

TRANSPORTATION DEPARTMENT



**Weycroft Subdivision:
Weycroft Grant Drive & Weycroft Ridge Drive**

Town of Cary – Traffic Calming Program

February 2023

Traffic Data Summary

Introduction

Cary has responded to a citizen-initiated application for traffic calming within Weycroft community by collecting data on the speed and volume of vehicles along several neighborhood roads. The following presents a summary of the data and a discussion of how it informs the recommendation for or against traffic calming devices and multi-modal improvements to be made by Cary staff.

Weycroft is located in western Cary, as shown on Figure 1. The area being evaluated includes Weycroft Grant Drive, Weycroft Ridge Drive, and the segment of Weycroft Avenue that connects the neighborhood to Green Level Church Road. The former two are local public streets while **Weycroft Avenue is classified as a Collector Street in the Cary Community Plan.**

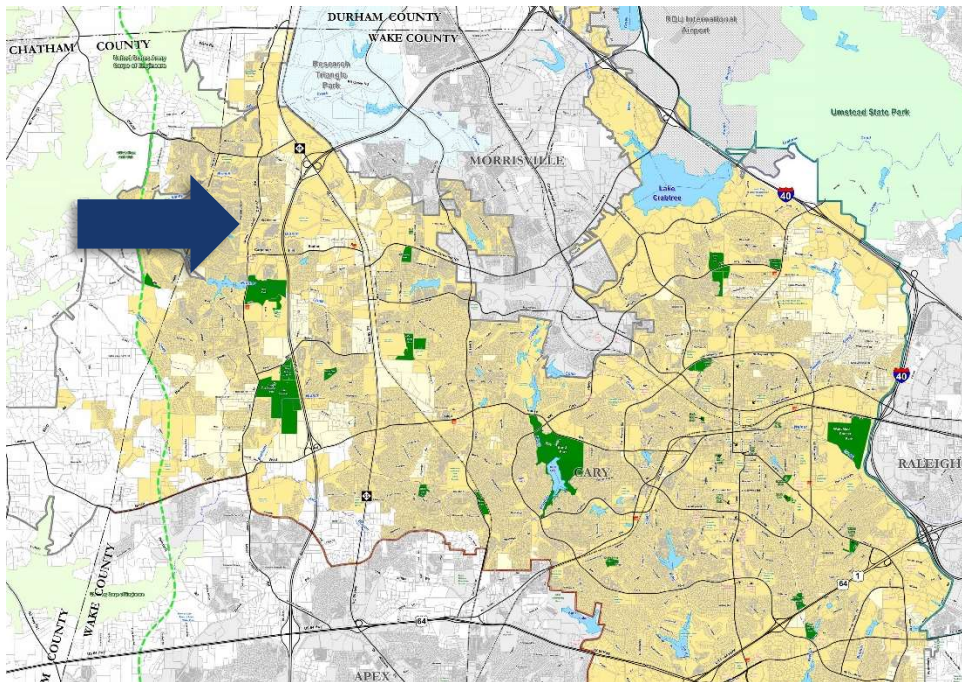


Figure 1 - Site Vicinity Map

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. Six (6) count locations were chosen at regular intervals between as shown on Figure 2. The counters recorded each vehicle passing over the tubes for a 72-hr period in Fall of 2022, 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

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.

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

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The ADT data is presented in Table 1 for the traffic counts that were conducted within the Weycroft subdivision.

Table 1 - Traffic Volume

Location	Date	Average Daily Traffic (ADT)
Weycroft Avenue	Oct 4-6, 2022	1672 vehicles per day
Weycroft Grant Drive between Ramsey Grant and Enfield Hill	Sep 27-28, 2022	316 vehicles per day
Weycroft Grant Drive south of Bolton Grant	Sep 27-28, 2022	133 vehicles per day
Weycroft Ridge Drive	Sep 27-28, 2022	212 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.

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 in a given scenario. 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 and below the "ticketable" threshold for a roadway, which is considered more than 9 mph above posted.

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The speed data is presented in Table 2 and Figure 3 for the traffic counts that were performed for Weycroft Avenue, Weycroft Grant Drive, and Weycroft Ridge Drive, which are all posted at 25 mph.

Table 2 - Traffic Speed

Location	Direction	Average Speed	85 th Percentile Speed
Weycroft Avenue	Eastbound	31 mph	37 mph
	Westbound	31 mph	37 mph
Weycroft Grant Drive between Ramsey Grant and Enfield Hill	Northbound	28 mph	34 mph
	Southbound	27 mph	33 mph
Weycroft Grant Drive south of Bolton Grant	Northbound	20 mph	24 mph
	Southbound	21 mph	24 mph
Weycroft Ridge Drive	Northbound	20 mph	24 mph
	Southbound	19 mph	24 mph

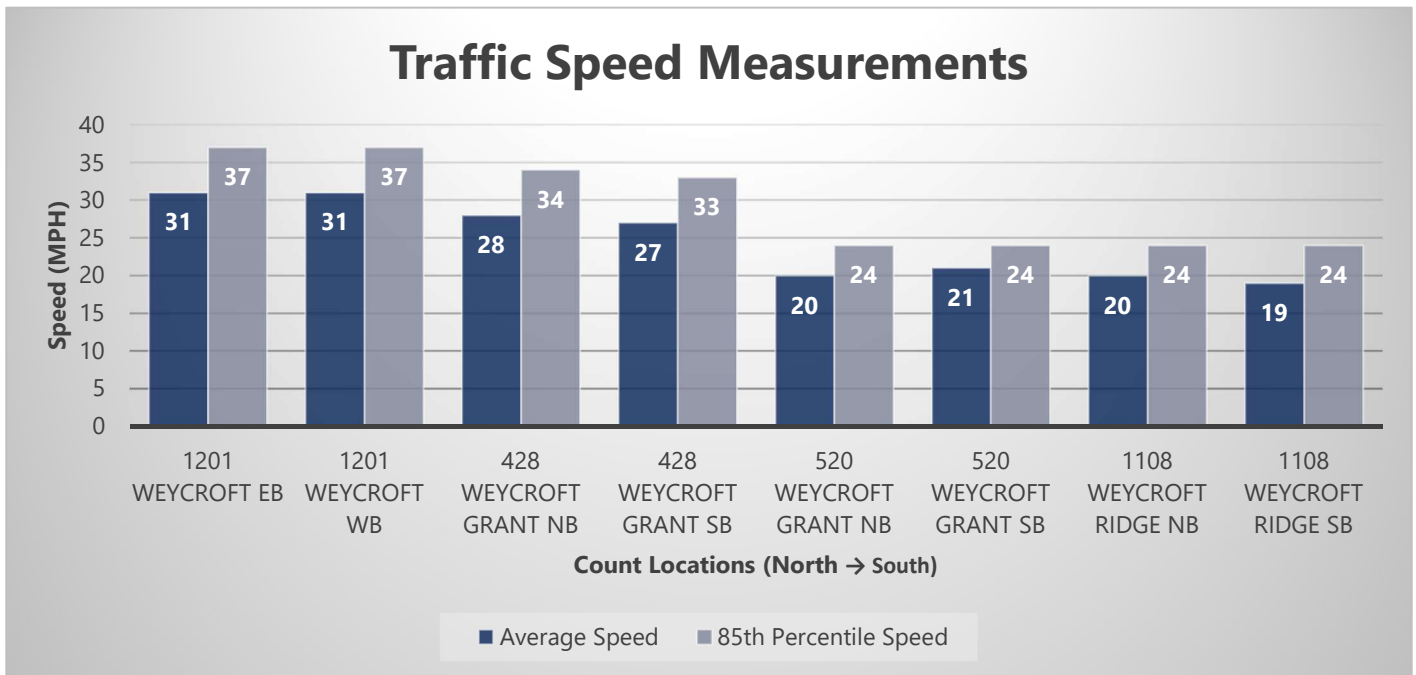


Figure 3 - Weycroft Speed Metrics

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 4. A gradual rise and fall of the speed curve represent a normal distribution.

In order to better exhibit the data trends that inform staff’s recommendations, the chart below does not include all traffic count locations. As a Collector Street, Weycroft Avenue will be addressed separately from the local neighborhood streets.

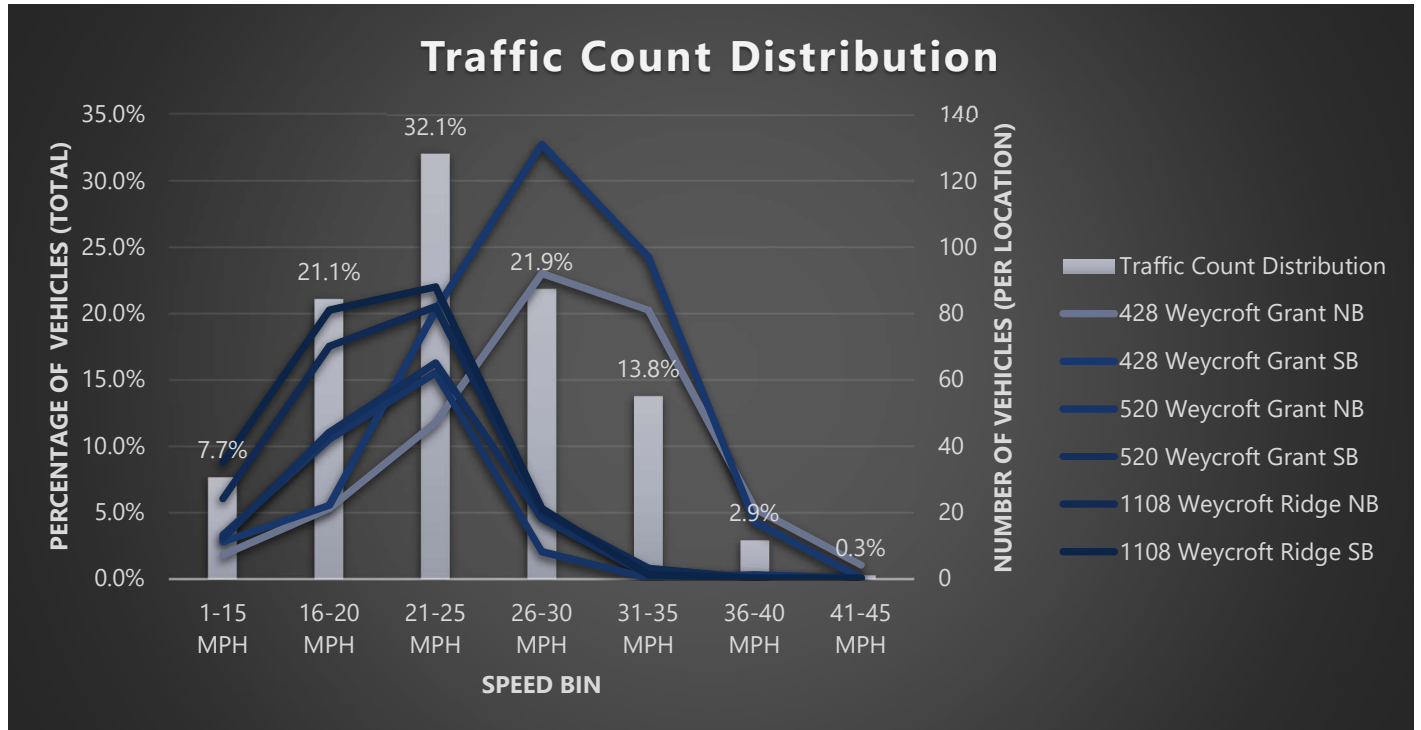


Figure 4 - Weycroft Subdivision Speed Distribution

The data trends for the Weycroft community show a clear difference between the northern half of Weycroft Grant Drive and the rest of the neighborhood. The two speed curves noticeably to the right indicate higher vehicle speeds than the remaining field. Focusing on just these curves, the peak above the 25-mph limit appears to indicate a pattern of speeding along the straight, northern portion of Weycroft Grant Drive.

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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 Weycroft Grant Drive yielded a highest measured 85th Percentile Speed of 34 mph, 9 mph above the posted speed limit. Speed metrics for Weycroft Ridge Drive and the southern portion of Weycroft Grant Drive were inconsistent with this measurement, both being within an acceptable range of the 25-mph limit. Reviewing the data as a whole for the Weycroft subdivision, traffic calming appears to be warranted, but not for the entire community. **As such, staff are recommending that Weycroft Grant Drive be considered for traffic calming north of Bolton Grant Drive. Staff do not recommend traffic calming along other portions of Weycroft Grant Drive or Weycroft Ridge Drive.**

The data for Weycroft Avenue appears to indicate the presence of excessive speeding with an 85th Percentile Speed of 37 mph. As a Collector Street, Weycroft impacts a significantly larger subset of Cary citizens than just the Weycroft subdivision. **In light of this context, staff are recommending that Weycroft Avenue be further evaluated, in a more holistic manner, to determine if traffic calming measures should be implemented.**

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