

Traffic Data Analysis

Yonge St.

Eastbound and Westbound



Town of Midland
Engineering Department

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1.0 Introduction

A traffic count was conducted from September 7th to September 20th, 2022 on Yonge St. for both eastbound and westbound directions. Vehicle speeds and traffic volume were collected by a traffic trailer (model ATS-3). The purpose is to see if there is any speeding issue around the school zone and raise safety awareness and help calm traffic by displaying speeds of vehicles approaching.

1.1 Location

The traffic trailer was placed on Yonge St between sidewalks and curbs to record the speed and volume of vehicles entering the school zone for both directions. Table 1 below shows the location of the traffic trailer and data collection period.

Table 1 Locations of Traffic Trailer

Direction	Location	Period
Eastbound	741 Yonge St, Midland, ON	6:00pm on September 7 th , 2022 – 01:00pm on September 14 th , 2022
Westbound	711 Yonge St, Midland, ON	01:00pm on September 14 th , 2022 – 1:00pm on September 21 st , 2022

1.2 Traffic Trailer

The traffic trailer used was model ATS-3 as shown in the Figure 1. The traffic trailer is set to display the speed of the approaching vehicle and display short messages depending on the speed. The traffic trailer uses radar to detect vehicles and group collected data into 1-hour intervals. The speed limit in this community safety zone changes at different time of a day according to school times. Therefore, the challenge was to change the settings on the trailer to correspond this schedule.



Figure 1 Traffic Trailer

2.0 Speed Summary

The posted speed limit on Yonge St is 50km/h; however, the traffic trailer was placed in a community safety zone where the speed limit will change to 40km/h during school times (08:15 to 9:00, 12:30 to 13:40, and 15:00 to 16:00 on weekdays).

Table 2 shows an overall speed summary for eastbound and westbound directions. The traffic trailer detected that the maximum speed of 92km/h occurred in the early morning (4:00) in the eastbound direction. For westbound, the maximum speed was 91km/h during the typical rush hour (18:00). Generally, it is accepted that vehicles that are travelling up to 10km/h above the posted speed limit are not considered to be speeding.

Table 2 Speed Summary

Direction	Time Period	Speed Limit (km/h)	Average Speed (km/h)
Eastbound	00:00-23:59	-	43.16
	00:00-07:59	50	44.98
	*08:00-08:59	40	41.43
	09:00-11:59	50	42.73
	*12:00-13:59	40	42.74
	14:00-14:59	50	43.8
	15:00-15:59	40	41.3
	16:00-23:59	50	43.55
Westbound	00:00-23:59	-	46.98
	00:00-07:59	50	48.58
	*08:00-08:59	40	45.76
	09:00-11:59	50	45.53
	*12:00-13:59	40	47.91
	14:00-14:59	50	46.84
	15:00-15:59	40	44.54
	16:00-23:59	50	47.89

*It is noticed that the traffic trailer is only able to collect data for one-hour intervals which could skew the average speed up when the speed limit is 40km/h. For example, the speed limit changes to 40km/h from 12:30 to 13:40; however, the best matched data can be downloaded from the traffic trailer is from 12:00 to 13:59. Therefore, the speed data collected during the 50km/h speed limit period (12:00-12:29 and 13:41-13:59) was also included in the 40km/h speed limit period.

2.1 Eastbound Speed Analysis

Figure 2 and 3 below show the percentages and speed ranges for eastbound traffic during speed limit of 40km/h and 50km/h respectively. As mentioned above, the traffic trailer groups data into one-hour intervals. Therefore, the percentages would be skewed when analyzing the 40km/h speed limit period.

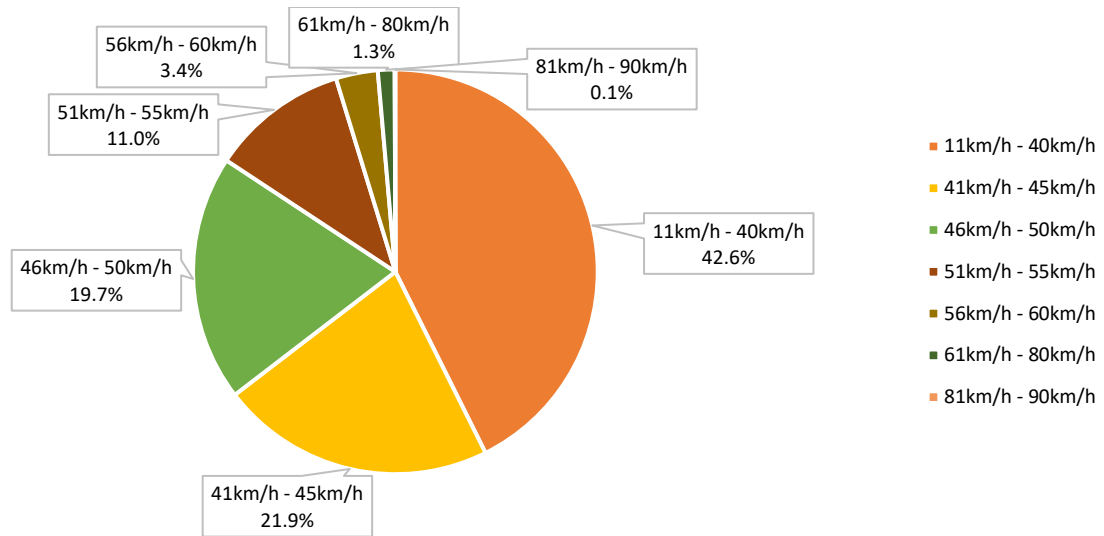


Figure 2 Yonge St. Eastbound Speed Ranges Pie Chart (speed limit: 40km/h)

Figure 2 above shows the speed summary for the eastbound traffic during school times. From this summary we can see that 42.6% of vehicles were travelling below the school times speed limit, 41.6% of vehicles were travelling between 41-50 km/h, and 15.8% of vehicles were travelling above 50km/h. When we consider the accepted speed limit is 10km/h over the school times speed limit, we find that a total of 84.2% of vehicles were travelling within the accepted speed limit.

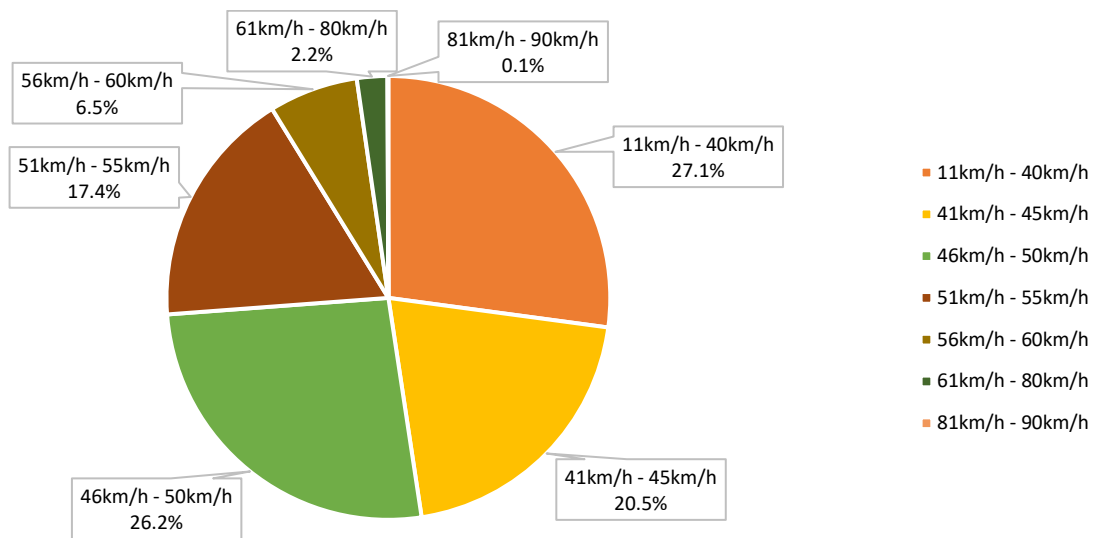


Figure 3 Yonge St. Eastbound Speed Ranges Pie Chart (speed limit: 50km/h)

Figure 3 above shows the speed summary for the 50km/h speed limit period. From this summary we can see that 73.8% of vehicles were travelling below the posted speed limit, 23.9% of vehicles were travelling between 51-60 km/h, and 2.3% of vehicles were travelling above 60km/h. When we consider

the accepted speed limit is 10km/h over the posted speed limit, we find that a total of 97.7% of vehicles were travelling within the accepted speed limit.

Figure 4 is the speed by hour graph in the eastbound direction from September 7th to September 9th and from September 12th to September 14th (weekday).

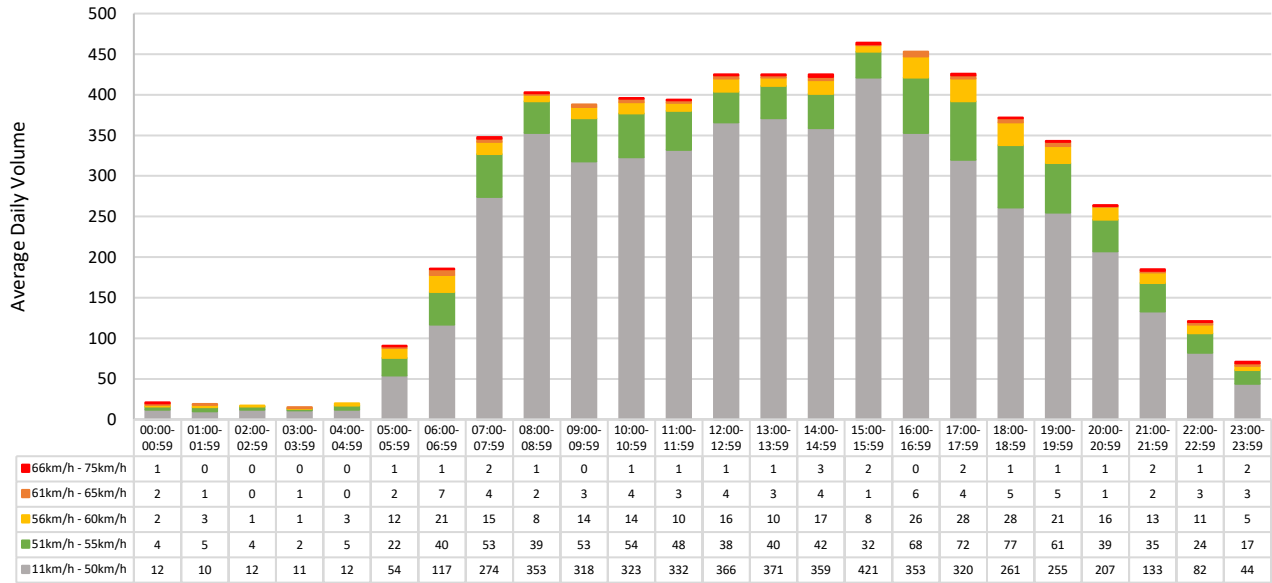


Figure 4 Speed by Hour Analysis for Eastbound (weekday)

Figure 5 is the speed by hour graph in the eastbound direction from September 10th to 11th (weekend).

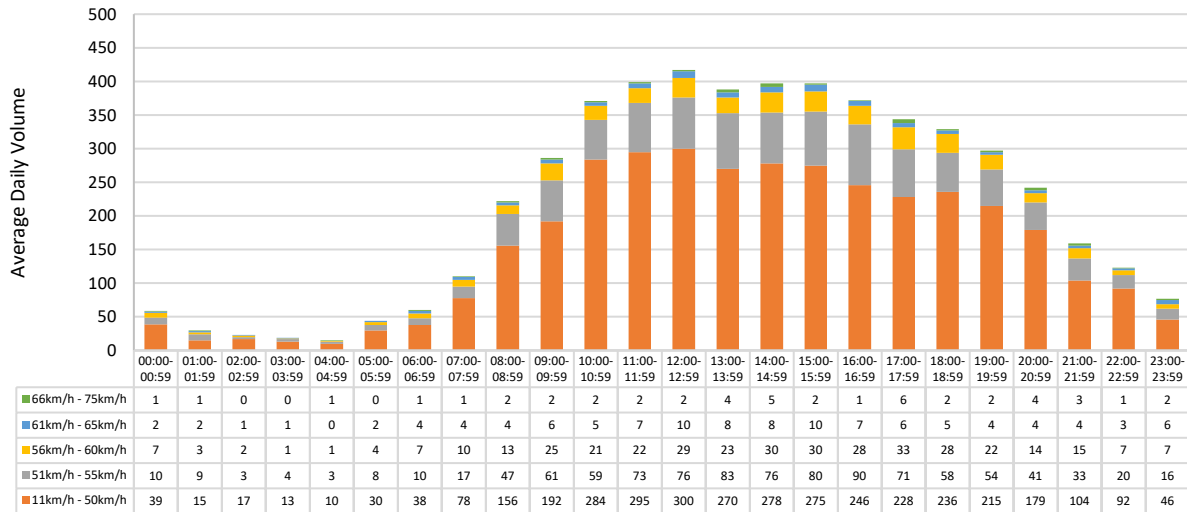


Figure 5 Speed by Hour Analysis for Eastbound (Weekend)

2.2 Westbound Speed Analysis

Figure 6 and 7 below are the percentages and speed ranges for Westbound traffic during speed limit of 40km/h and 50km/h respectively.

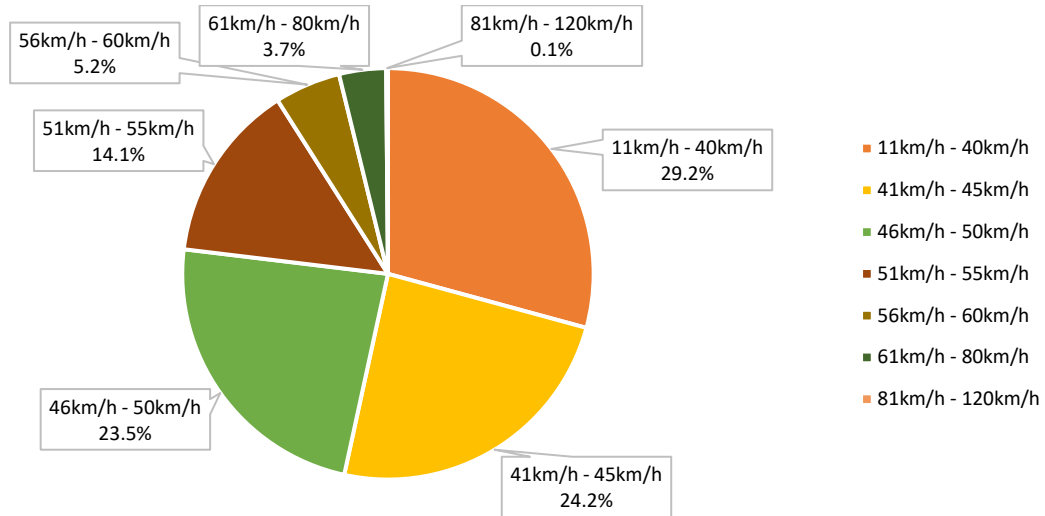


Figure 6 Yonge St. Westbound Speed Ranges Pie Chart (speed limit: 40km/h)

Figure 6 above shows the speed summary for the eastbound traffic during school times. From this summary we can see that 29.2% of vehicles were travelling below the school times speed limit, 47.7% of vehicles were travelling between 41-50 km/h, and 23.1% of vehicles were travelling above 50km/h. When we consider the accepted speed limit is 10km/h over the school times speed limit, we find that a total of 76.9% of vehicles were travelling within the accepted speed limit.

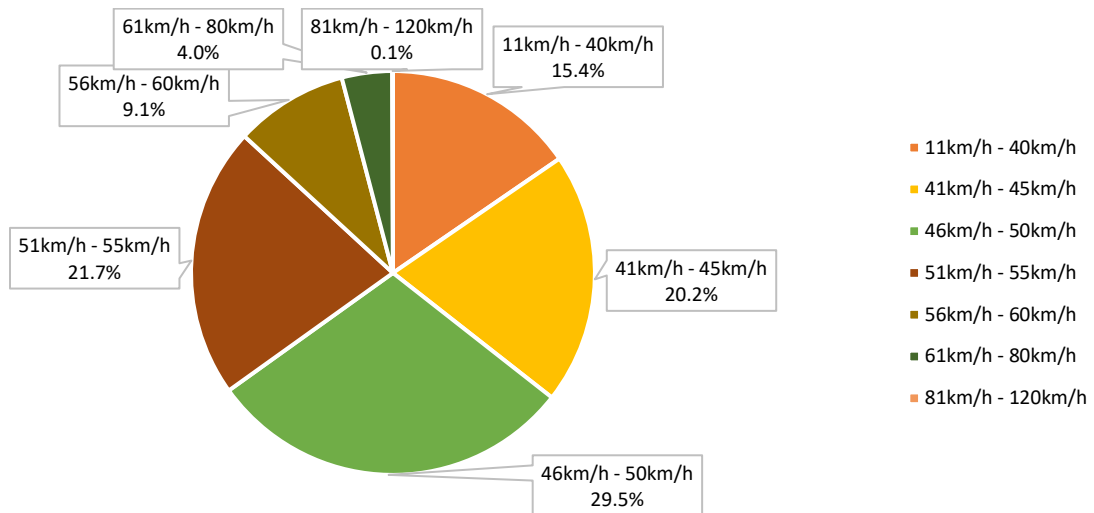


Figure 7 Yonge St. Westbound Speed Ranges Pie Chart (speed limit: 50km/h)

Figure 7 above shows the speed summary for the 50km/h speed limit period. From this summary we can see that 65.1% of vehicles were travelling below the posted speed limit, 30.8% of vehicles were

travelling between 51-60 km/h, and 4.1% of vehicles were travelling above 60km/h. When we consider the accepted speed limit is 10km/h over the posted speed limit, we find that a total of 95.9% of vehicles were travelling within the accepted speed limit.

Figure 8 and 9 below are the speed by hour graph for weekdays (September 15th, 16th, 19th, 20th, and 21st) and the weekend (September 17th and 18th) in the westbound direction.

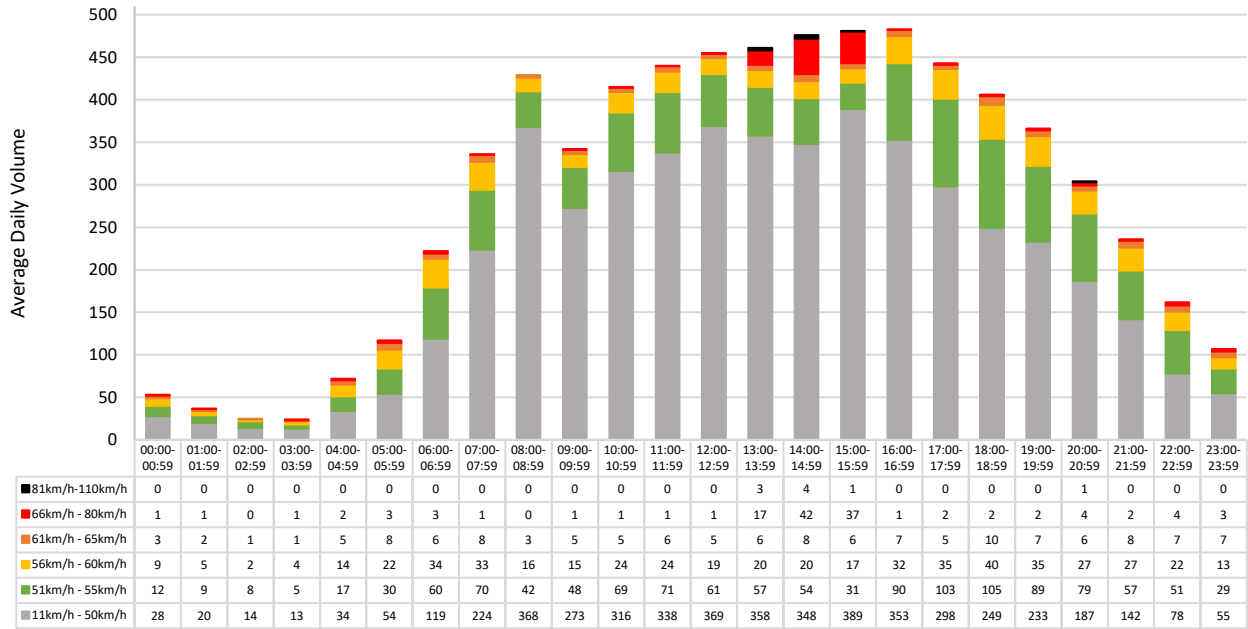


Figure 8 Speed by Hour Analysis for Westbound (weekday)

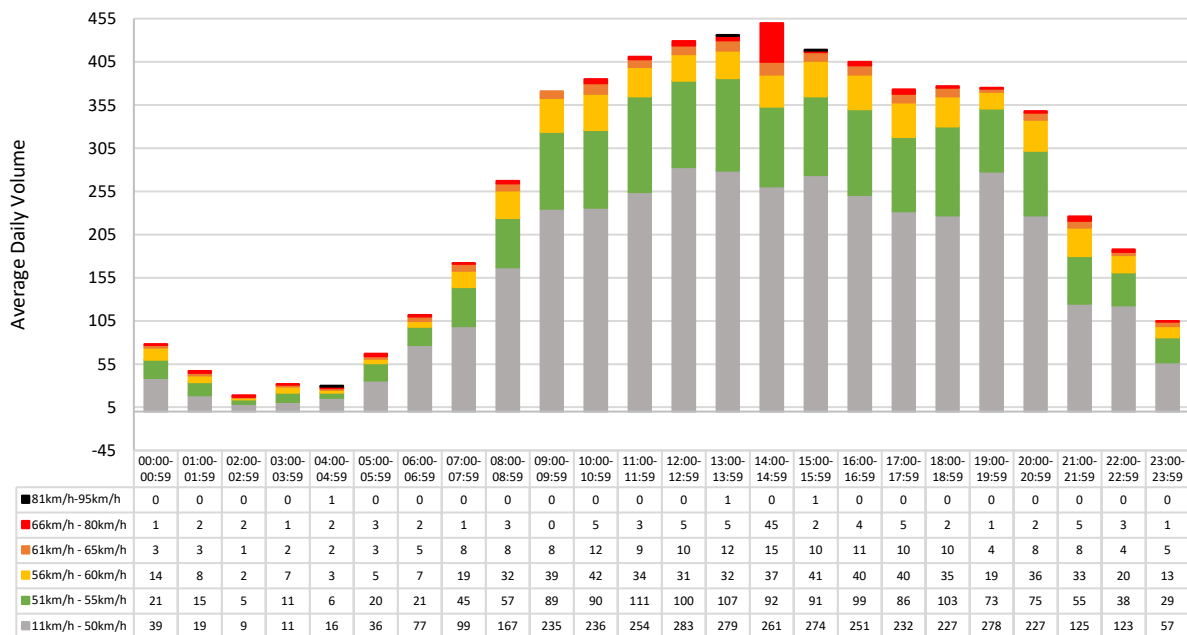


Figure 9 Speed by Hour Analysis for Westbound (weekend)

Furthermore, the traffic trailer detected that 54.5% of vehicles slowed down when approaching the trailer in eastbound direction and 60.7% slowed down in westbound direction. These percentages could include the vehicles slowed down to enter driveways or make a turn; however, it also shows that the trailer has an effect on traffic calming. It appears that some drivers are not slowing down when entering the community safety zone during school times. If so, alternative measures could be taken to further calm traffic during these times.

3.0 Traffic Volume

The average number of vehicles driving on Yonge St daily are shown in Table 3. Only the days when the traffic trailer was placed there for the full 24 hours are used in the traffic volume analysis.

Table 3 Volume Summary

Direction	Period	Average Daily Traffic Volume
Eastbound	Weekday	5,502.4
Eastbound	Weekend	5118.0
Westbound	Weekday	6,081.1
Westbound	Weekend	6042.0

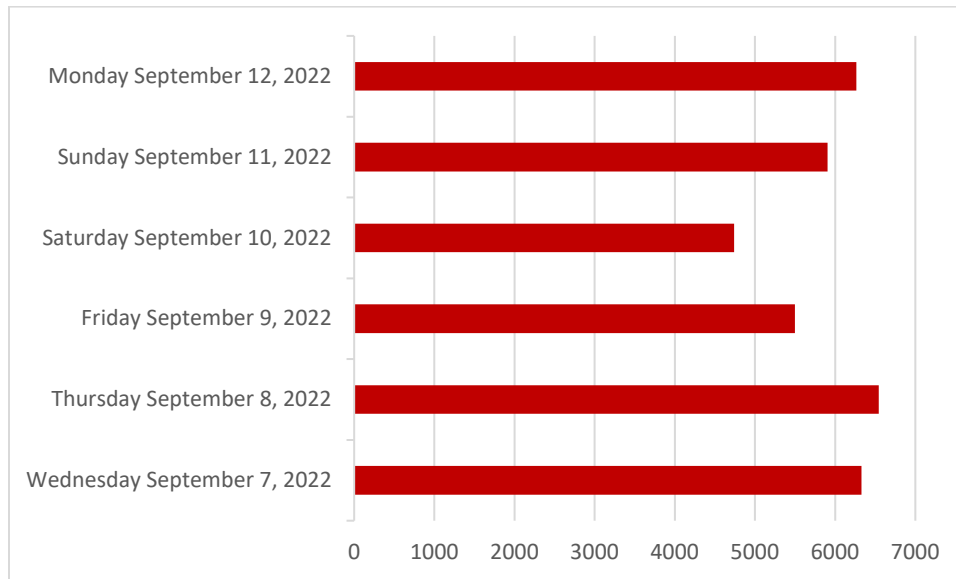


Figure 10 Total Volume per Day (Eastbound)

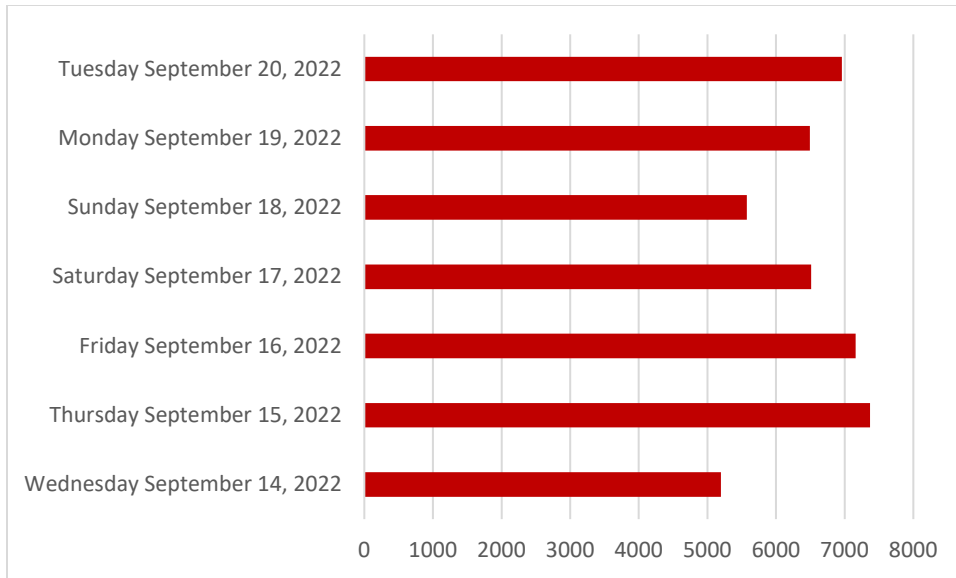


Figure 11 Total Volume per Day (Westbound)

3.1 Eastbound Volume by Hour

Figure 12 shows the average volume of vehicles travelling eastbound of Yonge St on weekdays. There is a spike during both the standard morning and evening rush hours.

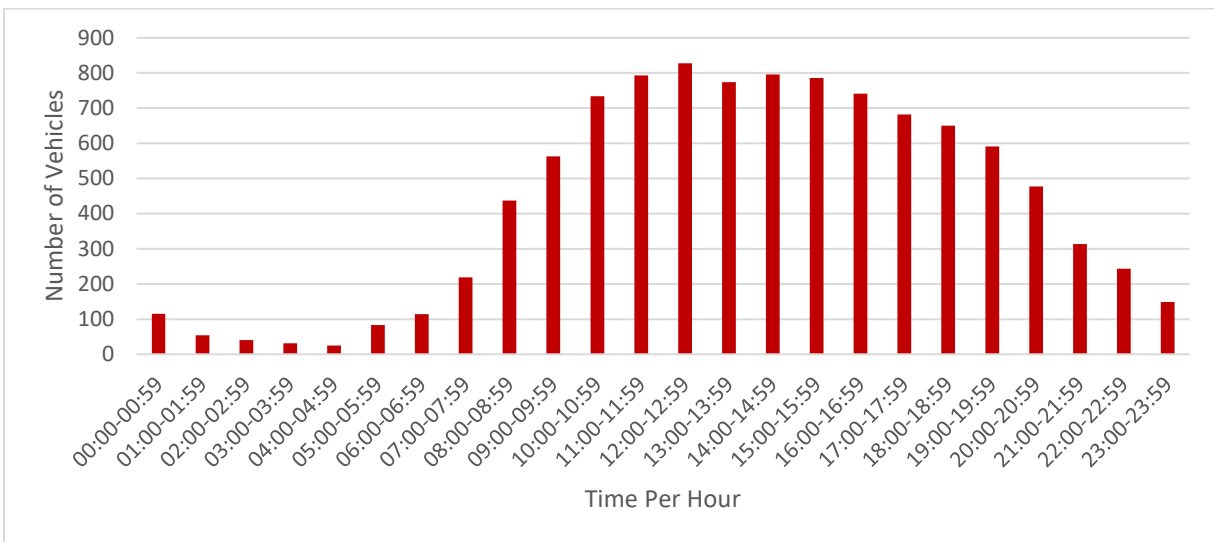


Figure 12 Average Volume by Hour for Weekdays (Eastbound)

Figure 13 shows the average volume of vehicles travelling eastbound of Yonge St on weekends. There is general curve throughout the days with the peak at 12:00 to 12:59.

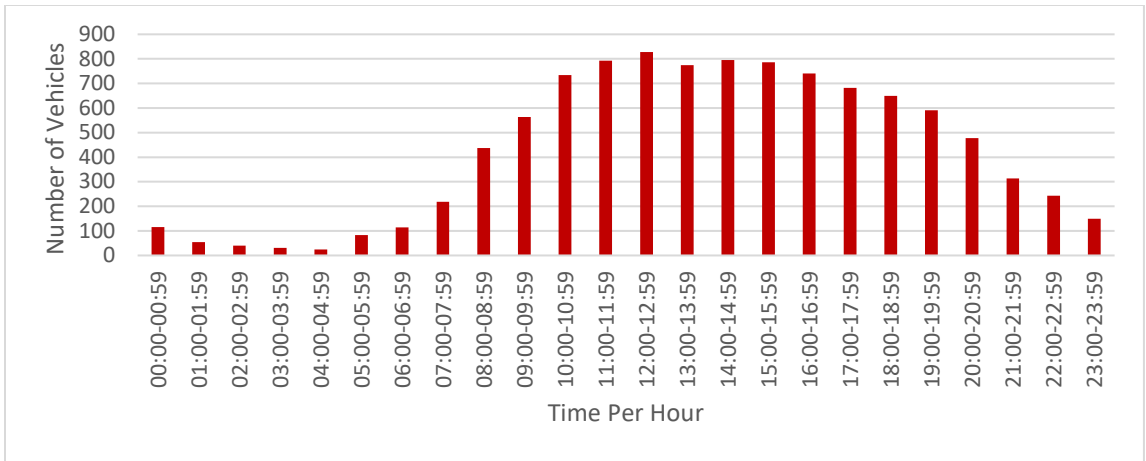


Figure 13 Average Volume by Hour on Weekends (Eastbound)

3.2 Westbound Volume by Hour

The data collected on weekdays is used to analyze the traffic volume by hour in the Westbound direction as shown in Figure 14. The volume started to increase around morning rush hour, peaked around 16:00 and decreased after the evening rush hour.

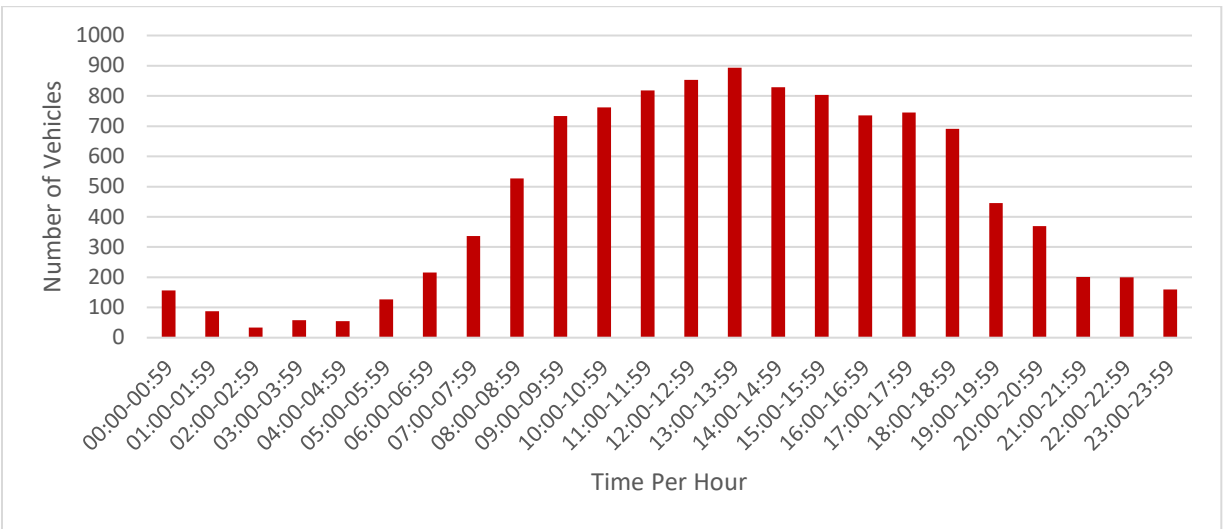


Figure 14 Volume by Hour on Weekdays (Westbound)

Figure 15 shows the average traffic volume on the weekend. The volume started to increase around morning rush hour, peaked around 13:00 and decreased after the evening rush hour.

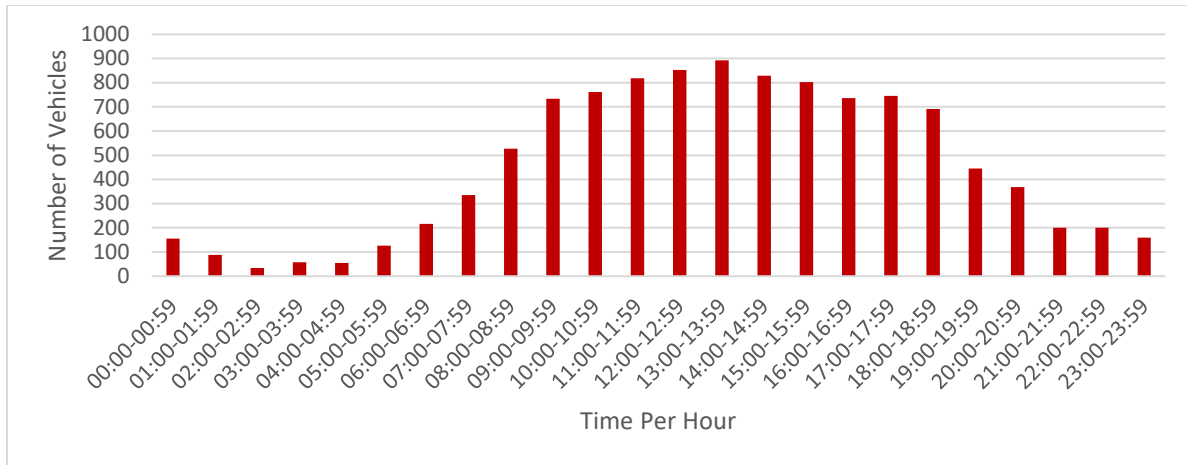


Figure 15 Average Volume by Hour on the Weekend (Westbound)

4.0 Conclusion

The traffic trailer was placed on Yonge St for both eastbound and westbound directions from September 7th to September 21st, 2022. From the speed analysis, when the posted speed limit is 50km/h, there were 97.7% of vehicles travelling within the accepted speed limit in the eastbound direction. It was also determined that during the 50km/h speed limit period, 95.9% of vehicles travelling in the westbound direction were within the accepted speed limit. In addition, during school times, 84.2% of vehicles driving eastbound were travelling within the accepted speed limit. It was also determined that during school times, 76.9% of vehicles travelling westbound were within the accepted speed limit. It appears that due to lower percentages of vehicles travelling within the accepted speed limit during school times, there may need to be alternative measures taken to calm traffic. Furthermore, from the traffic volume analysis, it was observed that the traffic volume on Yonge St continues to increase after the morning rush hour, peak around noon, and decrease after the evening rush hour.