my opinion, this will not lead to any noticeable traffic effects because this is smaller than the day to day variation in peak hour traffic volumes on Gordon Road.
13. The new site layout provides ample parking for customers using the new shop and will not contribute to higher on-street parking demands. Although the proposed changes to the parking arrangements along the site frontage will remove one parking space, in my opinion, the proposed layout will improve safety by reducing the potential for parking vehicles to obstruct sight lines at the driveways.
14. Overall, I have concluded that the proposed redevelopment can be supported from a transport perspective.

TRANSPORT ENVIRONMENT

Site Location

15. **Figure 1** shows the location of the existing BP service station at 72-76 Gordon Road. The site accommodates a small shop, workshop, licencing agency, trailer hire and fuel pumps. All access to the site is via five vehicle crossings to Gordon Road.

Road Network

16. Gordon Road forms part of State Highway 87 (**SH87**) which provides a connection from Mosgiel and Central Otago to the Dunedin Southern Motorway and is classified as a Secondary Collector road under the NZTA

One Network Road Classification Scheme. Secondary Collector roads link significant regional destinations such as Mosgiel with national routes such as State Highway 1 (**SH1**). Within urban area, secondary collector routes may carry high volumes of pedestrians and cyclists.

17. The Dunedin City District Plan classifies Gordon Road as a National Road because it forms part of the state highway network. Within the District Plan, national roads provide for the greatest level of movement with minimum access function. They connect major localities and link with areas outside of Dunedin city.
18. Gordon Road is the main road through Mosgiel. The land on either side of Gordon Road is zoned as Residential 2 generally south of Ayr Street and as Local Activity Zone 1 within central Mosgiel. There are several existing, non-residential activities located along Gordon Road within the Residential Zone including the BP service station, the new Countdown supermarket, community facilities and retail facilities. In my opinion, the mix of activities that have been established along Gordon Road reflect its role in the transport network.
19. A new set of traffic signals was recently installed at the Inglis Street intersection about 250m south of the site to provide safe access to the Countdown supermarket.

Travel Patterns

20. **Figure 2** and **Figure 3** show traffic volume information recorded on Gordon Road in September 2016 and in September 2017 respectively.
21. The morning peak hour traffic volume in 2017 ranged from 1,070vph to about 1,200vph with an average of about 1,130 vehicles per hour (vph) compared with an average of 1,120vph in 2016. The evening peak hour traffic volumes in 2017 ranged from 1,120vph to 1,400vph and the average weekday volume of 1,260vph also showed a small increase from 1,230vph in 2016. However, there was no change in the total volume of weekday traffic recorded on Gordon Road between 3:00pm and 6:00pm and the average daily weekday traffic volume was lower in 2017 than in 2016. In my opinion, this suggests that there has been no noticeable growth in the traffic volumes on Gordon

Road in the last year even with the opening of the new Countdown supermarket.

22. **Figure 4 and Figure 5** show the driveway turning volumes recorded at the existing facilities in May 2017. The survey recorded 85 vehicle movements over a one hour period in the morning and about 90 movements¹ in the evening peak hour. The volume of driveway movements suggests that 3-4% of passing vehicles stopped at the service station.
23. The vehicle movements at the southern driveways were predominantly associated with the fuel pumps. The analysis of turning patterns at these driveways suggests that about 75% of all movements followed a “pass-by” pattern, that is, they involved either two left turn movements or two right turn movements. This type of movement reflects the most common driver behaviour at service stations where fuel is purchased as a secondary activity enroute to another destination. The other movements at the service court involved customers arriving and departing from the same direction.
24. During the survey, 13% of all driveway movements were not directly associated with the fuel facilities and occurred at the northern end of the site.

Road Safety

25. Road crash information for the five-year period 2012-16 is included in the ITA for the section of Gordon Road between Laing Street and Ayr Street. None of the reported crashes involved vehicle movements at the driveways to the service station.
26. There have been three crashes reported on Gordon Road in 2017 with none of the crashes resulting in injuries. None of the crashes involved vehicles using the existing site facilities. On this basis, I have no safety concerns regarding the operation of the existing site.

TRAFFIC GENERATION

27. The RR453 report recommends that the 85th percentile traffic generation rate is adopted for design and assessment purposes. This represents a rate that broadly corresponds with the 50th busiest hour of the year. The survey of

1 Extrapolated from a 30-minute survey.

the existing facilities recorded a traffic generation rate of about 100vph per 100m² GFA² (**Ground Floor Area**). This is consistent with the 85th percentile traffic generation rate for service stations reported in RR453 and therefore, I consider that the observed traffic generation rate provides a good basis for assessing future traffic generation.

28. TDG has previously undertaken traffic surveys at other BP service stations around New Zealand. I have used this data in conjunction with survey data published in RR453 and the survey data from the Mosgiel service station to estimate the traffic generation of the service station following the site redevelopment.
29. The Mosgiel survey indicated that at least 75% of driveway movements were associated with pass-by travel patterns. This is consistent with other surveys³ which have indicated that the majority of trips to a service station are by vehicles already on the road network, such as passing traffic, and that service stations do not generate a significant number of primary trips, that is, trips that are solely to and from the service station.
30. One consequence of this trip pattern is that the traffic generation of a service station has a greater correlation with the volumes of passing traffic than with the facilities provided on the site such as the number of fuel pumps. Since the traffic volumes on Gordon Road show very low levels of growth, I consider that it is unlikely that the increase in the number of fuel pumps would contribute to a noticeable increase in the volume of driveway movements of the service station.
31. I understand that the proposed site expansion is in response to existing demand with the objective of providing a much enhanced service and associated increased spend per trip by existing customers. Since this will make the site more attractive for customers, I would expect any increase in traffic generation into the BP site will be associated with the non-fuel related purchases rather than the increase in number of fuel pumps.
32. The observations of vehicle movements at the driveways suggests that 10-15 movements during the morning and evening peaks did not involve fuel purchases. If this component increased in direct proportion to the change in

² ITA, Section 5.1.

³ TDG survey at BP Edgeware, in Christchurch.

shop size ($290\text{m}^2 / 80\text{m}^2$), there could be 25-30 additional vehicle movements per hour at the driveways compared with the current site.

- 33.** Since the BP Connect shop will have generated a different pattern of vehicle movements over the day compared with the existing workshop, I have also investigated an alternative approach to estimating the non-fuel related traffic generation of the shop. The RR453 report recommends traffic generation rates for design purposes for a range of activities. The 85th percentile design rate for a shop is 42.5vph per 100m² GFA and applying this rate to the proposed BP Connect shop results in a forecast peak hour traffic generation of 123vph. Based on transaction information from the BP Edgeware service station which has a similar sized BP Connect shop to the one proposed in Mosgiel, at least 70% of the shop activity would be expected to be associated with fuel purchases. On this basis, the non-fuel related purchases could be expected to generate about 35vph at peak times. As this would replace the existing 10-15 vehicle movements associated with the existing workshop activity, the net increase in driveway movements following the redevelopment based on this calculation would be 20-25 movements per hour during the busiest times of the day.
- 34.** The traffic generation and parking demands for small shops providing coffee and snack food typically peaks between late morning and early afternoon before falling through the afternoon and evening. Based on parking demand rates reported in the ITA Parking Manual, I would expect the traffic generation during the evening, that is after 6:00pm, to be less than 30 percent of the peak traffic generation. On this basis, the BP Connect shop would generate a maximum of 10-15 non-fuel related vehicle movements during the evening.
- 35.** Overall, I have concluded that the proposed site re-development will increase the peak hour traffic generation associated with the BP site by 20-30vph, with the most probable value being at the lower end of this range. During the evening, I would expect any change in the traffic volumes to be primarily associated with non-fuel related purchases at the shop and that the change in vehicle movements would be less than 10-15vph.

TRANSPORT EFFECTS

36. An increase of 20-30vph in the volume of driveway movements at peak times could change the traffic volume on Gordon Road by 10-20vph depending upon the pattern of movements generated by the non-fuel related activity. Since the peak hour traffic volumes on Gordon Road vary by more than this on a daily basis, I do not consider that this would contribute to a noticeable effect for other drivers.
37. The consolidation of driveways from five⁴ to two following the redevelopment moves the driveways further from the driveways of neighbouring properties and will reduce the number of conflict points with pedestrians which will improve safety for pedestrians using the footpath beside the service station.
38. Although the number of crossings still exceeds the maximum permitted under the District Plan (one), in my opinion, this provides a better access configuration for motor vehicles with greater separation between potential vehicle conflict points which contributes to greater efficiency of movement into, within and from the site.
39. The increase in the number of fuel service lanes to eight will also reduce the likelihood that vehicles will queue back from the forecourt onto Gordon Road. This will contribute to higher levels of safety at the driveways.

SUBMISSIONS

40. The increased volume of vehicle movements at the service station has been raised in the several submissions.⁵ The hourly traffic volumes on Gordon Road vary widely across the day and also through the week. In my opinion, an increase in the peak hourly traffic volumes of 10-20vph would not be noticeable against this level of variation.
41. Mr Kirby has raised concerns about increased traffic volumes at all times of the day. The volumes of movements at service station driveways are strongly correlated with the volume of passing traffic. In my opinion, the change in the number of fuel pumps will not affect the volume of driveway movements. However, the BP Connect shop could generate 20-30

⁴ Four at existing site and one at 70 Gordon Road.

⁵ Judith and Eric Kirby, Craig Byers, Gwendoline Bambery and Leon Roff.

additional vehicle movements at the driveways during the peak hours and generate lower volumes throughout the rest of the day. At peak times, this level of increase represents one extra vehicle movement at the driveways every two to three minutes compared with the current situation. I do not consider that this would be noticeable against a background traffic volume on Gordon Road of 1,100-1,300vph.

42. The traffic surveys at the service station recorded 85-90 vehicle movements per hour at the driveways during the peak hours on Gordon Road. The forecast increase in the volume of driveway movements of 20-30vph following redevelopment represents a 25-35% increase. Mr Byers considers that the increase in vehicle movements is more than a minor effect because it represents a large percentage change. In my opinion, the percentage change does not provide a good basis for assessing whether the increase is a minor effect because of the small magnitudes of the numbers involved. At peak times, the existing facilities generate one vehicle movement every 40-45 seconds on average. Following the redevelopment, the service station could generate one vehicle movement every 30-35 seconds during the busiest periods of the day. In my opinion, this would not contribute to a noticeable effect because the high traffic volumes at peak times on Gordon Road mean that there is one vehicle passing the site every three to four seconds.
43. Mr Byers suggests that the analysis of traffic effects has been based on models. This is incorrect: the analysis has been based on surveys of driveway movements at the existing service station as shown in **Figure 4** and **Figure 5** and also on survey information collected for a similar improvement at BP Edgeware in Christchurch.
44. Mr Kirby is concerned that the new service station will increase the volume of heavy vehicle movements. The closure of the vehicle servicing workshop and removal of the truck stop will reduce the volume of for heavy vehicle movements at the site. There will still be a need to service the BP Connect shop but I would expect this to involve four truck movements or less per day (in and out) on average.

45. Mr McDonald has raised concerns about the effects of the development upon on-street parking.⁶ The Gordon Road frontage to the site is about 80m long and the current configuration of driveways allows five vehicles to be parked on the street clear of the driveways. The proposed development will reduce the number of driveways from five⁷ to two and reduces the number of on-street parking spaces by one because “no stopping” lines are proposed between the new service station driveways to improve safety by reducing the potential for parked vehicles to obstruct sight lines. No changes to parking are proposed on the opposite side of Gordon Road in front of Mr McDonald’s property. Since the development will provide ample parking on site for customers of the BP Connect shop, I do not expect the proposed changes to the on-street parking on the site frontage to have any noticeable effect on parking in the area.

OFFICER’S REPORT AND CONSENT CONDITIONS

46. I have read the Council’s planning report and have the following comments on transport related matters raised in that report.
47. The planning report notes that the New Zealand Transport Agency (NZTA) has proposed three conditions of consent.⁸ In my opinion, these are appropriate and should be included as part of the conditions of consent if resource consent is granted.
48. The planning officer suggests that the traffic generation of the new shop will generate traffic movements through the night at the same level as during the peak hour.⁹ I consider that this is unlikely based on transaction data that I have seen for fuel related purchases at a service station and separately for a supermarket. The volume of fuel related driveway movements between 9:00pm and midnight were about 50 percent of the peak hour movements. By comparison, I would expect the non-fuel / shop related transaction rates over this period would be about-30% or less of the peak rate. On this basis, I would expect the shop would be generating less than ten vehicle movements per hour at these times.

6 Victor McDonald.

7 Four at existing service station plus one for 70 Gordon Road.

8 Paragraph 142.

9 Paragraph 149.

49. While I agree that this may still be noticeable compared with the current environment with no driveway movements, in my opinion, the change in traffic volumes on Gordon Road would not be noticeable.
50. The Council's transport planner has noted that traffic volumes on Gordon Road may increase as a consequence of increased residential development south-east of Mosgiel. Based on the peak hour traffic volumes on Gordon Road and the observed driveway turning volumes, I have calculated that 3-4% of vehicles using Gordon Road during the peak hours will have stopped at the existing service station. Although the proposed shop could marginally increase this percentage, a ten percent increase in the Gordon Road traffic volumes would only increase the volume of driveway movements by 10vph at peak times. Since any growth in the Gordon Road traffic would be spread over several years, I would not expect any effects to be noticeable to drivers.
51. The transport planner has proposed five conditions of consent relating to the design of the vehicle crossings, conditions 15 to 19. I consider that these are appropriate.

CONCLUSION

52. The ITA that was prepared as part of the resource consent application concluded that the traffic generation of the service station would increase by about 20 vehicle movements per hour at peak times. I have now investigated the traffic generation using some different approaches and have concluded that the future traffic generation of the service is likely to be 20-30vph higher than at present during the morning and evening peak hours.
53. Even with this higher level of traffic generation, I have concluded that any traffic effects are unlikely to be noticeable against the background volume of traffic on Gordon Road which exceeds 1,100vph at peak times and has a day to day variation in hourly volumes of more than 50vph compared to the weekday peak hour averages.
54. Since the site layout provides ample parking to meet the anticipated parking demands generated by the BP Connect shop, I do not expect the proposal to generate any parking effects on Gordon Road.

55. I have reviewed the submissions on the proposal and these do not change my opinion that the proposal will not contribute to noticeable traffic effects and can be supported from a transport perspective.

A handwritten signature in dark ink, appearing to read "C. Rossiter". The signature is written in a cursive, flowing style.

Chris Rossiter

29 November 2017



Figure 1: Aerial View of Site (Source: Dunedin City GIS)

**08700001 Gordon Road,
Mosgiel (Two-Way)**

Week Beginning Sun 18-Sep-16

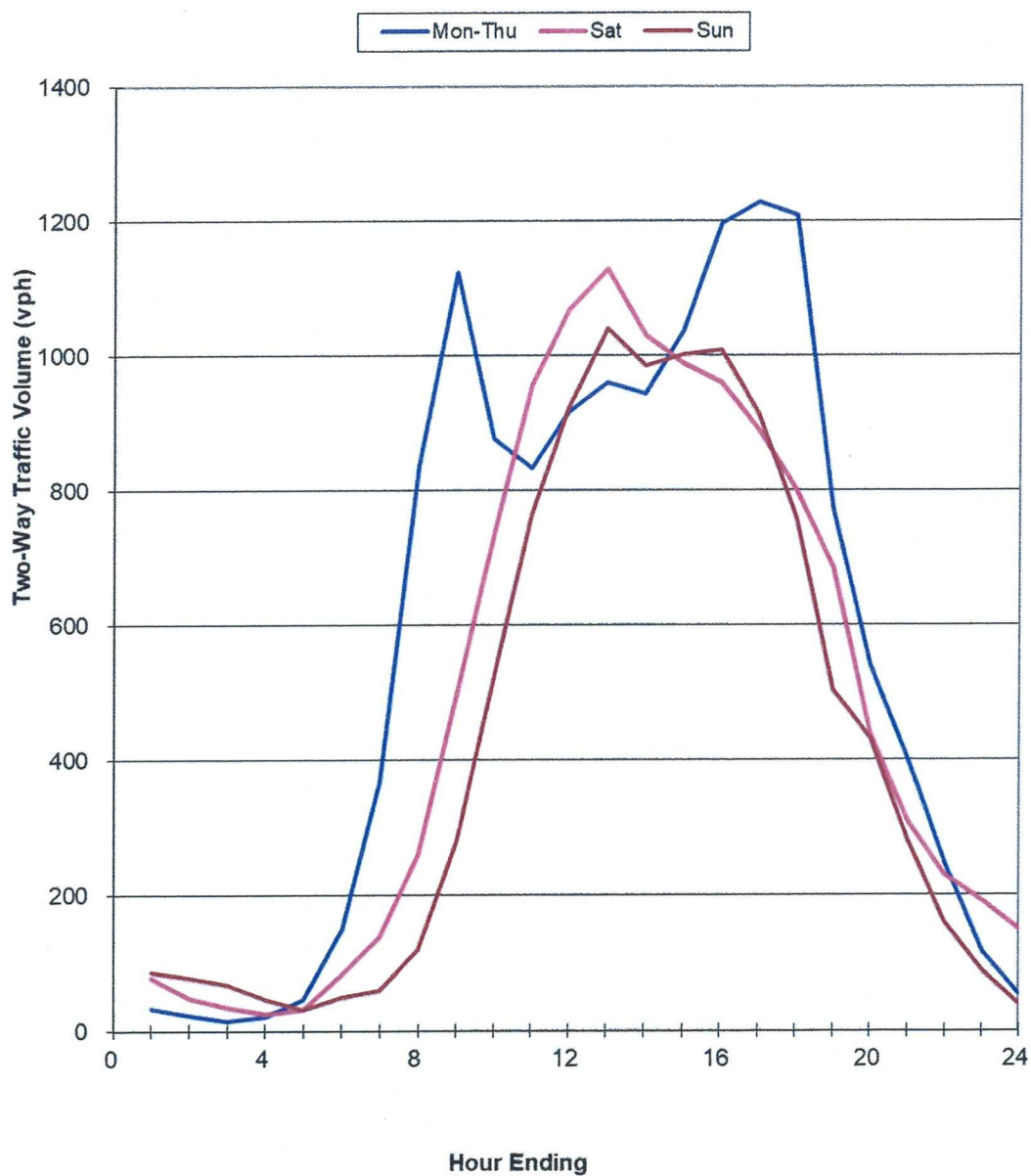


Figure 2: Traffic Volumes on Gordon Road – 2016

**08700001 Gordon Road,
Mosgiel (Two-Way)**

Week Beginning Sun 17-Sep-17

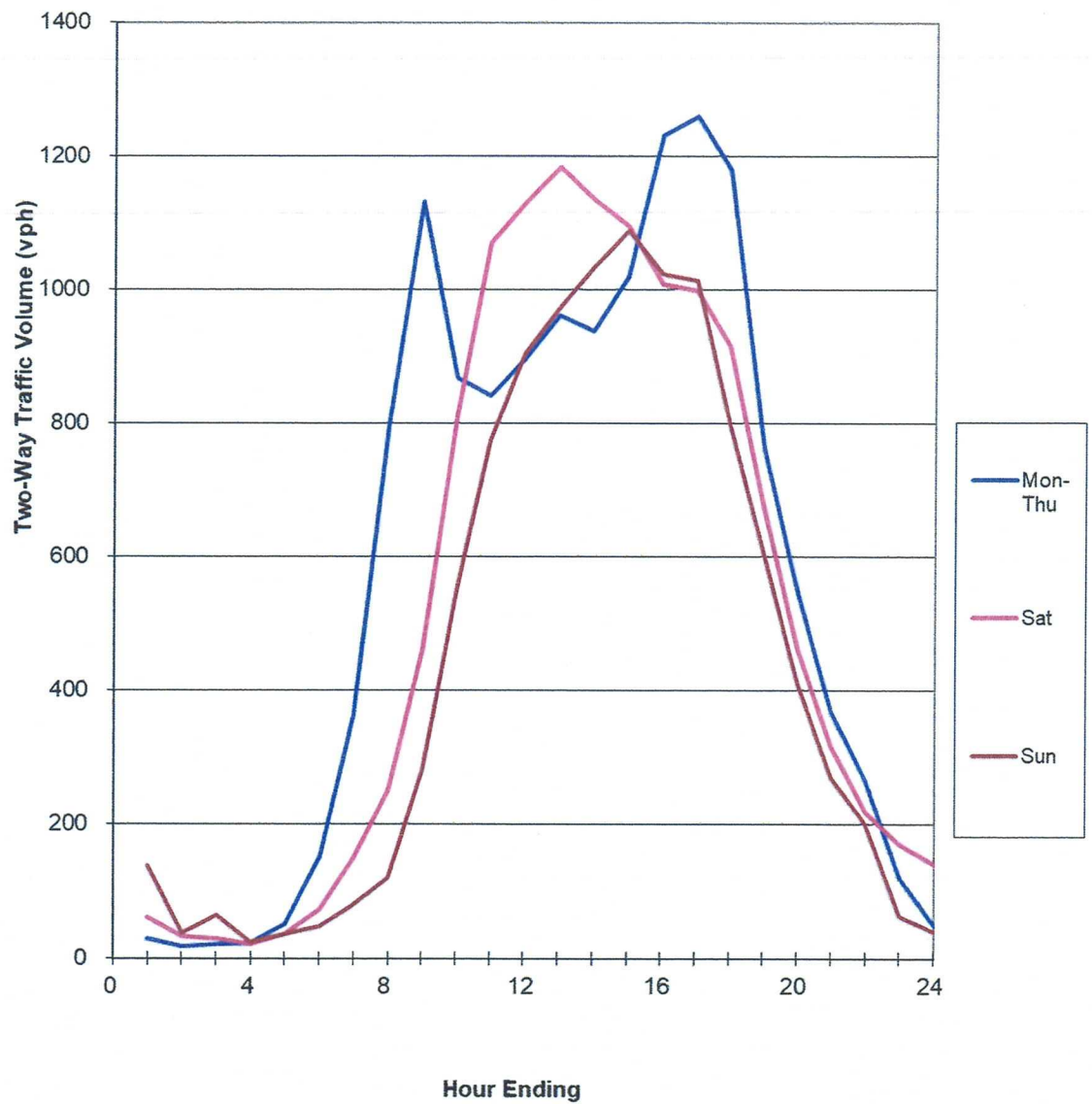


Figure 3: Traffic Volumes on Gordon Road – 2017

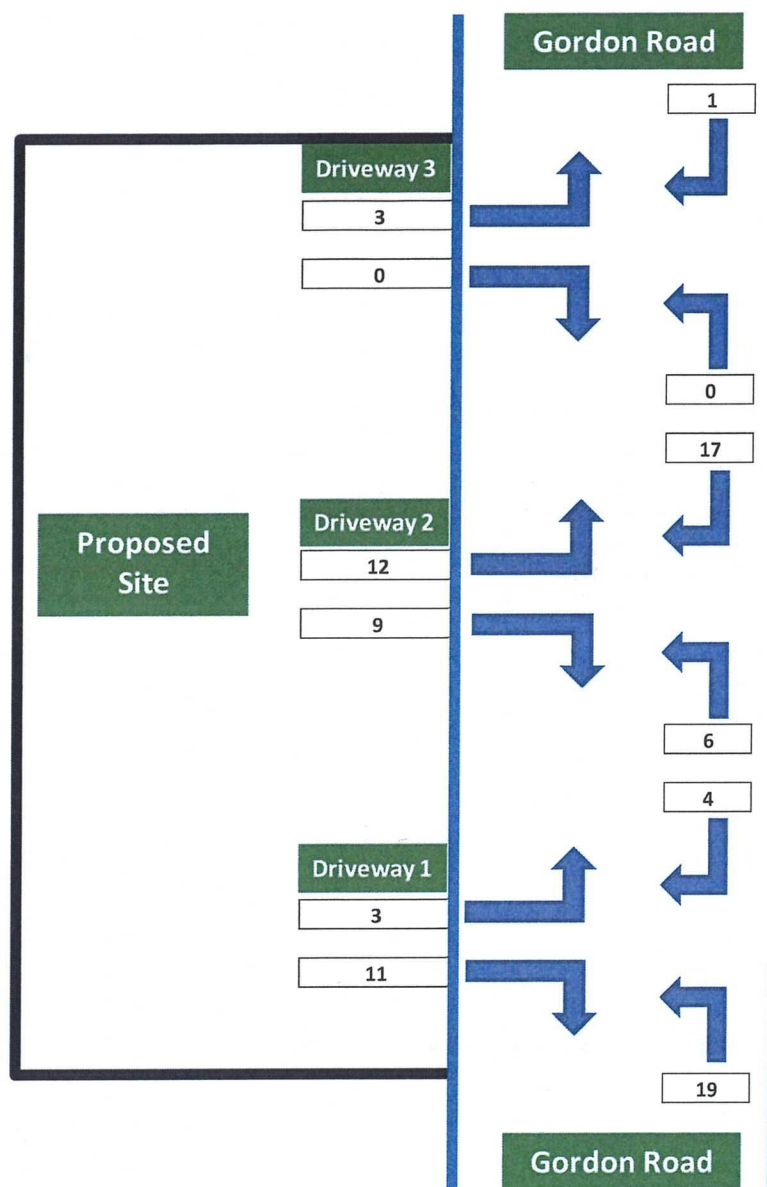


Figure 4: Driveway Movements at Existing facilities – Morning Peak

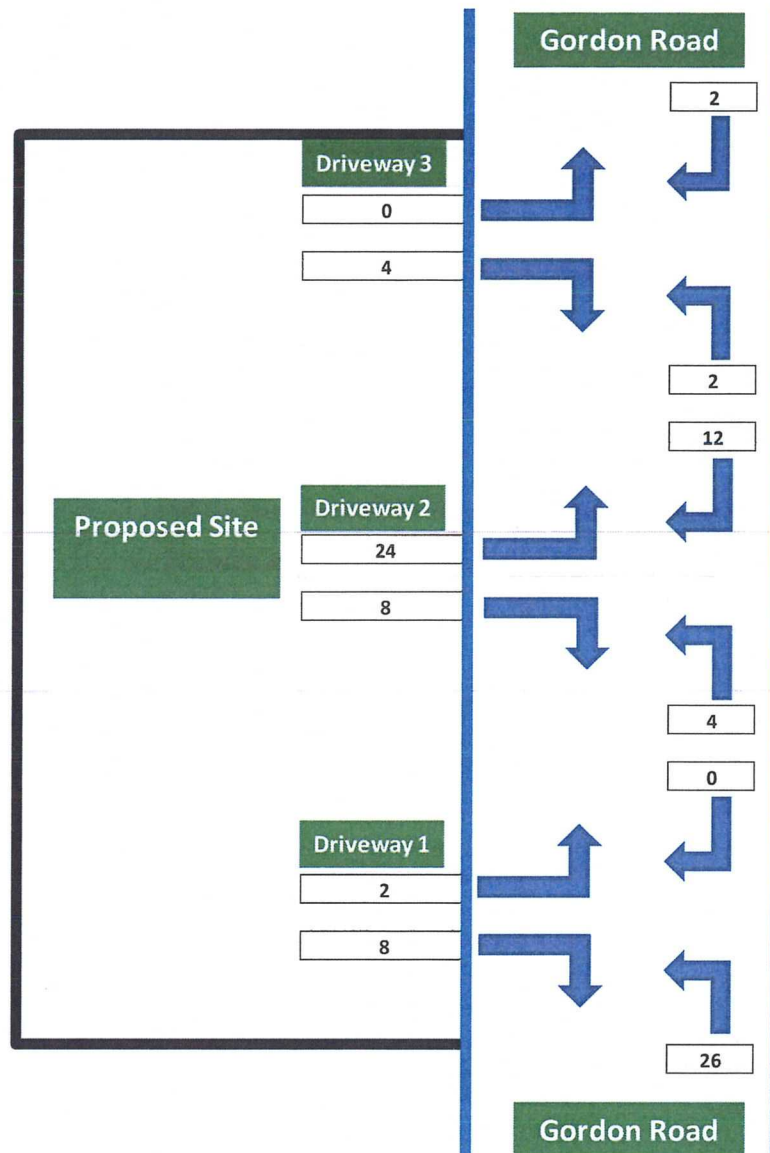


Figure 5: Driveway Movements at Existing facilities – Evening Peak