

TRANSPORTATION DEPARTMENT



**Hillsdale Forest:
Kingston Ridge Road**

Town of Cary – Traffic Calming Program

March 2024

Traffic Data Summary

Introduction

Cary has responded to a citizen-initiated application for traffic calming within the Hillsdale Forest community by collecting data on the speed and volume of vehicles traveling along Kingston Ridge 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.

Hillsdale Forest is located in eastern Cary, as shown on Figure 1. The area evaluated includes an approximately 3,500-ft long segment of Kingston Ridge Road extending south from Walnut Street. **It is classified as a Collector Street in the Cary Community Plan.**

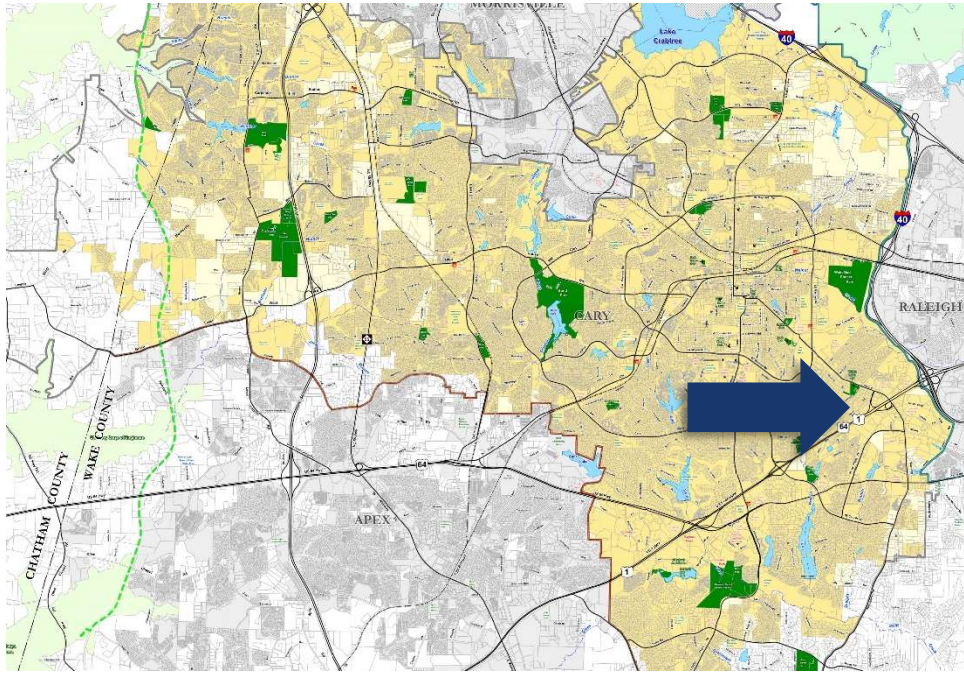


Figure 1 - Site Vicinity Map

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. Four (4) count locations were chosen for **Kingston Ridge Road** as shown on Figure 2. The counters recorded each vehicle passing over the tubes for a 72-hr period in August 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 Locations

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
- 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 Kingston Ridge Road.

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Table 1 - Traffic Volume

Location	Date	Average Daily Traffic (ADT)
1201 Kingston Ridge Road	Aug 8-10, 2023	1065 vehicles per day
1224 Kingston Ridge Road	Aug 8-10, 2023	933 vehicles per day
1301 Kingston Ridge Road	Aug 8-10, 2023	838 vehicles per day
1328 Kingston Ridge Road	Aug 8-10, 2023	539 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.

The speed data is presented in Table 2 and Figure 3 for the traffic counts that were performed for **Kingston Ridge 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).

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Table 2 - Traffic Speed Metrics

Location	Direction	Average Speed	85 th Percentile Speed
1201 Kingston Ridge Road	Northbound	27 mph	32 mph
	Southbound	23 mph	28 mph
1224 Kingston Ridge Road	Northbound	29 mph	34 mph
	Southbound	28 mph	33 mph
1301 Kingston Ridge Road	Northbound	26 mph	31 mph
	Southbound	28 mph	34 mph
1328 Kingston Ridge Road	Northbound	22 mph	27 mph
	Southbound	26 mph	30 mph

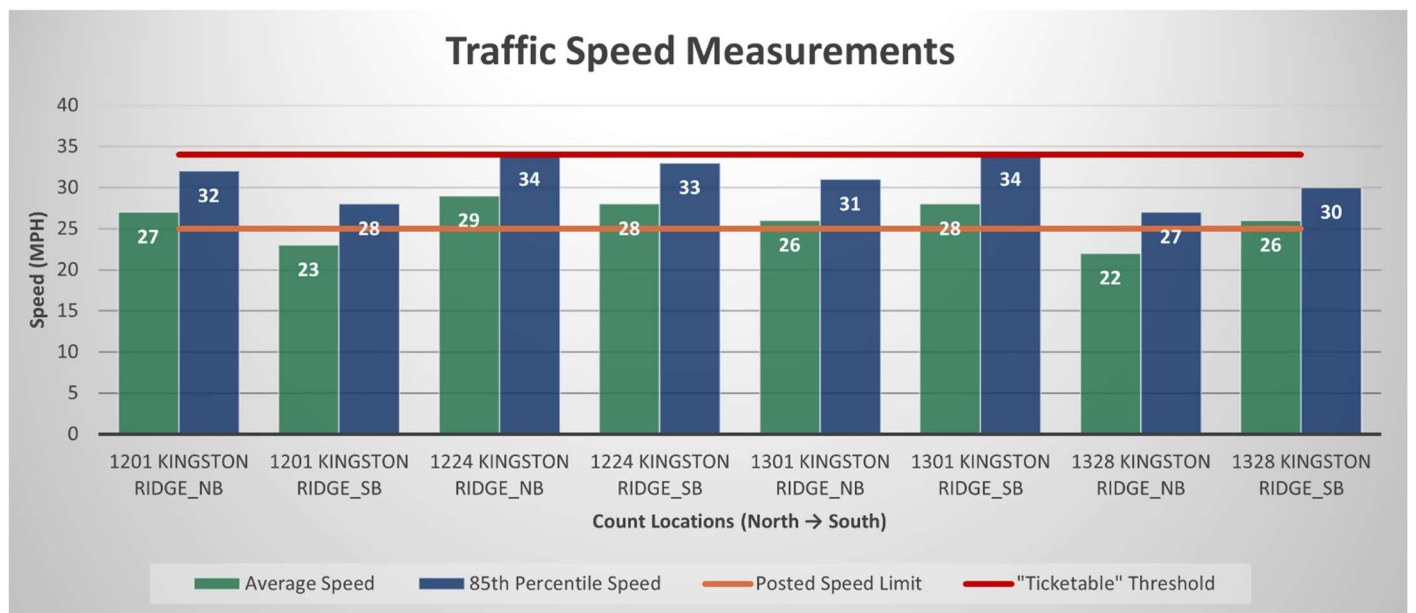


Figure 3 - Speed Metrics Chart

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 (bell curve) represent a normal distribution.

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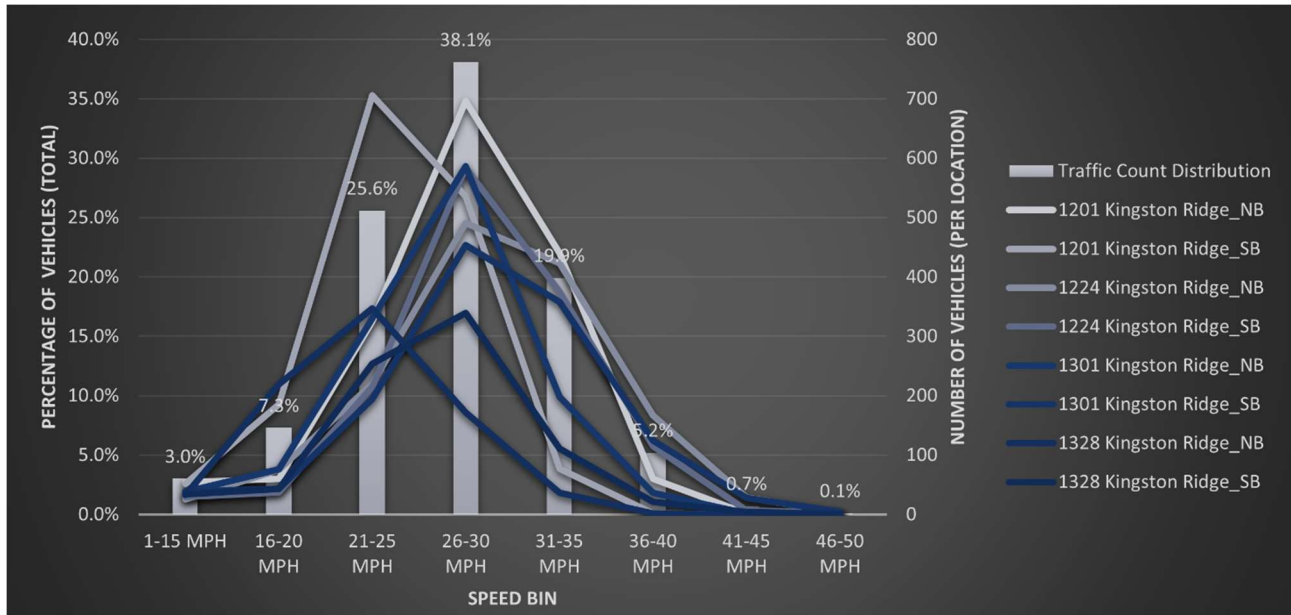


Figure 4 - Speed Distribution Chart

The data trends for **Kingston Ridge Road** show a notable percentage of traffic is traveling above the 25-mph posted speed limit. The speed curves for most locations depict peaks above the 25-mph speed limit with more than 5% of vehicles in the “ticketable” range. There is a conspicuous difference for 1328 Kingston Ridge_NB and 1201 Kingston Ridge_SB (as evidenced by those curves being offset to the left), but those are the outlying values. These results appear to indicate that a pattern of speeding exists along Kingston Ridge Road, albeit not one that would be considered excessive.

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 **Kingston Ridge Road** measured a highest 85th Percentile Speed of 34 mph, approaching 10 mph above the posted speed limit. Several other measurements aligned with this value, indicating a pattern. In addition, the percentage of vehicles measured in the “ticketable” range is notable. The aggregate data indicates that traffic calming appears to be warranted to encourage safer driver behavior, so **staff are recommending that Kingston Ridge Road be considered for traffic calming.**

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