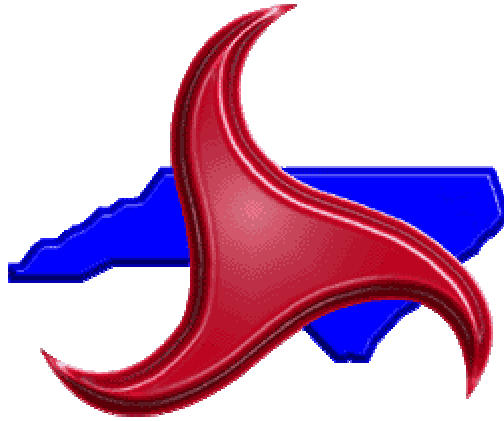


# An Evaluation of the Operation Yellow Jacket Enforcement Program Implemented in the I-2704 Work Zone



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## INTRODUCTION

The purpose of this project is to investigate the effect of the Operation Yellow Jacket enforcement program on vehicle speeds. Operation Yellow Jacket involves placing a uniformed State Highway Patrol (SHP) officer in a yellow Department of Transportation (DOT) vehicle for the purposes of speed enforcement. The SHP officer uses a radar gun to record vehicle speeds and relays violator information to officers in marked patrol cars downstream.

The Operation Yellow Jacket enforcement program was implemented in the I-2704 workzone on I-95 in Johnston County. I-95 in this particular area has relatively little commuter traffic and a large percentage of out-of-state traffic. The I-2704 project involved a bridge replacement and interchange modification of the I-95 and SR 1162 / SR 1178 interchanges near Four Oaks. Originally, SR 1178 and SR 1162 had partial movement interchanges. The I-2704 project removed the partial movement interchange from SR 1162 and constructed a full movement interchange at SR 1178 and replaced the SR 1178 bridge. Figure 1 shows a vicinity map of the project.

**Figure 1. Project Vicinity Map**



The Operation Yellow Jacket enforcement program was in place from August 23<sup>rd</sup> through October 29<sup>th</sup> 2004. The program operated from 6:00 AM to 3:00 PM Monday through Friday. It should also be noted that the media was not made aware of this program. It is likely that very few drivers were aware that an officer in a DOT truck was monitoring their speed.

## METHODOLOGY

The basic premise of this study was to perform a before and after type analysis to determine the effects of the enforcement program on vehicle speeds. Unfortunately, the evaluation team did not learn of the enforcement program until it had already been implemented. Speed data was collected during the enforcement program, and again 4 weeks after the program had ended. The assumption was that the speeds at the site would eventually return to the “before” conditions after the enforcement program had ended.

Speed data was collected during Operation Yellow Jacket on September 29<sup>th</sup>, 30<sup>th</sup> and October 1<sup>st</sup> 2004. Ideally, speed data would have been collected during each week of the enforcement program. Weather conditions and lane reductions at the site prohibited this from taking place. The after speed data was collected on December 1<sup>st</sup>, 8<sup>th</sup>, and 15<sup>th</sup>.

Data collection took place between 10:00 AM and 2:00 PM and again between 7:00 PM and 10:00 PM on typical weekdays. The idea was to gather data during non-peak periods when more drivers were choosing their own speed and not affected by capacity constraints. The evening speeds were collected to attempt to determine if the daytime enforcement had a lasting effect during other time periods. The assumption was made that the level of enforcement was constant during the daytime data collection periods.

At least 150 speed samples in each direction were recorded during each data collection period. Data collectors targeted only vehicles that were setting their own speed. Vehicles in platoons were excluded from the study, as they were not actively choosing the speed at which they were travelling. This is standard procedure when evaluating a countermeasure that is aimed at changing driver behavior.

## RESULTS

Table 1 below shows the results of the speed analysis.

**Table 1. Results of Speed Analysis**

	<b><i>During</i></b> Operation Yellow Jacket				<b><i>After</i></b> Operation Yellow Jacket			
	Day		Night		Day		Night	
	SB	NB	SB	NB	SB	NB	SB	NB
Observations	306	311	313	313	300	150	320	322
Average Speed	<b><i>69.5</i></b>	68.4	70.9	<b><i>68.8</i></b>	<b><i>70.3</i></b>	68.7	70.5	<b><i>70.1</i></b>
85th Percentile Speed	73.8	72.7	75.1	73.7	74.1	72.6	75.1	74.1
Variance	26.5	24.4	27.8	27.1	24.9	16.3	24.0	23.4
% Vehicles Over Speed Limit	<b><i>77%</i></b>	<b><i>72%</i></b>	85%	<b><i>71%</i></b>	<b><i>84%</i></b>	<b><i>79%</i></b>	86%	<b><i>83%</i></b>

\* Bold, Italicized Items are Statistically Significant at 80% Confidence Level

As can be seen in the table of results above, there was little change in average and 85<sup>th</sup> percentile speeds between the two data collection periods. There was a statistically significant change in average speeds when comparing Southbound day and Northbound night speeds in the during

enforcement and after enforcement periods. However, this change is still quite small and not practically significant. The biggest change in the two data collection periods appear to be in the percent of vehicles traveling above the posted speed limit. In all but one category, the percentage of vehicles exceeding the speed limit was significantly lower during operation yellow jacket when compared to data collected after the program had ceased.

It should be noted that the change in speeds noted can not be directly linked to the Operation Yellow Jacket enforcement program. As with any observational before and after study, it is difficult to separate the effects of the treatment from the effects of other things that changed at the site. This is especially true in a work zone setting where things are often changing from day to day. It would seem logical that reduction of vehicles traveling over the speed limit would be in part due to the enforcement program. However, there may be other factors unaccounted for in this study that influenced the reduction as well.

## **FINAL COMMENTS**

The Operation Yellow Jacket Enforcement program does show some promise of being successful, particularly in reducing the percentage of vehicles traveling above the speed limit. It is difficult to make definite conclusions from this study because of the necessary assumptions made and the less than ideal data collection arrangement. In future evaluations of this type, it would be desirable to be able to plan out an approach before the program is actually implemented. This would allow the study team to have more control over the study parameters and better account for the other factors that change between data collection periods.

This implementation of Operation Yellow Jacket was not accompanied by a media campaign to notify the public of what was taking place. It is very likely that this would make a significant difference in observed speeds in the work zone. The goal with this type of program is to get the traveling public to associate yellow DOT trucks in work zones with highway patrol officers. It is possible that this association would increase work zone safety even in areas where operation yellow jacket enforcement is not active.

It would also be interesting to determine if this type of program would work better in a site where there is mostly commuter traffic. This implementation of the program on I-95 was in a location where there is relatively little commuter traffic. There would likely be a greater effect on the behavior of commuters who drive through the site everyday and see the operations as opposed to an out-of-state traveler that only drives the site once. Implementation on a commuter site accompanied with a media campaign to inform the public of the activities would perhaps yield better results.

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