

MEMORANDUM

February 7, 2023

To: Mike Moran, Patrick Golier

Organization: City of Lafayette, Engineering and Public Works

From: Sarah Davis, Drew Parker

Project: Safe Student Travel Around Lafayette Schools

Re: Burton Valley Elementary Traffic Calming Pilot Study: Final Results

Introduction/Purpose

The City of Lafayette, California tasked Toole Design to conduct a pre- and post-project evaluation of the Burton Valley Elementary Safe Routes to School traffic calming pilot project installed by the City in Fall 2021. The traffic calming included:

- Speed humps with flex post delineators at the edge of the speed humps installed on streets throughout the neighborhood
- Restricted parking on segments of Merriewood Drive, Silverado Drive, Rohrer Drive and Indian Way to align with the drop-off and pick-up times at Burton Valley Elementary School.
- Reduced lane widths on Silverado
- Markings and delineators to emphasize lane lines for drivers at locations where drivers had cut the corners or drove into the shoulder.
- No parking zones in advance of crosswalks
- Upgraded school zone crosswalks
- Right-turn-only sign from the Burton Valley Elementary driveway onto Merriewood Drive

This memo provides a comparison of data collected before and after the pilot project implementation to help City staff and community members evaluate whether the measures installed as part of the pilot project helped to meet the goals of the project. These goals include slowing vehicle speeds on neighborhood streets, increasing the numbers of students walking and biking to/from school, and improving the perception of safety from the school community and local residents.

Summary of Key Findings

The posted speed limit in the neighborhood is 25 mph. Before speed humps and other traffic calming measures were installed, on average, **58% of people driving were traveling 1 mph or more over the speed limit** in the neighborhood. After speed humps and traffic calming were installed, on average, **16% of people driving were traveling 1 mph or more over the speed limit** in the neighborhood. This means the speed humps and traffic calming likely contributed to a **42% reduction in the number of people driving that are speeding**. The 85th percentile speeds in the neighborhood were reduced from 32 mph to 27 mph, a reduction of 5 mph, representing a 16% reduction in 85th percentile speeds.

The 85th percentile speed is defined as the speed at or below which 85 percent of all vehicles are traveling, under normal, or free-flow, conditions. This statistic is typically used by Traffic Engineers to determine speed limits as well as evaluate vehicle speeds on a segment of roadway.

Overall, the counts showed the number of people walking, bicycling, or driving in the area was slightly lower or increased slightly after installation of the treatments.

Data

For each data collection period, Average Daily Traffic (ADT) and Turning Movement Counts (TMC) were collected. ADT counts include the numbers of vehicles as well as vehicle speeds along roadway segments. TMC collect the numbers of vehicles, bicycles and pedestrians moving through the identified intersections. ADT counts were collected by National Data & Surveying Services (NDS), a well-established source for recording vehicle count and speed information. The ADT counts were collected using pneumatic tube counters and included 7-day counts (full 24-hour days) at 5 locations. The pneumatic tube counters were placed as far away from the speed humps as possible. Figure 2 through Figure 5 on the following pages show the approximate location where the ADT tubes were placed. The TMC data was collected using traffic cameras, including 3-day counts (5 hours per day from 7:30-9:30am and 1:00-4:00pm) at 6 locations. Data was provided in both 15-minute and 1-hour bins.

Data was collected **before** the traffic calming implementation on the following dates:

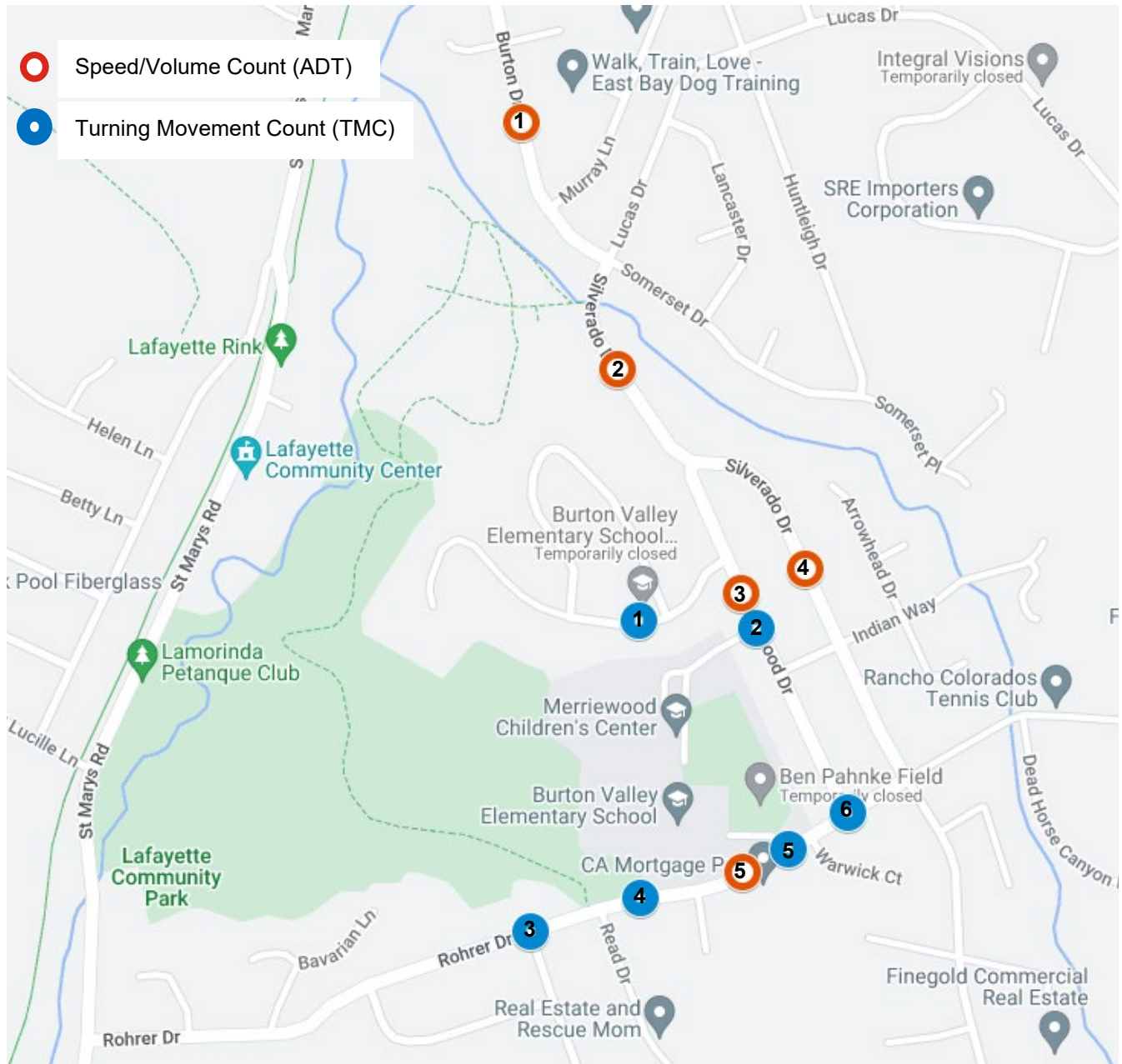
- ADT: Thursday, 11/4/2021 – Wednesday, 11/10/2021
- TMC: Friday, 11/3/2021 – Tuesday, 11/9/2021 (excluding Saturday and Sunday)

Data was collected **after** the traffic calming implementation on the following dates:

- ADT:
 - » Tuesday, 5/10/2022 – Monday, 5/16/2022
 - » Monday, 8/1/2022 – Sunday, 8/7/2022
 - » Thursday, 11/3/2022 – Wednesday, 11/9/2022
- TMC:
 - » Tuesday, 5/10/2022 – Thursday, 5/12/2022
 - » Tuesday, 7/26/2022 – Thursday, 7/28/2022
 - » Thursday, 11/3/2022; Tuesday, 11/8/2022; Wednesday, 11/9/2022

Figure 1 on the following page shows the location of the traffic counts.

Figure 1. Traffic Count Location Map



For ADT location #1 the tube counter was installed on Burton Drive approximately 200 feet south of the Apache Court/Murray Lane intersection.



Figure 2. Burton Dr between Burton Ct/Apache Ct and Murray Ln

For ADT location #2 the tube counter was installed on Silverado Drive approximately 60 feet south of the new speed hump.



Figure 3. Silverado Dr between Somerset Dr and Merriewood Dr

For ADT location #3 the tube counter was installed on Merriewood Drive approximately 60 feet south of the Sandalwood Court intersection.



Figure 4. Merriewood Dr between Sandalwood Ct and School Driveway

For ADT location #4 the tube counter was installed on Silverado Drive approximately 120 feet south of one of the new speed humps and approximately 330 feet north of the other new speed hump.



Figure 5. Silverado Dr between Merriewood Dr and Indian Way

For ADT location #5 the tube counter was installed on Rohrer Drive near the school driveway entrance, approximately 190 feet east of a new speed hump.



Figure 6. Rohrer Dr between Burnt Oak Cir and School Driveway

The analysis utilizes the following data points and includes the percent and total change values for each data point before and after the speed humps were installed:

- Average daily (24-hour period) number of vehicles
- Number of vehicles traveling above the speed limit (25 MPH) before and after implementation
- 85th Percentile Speeds
 - » The 85th percentile speed is the speed at which 85 percent of people are driving at or below
- Average daily number of bicyclists and pedestrians

Data were evaluated in weekday (5-day), and weekend (2-day) and weekly (7-day) averages. In most cases the full 7-day count period was used to calculate a daily average for comparison.

Results

Key Findings – Average Daily Traffic and Vehicle Speeds

The 7-day ADT data collection effort was used to calculate daily averages of the numbers of vehicles, the numbers of speeding vehicles and the average of the 85th percentile travel speed.¹

The 7-day, weekday, and weekend average daily traffic volumes at each location before and after installation is shown in Table 1. 7-Day Average Daily Traffic Volume; Table 2. Weekday Average Daily Traffic Volume; and Table 3. Weekend Average Daily Traffic Volume.

Generally, 7-day average daily traffic volumes stayed the same or decreased (between 8 to 22 percent) at the five survey locations, while weekday average daily traffic volumes increased slightly or decreased between one to 18 percent. However, the numbers of vehicles traveling over the speed limit decreased consistently at each of the locations, with a corresponding decrease in 85th percentile speeds of between 10 to 24 percent at the five survey locations.

Table 1. 7-Day Average Daily Traffic Volume

Location	Total Number of Vehicles Counted Daily (7-Day Average)			
	Before (Nov. 2021)	After*	Value Change	Percent Change
1. Burton Dr between Burton Ct/Apache Ct and Murray Ln	3,154	3,164	10	0%
2. Silverado Dr between Somerset Dr and Merriewood Dr	3,430	3,141	-289	-8%
3. Merriewood Dr between Sandalwood Ct and School Driveway	1,766	1,378	-388	-22%
4. Silverado Dr between Merriewood Dr and Indian Way	1,665	1,663	-2	0%
5. Rohrer Dr between Burnt Oak Cir and School Driveway	1,328	1,191	-136	-10%

*Average of three post-installation periods.

¹ In all cases the before data is from November 2021, and the after data is presented as an average of the three after count periods in May, August, and November 2022.

Table 2. Weekday Average Daily Traffic Volume

Location	Total Number of Vehicles Counted Daily (Weekday Average)			
	Before (Nov. 2021)	After*	Value Change	Percent Change
1. Burton Dr between Burton Ct/Apache Ct and Murray Ln	3,414	3,513	99	3%
2. Silverado Dr between Somerset Dr and Merriewood Dr	3,785	3,491	-294	-8%
3. Merriewood Dr between Sandalwood Ct and School Driveway	2,012	1,644	-368	-18%
4. Silverado Dr between Merriewood Dr and Indian Way	1,804	1,779	-25	-1%
5. Rohrer Dr between Burnt Oak Cir and School Driveway	1,435	1,309	-126	-9%

*Average of three post-installation periods.

Table 3. Weekend Average Daily Traffic Volume

Location	Total Number of Vehicles Counted Daily (Weekend Average)			
	Before (Nov. 2021)	After*	Value Change	Percent Change
1. Burton Dr between Burton Ct/Apache Ct and Murray Ln	2,505	2,235	-269	-11%
2. Silverado Dr between Somerset Dr and Merriewood Dr	2,543	2,266	-276	-11%
3. Merriewood Dr between Sandalwood Ct and School Driveway	1,150	715	-436	-38%
4. Silverado Dr between Merriewood Dr and Indian Way	1,318	1,376	58	4%
5. Rohrer Dr between Burnt Oak Cir and School Driveway	1,061	898	-163	-15%

*Average of three post-installation periods.

The number and percent of speeding vehicles decreased at all five count locations and is summarized in Table 4.

Table 4. Numbers of Vehicles Per Day Traveling Above the Speed Limit (25 mph)

Location	Number of Speeding Vehicles Daily (7-Day Average)					
	Before	Before Percent	After*	After Percent	Value Change	Reduction
1. Burton Dr between Burton Ct/Apache Ct and Murray Ln	2,538	80%	573	18%	-1,965	-62%
2. Silverado Dr between Somerset Dr and Merriewood Dr	1,930	56%	533	17%	-1,397	-39%
3. Merriewood Dr between Sandalwood Ct and School Driveway	614	35%	134	10%	-480	-25%
4. Silverado Dr between Merriewood Dr and Indian Way	1,014	61%	282	17%	-732	-44%
5. Rohrer Dr between Burnt Oak Cir and School Driveway	796	60%	212	18%	-584	-42%

*Average of three post-installation periods.

The average of the 85th percentile speed decreased at all five count locations and is summarized in Table 5.

Table 5. 7-Day Average of the 85th Percentile Speeds of Motor Vehicles

Location	7-Day Average 85 th Percentile Speed (mph)			
	Before	After*	Value Change	Percent Change
1. Burton Dr between Burton Ct/Apache Ct and Murray Ln	34	26	-8	-24%
2. Silverado Dr between Somerset Dr and Merriewood Dr	31	27	-4	-13%
3. Merriewood Dr between Sandalwood Ct and School Driveway	30	27	-3	-10%
4. Silverado Dr between Merriewood Dr and Indian Way	32	27	-5	-16%
5. Rohrer Dr between Burnt Oak Cir and School Driveway	32	27	-5	-16%

*Average of three post-installation periods.

The following figures summarize the 7-day average daily number of people driving above the speed limit (25 mph) before and after the speed humps were installed.

Figure 7. Average Daily Percent of Vehicles Traveling above Speed Limit – 1. Burton Dr between Burton Ct/Apache Ct and Murray Ln

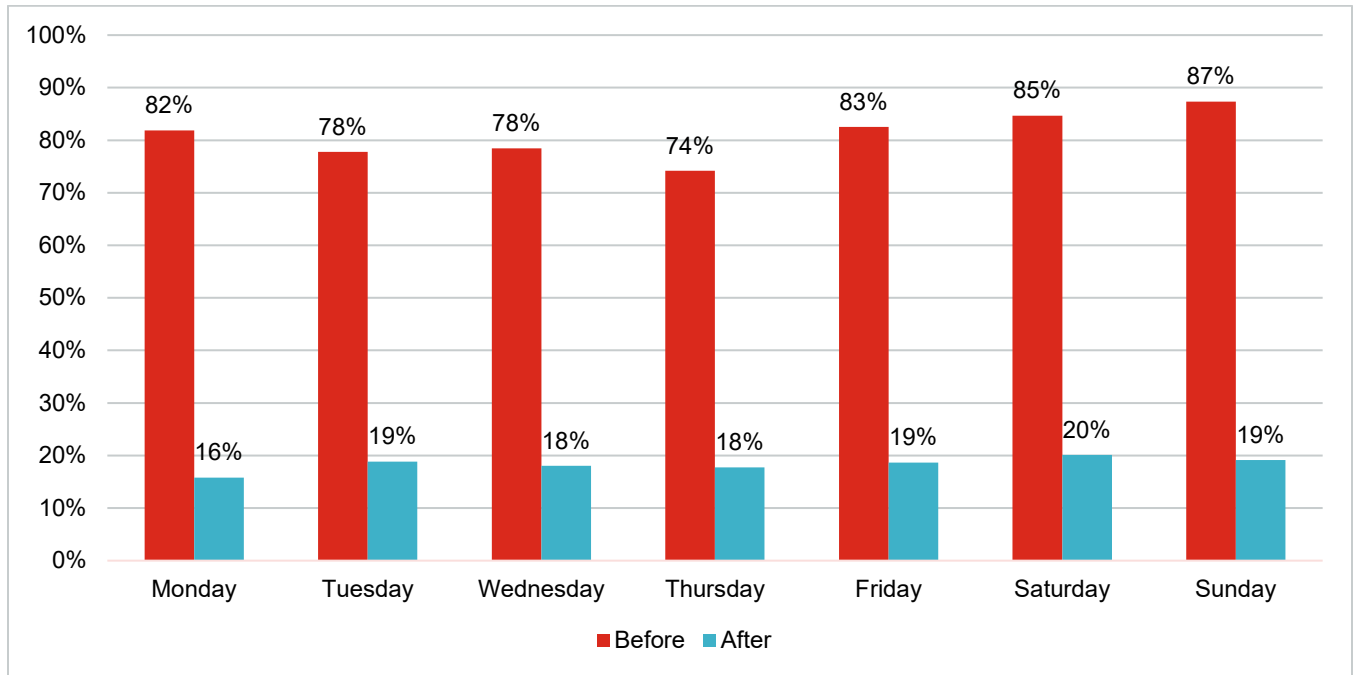
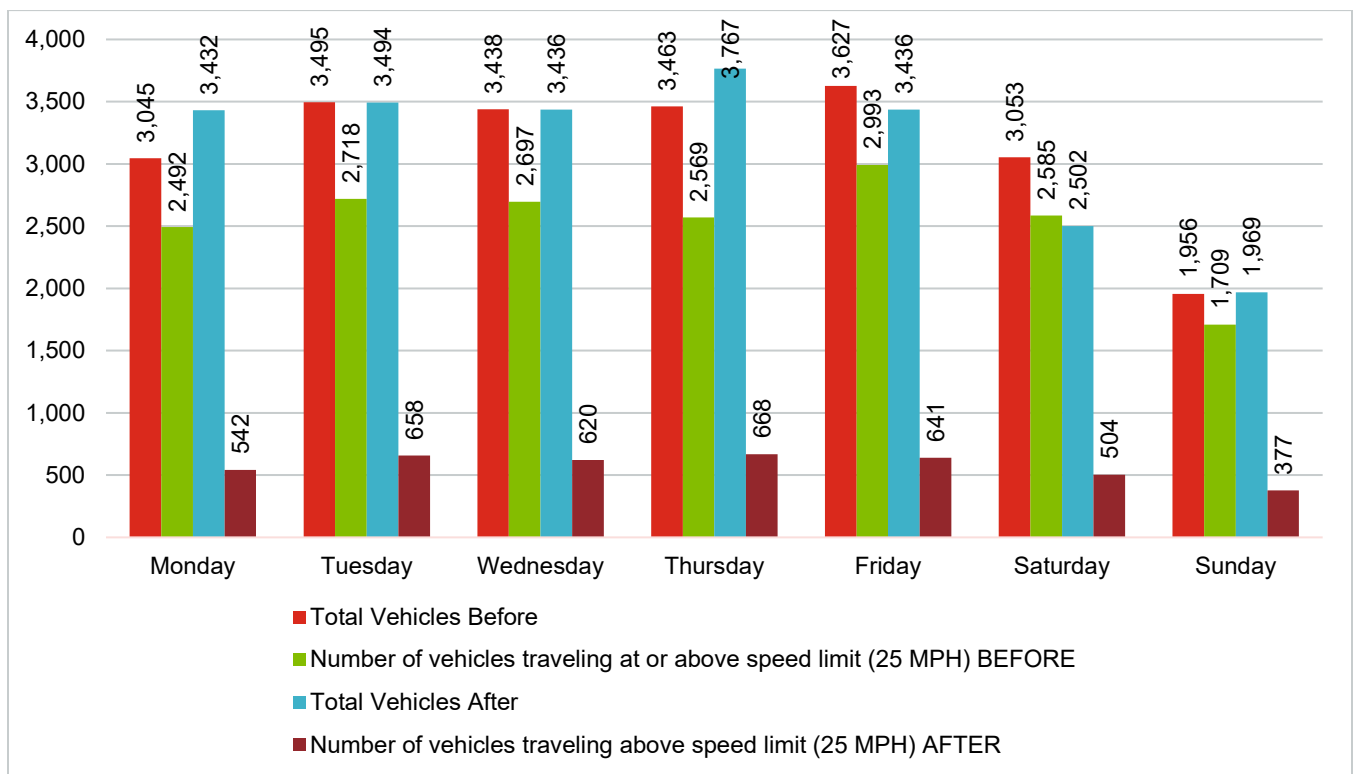


Figure 8. Average Daily Number of Total Vehicles and Speeding Vehicles – 1. Burton Dr between Burton Ct/Apache Ct and Murray Ln



*After data is an average of three post-installation periods.

Figure 9. Average Daily Percent of Vehicles Traveling above Speed Limit – 2. Silverado Dr between Somerset Dr and Merriewood Dr

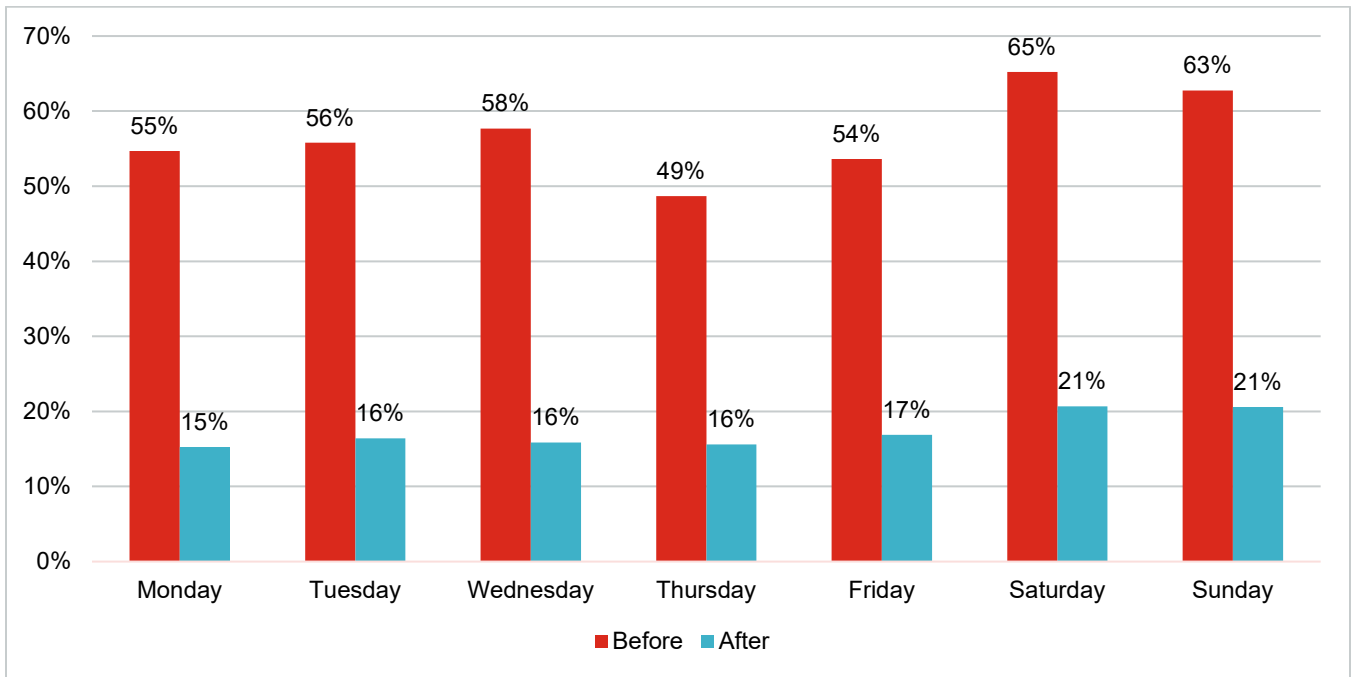
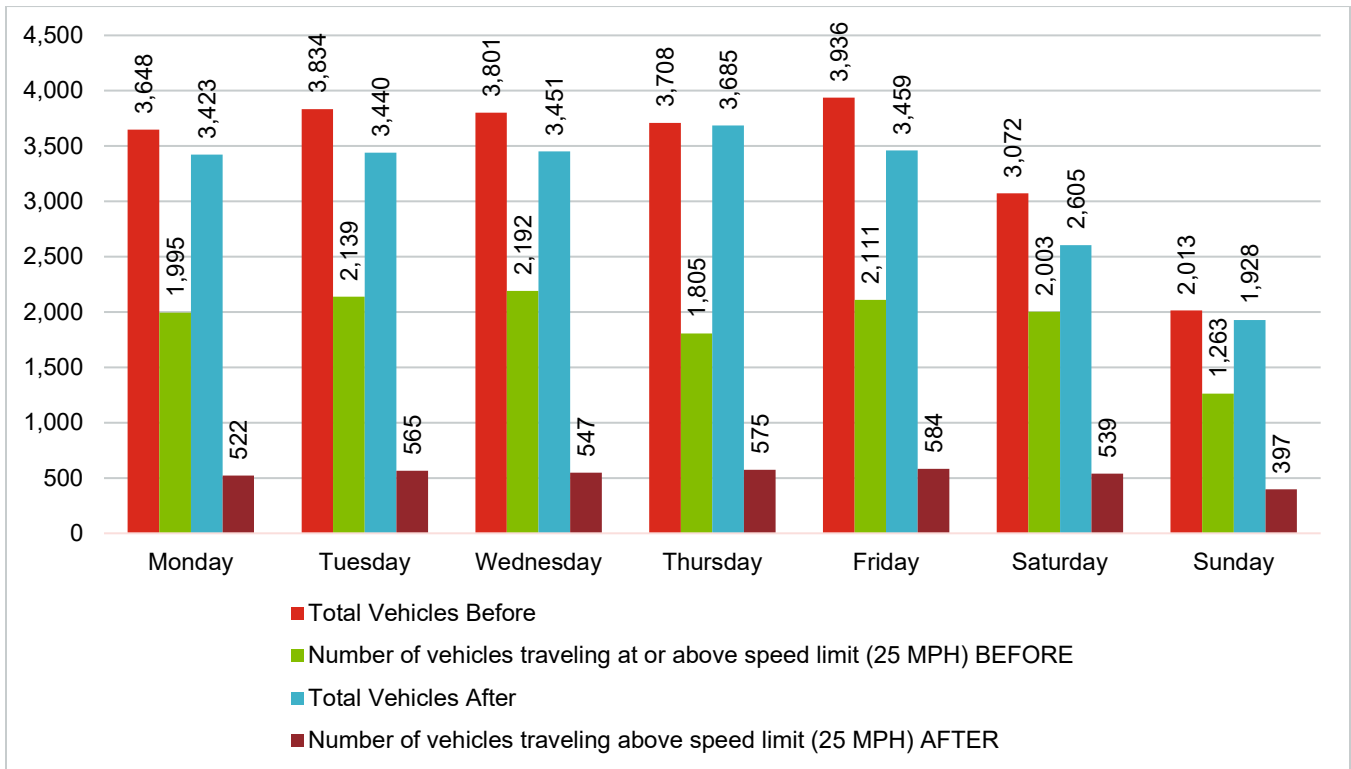


Figure 10. Average Daily Number of Total Vehicles and Speeding Vehicles- 2. Silverado Dr between Somerset Dr and Merriewood Dr



*After data is an average of three post-installation periods.

Figure 11. Average Daily Percent of Vehicles Traveling above Speed Limit – 3. Merriewood Dr between Sandalwood Ct and School Driveway

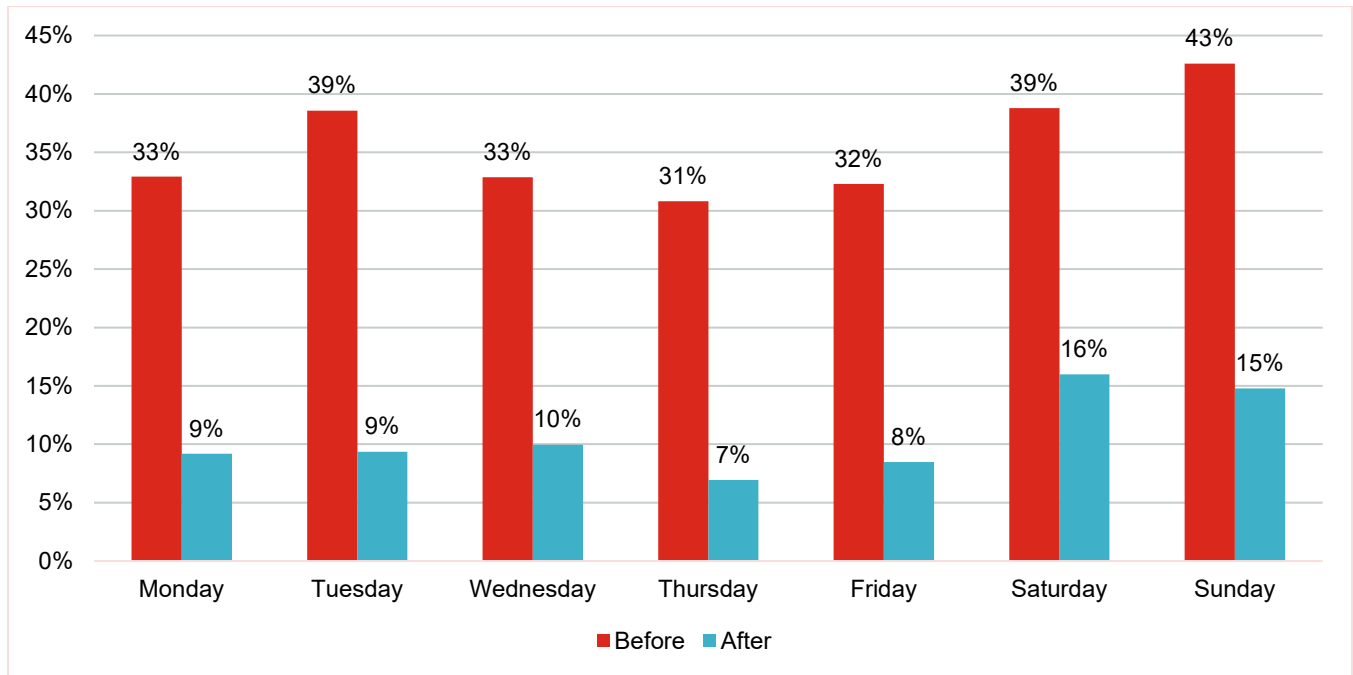
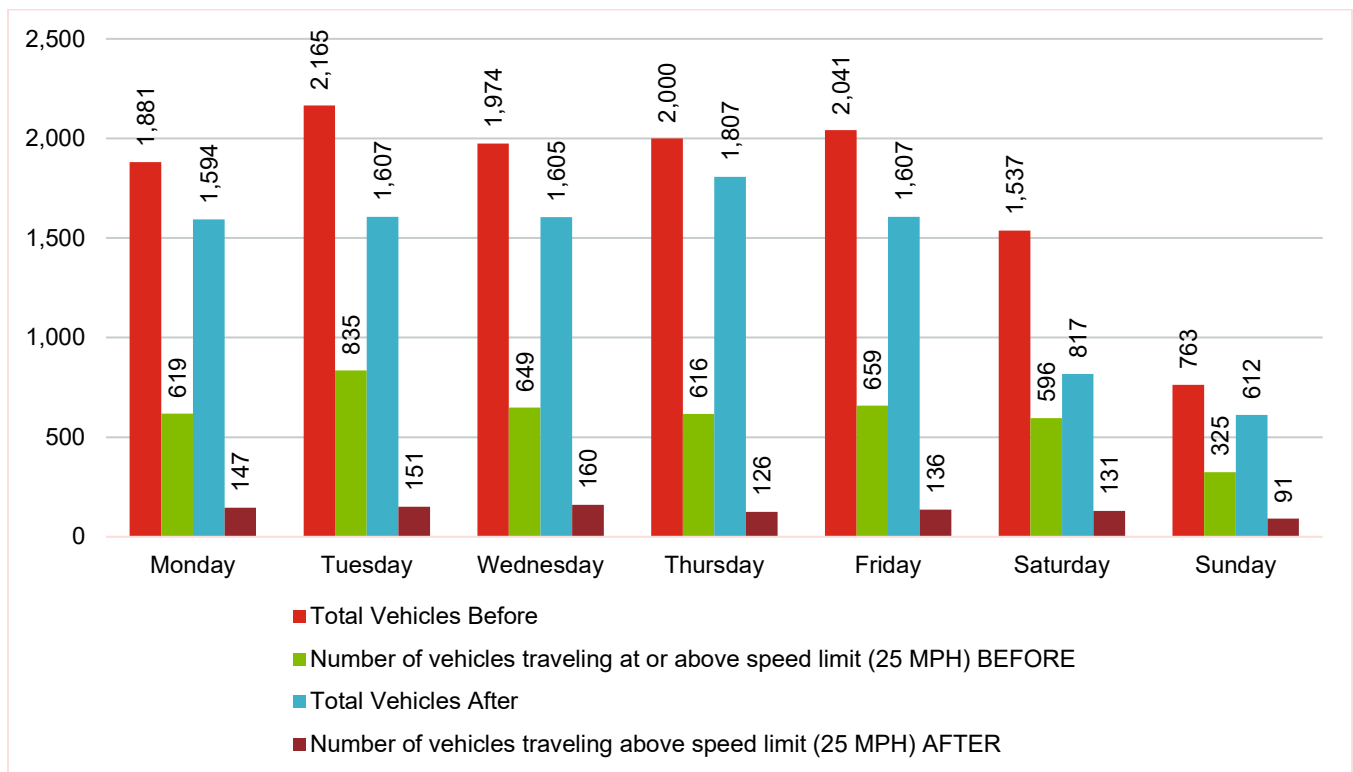


Figure 12. Average Daily Number of Total Vehicles and Speeding Vehicles – 3. Merriewood Dr between Sandalwood Ct and School Driveway



*After data is an average of three post-installation periods.

Figure 13. Average Daily Percent of Vehicles Traveling above Speed Limit – 4. Silverado Dr between Merriewood Dr and Indian Way

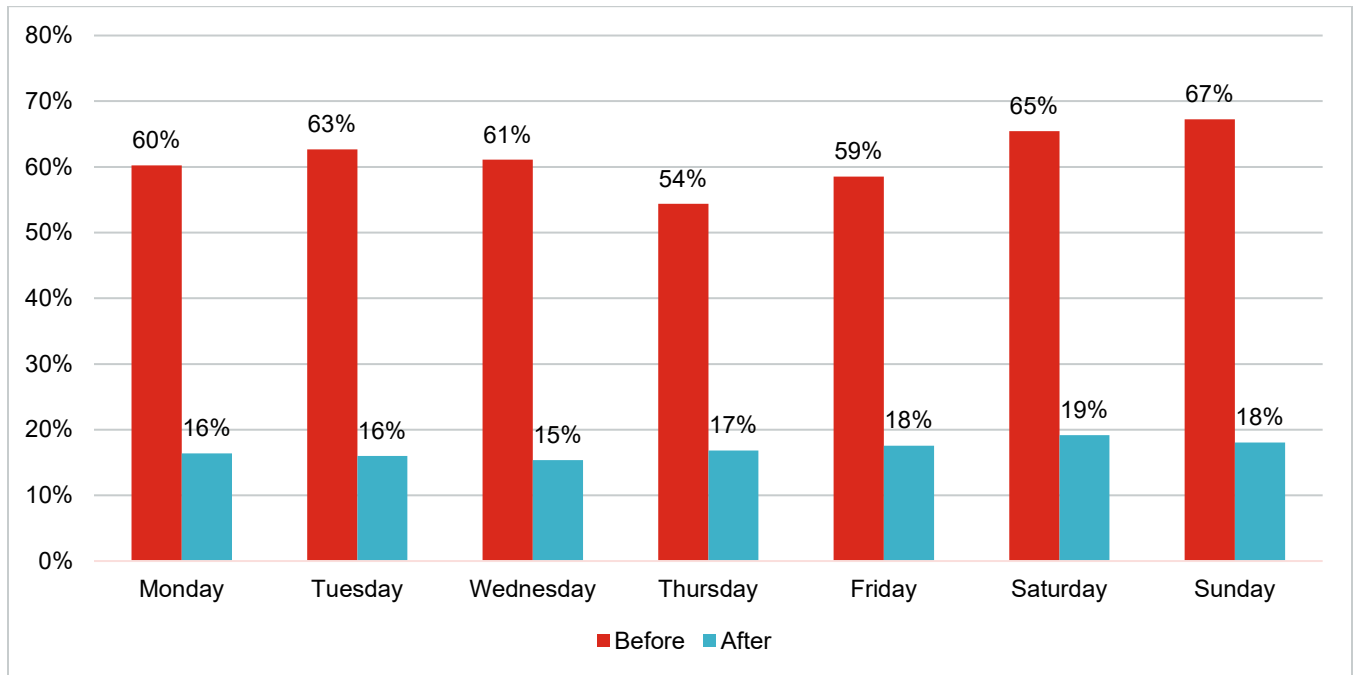
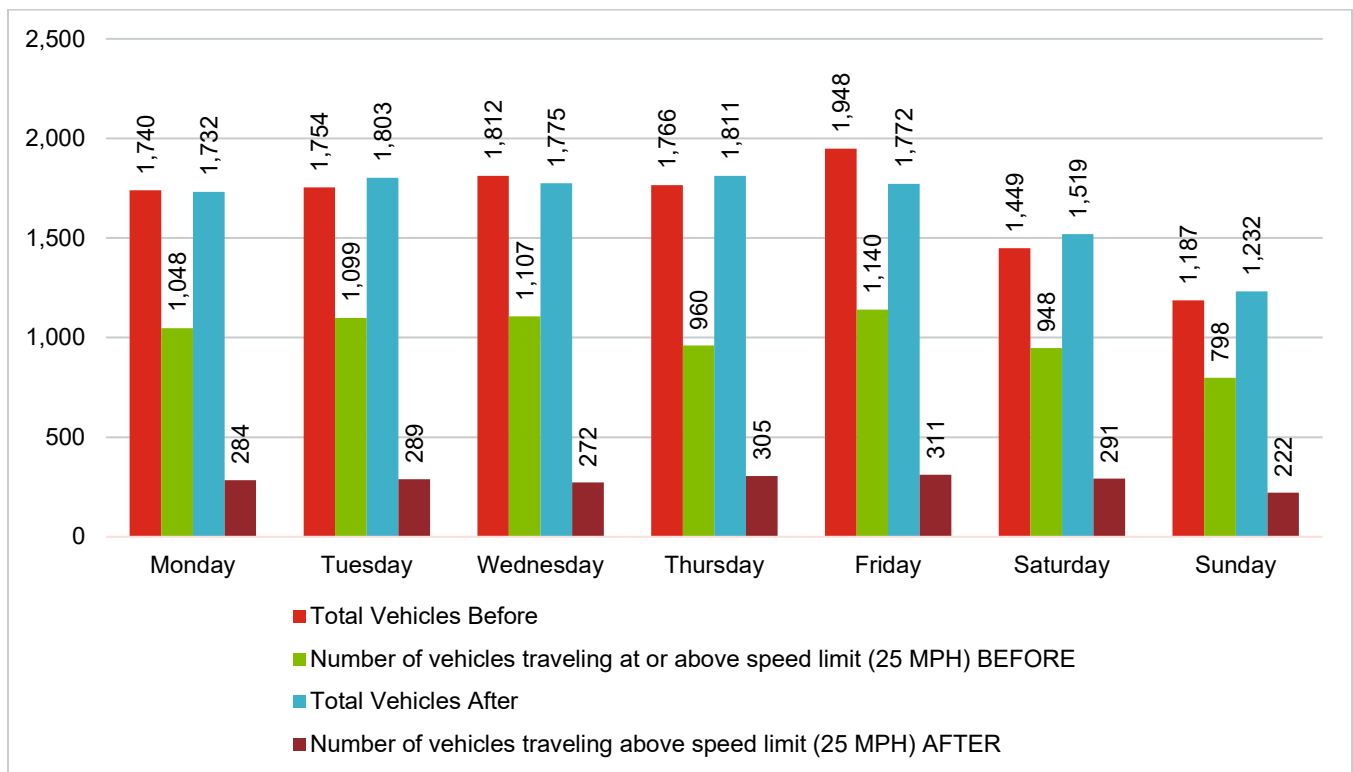


Figure 14. Average Daily Number of Total Vehicles and Speeding Vehicles – 4. Silverado Dr between Merriewood Dr and Indian Way



*After data is an average of three post-installation periods.

Figure 15. Average Daily Percent of Vehicles Traveling above Speed Limit – 5. Rohrer Dr between Burnt Oak Cir and School Driveway

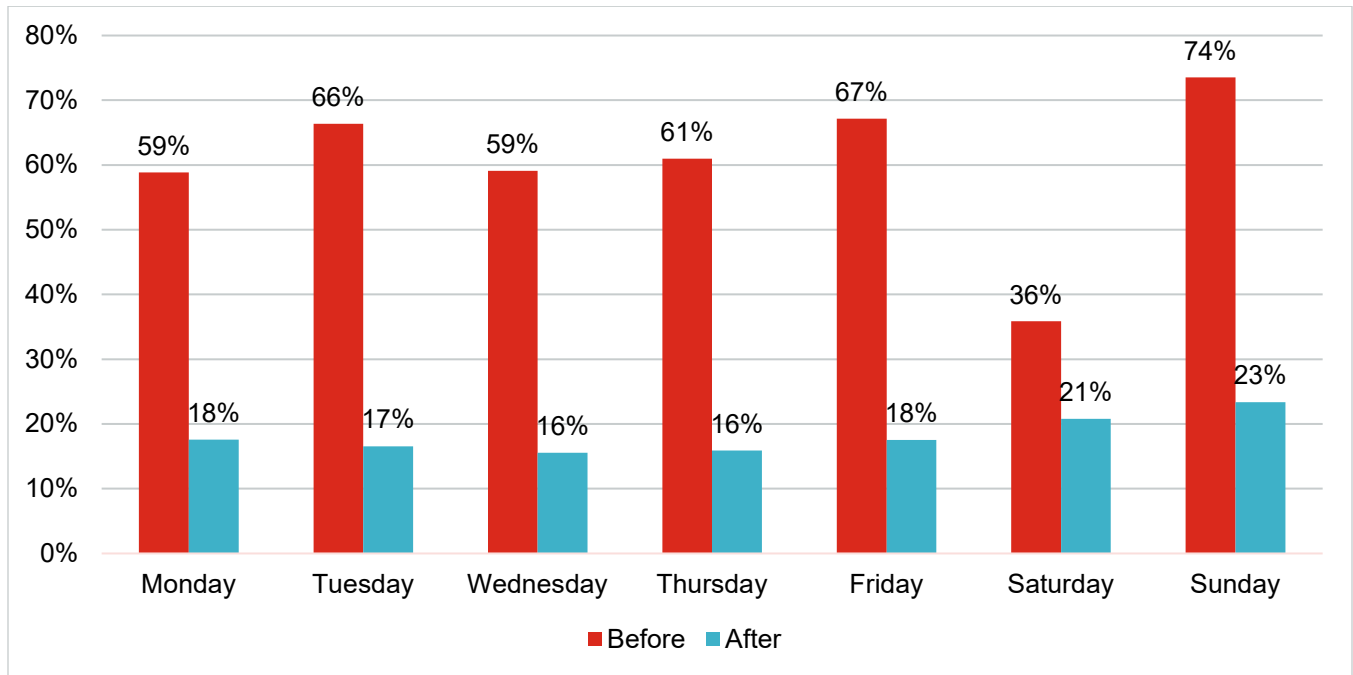
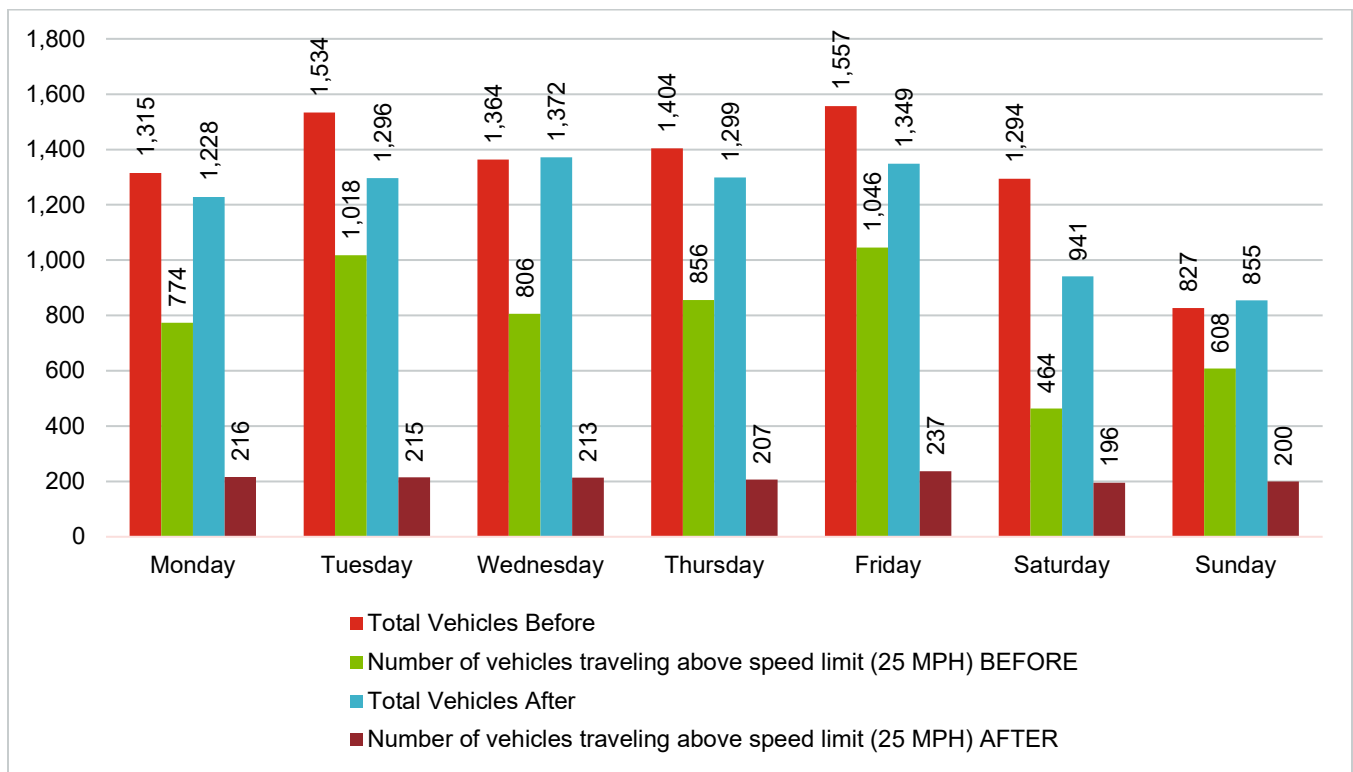


Figure 16. Average Daily Number of Total Vehicles and Speeding Vehicles – 5. Rohrer Dr between Burnt Oak Cir and School Driveway



*After data is an average of three post-installation periods.

Key Findings – Turning Movement Counts

Weekday Turning Movement Counts were collected to understand the impact the traffic calming may have had on the number of people walking, bicycling, and driving in the Burton Valley neighborhood.

From this analysis, there were no major changes found in the number of people traveling through the six identified intersections throughout the neighborhood, with a small reduction or modest increase in volumes for all modes as shown in Table 4 below.

Table 6. 3-Day Average Total Number of Bicyclists, Pedestrians, and Motor Vehicles at All Legs Of The Intersection Within A 5-Hour Weekday Count Period (7:30-9:30am and 1:00-4:00pm)

Location and Travel Mode	Before	After*	Value Change	Percent Change
3. Castello Rd & Rohrer Dr				
Bicyclists	5	6	2	33%
Pedestrians	25	31	6	22%
Motor Vehicles	850	801	-49	-6%
4. Burton Valley Elementary School Exit Driveway & Rohrer Dr				
Bicyclists	4	5	1	25%
Pedestrians	83	74	-9	-11%
Motor Vehicles	819	792	-28	-3%
5. Burton Valley Elementary School Entry/Exit Driveway/Warwick Ct & Rohrer Dr				
Bicyclists	8	8	0	-1%
Pedestrians	72	15	-57	-79%
Motor Vehicles	1,169	1,104	-66	-6%
6. Merriewood Dr & Rohrer Dr (Part-Time Parking Restrictions)				
Bicyclists	10	11	1	10%
Pedestrians	128	111	-17	-13%
Motor Vehicles	1,090	1,019	-71	-7%
2. Merriewood Dr & Burton Valley Elementary School Driveway (Part-Time Parking Restrictions)				
Bicyclists	6	11	4	68%
Pedestrians	76	86	9	12%
Motor Vehicles	1,234	1,190	-44	-4%
1. Burton Valley Elementary School Driveway & Sandalwood Ct				
Bicyclists	37	28	-9	-23%
Pedestrians	64	80	17	26%
Motor Vehicles	117	135	18	15%
<i>Note: Counts shown in the table above are a combined 5-hour total including 2-hour AM and 3-hour PM peak periods, and are an average calculated from 3 weekday counts collected on a Tuesday, Wednesday, and Thursday)</i>				

*Average of three post-installation periods.