

Pole Mounted Speed Display Pilot Program Study

January, 2016

The Prince William County Department of Transportation (PWC DOT) began researching the use of pole mounted speed displays (PMSDs) during the summer of 2015 when we were informed by the Virginia Department of Transportation that the PMSDs could be installed by municipalities on state right-of-way. The goal of the research was to provide empirical data to justify their use and to have an alternative safety measure for roads that do not meet PWC DOT's residential traffic calming guidelines which are as follows:

- 25 mph posted speed limit
- Two lane roadway
- Do not serve as primary access to any significant commercial or industrial sites
- Have a documented speeding problem (recorded average speeds of 30 mph or greater)
- Average annual daily traffic (AADT) of 600 – 6000 vehicles per day
- Identified community support for the traffic calming plan

With these guidelines, PWC DOT is limited in what we can do on roads that are not classified as residential, have higher speed limits than 25 mph or volumes exceeding the maximum 6000 vehicles per day. The PMSDs are an effective alternative means of potentially improving the safety of different stretches of roadway for approximately \$5000 +/- per device. PWC DOT identified two roads, Vint Hill Road and Hillendale Drive, to act as the pilot program for the possible adoption of the PMSDs as a practice for the County. To gauge the effectiveness of the PMSDs, PWC DOT conducted before and after sets of speed studies on both roads.

Vint Hill Road (SR-215)

The posted speed limit on Vint Hill Road (Brentsville Magisterial District) entering the town of Greenwich is 35 mph and Vint Hill Road is classified as a major collector. The first speed study was conducted from September 23, 2015 to September 25, 2015 to determine if there was a quantifiable speeding problem that would warrant the installation of the PMSDs. **Since there was an identifiable speeding problem on this stretch of roadway, with average speeds of 45 mph eastbound and 45 mph westbound, PWC DOT decided to move forward with the installation of the PMSDs.** The PMSDs were installed and operational in October 2015 at the locations shown in Figure 1.

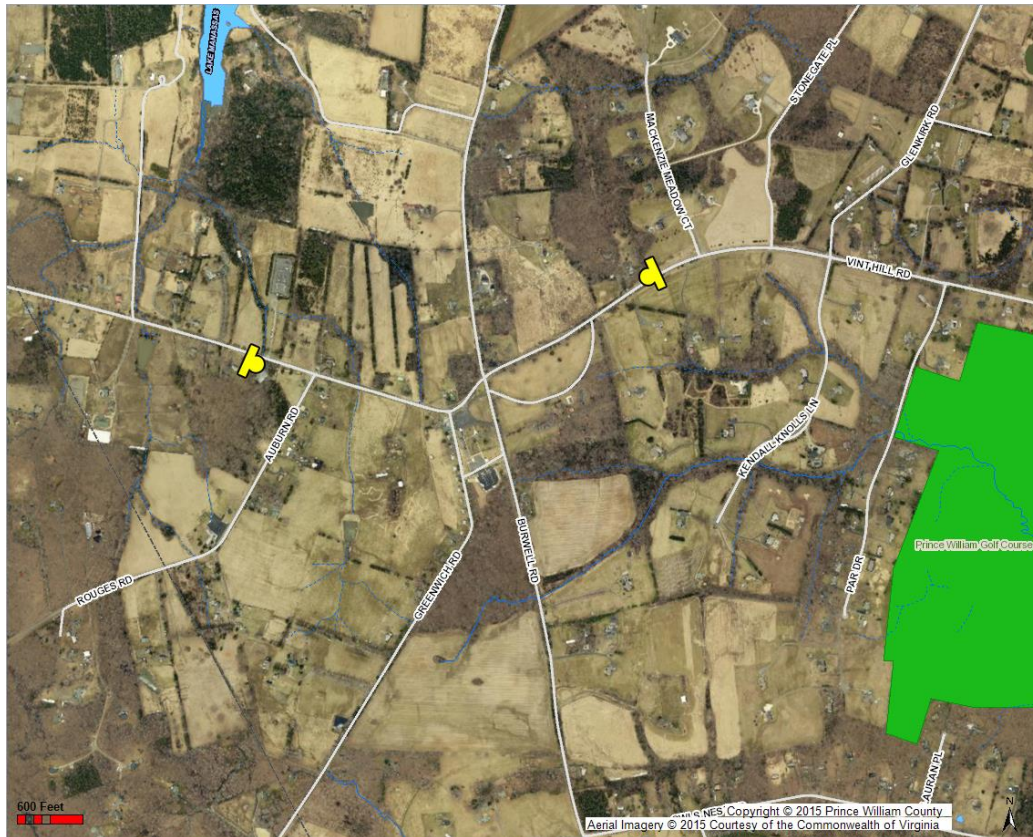


Figure 1. There are two PMSDs positioned on the outskirts of the town of Greenwich at the beginning of the 35 mph zones.

PWC DOT conducted a follow-up study from December 12, 2015 to December 23, 2015 to see if the average speeds through the stretch of roadway had decreased. **From the data of the follow-up study, we saw average speeds of 39 mph eastbound and 37 mph westbound, a 6 mph reduction and an 8 mph reduction from the average speed of 45 mph in both directions.** Besides the changes in average speed observed along this stretch of roadway, PWC DOT analyzed the results in more detail to see the changes in motorists' behavior. **The speed study results showed a 27% increase in motorists following the speed limit after the installation of the PMSDs, meaning motorists driving 35 mph or less.** In the eastbound direction, there was an 18% decrease in reckless driving (speeding in excess of 20 mph over the speed limit). In the westbound direction, there was a 33% increase in lawful driving for motorists entering the town of Greenwich.

Hillendale Drive (SR-1954)

PWC DOT conducted two sets of speed studies on Hillendale Drive, SR-1954. The posted speed limit is 25 and it is in the Neabsco Magisterial District. Since the AADT for the study was 10,416 vehicles per day and the road is classified as a major collector traditional traffic calming measures could not be considered. With this in mind PWC DOT determined that Hillendale Drive would be a suitable road for the PMSD pilot program.

The first study was conducted from September 23, 2015 to September 25, 2015 to determine if there was a quantifiable speeding problem that would warrant the installation of the PMSDs. **The data from the study recorded average speeds on Hillendale Drive 30 mph northbound and 28 mph southbound.**

The PMSDs were installed and operational in October 2015 at the locations shown in Figure 2. PWC DOT conducted follow-up speed studies in January 2016. **We observed average speeds of 30 mph northbound and 27 mph southbound, only a 1 mph speed reduction in the southbound direction. From the speed study data, we saw a 7% increase lawful driving on Hillendale Drive, meaning motorists driving at 25 mph or less.** We believe that the implementation of PMSDs was a success on Hillendale Drive due to the increased number of motorists obeying the speed limit and the reduction of reckless drivers.



Figure 2. The locations of the two PMSDs on Hillendale Drive.

Continuation of the Pilot Program

Based on the recorded success of the two PMSD locations PWC DOT will be expanding the program to other locations with documented speeding problems in the County where conventional measures cannot be considered. Ongoing data collection will be continued at future sites to measure their effectiveness. The public has provided a large amount of positive feedback on the implementation of the PMSDs and we have received numerous requests from residents and communities to consider their roads as candidates for the devices. PWC DOT has determined that even though the PMSDs are effective at reducing vehicle operating speeds we do not want to saturate residential streets throughout the County with them because it may jeopardize the integrity of the devices.



Vint Hill Road



Hillendale Drive

Appendices:

Table A1. The data for the eastbound traffic on Vint Hill Road travelling towards Route 28 for ‘Before’ and ‘After’ is tabulated below. Note the 18% decrease in reckless driving following the installation of the PMSDs.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 35 (Lawful)	393	16%	1553	25%	9%
35 to 54 (Speeding)	1600	66%	4618	74%	9%
> 54 (Reckless)	447	18%	48	1%	-18%
Total:	2440		6219		

Table A2. The data for the westbound traffic on Vint Hill Road travelling towards Route 29 for ‘Before’ and ‘After’ is tabulated below. Note the 33% increase in lawful driving following the installation of the PMSD.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 35 (Lawful)	451	4%	3821	37%	33%
35 to 54 (Speeding)	9938	91%	6397	62%	-28%
> 54 (Reckless)	578	5%	28	0%	-5%
Total:	10967		10246		

Table A3. Combined directions for ‘Before’ and ‘After’ data is tabulated below. Note the 27% increase in lawful driving following the installation of the PMSDs.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 35 (Lawful)	844	6%	4214	33%	27%
35 to 54 (Speeding)	11538	86%	7997	63%	-23%
> 54 (Reckless)	1025	8%	475	4%	-4%
Total:	13407		12686		

Table A4. The entire, uncombined data from the two different speed studies that was used to generate the classification tables for Vint Hill Road.

Speed	Before: Westbound		After: Westbound		Change	Before: Eastbound		After: Eastbound		Change
	Volume	Percentage	Volume	Percentage		Volume	Percentage	Volume	Percentage	
< to 9	4	0.04%	0	0.00%	-0.04%	45	1.84%	3	0.05%	-1.80%
10 to 14	12	0.11%	10	0.10%	-0.01%	33	1.35%	11	0.18%	-1.18%
15 to 19	19	0.17%	26	0.25%	0.08%	17	0.70%	6	0.10%	-0.60%
20 to 24	18	0.16%	39	0.38%	0.22%	128	5.25%	23	0.37%	-4.88%
25 to 29	60	0.55%	490	4.78%	4.24%	43	1.76%	157	2.52%	0.76%
30 to 34	338	3.08%	3256	31.78%	28.70%	127	5.20%	1353	21.76%	16.55%
35 to 39	1485	13.54%	4230	41.28%	27.74%	132	5.41%	2455	39.48%	34.07%
40 to 44	3153	28.75%	1662	16.22%	-12.53%	533	21.84%	1483	23.85%	2.00%
45 to 49	3484	31.77%	407	3.97%	-27.80%	416	17.05%	549	8.83%	-8.22%
50 to 54	1816	16.56%	98	0.96%	-15.60%	519	21.27%	131	2.11%	-19.16%
55 to 59	520	4.74%	26	0.25%	-4.49%	325	13.32%	41	0.66%	-12.66%
60 to 64	58	0.53%	2	0.02%	-0.51%	122	5.00%	7	0.11%	-4.89%
65 to 69	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
70 to 74	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
75 to >	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
Total:	10967		10246			2440		6219		

Table A5. The speed bins for before and after the installation of the PMSDs in the northbound direction towards Prince William County Parkway on Hillendale Drive.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 25 (Lawful)	873	8%	822	14	5%
25 to 44 (Speeding)	9328	91%	5202	86	-5%
> 44 (Reckless)	75	1%	23	0	0%
Total:	10276		6047		

Table A6. The speed bins for before and after the installation of the PMSDs in the southbound direction towards Dale Boulevard on Hillendale Drive.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 25 (Lawful)	2332	24%	2151	31%	8%
25 to 44 (Speeding)	7369	75%	4690	68%	-7%
> 44 (Reckless)	149	2%	44	1%	-1%
Total:	9850		6885		

Table A7. The speed bins for before and after the installation of the PMSDs in both directions on Hillendale Drive.

Speed (mph)	Before		After		Change
	Volume	Percentage	Volume	Percentage	
< 25 (Lawful)	3205	16%	2973	23%	7%
25 to 44 (Speeding)	16697	83%	9892	76%	-6%
> 44 (Reckless)	224	1%	67	1%	-1%
Total:	20126		12932		

Table A8. The entire, uncombined, data from the two different speed studies that was used to generate the classification tables for Hillendale Drive

Speed	Before: Northbound		After: Northbound		Change	Before: Southbound		After: Eastbound		Change
	Volume	Percentage	Volume	Percentage		Volume	Percentage	Volume	Percentage	
< to 9	1	0.01%	14	0.23%	0.22%	3	0.03%	3	0.04%	0.01%
10 to 14	23	0.22%	6	0.10%	-0.12%	65	0.66%	55	0.80%	0.14%
15 to 19	68	0.66%	19	0.31%	-0.35%	245	2.49%	306	4.44%	1.96%
20 to 24	781	7.60%	783	12.95%	5.35%	2019	20.50%	1787	25.95%	5.46%
25 to 29	4407	42.89%	3056	50.54%	7.65%	4512	45.81%	3552	51.59%	5.78%
30 to 34	3793	36.91%	1695	28.03%	-8.88%	2149	21.82%	969	14.07%	-7.74%
35 to 39	975	9.49%	371	6.14%	-3.35%	552	5.60%	134	1.95%	-3.66%
40 to 44	153	1.49%	80	1.32%	-0.17%	156	0.58%	35	0.51%	-1.08%
45 to 49	39	0.38%	15	0.25%	-0.13%	75	0.76%	26	0.38%	-0.38%
50 to 54	18	0.18%	7	0.12%	-0.06%	39	0.40%	13	0.19%	-0.21%
55 to 59	18	0.18%	0	0.00%	-0.18%	31	0.31%	3	0.04%	-0.27%
60 to 64	0	0.00%	1	0.02%	0.02%	4	0.04%	2	0.03%	-0.01%
65 to 69	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
70 to 74	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
75 to >	0	0.00%	0	0.00%	0.00%	0	0.00%	0	0.00%	0.00%
Total:	10276		6047			9850		6885		