

TRANSPORTATION DEPARTMENT



Ridgecrest Road & Dry Avenue

Town of Cary – Traffic Calming Program

October 2022

Traffic Data Summary

Introduction

Cary responded to a citizen-initiated application for traffic calming along Ridgecrest Road by collecting data on the speed and volume of vehicles traveling thereon. The following presents a summary of the data, corresponding analysis and a discussion of how it informs the recommendation for or against traffic calming devices to be made by Cary staff.

Ridgecrest Road is located in the central core of Cary, as shown on Figure 1, and extends from West Chatham Street east to South Dixon and then northeast to West Park Street. Based on some of the data discussed herein, staff re-focused the evaluation area to eliminate the segment east of South Dixon and to include portions of South Dixon and South West Streets and Dry Avenue east to Harrison Avenue. The resultant corridor analyzed is an approximately 3,000-ft long network that connects West Chatham Street to the downtown core, and further to Walnut Street. All of the roads in this corridor are local public streets.



Figure 1 - Site Vicinity Map

Data Collection

Staff have collected traffic counts using one of Cary's on-call vendors for traffic data collection. Pneumatic tube counters were placed at the two (2) locations recommended by staff between West Chatham and South Dixon, as shown on Figure 2. The counters recorded each vehicle passing over the tubes for a 72-hr period in September 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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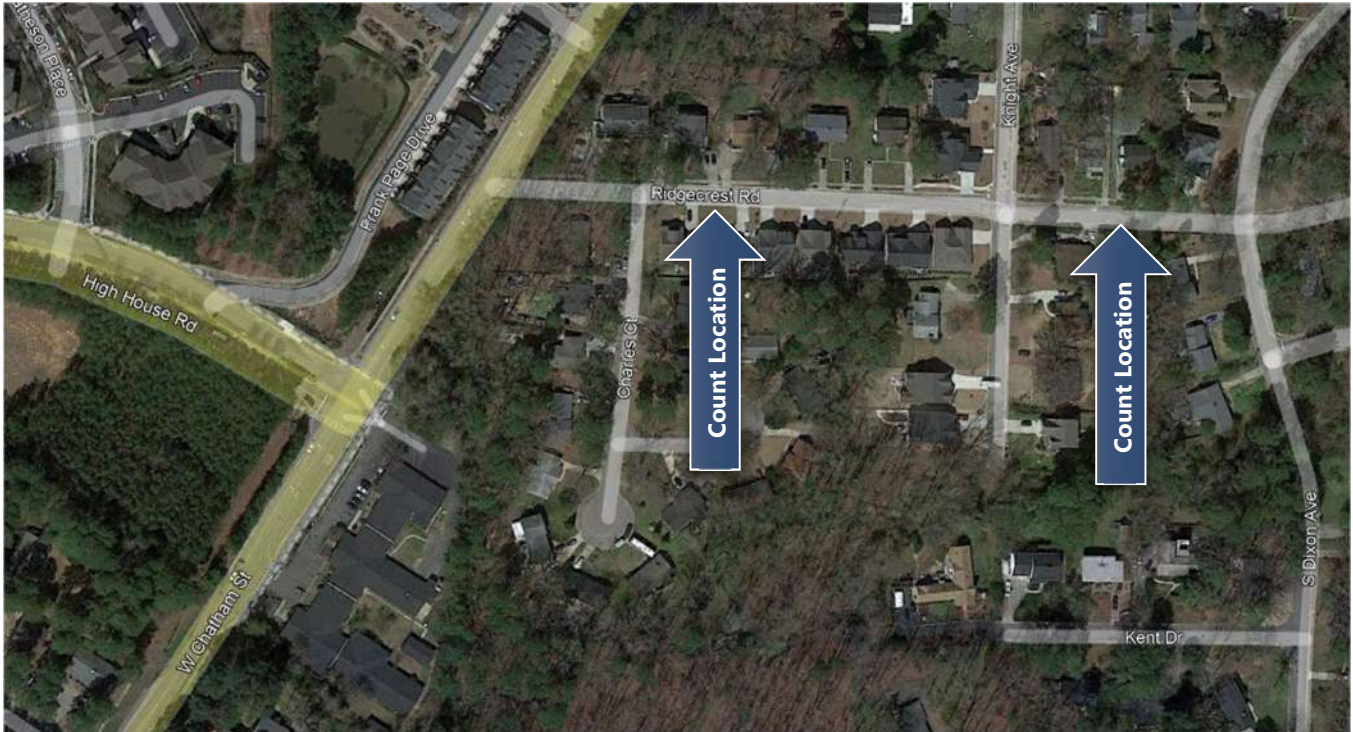


Figure 2 - Traffic Count Location

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

The ADT data is presented in Table 1 for the traffic counts that were conducted for Ridgecrest Road.

Table 1 - Traffic Volume

Location	Date	Average Daily Traffic (ADT)
510 Ridgecrest Road	Sept 13-15, 2022	1,012 vehicles per day
420 Ridgecrest Road	Sept 13-15, 2022	1,011 vehicles per day

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Traffic Volume: Open Data Evaluation

In addition to the 72-hour pneumatic tube data collection, Cary utilizes the cloud-based open data platform, *InSight*, available from *StreetLight Data, Inc.*, to evaluate traffic speed and volume over longer periods of time and using larger sample sizes. This anonymized and aggregated data is used to:

- assess changes in behaviors and conditions over time,
- correct for the non-representative peaks and valleys possible in traditional data collection,
- and to observe speed and volume along the entire corridor.

Using the *InSight* platform, Cary staff performed a preliminary analysis of Ridgecrest Road and were able to identify a trend of vehicle trips connecting High House Road and Walnut Street via Ridgecrest, Dixon and Dry, shown by the thick blue lines on Figure 3.

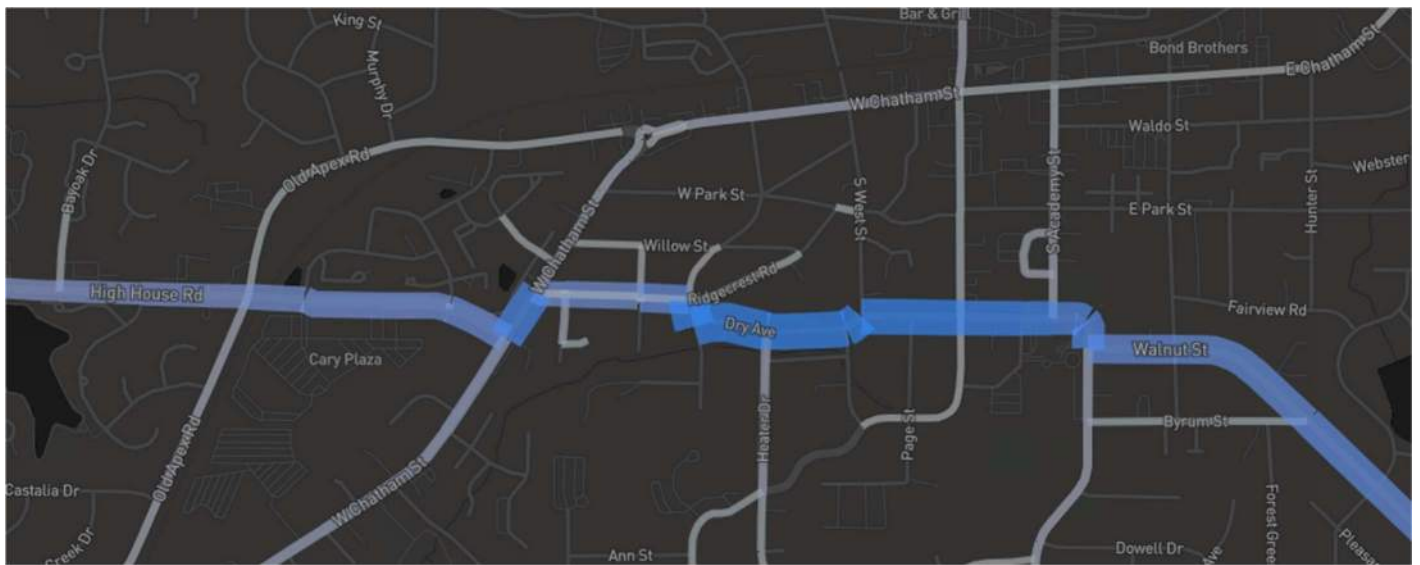


Figure 3 - *InSight* Analysis Results

Building on the preliminary analysis, staff then evaluated a dataset that represented vehicle trips throughout five (5) months between September of 2021 and April of 2022 to estimate the volume of cut-through traffic. The data in Table 2 represents the estimated average percentage of cut-through traffic.

Table 2 – *InSight* Cut-through estimate

Location	Cut-through Volume (% of entering trips)
Trips entering Ridgecrest from West Chatham Street	-----
Trips continuing for the full length of Ridgecrest and turning south on Dixon	75.6%
Trips continuing along Dixon to Dry	70.8%
Trips continuing along Dry past the West Street intersections	63.9%

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The data from this analysis shows that most traffic is on Ridgecrest appears to be cut-through traffic. Based on the data reviewed, **less than 40% of the vehicles traveling on Ridgecrest would be considered neighborhood traffic.**

This result is supported by traffic counts performed along Ridgecrest Road, east of Dixon, that show a substantial drop in ADT when compared to the western segment.

Traffic Speed

In addition to the volume/cut-through evaluation, traffic speed is an important component of this corridor evaluation. 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.

The speed data is presented in Table 3 for the traffic counts that were performed on Ridgecrest Road, which is posted at 25 mph.

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Table 3 - Traffic Speed

Location	Date	Average Speed	85 th Percentile Speed
510 Ridgecrest Road	Sept 13, 2022	24.6 mph	29.3 mph
	Sept 14, 2022	24.0 mph	29.2 mph
	Sept 15, 2022	24.3 mph	29.3 mph
420 Ridgecrest Road	Sept 13, 2022	21.5 mph	24.7 mph
	Sept 14, 2022	21.2 mph	24.6 mph
	Sept 15, 2022	21.1 mph	24.7 mph

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 be 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.

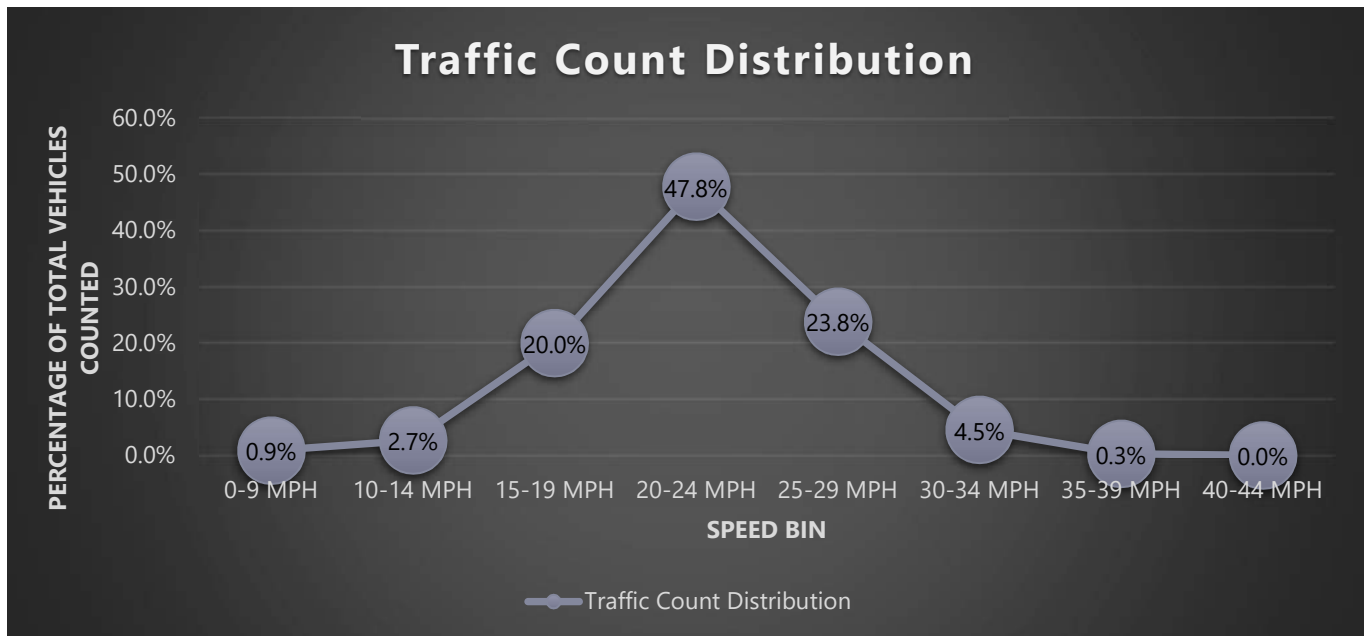


Figure 4 - Ridgecrest Road Speed Distribution

The data for Ridgecrest Road shows the highest number of vehicles traveling within the 10-mph pace speed around the posted speed limit. The peak of the distribution is below the posted speed limits, with less than 1% of vehicles shown in the "ticketable" range.

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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 notably 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 Ridgecrest Road yielded a highest measured 85th Percentile Speed of 29.3 mph, which is less than 5 mph above the posted speed limit. **Accordingly, traffic speed alone is not excessive enough to support a staff recommendation for speed humps to be installed.**

Several factors are combined with data results to impact staff's recommendations with respect to traffic calming and similar improvements. The environmental context of the downtown core is such that pedestrians, cyclists and vehicles often occupy the same congested spaces, so Cary staff are continually working to promote safety while also maintaining that setting. In addition, the street network is intended to promote connectivity, providing multiple access points to downtown and spreading the traffic load to destinations like Town Hall and the Downtown Park.

Based on the context of downtown, residents of this area can expect more non-neighborhood traffic, a higher degree of congestion, and generally more conflicts between travel modes than would be considered acceptable on a street in a traditional residential subdivision. Therefore, staff expect cut-through volumes to be higher on downtown streets. That said, **the data reviewed for Ridgecrest Road indicates a cut-through percentage that staff believe exceeds the norm for even the downtown core** and warrants addressing. Staff is currently exploring opportunities to reinforce the residential nature of this community while still maintaining the downtown context. **Final recommendations for traffic calming will be developed based on staff's expertise combined with community input.**

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