Slow Down Lafayette Program

Reducing Speeds on Acalanes Rd

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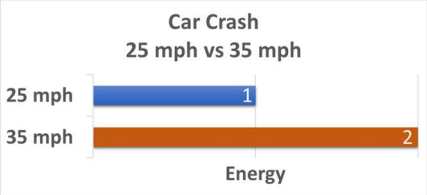
Overview

Slow Down Lafayette

The Slow Down Lafayette Program is the Police Department's contribution to the City of Lafayette's Vision Zero project started in 2021. All the City departments and the community are working together towards a common goal of reducing severe and fatal injury collisions in Lafayette.

Our approach to reducing severe collisions is to reduce the factors that contribute to the severity of injury. While many factors can cause a collision, speed is by far the most critical factor affecting injuries. As a vehicle speed doubles, the kinetic energy increases four-fold. If you double your speed and are involved in a collision, four times the energy will be delivered. In addition, since you are travelling twice as fast, the energy is transferred in half the time relative to the same collision at half that speed. As a reference to many of our streets, a collision at 35 mph has twice the energy of a collision at 25 mph. This results in more than a 2X increase in the chance of severe injury.



Speed is by far the most critical factor affecting injuries in a collision

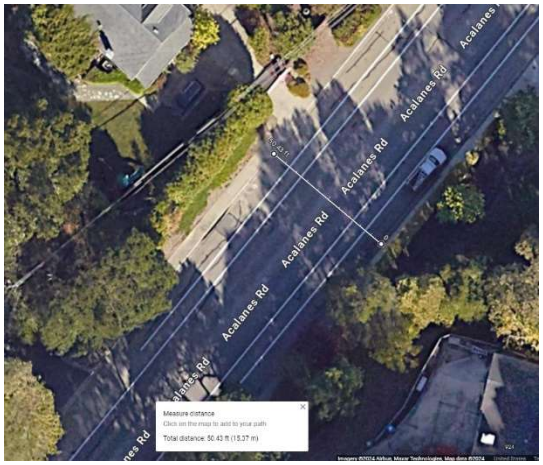
The Lafayette Police Slow Down Lafayette Program uses a combination of technology, education, and enforcement to reduce the chance of a severe injury collision. We are doing this by:

- Identifying and mitigating current hot spots of collision risk
  - Using past data and newly collected information to identify current hot spots
  - Providing real-time feedback to drivers to help them reduce those risks
- Working together with the community and other City departments
  - Sharing information with internal and external stakeholders
  - Providing tips and education to road users
- Enforcing traffic laws for critical areas and times

Acalanes Rd

Acalanes Rd between Mt. Diablo Blvd and Hidden Valley Rd has been identified as an area of concern by neighbors. This two-lane road has a 25-mph speed limit and is approximately 50 feet wide including bicycle and parking lanes on each side. The road is a pedestrian and bicycle school route and is also an evacuation route.

Based on the neighborhood concerns, the Slow Down Lafayette Program successfully evaluated and reduced speeds.



500+ vehicles per day traveling over 30 mph were eliminated

This document describes the speed-reduction efforts performed and the detailed results achieved.

Acalanes Rd Evaluation

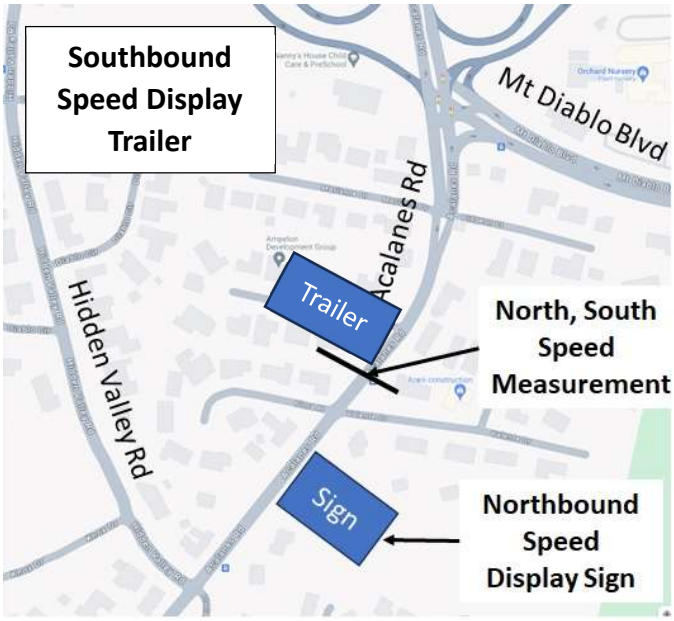
The Lafayette Police Slow Down Lafayette Program took a series of steps to understand and affect the traffic along Acalanes Rd between Mt. Diablo Blvd and Hidden Valley Rd. Our goal was to reduce the number of cars speeding on the road, with a particular focus on those going 10+ mph over the 25-mph speed limit. The vehicles traveling at higher speeds have the potential to cause the most injury if involved in a collision.

This roadway segment was also a good test area for the Slow Down Lafayette Program, allowing us to try several approaches to reduce collision risk and to measure the effects from those mitigations.

The following steps where performed:

Establish Baseline Speeds and Volumes

Our first step was to determine the existing traffic patterns. A low-profile Radar device was installed that captured the speed, direction, and current time for each vehicle that passed. Note that no personal information is captured by our equipment. We then used that information to determine the baseline speed profile of the road over a two-week period.



Install Temporary Speed Display Sign

Next, we installed a speed display sign on the Northbound side of Acalanes Rd, providing drivers with real-time feedback. Our low-profile Radar location was downstream of the sign, and captured speed-volume data while the display sign was running.

Increase Traffic Enforcement

Third, we increased our police presence and enforcement in the area and measured the speed profile of the road again. Enforcement was performed on multiple days for approximately one hour during the early- to mid-afternoons. Enforcement was primarily on the Northbound side and was clearly visible to Southbound traffic.

Install Speed Display Trailer

Fourth, we installed a large speed display trailer on the Southbound side of Acalanes Rd and measured the changes in speed.

Analyze Data

Finally, we analyzed the data we collected prior traffic surveys to determine how traffic patterns have changed. Since speed is the main contributing factor to injury accidents, we particularly looked at the change in the number of vehicles traveling above the speed limit.

Speed Reduction Results

The overall results are presented here. Additional details are provided in the Appendices.

Overview

Data Gathered

We gathered data from August to December 2023 during this project. The project covered:

- 84 days
- 483,450 vehicles
- 20 enforcement days
- 29 traffic citations

The data was divided into Northbound and Southbound segments and covered almost all combinations of speed display sign use and enforcement. The different methods used during the project were:

Dates	Northbound (NB)	Southbound (SB)
08/16 – 8/29/2023	Baseline	Baseline
09/10 – 9/23/2023	NB Sign	
10/15 – 10/21/2023	NB Sign + NB Enforcement	
11/11 – 11/17/2023	NB Sign	
11/30 – 12/06/2023	NB Enforcement	SB Trailer
12/10 – 12/16/2023	NB Sign	SB Trailer

- **Baseline** no speed display and no traffic enforcement
- **Northbound (NB) speed display sign** mounted on a speed limit pole
- **Southbound (SB) speed display trailer** located in the parking lane
- **Northbound (NB) Enforcement** visible in both directions but primarily focused on Northbound traffic which was observed to have faster speeds on average

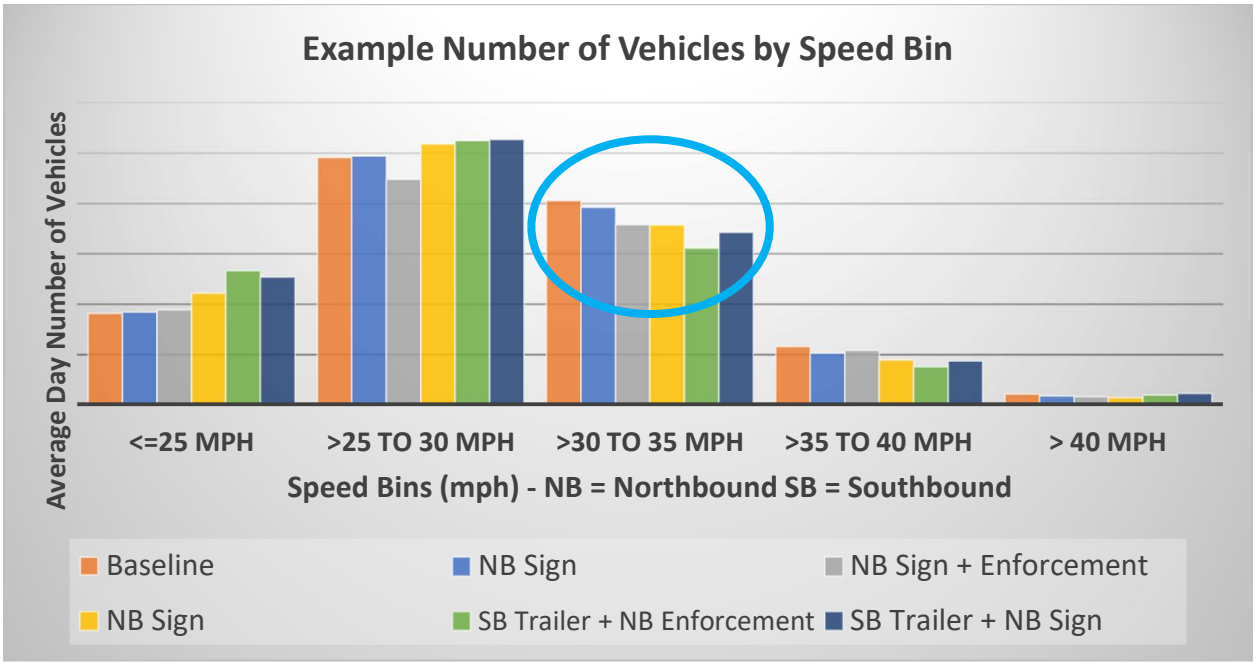
Data Processing

Our project compared baseline traffic data from the beginning of the project with data collected using the different methods listed above. The data showed that weekend and holiday times generally had fewer speeders. In addition, other external factors affected traffic patterns, including weather, the end of daylight savings, non-school days, and holidays. To minimize these affects we used data in blocks of complete weeks that did not include known external factors.

The data gathered for each speed reduction method above was then processed as follows:

- **Group into "Speed Bins":** we counted the number of vehicles traveling within a few different speed ranges:
    - In 5 mph speed bins of 25 – 30 mph, 30 – 35 mph, and 35 – 40 mph
    - Below the 25-mph speed limit and above 40 mph
- **Determine the Average Daily Volume:** we then divided the total count of vehicles in each speed bin by the number of days that the data was gathered to give us an Average Daily Volume within the time period that each method was performed.
- **Remove weekly volume changes:** The total traffic volume varied slightly for each week of data we collected across all the different speed reduction methods. Since we want to compare the changes based on what we did, not the slight differences in traffic volumes outside of our control, we removed the weekly variations by scaling the data up or down slightly so the data for each method had the same average weekly volume.

Data Display



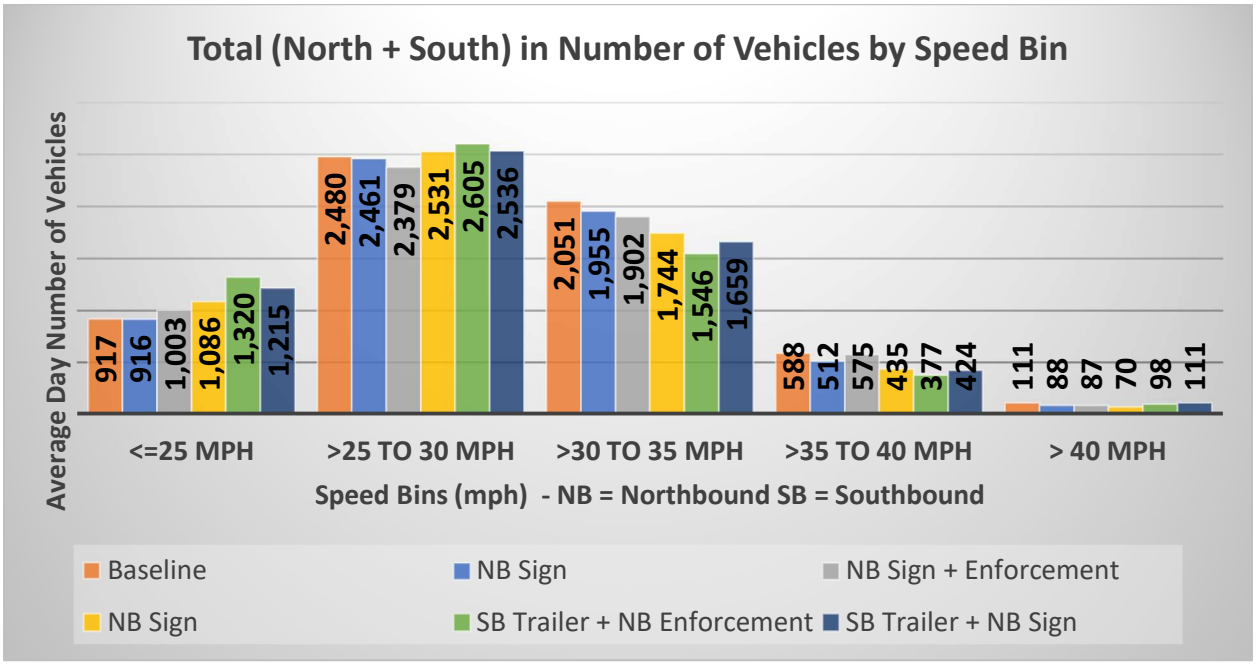
Once all the data was processed, we then displayed it on several charts similar to the chart above.

- **Horizontal Axis:** The horizontal axis shows each speed bin we used to summarize the data.
- **Vertical Axis:** The vertical axis shows the average daily volume of vehicles traveling within the speed range shown on the horizontal axis. On some charts we show a percentage change instead of a count of the number of vehicles
- **Data bars:** The different colored bars within each speed bin correspond to the data from each speed reduction method we performed.
    - **Changes across speed bins:** If you look at the same-colored bar across each speed bin (e.g., the left most orange bar for the baseline) you can see how volumes varied across the different speeds for that speed reduction method we tried
    - **Comparison of different speed reduction methods:** If you look at the different colored bars within a single speed bin (e.g., the 30 – 35 mph area circled) you can see how each speed reduction method compared to the others tried. Note also that the bars are ordered left-to-right in the chronological order that our speed reduction methods were performed, allowing you to see changes over time

The charts that follow in this report use the structure above and display three types of data:

- **Average Daily Volume:** showing the total volume of vehicles
- **Reduction in volume:** showing the number of vehicles reduced relative to the original base line (leftmost orange bars)
- **Percent reduction in volume:** showing the percent change in volume relative to the original baseline

Average Daily Traffic Volumes



The chart above shows the Average Daily Volume of traffic during our test. This gives an understanding of how traffic speeds are distributed. A few items to note:

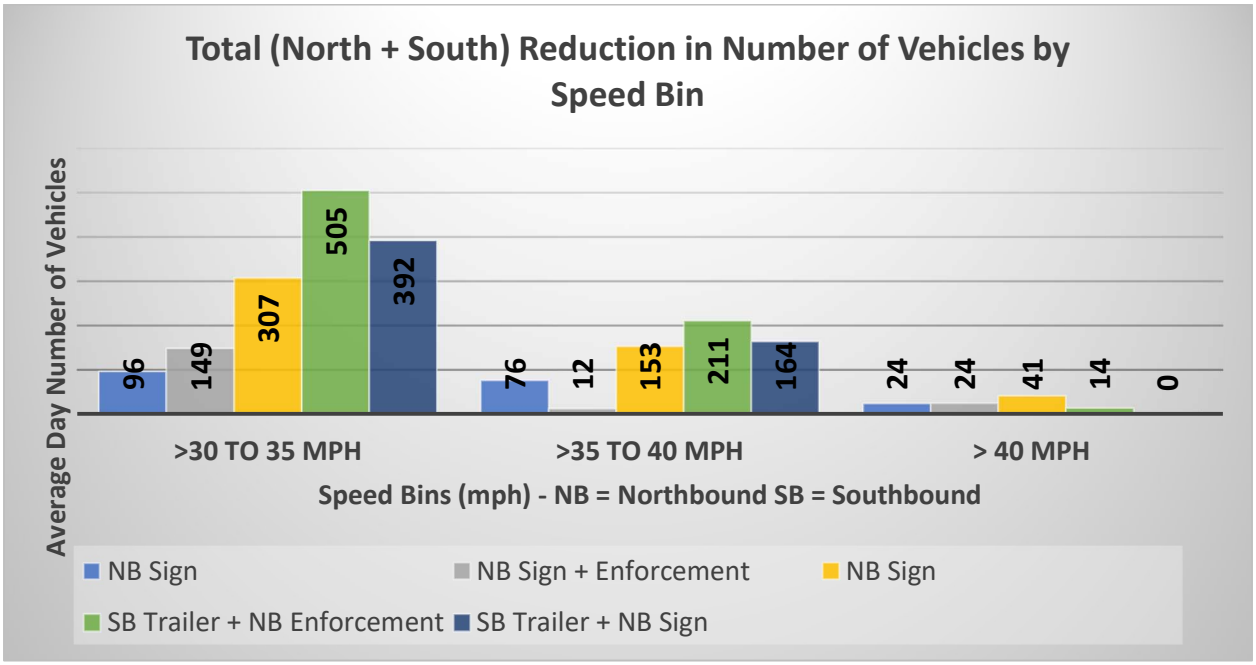
- The largest bulk of traffic is traveling 25 – 30 mph, with most of the traffic traveling below 35 mph.
- Traffic speeds shifted downward during our speed reduction efforts. Traffic volumes increased below the speed limit and in the 25 – 30 mph range, and generally decreased above 30 mph. For example, our baseline had 917 cars/day below 25 mph, and that volume increased to a peak of 1,320 cars/day during our combined speed display and enforcement work. Similarly, the volume traveling 30 -35 mph reduced from 2,051 to a low of 1,546 cars/day through our work

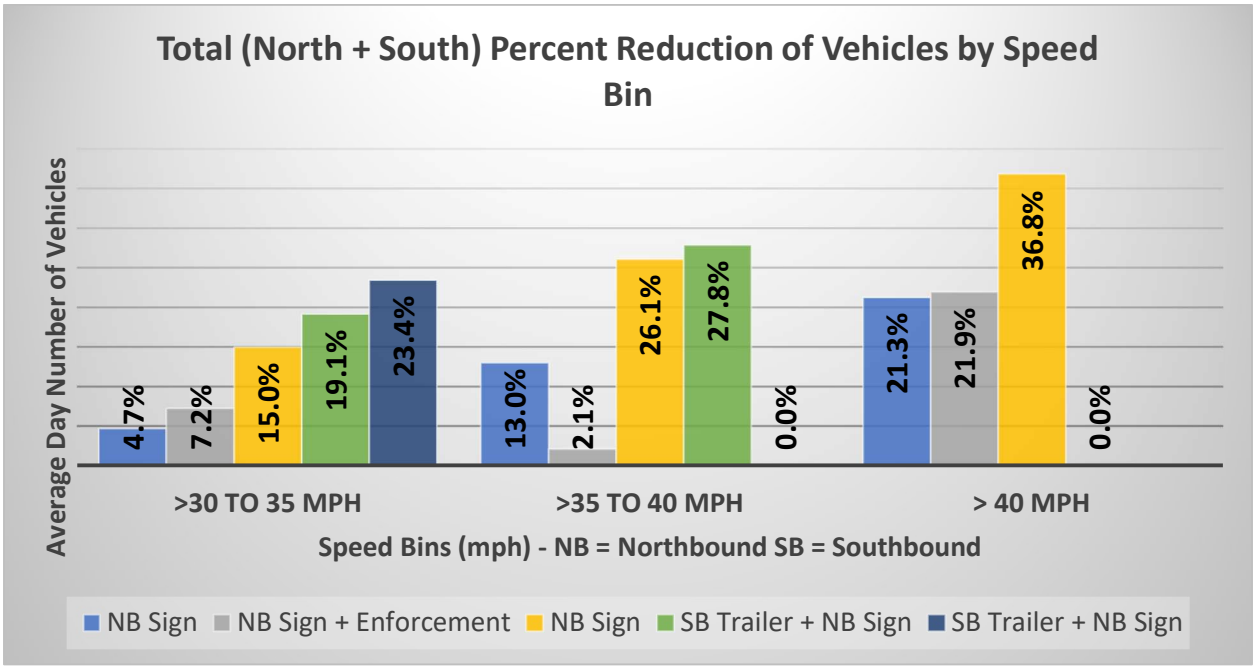
While it is not shown on this chart, the Traffic Average Daily Volumes across the entire project were:

Average Number of Vehicles per Day		
Northbound	**Southbound**	**Combined**
2,756	3,187	5,947

Changes in Average Daily Traffic Volumes

The following charts show how much traffic volumes changed relative to our initial baseline. Volumes increased below the speed limit and in the 25 – 30 mph speed range. To simplify the charts, we only show the speed bins above 30 mph.



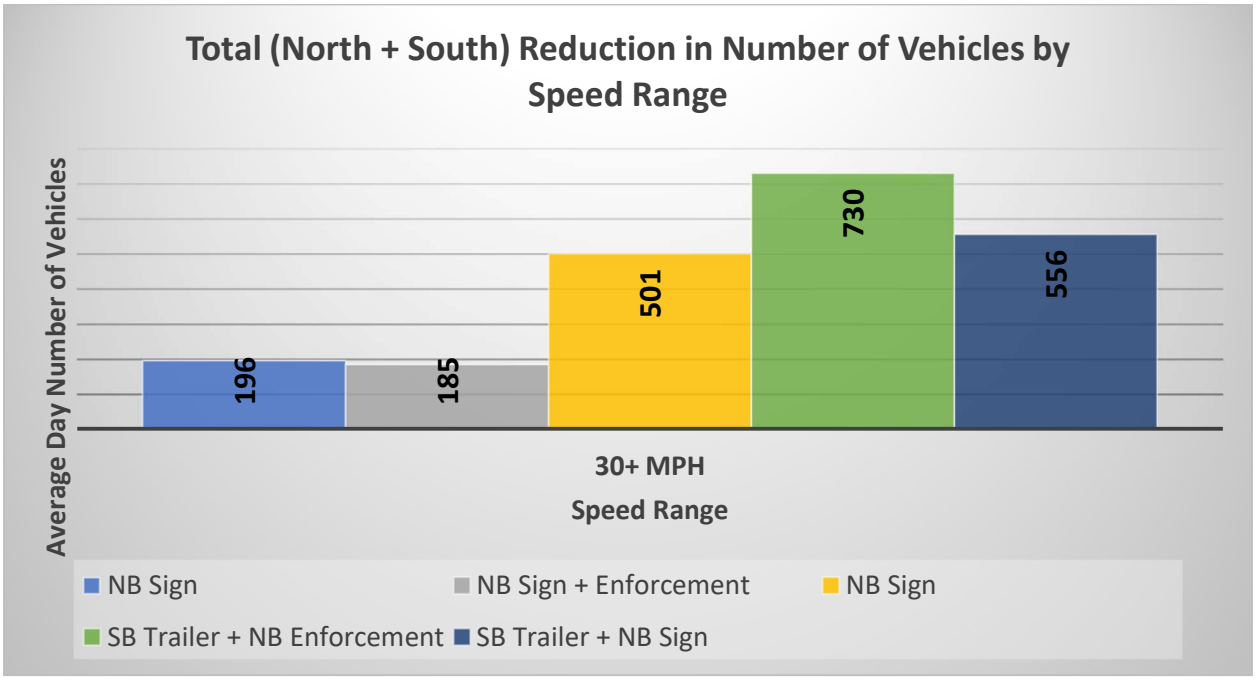


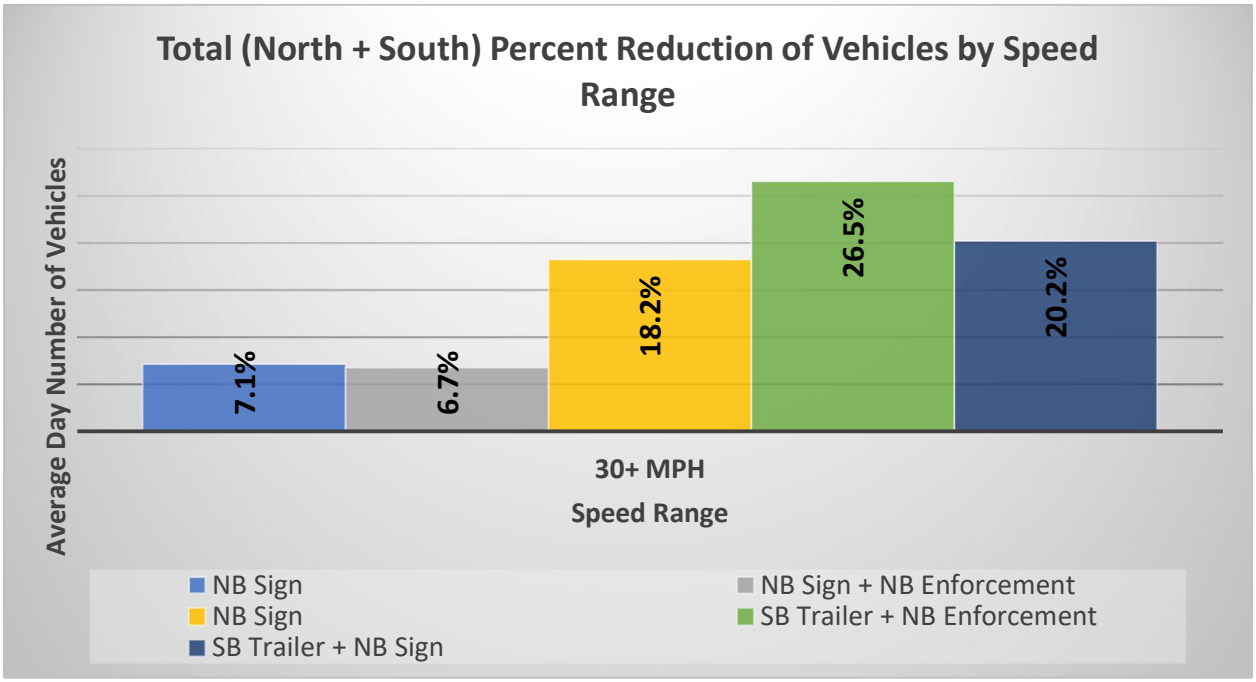
The charts above show the total reduction in the daily number and percentage of speeding vehicles relative to our baseline data.

Overall Findings

Our project reduced the number of vehicles traveling 30 mph or faster by an average of 500 – 730 vehicles/day, an 18% to 26% improvement.

The charts below show the volume changes for vehicles traveling over 30 mph (e.g., adding the volumes of the 30-35 mph, 35-40 mph, and 40+ mph bins previously shown)





Our project also found the following:

- **Severe Injury Collisions:**
  - There have been no severe injury collisions on this roadway segment in the last 5 years.
  - The roadway segment is not one of our High Injury Network Roads
- **Faster Direction:** Northbound traffic generally had faster speeds than Southbound traffic. Roughly 14% of Northbound traffic and 10% of Southbound traffic was initially traveling over 35 mph. The downhill direction on the road is Northbound.
- **Speed Display Signs**: Display signs reduced the volume of faster vehicles as follows (based on Northbound data):
  - Vehicles traveling 35 mph or more reduced by 19%
  - Vehicles traveling 40 mph or more reduced by 27%
- **Limited traffic enforcement + Speed Display:** We enforced traffic roughly 1 hour/day, 3 – 4 days per week during the times the display signs were operating. Enforcement performed with the speed display sign operating reduced the volume of faster vehicles as follows (based on Northbound data):
  - Vehicles traveling 35 mph or more reduced by 40% (20% from enforcement)
  - Vehicles traveling 40 mph or more reduced by 40% (15% from enforcement)
- **Enforcement in the area**: A Speed Display Trailer with traffic enforcement taking place in the area reduced the volume of vehicles travelling 35 mph or more by 21% - 23% (based on the Southbound data during weeks when Northbound enforcement occurred).
- **Total Speeding traffic reduction:** 501 – 730 cars per day, or 18.2% - 26.5% of the baseline volume, were removed from the 30+ mph over speed limit traffic during this project using display signs and enforcement.

Our combination of a speed display sign and traffic enforcement successfully reduced the number of speeders in both the Northbound and Southbound directions which, in the event a collision occurs in the future, has reduced the potential severity of a collision.

Next Steps

We have several steps planned to help manage traffic speeds on this roadway segment:

Enforcement: This Acalanes Rd segment has been one of our traffic enforcement areas for a long time and will continue to be on our rotation for traffic enforcement.

Traffic Engineering: Lafayette's Traffic Engineering department is looking into further traffic calming options in the area. This road is an evacuation route so there are limits on what can be done to further reduce speed.

Social Media: We will include a discussion about the Acalanes Rd segment in upcoming social media, reminding people to keep their speeds down

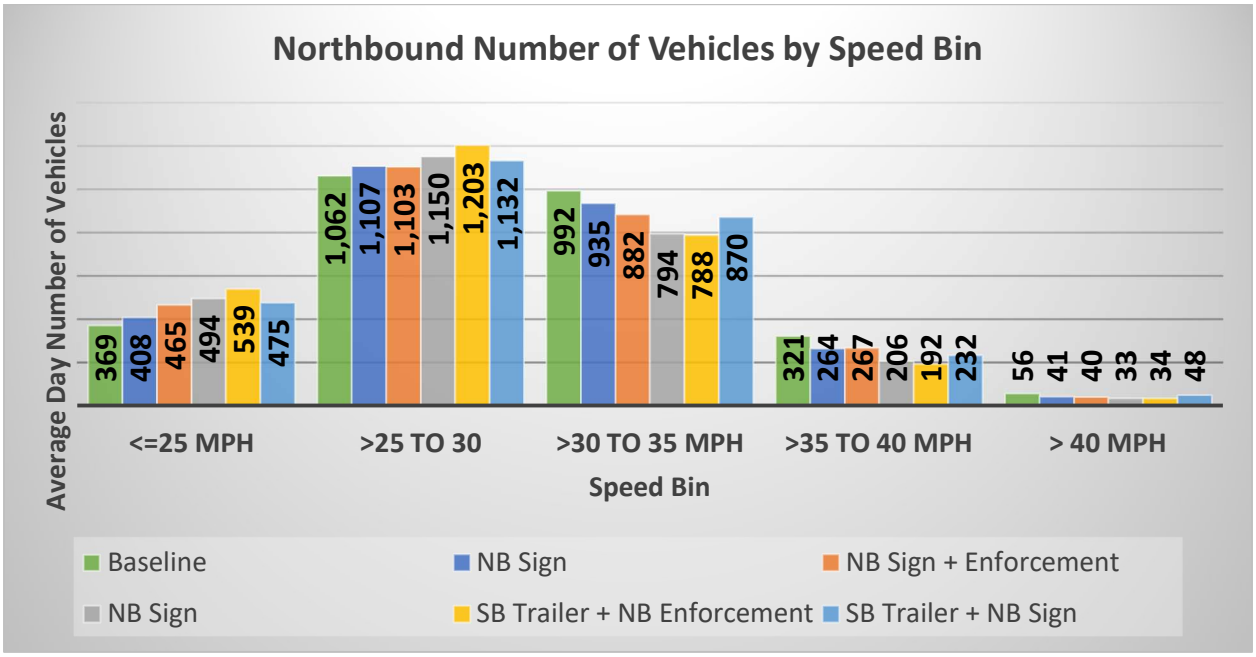
Periodic Recheck: The Slow Down Lafayette Program will periodically check speeds and potentially place speed display signs as needed along this roadway segment

Appendices

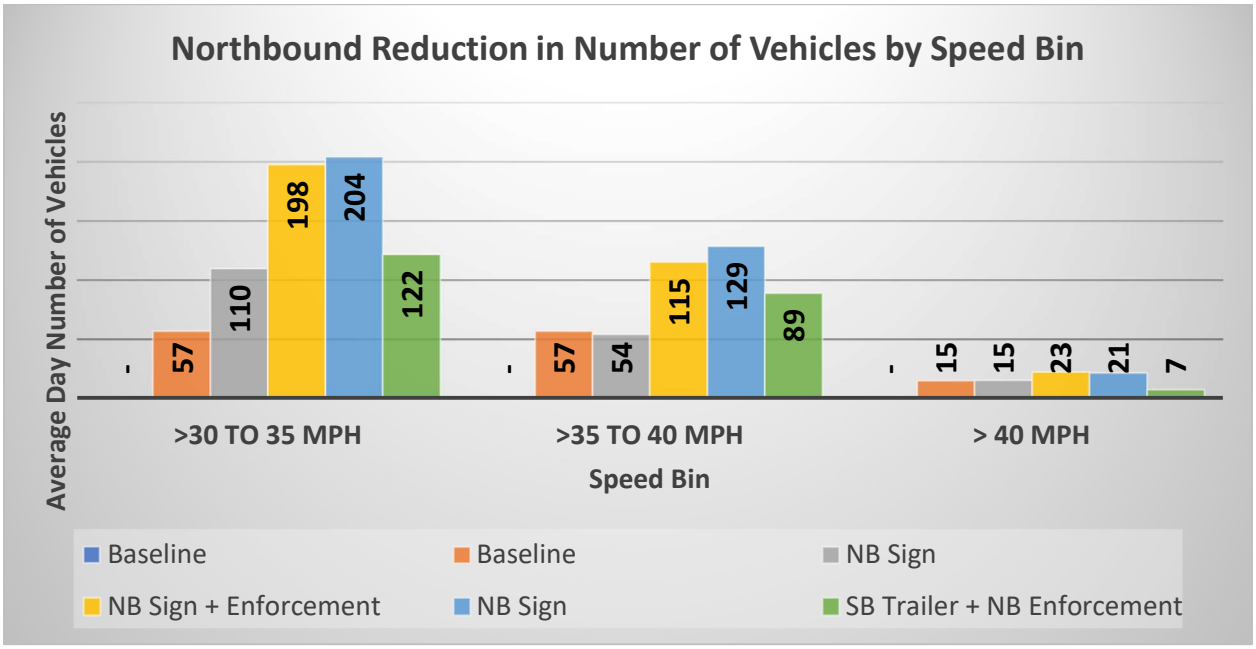
Appendix 1- Northbound Traffic

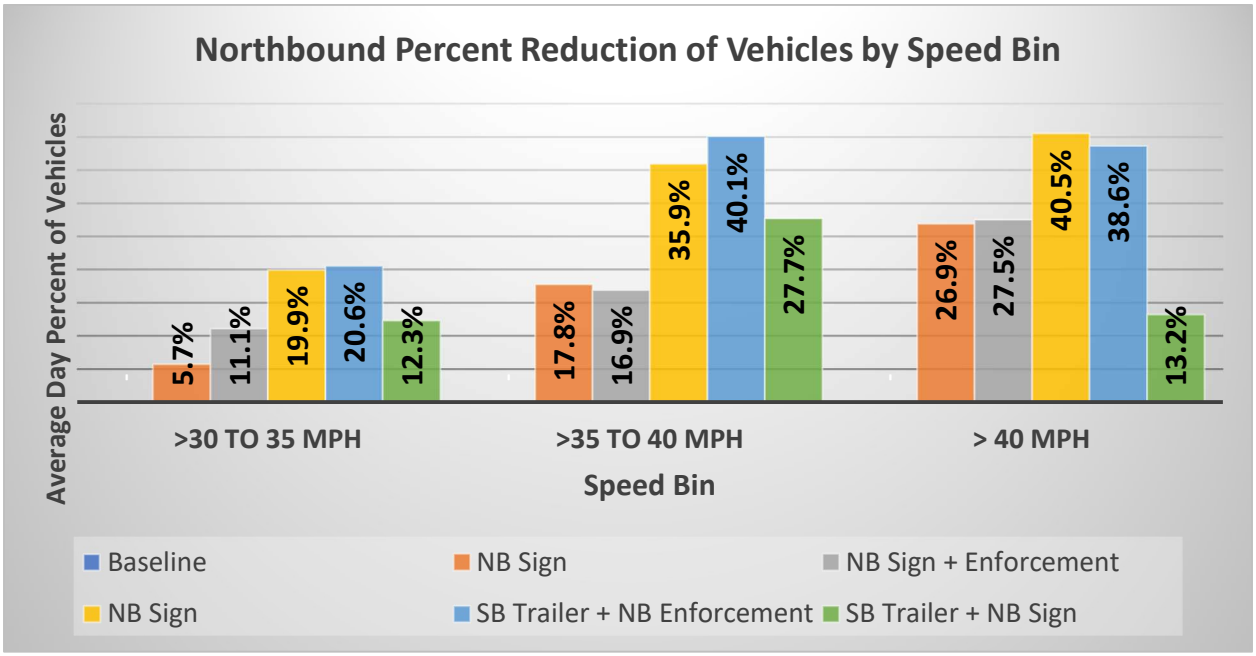
Average Daily Traffic Volumes

Northbound traffic averaged 2,756 vehicles per day.



Changes in Average Daily Traffic Volumes



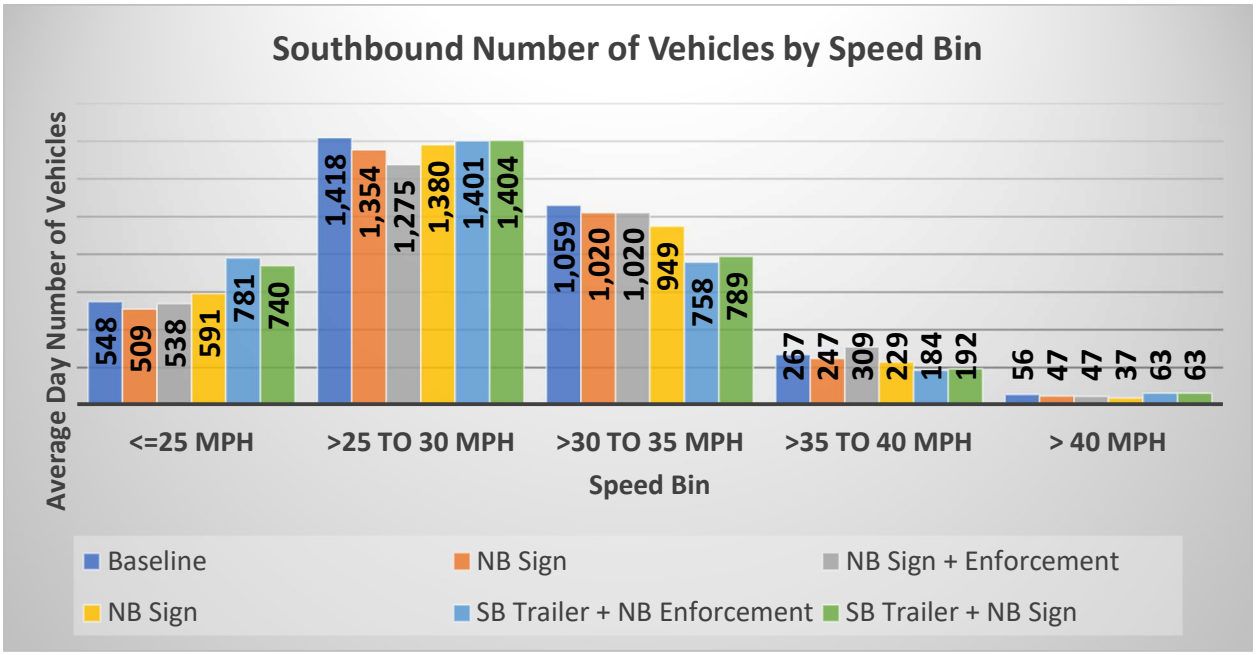


We compared the number and percent of our baseline number of vehicles that were slowed down to understand how effective our project was on reducing the higher risk volumes. We achieved the highest percent reduction in speeders at our fastest speeds during the peak of this project.

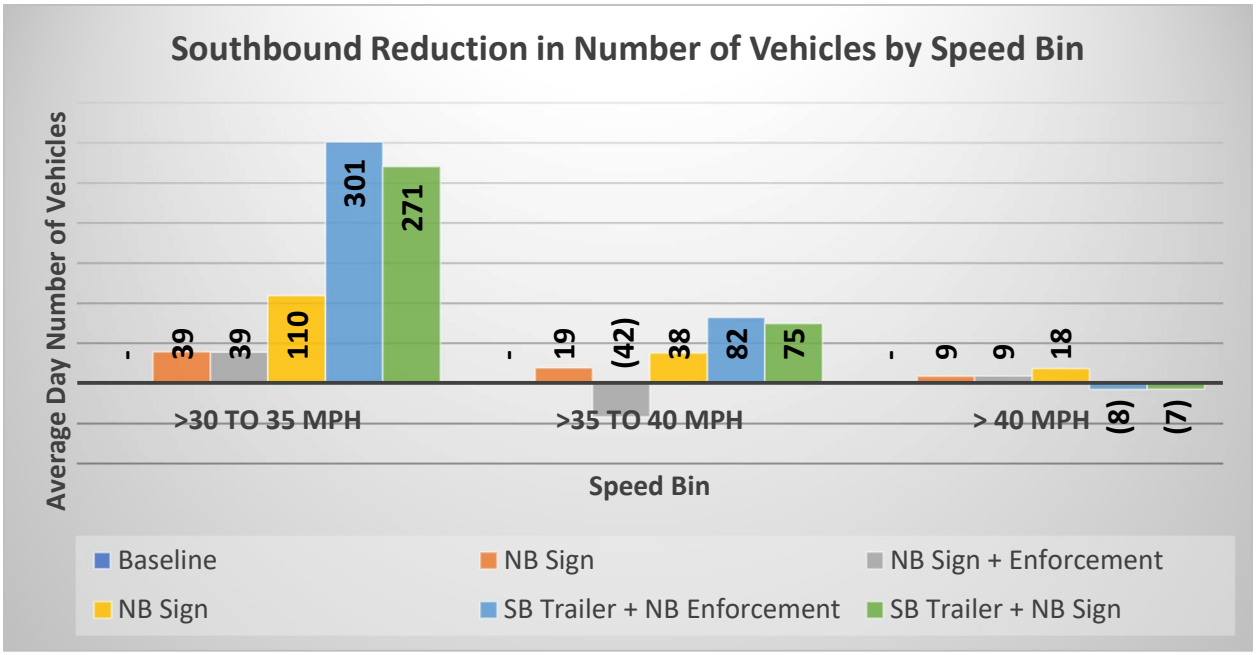
Appendix 2- Southbound Traffic

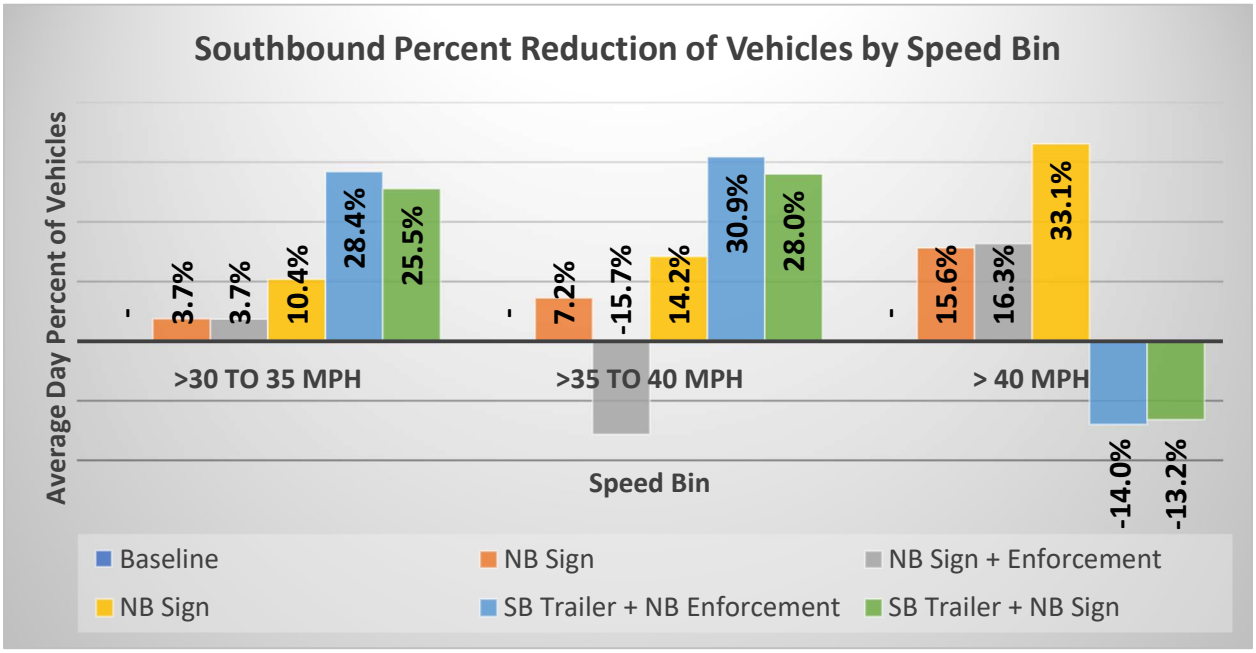
Average Daily Traffic Volumes

Southbound traffic averaged 3,187 vehicles per day.



Changes in Average Daily Traffic Volumes

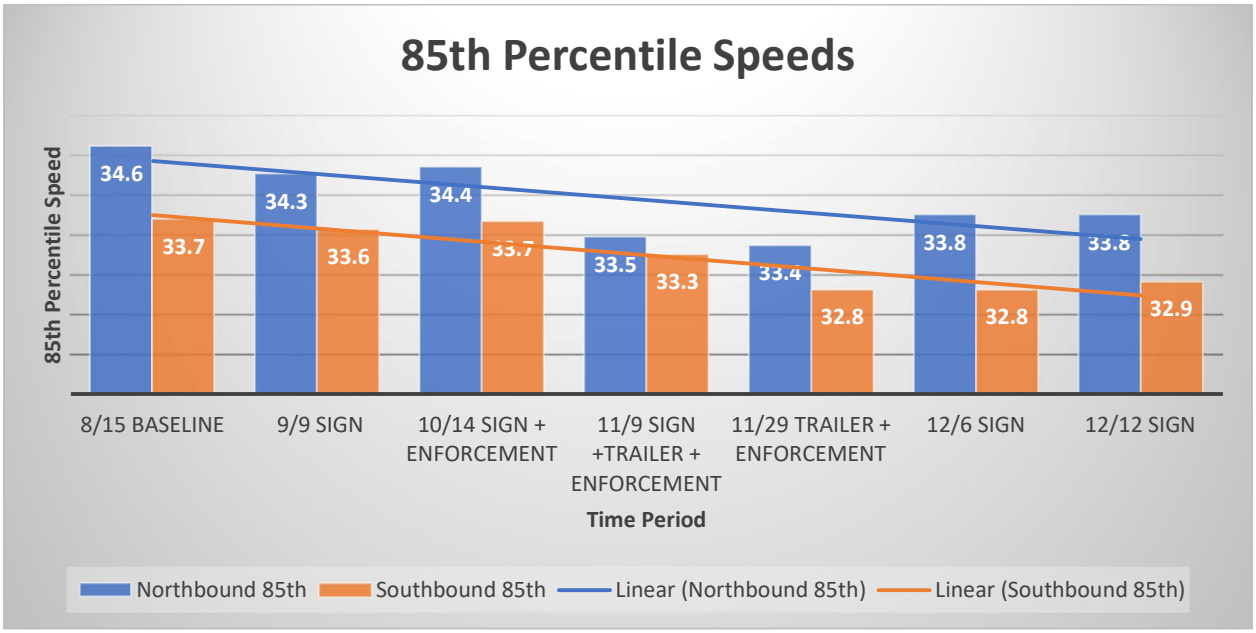




We compared the number of vehicles reduced to our baseline number of vehicles to determine what percent of our baseline was reduced. We achieved the highest percent reduction in speeders in the 5+ and 10+ mph speed ranges. We achieved the highest percent reduction in speeders in the 3- = 35 mph and 35 - 40 mph speed bind. Visible police presence also appears to have had a roughly 3% affect in these ranges. The number of vehicles traveling 40+ mph increased by 7-8 per day at the end of the project. It is unclear what caused this change in the Southbound direction.

Appendix 3- 85th Percentile Speeds

Traffic engineers use 85th Percentile speeds to help determine how the bulk of traffic behaves. Our Slow Down Lafayette program goal is to slow down the fastest speeders, which means we are primarily focused on the top 15th percentile of traffic above the 85th percentile.



Our baseline 85th Percentile speeds were 34.6 mph Northbound and 33.7 mph Southbound, or just under 10 mph over the speed limit. We reduced 85th percentile speeds by 1 mph (3.0 %) Northbound and 0.8 mph (2.2%) Southbound over the course of the project. Note that the large changes in the top 15% percentile that we achieved only appear as small changes in the 85th percentile.

Appendix 4- Injury and Severe Collision History

We looked at prior accident information and found the following:

- No severe injury collisions per million vehicle miles (c/mvm), based on an external traffic survey of 2019 – 2021 state SWITRS data. The California average was 1.20 c/mvm
- No severe injury collisions and one *Injury – Complaint of Pain* collision (2019 – 2023)
- Not in the City of Lafayette High Injury Network