

TRANSPORTATION DEPARTMENT



East/West Cornwall Road

Town of Cary – Traffic Calming Program

March 2024

Traffic Data Summary

Introduction

Cary has responded to a citizen-initiated application for traffic calming along East and West Cornwall Road by collecting data on the speed and volume of vehicles traveling the corridor on either side of Kildaire Farm Road. The following presents a summary of the data and a discussion of how it informs the recommendation for or against traffic calming devices to be made by Cary staff.

Cornwall Road is located in central Cary, as shown on Figure 1. The area evaluated includes all of West Cornwall Road and the segment of East Cornwall Road from Kildaire Farm Road to Ralph Drive. **Both are classified as Collector Streets in the Cary Community Plan.**

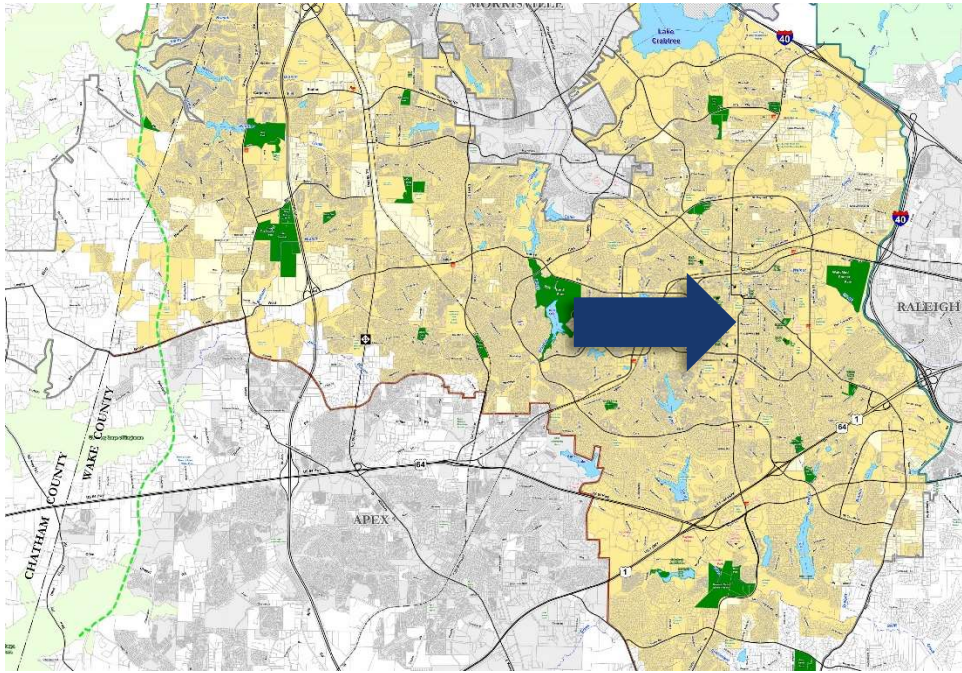


Figure 1 - Site Vicinity Map

Data Collection

Staff initiated traffic counts using one of Cary's on-call vendors for traffic data collection. Pneumatic tube counters were placed at the locations recommended by staff. Five (5) count locations were chosen for the 4,400-ft long **West Cornwall Road**, including segments with existing traffic calming devices (speed humps), as shown on Figure 2. Three (3) count locations were chosen for the shorter, 2,400-ft long, segment of **East Cornwall**, as shown on Figure 3. The counters recorded each vehicle passing over the tubes for a 72-hr period in the winter of 2023, the direction and speed thereof, and classified them according to size and axle configuration. The data was then aggregated into actionable metrics of volume (Average Daily Traffic) and speed (Average Speed and Percentile Speed).

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Figure 2 - Traffic Count Location (West Cornwall)



Figure 3 - Traffic Count Location (East Cornwall)

Traffic Volume

The total volume of vehicles traveling over the count location is represented using the conventional traffic engineering metric of **Average Daily Traffic (ADT)**. ADT is the total volume during a given time period (in whole days), greater than one day and less than one year, divided by the number of days in that time period. It is common to see a fluctuation in the average daily traffic along a road. Therefore, the values presented herein are averages of the 24-hour counts in the collected data sets.

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What are considered typical traffic volumes for various Cary street classifications are listed below, as defined in Section 3000 of the Cary Standard Specifications. The ADT limits listed are guidelines used for planning purposes and may vary.

Minor Local Street.....	ADT less than 400 vehicles per day
Major Local Street.....	ADT less than 1,500 vehicles per day
Collector Street.....	ADT less than 3,000 vehicles per day
Major Collector Street/Avenue.....	ADT expected to exceed 3,000 vehicles per day

The ADT data is presented in Table 1 for the traffic counts along East & West Cornwall Road.

Table 1 - Traffic Volume

Location	Date	Average Daily Traffic (ADT)
515 West Cornwall Road – btw Hillview & Union	Dec 12-14, 2023	429 vehicles per day
415 West Cornwall Road – btw Union & Griffis	Dec 12-14, 2023	599 vehicles per day
257 West Cornwall Road – btw Pond & Glenhope	Dec 12-14, 2023	1,450 vehicles per day
241 West Cornwall Road – btw Glenhope & Epping	Dec 12-14, 2023	1,987 vehicles per day
125 West Cornwall Road – btw Epping & Kildaire Farm	Nov 28-30, 2023	2,268 vehicles per day
108 East Cornwall Road – btw Kildaire Farm & Ed Simmons	Nov 28-30, 2023	1,183 vehicles per day
239 East Cornwall Road – btw Ed Simmons & Washington	Nov 28-30, 2023	1,164 vehicles per day
401 East Cornwall Road – btw Warren & Ralph	Dec 12-14, 2023	901 vehicles per day

Traffic Speed

Directional speed was collected for each vehicle that traveled over the count location for the 72-hour collection period. Speed can be aggregated and presented using multiple metrics, each of which provides traffic engineers with a different perspective on the prevailing pattern of behavior. For the purpose of informing Cary staff's recommendations on traffic calming, the metrics of Average Speed and Percentile Speed are valuable.

Average Speed is a straightforward account of all speed measurements taken divided by the total number of vehicles counted. Average Speed would ideally fall below the posted speed limit and within a several miles-per-hour range of the Design Speed for a roadway. Cary staff use this to determine if other metrics are within a reasonable range of the total average.

Percentile Speed is the speed below which a given percentage of measured vehicles were traveling. For example, if 50 out of 100 vehicles are measured below 24 mph and all but 5 are measured below 30 mph, the 50th Percentile Speed for that group is 24 mph and the 95th Percentile Speed is 30 mph.

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One of the most commonly used metrics by traffic engineers is the **85th Percentile Speed**. Again, this value shows the speed below which 85% of the vehicles counted were traveling. This value has historically been used by most U.S. jurisdictions to establish posted speed limits and should correlate to the safe travel speed (**Design Speed**) for a given roadway. It is also often used to describe the behavior of “most” drivers.

The speed data is presented in Table 2 and Figure 4 for the traffic counts that were performed for **West Cornwall Road**, which is posted at 25 mph. In the context of traffic calming, Cary staff look for the 85th Percentile Speed to fall within several miles-per-hour of the posted speed limit (orange line) and below the “ticketable” threshold for a roadway, which is considered more than 9 mph above posted (red line).

Table 2 - Traffic Speed (West Cornwall Road)

Location	Direction	Average Speed	85 th Percentile Speed
515 West Cornwall Road – btw Hillview & Union	Eastbound	23 mph	28 mph
	Westbound	24 mph	28 mph
415 West Cornwall Road – btw Union & Griffis	Eastbound	21 mph	26 mph
	Westbound	22 mph	28 mph
257 West Cornwall Road – btw Pond & Glenhope	Eastbound	22 mph	28 mph
	Westbound	23 mph	29 mph
241 West Cornwall Road – btw Glenhope & Epping	Eastbound	21 mph	26 mph
	Westbound	22 mph	27 mph
125 West Cornwall Road – btw Epping & Kildaire Farm	Eastbound	23 mph	28 mph
	Westbound	21 mph	25 mph

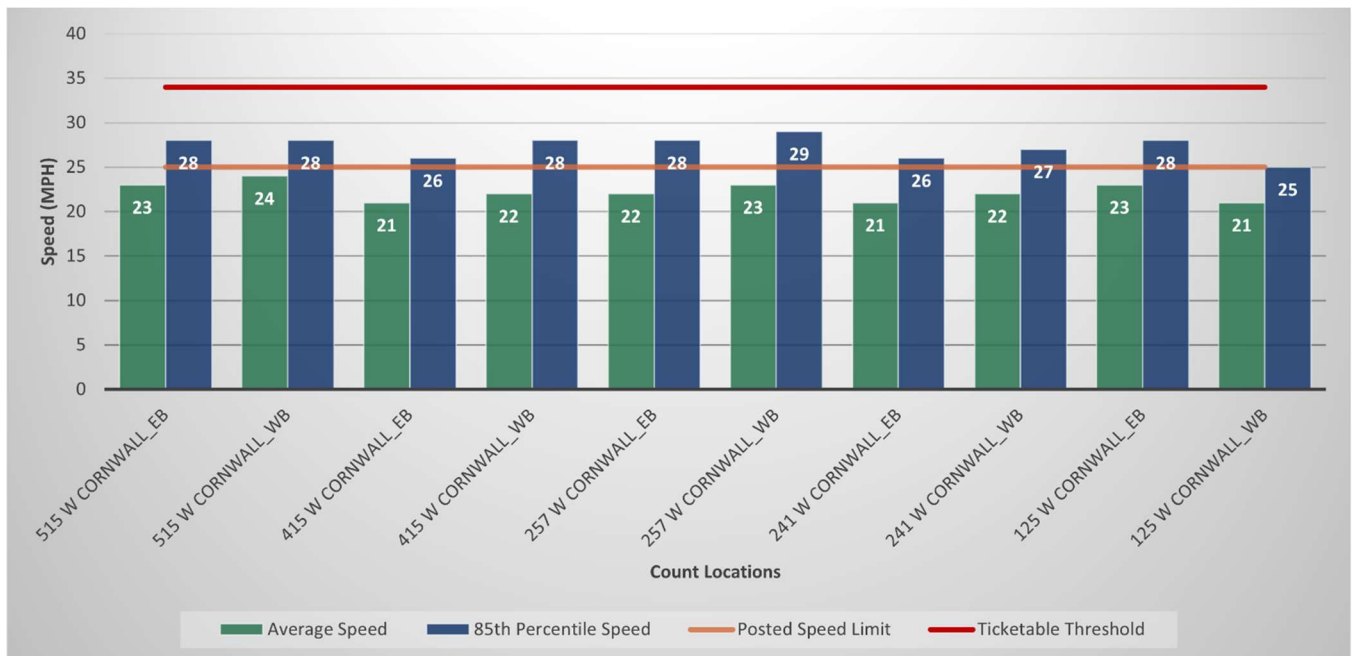


Figure 4 - Speed Metrics Chart (West Cornwall Road)

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The speed data is presented in Table 3 and Figure 5 for the traffic counts that were performed for **East Cornwall Road**, which is posted at 25 mph.

Table 3 - Traffic Speed (East Cornwall Road)

Location	Direction	Average Speed	85 th Percentile Speed
108 East Cornwall Road – east of Kildaire Farm	Eastbound	27 mph	32 mph
	Westbound	29 mph	34 mph
239 East Cornwall Road – east of Washington	Eastbound	27 mph	32 mph
	Westbound	27 mph	33 mph
401 East Cornwall Road – btw Warren & Ralph	Eastbound	25 mph	29 mph
	Westbound	23 mph	28 mph

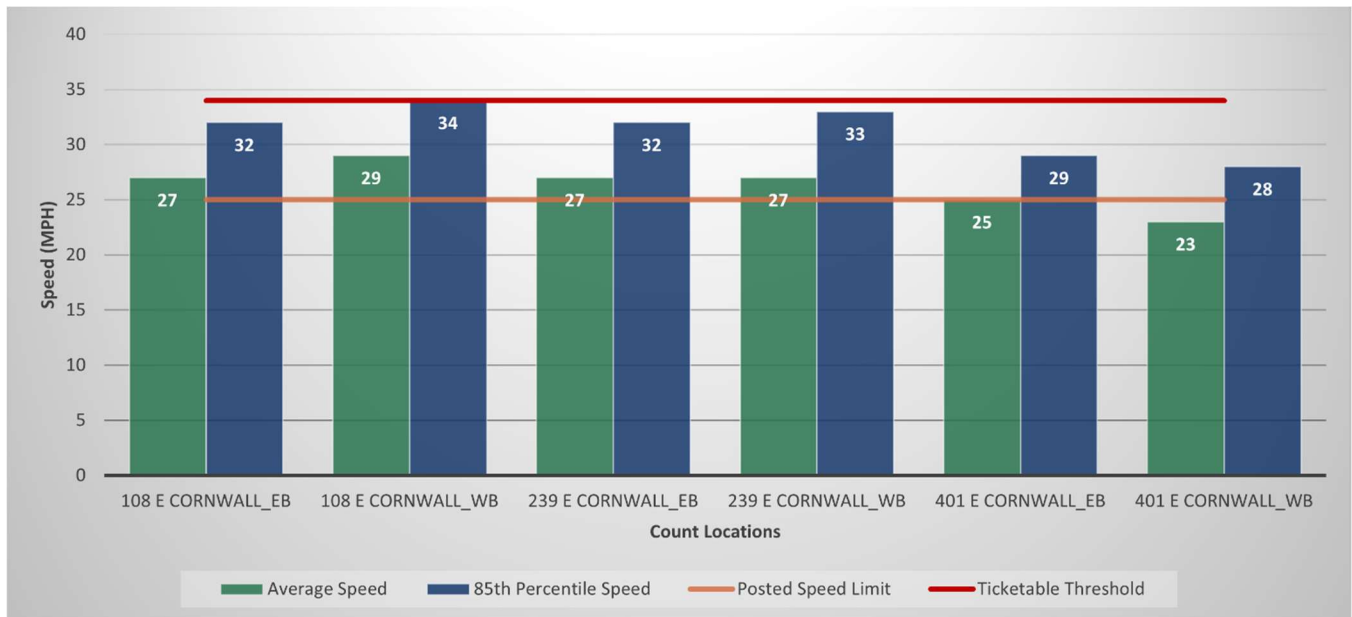


Figure 5 - Speed Metrics Chart (East Cornwall Road)

Beyond the measured numbers, how speeds are distributed across the range is reviewed by Cary staff. It is expected that speeds are normally distributed, meaning that most values for speed typically occur in a central range, with fewer values occurring outside of this range on either the high or the low side. Few drivers will drive extremely fast or extremely slow in comparison to others. In order to exhibit this, vehicle speeds are broken down into speed "bins" and charted as shown on Figure 6 and Figure 7. A gradual rise and fall of the speed curve (bell curve) represent a normal distribution.

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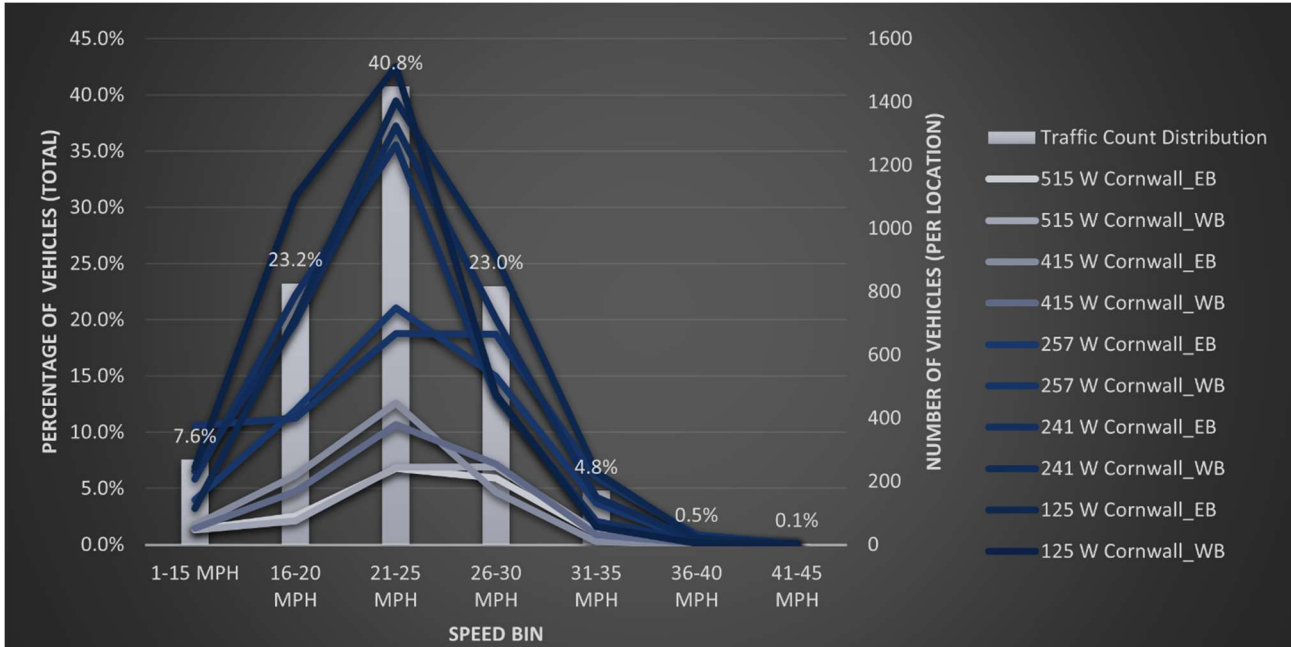


Figure 6 - Speed Distribution Chart (West Cornwall Road)

The data trends for **West Cornwall Road** show that the majority of traffic is traveling within 5 mph of the posted speed limit. The distribution curves and speed metrics appear consistent across all count locations, with the curves depicting the notable drop in traffic volume for the western locations (curves falling closer to the bottom of the graph). The speed curves show peaks below the 25-mph speed limit with a small portion of vehicles in the “ticketable” range. These results do not indicate that a pattern of speeding exists along West Cornwall Road, neither where speed humps are present nor where they are not.

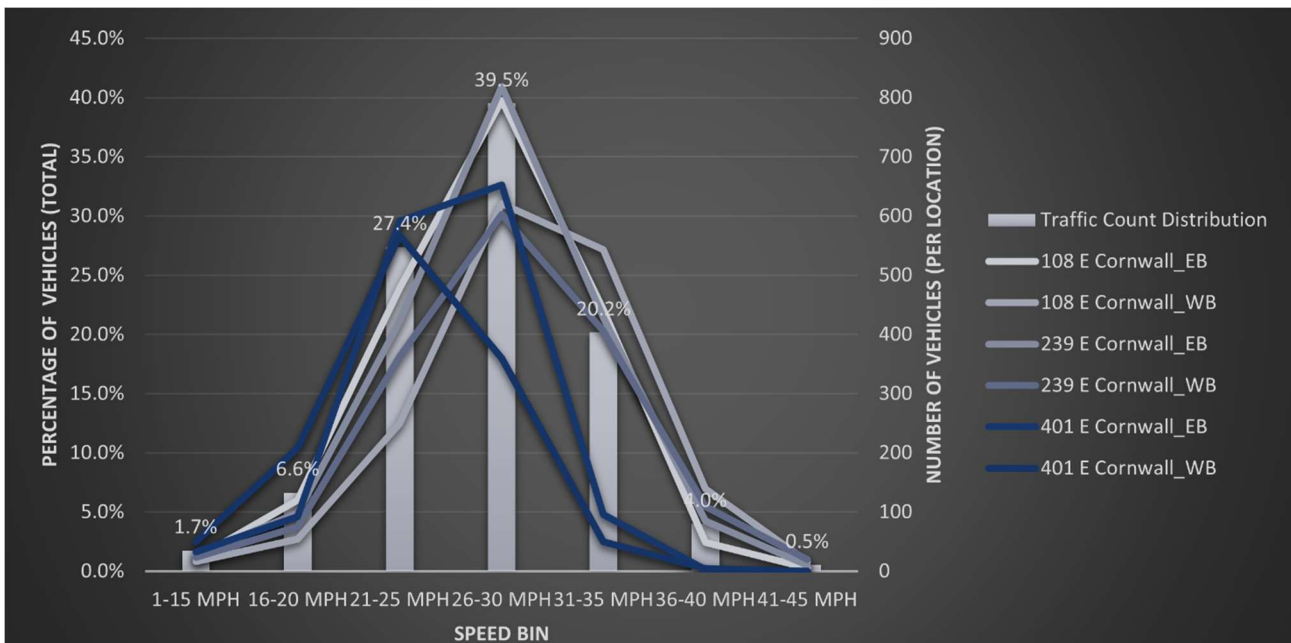


Figure 7 - Speed Distribution Chart (East Cornwall Road)

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The data trends for **East Cornwall Road** show a notably higher percentage of traffic is traveling above the 25-mph posted speed limit. The distribution curves and speed metrics appear consistent for the western two count locations, with the third count location measuring conspicuously lower. This is to be expected given the stop conditions present at Warren Avenue and Ralph Drive. The speed curves for those western locations show peaks above the 25-mph speed limit with approximately 5% of vehicles in the “ticketable” range. These results do indicate that a pattern of speeding exists along East Cornwall Road.

Conclusion & Recommendation

Traffic calming devices, and specifically speed humps, raised crosswalks and the like, are designed to keep traffic near Cary’s statutory speed limit of 25 mph and are therefore relatively traversable at that speed. In cases where the 85th Percentile Speed is 35 mph or higher, a reduction in average speed of several miles per hour or more can be anticipated with certain traffic calming solutions. Consequently, *Cary’s Traffic Calming Program* references a threshold of 9 mph as the benchmark for staff to recommend traffic calming in order to focus such devices where their impact can be maximized.

For instances where most vehicles are traveling near the 25-mph statutory limit, staff do not expect that speed humps or similar devices will result in a meaningful change to driver behavior. Neighborhoods where this is the case can sometimes benefit more from active efforts by the community, such as education of other residents and increasing the frequency of on-street parking.

The data for **West Cornwall Road** measured a highest 85th Percentile Speed of 29 mph, well within a reasonable range of the posted speed limit. In addition, the two locations east of Griffis Street where no speed humps exist did not register significantly higher speeds than the data collected where speed humps do exist. This is an indication that additional traffic calming will not result in lower speeds. The percentage of vehicles measured in the “ticketable” range is also not significant. The aggregate data indicates that traffic calming does not appear to be warranted so **staff are not recommending that West Cornwall Road be considered for additional traffic calming devices.**

The data for **East Cornwall Road** tells a different story, with a highest measured 85th Percentile Speed of 34 mph, approaching 10 mph above the posted speed limit. Several other measurements, while lower, were within a few miles-per-hour, indicating some consistency. In addition, the percentage of vehicles measured in the “ticketable” range is notable, particularly for the western count locations. The aggregate data indicates that traffic calming appears to be warranted to encourage safer driver behavior, so **staff are recommending that East Cornwall Road be considered for traffic calming.**

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