

# Speed Sentry Data Report

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Bloomsbury Borough Loan:  
December 20, 2010 through January 19, 2011



**HART Commuter Information Services**  
Serving commuters, business and community

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*Thanks to Robert Heinrich Sr. and  
the Bloomsbury Public Works Department  
for installing the equipment*

## **Introduction**

In an effort to improve pedestrian and bicycle safety around Hunterdon County schools, HART Commuter Information Services purchased a radar feedback display sign, a Speed Sentry 12 ([www.alltrafficsolutions.com](http://www.alltrafficsolutions.com)), which HART loans for 4 week periods to municipalities in Hunterdon County.

The feedback sign was loaned to Bloomsbury Borough from December 20, 2010 to January 19, 2011 and placed near Bloomsbury Elementary School. The purpose of the loan was to measure typical speeds and estimate the effect of the sign on motorist speeds. The data which was collected is analyzed and presented in this report.

## **Location & Placement**

The Speed Sentry was placed on Main Street southbound just prior to Center Street. The speed limit is posted at 25 mph here, and the nearest speed limit sign is approximately 0.4 miles north at Wilson Street. The Speed Sentry sign was placed one block north of Bloomsbury Elementary School.

## **Sign Capabilities and Settings**

The sign has three settings for responding to an oncoming vehicle:

- No Display
- Display the speed (blinking or steady)
- Display the speed and flash a strobe light

These three choices can be set to trigger at different speeds. If speeds during the period when the sign was set to not display are compared to periods when it was activated, the effectiveness of the sign can be evaluated.

For comparison, the 4 weeks are divided into 2 periods, the "Normal" or "Off" period when the display was off and the sign tracked normal speeds, and the "Strobe" period when the display was activated for all drivers and the strobe triggered for those over 25 mph. The data was divided as follows for the analysis:

Total Period: 28 full days  
Weekdays: 22 days  
Weekends: 6 Days

Strobe Period – 16 Days; December 20<sup>th</sup> to January 4<sup>th</sup>  
Off Period -12 Days; January 7<sup>th</sup> to January 18<sup>th</sup>

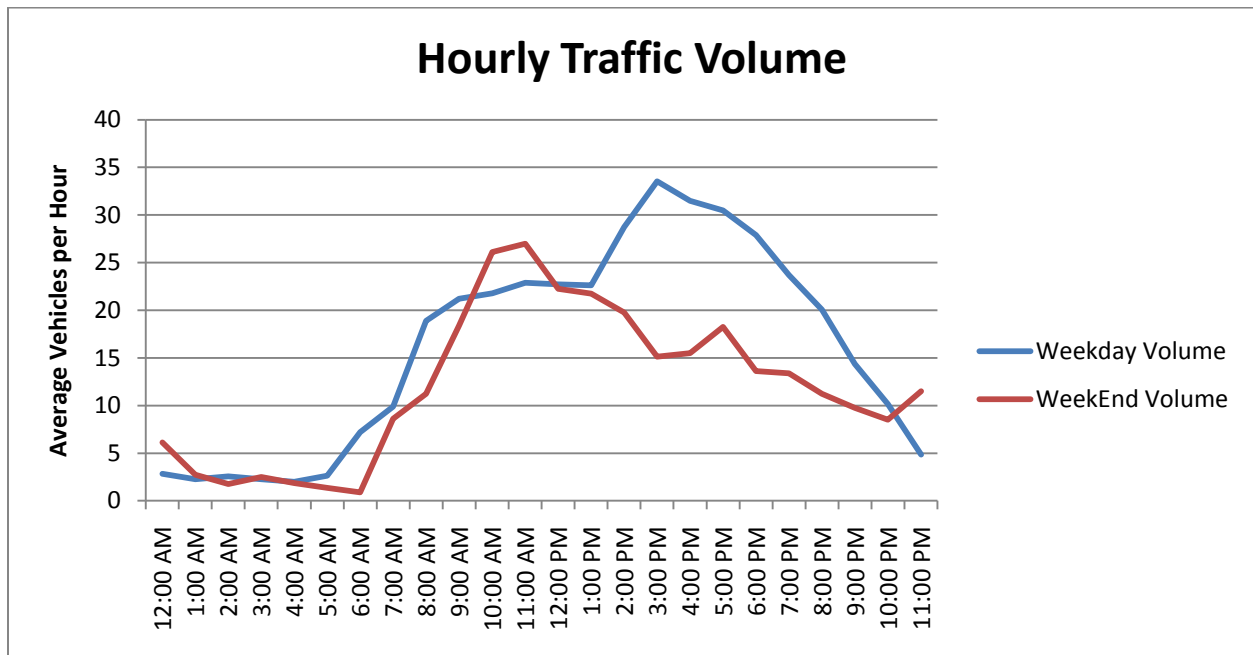
The data cannot be separated within one day when the settings are changed in the middle of the day, such as on January 5<sup>th</sup>, so the day was removed from the speed analysis. The 2 day gap instead of one day near January 5<sup>th</sup> and the large number of

days with the display off was due to a miscommunication between HART and Bloomsbury's Public Works Department.

The Speed Sentry collects individual speeds into 5 mph ranges. This limits the precision of the data analysis, but general trends can be calculated. Because the original hourly data is provided as the number of cars in each speed range, most of the analysis is presented in this way, as opposed to averages.

**Volume**

The traffic volume on Main Street was an average of 387 per day on weekdays and 289 per day on weekends. The traffic peak on weekdays is 3 pm and 10 am – 11am on weekends.



**Averages**

The software provided an overall average speed of 23.1 mph. The sign display and strobe did not alter the average speed significantly. The averages for each period are shown below.

Table 1		
Average Speeds (mph)		Difference from Normal
Normal	23.3	
Strobe	22.7	- 0.6

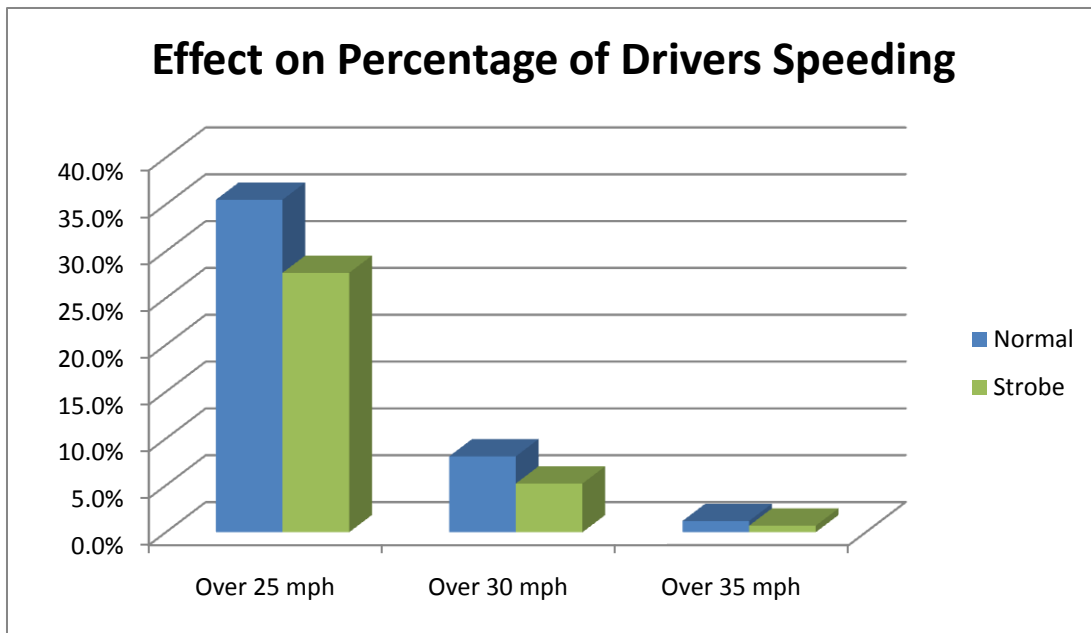
Since speeds are only available in 5 mph categories, the average speeds were determined by averaging the median speed in each speed category (ex. 13 mph in an 11-15 mph category) weighted by the frequency of its occurrence.

## **Percentiles**

Though the average speed was not affected much by the presence of the sign, looking at the number of vehicles travelling at various speeds shows a different trend. This section looks at the number of drivers below or above various speeds. This type of analysis is closest to the original format of the data.

The overall 85<sup>th</sup> percentile speed was 28 mph, that is 85% of drivers travelled at or below 28 mph. For traffic engineering purposes, the 85<sup>th</sup> percentile speed is the design speed of a roadway. "Prior research has shown that 85<sup>th</sup> percentile speeds for vehicles traveling on many urban and suburban streets...generally exceed the posted speed limit by 6 to 14 mi/h." <sup>1</sup>

With the display and the strobe light activated, 7.8% more of drivers traveled below 25 mph. Also, 2.9% more of drivers travelled below 30 mph with the sign activated. So few drivers travel above 35 mph, that only a 0.5% difference was observed. (Table 2)

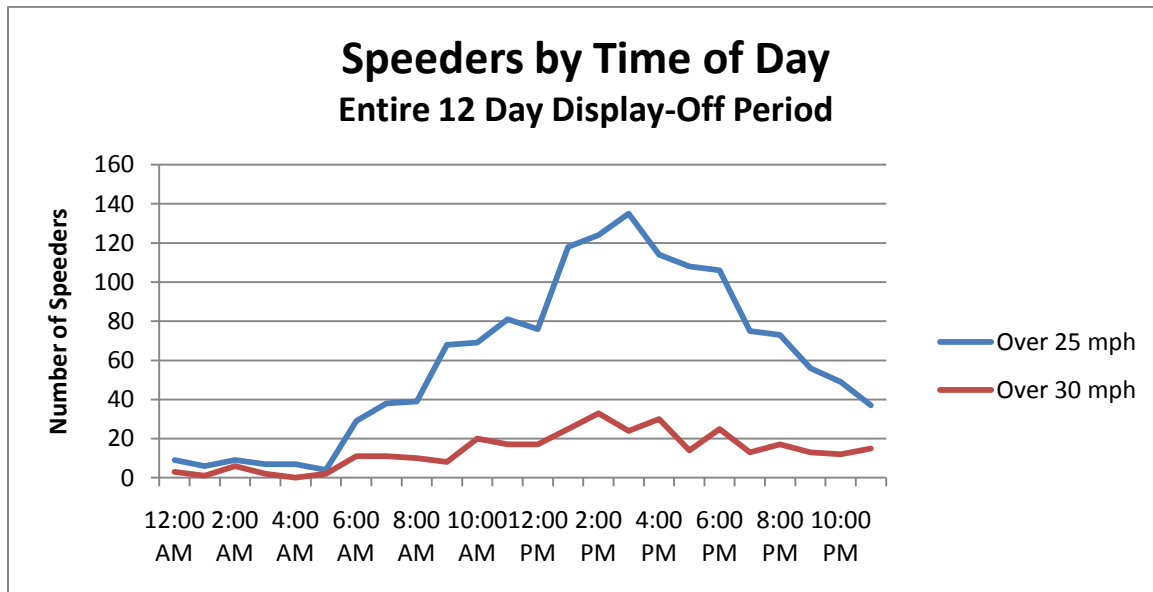


<sup>1</sup> D.L. Harkey, H.D. Robertson, and S.E. Davis, "Assessment of Current Speed Zoning Criteria," Transportation Research Record 1281, Transportation Research Board, Washington DC 1990.

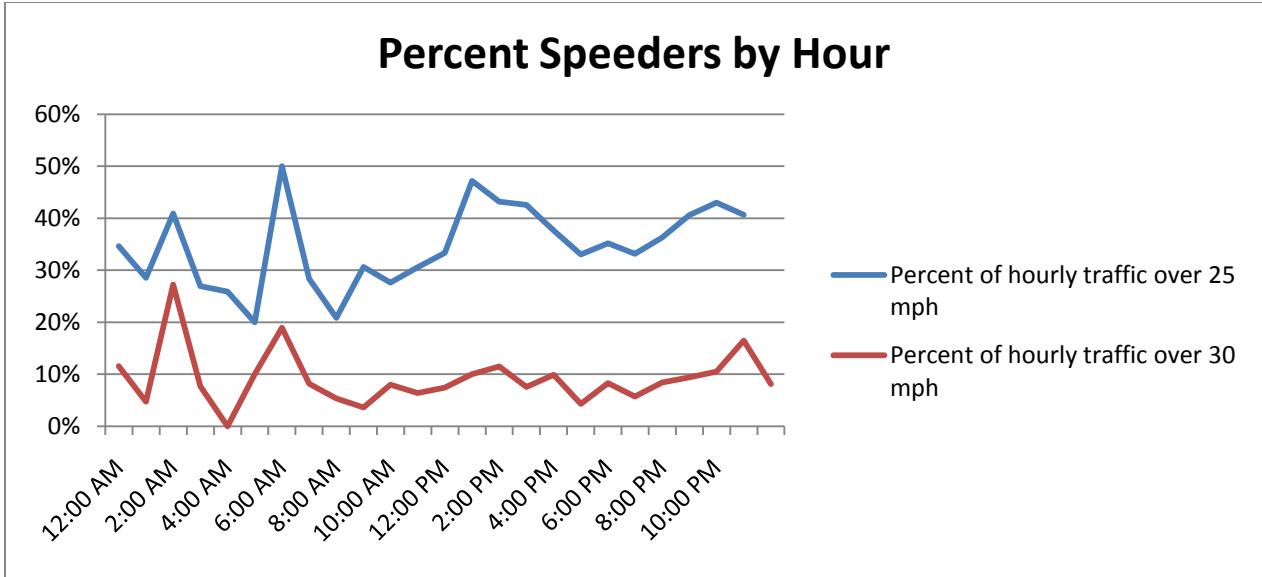
Table 2 Percent of Drivers at Various Speeds		
Range	Normal	With Strobe
% <= 25mph	64.4%	72.3%
% > 25 mph	35.5%	27.7%
Difference in % over 25 mph		<b>-7.8%</b>
Range	Normal	With Strobe
% <= 30 mph	91.8%	94.8%
% > 30 mph	8.1%	5.2%
Difference in % over 30 mph		<b>-2.9%</b>
Range	Normal	With Strobe
% <= 35mph	98.7%	99.3%
% > 35 mph	1.2%	0.7%
Difference in % over 35 mph		<b>-0.5%</b>

### Speeding by Time of Day

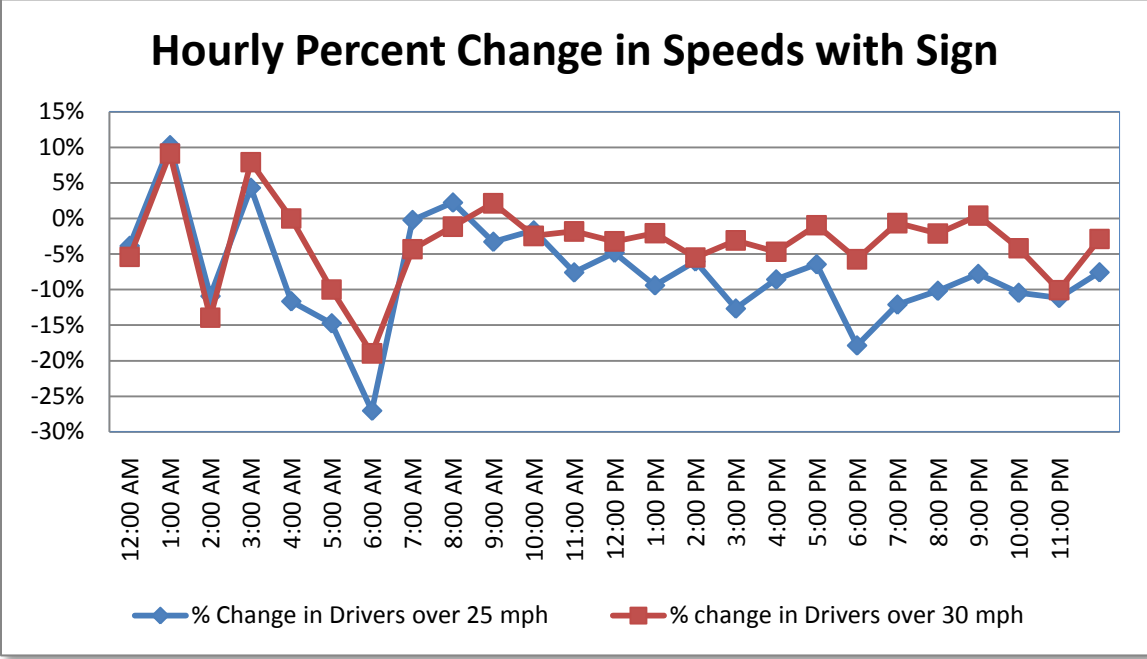
An analysis of speeds during the off period showed that 3 pm is the peak for moderate speeding.



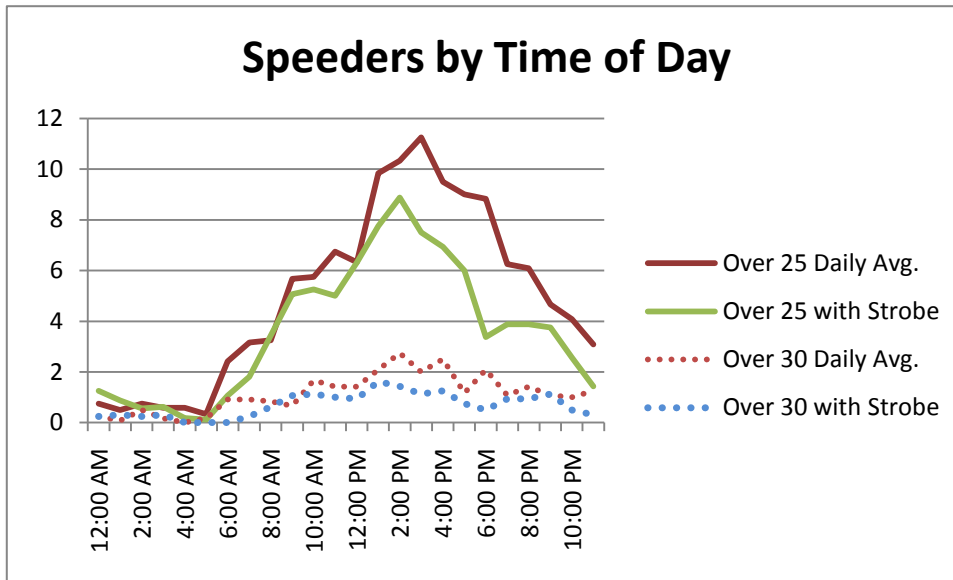
Because the total number of speeders in a 12 day period has limited utility, and the average hourly number of speeders is so small (1-11 per hour) the chart below may provide clarity. It shows the percent of traffic during different hours above 25 mph and 30 mph. This helps control for the shifting volume of traffic throughout the day.



The chart below shows the difference that the sign created in the percentage of drivers travelling over 25 mph and 30 mph in each hourly period.



Finally, this chart estimates the impact which the sign had on speeding throughout the day. This chart is standardized to compensate for the differing number of days in each period. Table 3 provides the data which this chart is based upon.



Time Start	Time End	Vehicles over 25 mph (Total)	% of Hourly Traffic over 25 mph	Vehicles over 25 mph (Daily)	Vehicles Over 30 mph (Total)	% of Hourly Traffic over 30 mph	Vehicles over 30 mph (Daily)
12:00 AM	12:59 AM	9	35%	1	3	11.5%	0
1:00 AM	1:59 AM	6	29%	1	1	4.8%	0
2:00 AM	2:59 AM	9	41%	1	6	27.3%	1
3:00 AM	3:59 AM	7	27%	1	2	7.7%	0
4:00 AM	4:59 AM	7	26%	1	0	0.0%	0
5:00 AM	5:59 AM	4	20%	0	2	10.0%	0
6:00 AM	6:59 AM	29	50%	2	11	19.0%	1
7:00 AM	7:59 AM	38	28%	3	11	8.2%	1
8:00 AM	8:59 AM	39	21%	3	10	5.3%	1
9:00 AM	9:59 AM	68	31%	6	8	3.6%	1
10:00 AM	10:59 AM	69	28%	6	20	8.0%	2
11:00 AM	11:59 AM	81	31%	7	17	6.4%	1
12:00 PM	12:59 PM	76	33%	6	17	7.5%	1

1:00 PM	1:59 PM	118	47%	10	25	10.0%	2
2:00 PM	2:59 PM	124	43%	10	33	11.5%	3
3:00 PM	3:59 PM	135	43%	11	24	7.6%	2
4:00 PM	4:59 PM	114	38%	10	30	9.9%	3
5:00 PM	5:59 PM	108	33%	9	14	4.3%	1
6:00 PM	6:59 PM	106	35%	9	25	8.3%	2
7:00 PM	7:59 PM	75	33%	6	13	5.8%	1
8:00 PM	8:59 PM	73	36%	6	17	8.5%	1
9:00 PM	9:59 PM	56	41%	5	13	9.4%	1
10:00 PM	10:59 PM	49	43%	4	12	10.5%	1
11:00 PM	11:59 PM	37	41%	3	15	16.5%	1
Average			<b>36%</b>			<b>8.1%</b>	
%							

Table 4 is support data for the volume summary on page 2.

<b>Time Start</b>	<b>Time End</b>	<b>Weekday Average</b>	<b>Weekend Average</b>
12:00 AM	12:59 AM	3	6
1:00 AM	1:59 AM	2	3
2:00 AM	2:59 AM	3	2
3:00 AM	3:59 AM	2	3
4:00 AM	4:59 AM	2	2
5:00 AM	5:59 AM	3	1
6:00 AM	6:59 AM	7	1
7:00 AM	7:59 AM	10	9
8:00 AM	8:59 AM	19	11
9:00 AM	9:59 AM	21	18
10:00 AM	10:59 AM	22	26
11:00 AM	11:59 AM	23	27
12:00 PM	12:59 PM	23	22
1:00 PM	1:59 PM	23	22
2:00 PM	2:59 PM	29	20
3:00 PM	3:59 PM	34	15
4:00 PM	4:59 PM	31	16
5:00 PM	5:59 PM	30	18
6:00 PM	6:59 PM	28	14
7:00 PM	7:59 PM	24	13

8:00 PM	8:59 PM	20	11
9:00 PM	9:59 PM	14	10
10:00 PM	10:59 PM	10	9
11:00 PM	11:59 PM	5	12
<b>Total</b>		<b>387</b>	<b>289</b>

## **Conclusions**

The key conclusions of this analysis are that:

- On a typical day, with the sign display deactivated, nearly 92% of drivers travel less than 5 mph over the speed limit. Nearly 65% drive under the speed limit.
- With the speed display and strobe light activated, 7.8% more of drivers drove under the speed limit.

Because this loan was only a few weeks, it cannot be guaranteed that the reductions in speed would continue in the long term. Drivers may acclimate to the device and return to their previous speeds.