



Report Title	Report Date: 2000
Drone Radar	
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Supplemental Notes	
Abstract Two drone radar units were deployed at a rural Interstate work zone where traffic was limited to one lane in each direction for a reconstruction project. Speed data were collected at several locations over about a 1-mi segment for a week prior to deployment and a week following deployment. Some speed differences observed between the before and after data were statistically significant, but the differences were inconsistent. In some locations the speeds decreased after deployment, and in other locations they increased. No explanations for the changes could be identified, but their inconsistency suggests that the radar drone is not an effective speed control device.	

DRONE RADAR

Speed Measurement Laboratories

Evaluation Team

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Description

Two radar drone units were deployed at either end of a 1 mile segment of an Interstate work zone (the entire work zone was approximately 5 mi long). Speeds were monitored to determine the effect of a radar drone on traffic within the work zone.

Study site

I-70, Wabaunsee County

From milepost 8.22

To milepost 9.96

ADT = 18,000 vpd

Is this ADT directional? NO

T = 20.5%

D = 60%

$V_{\text{current}} = 70$ mph

$V_{\text{construction}} = 60$ mph

$V_{\text{advisory}} = \text{NA}$

Performance Measures

The objectives of this application and the associated performance measures are shown as Table 3-20.

TABLE 3-20 Radar drone: objectives and performance measures.

Objectives	Performance Measures
Reduce speeds in work zones	1. speed
Reduce speed variance in work zones	2. speed distribution

Experimental Design

Study type: Before and after.

Data Collected

Speeds

Collection method: pneumatic hoses and automatic traffic recorders

Sample size: 1 week, 24 hrs/day, with and without radar

Analysis technique: Comparison of 85th percentile speeds, mean speeds, and standard deviations.

Evaluation Results

Radar drones are intended to trigger radar detectors, causing those drivers to reduce their speed. Assuming that drivers using radar detectors tend to travel faster than the mean, this would reduce not only the mean speed but also the variation in speeds. Two radar drone units were deployed within a work zone approximately 1.6 km (1 mi) apart. Speeds were collected for four days prior to the deployment of the drones, and for four days after deployment. Speeds were collected at a total of 10 points between the drones units. Twice during the week personnel were on site downloading data from the counters. In both cases the drones were inspected, and the power supplies for one or both units were found to be exhausted. It was later determined the batteries could be expected to power the drones for at least 24 hours. Consequently, only the 24 hours following those two inspections were used in the analysis.

Some changes in the mean and 85th percentile speeds were observed, but no consistent pattern existed. As shown in Figure 3-15, the mean speed decreases with the activation of the drone units at data point 9, the first data point downstream of the lead drone unit. The change in mean speed was not statistically significant at a 95% confidence level. At other data points (with the exception of data point 5) all three speed-related parameters actually increased after the activation of the unit, some by statistically significant amounts.

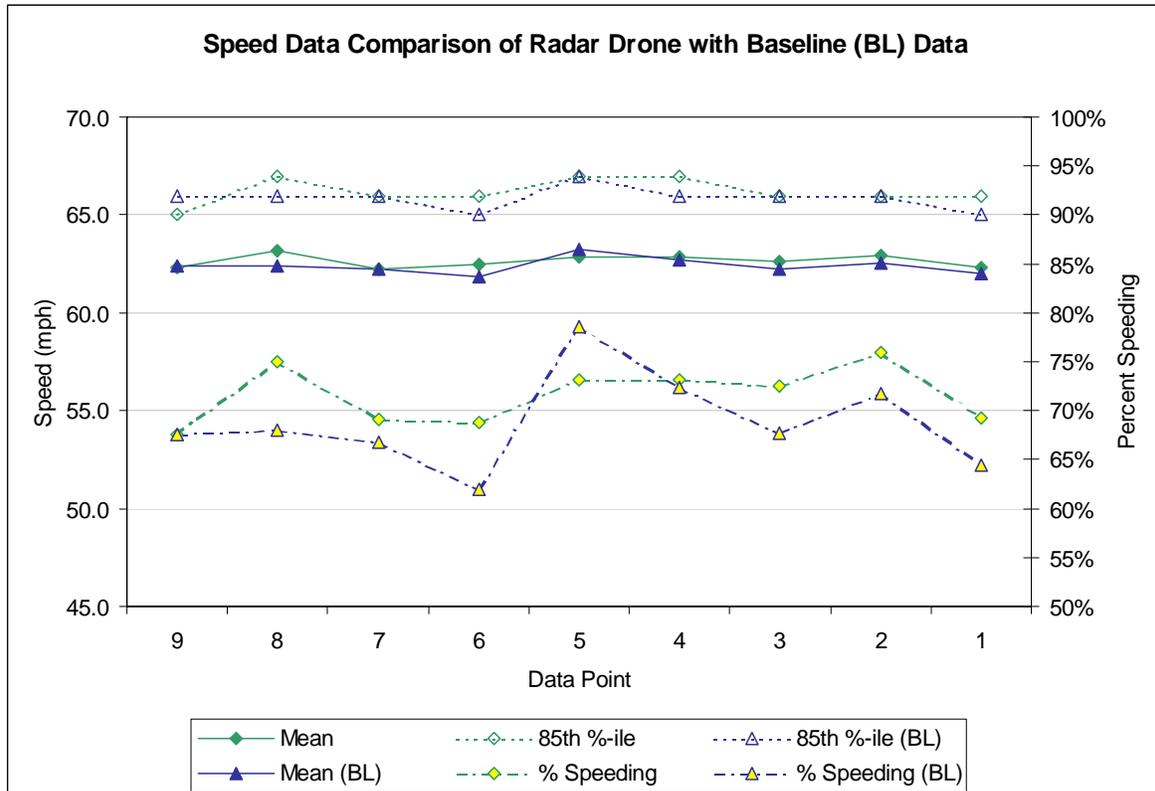


FIGURE 3-15 Radar drone: mean and 85th percentile speeds and percent speeding.

Conclusions

The data suggests that drones may cause a small decrease in the 85th percentile speed near the unit, but that speeds increase farther downstream. The use of a radar drone does not seem to be an effective device for reducing speeds in highway work zones.

Recommendations

On the basis of data collected during this evaluation, the use of radar drones for reducing speeds in highway work zones is not recommended.