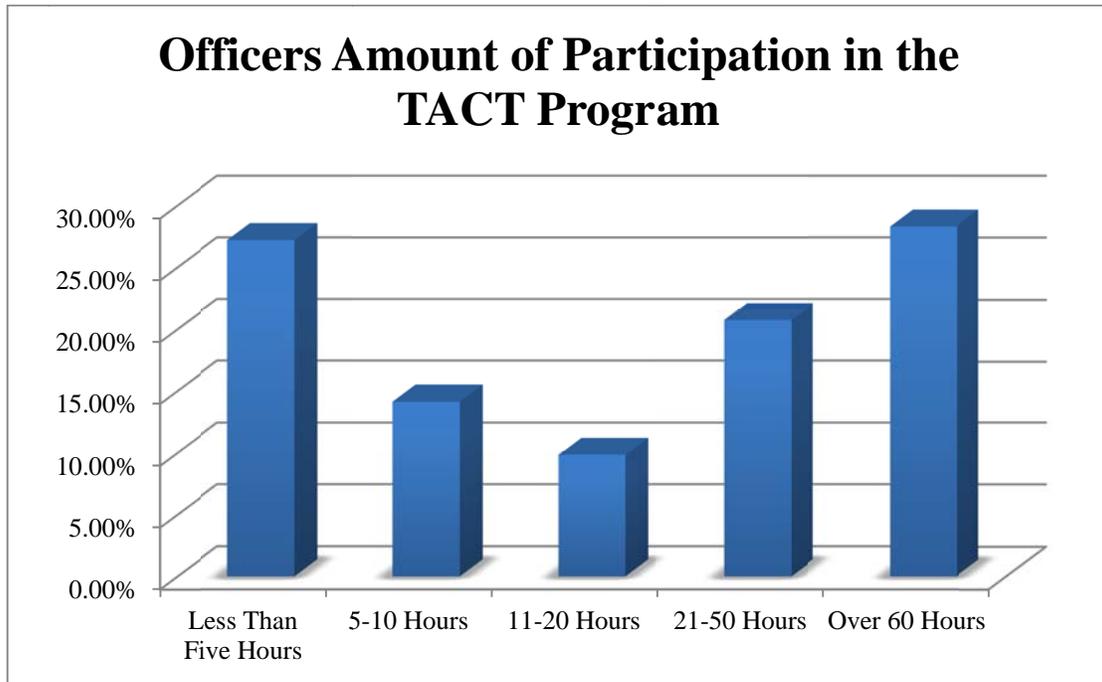


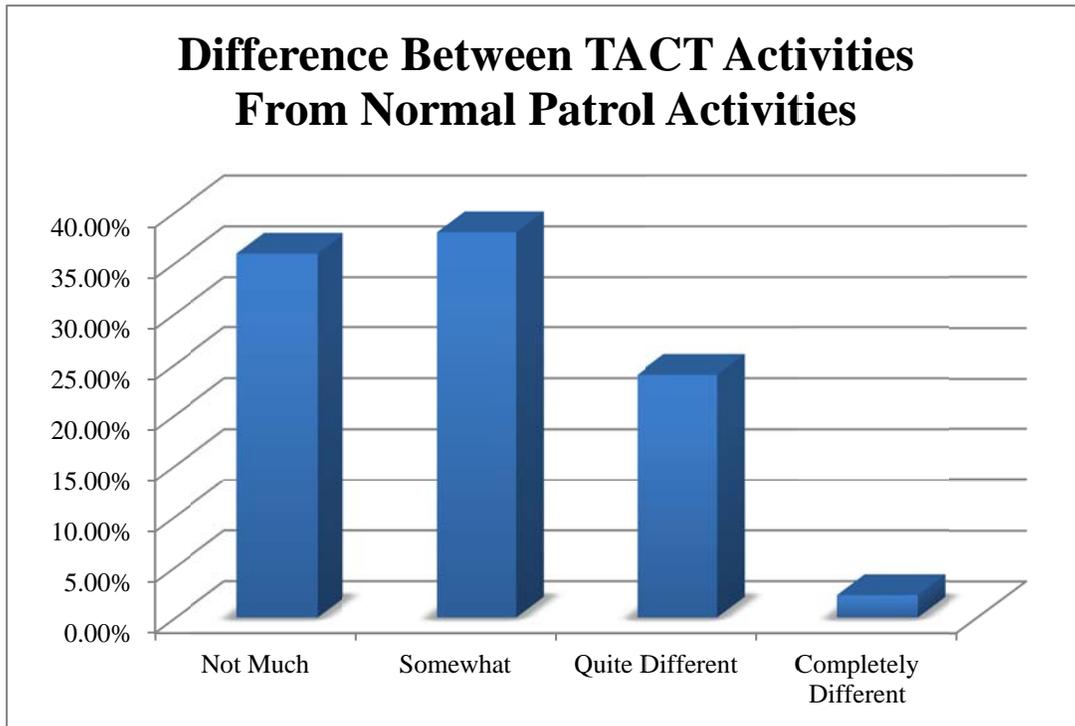
A total of 100 officers responded to the survey. The respondents comprised 92 officers and 8 law enforcement administrators. Display 6.3.1.1b shows a breakdown of the level of involvement (measured in hours) in the TACT program among the responding officers.

Display 6.3.1.1b



Officers were asked whether TACT-related activities were different from their normal patrol activities. According to the summary presented in Display 6.3.1.1c, the majority of officers indicated that TACT-related duties were not too dissimilar from their normal patrol duties.

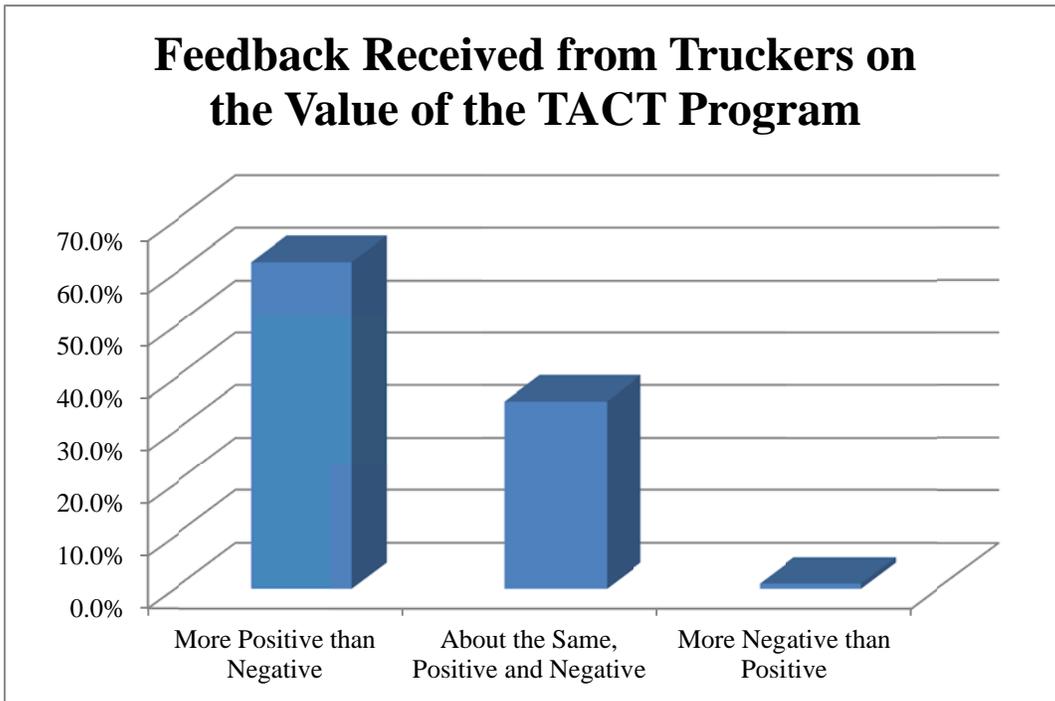
Display 6.3.1.1.c



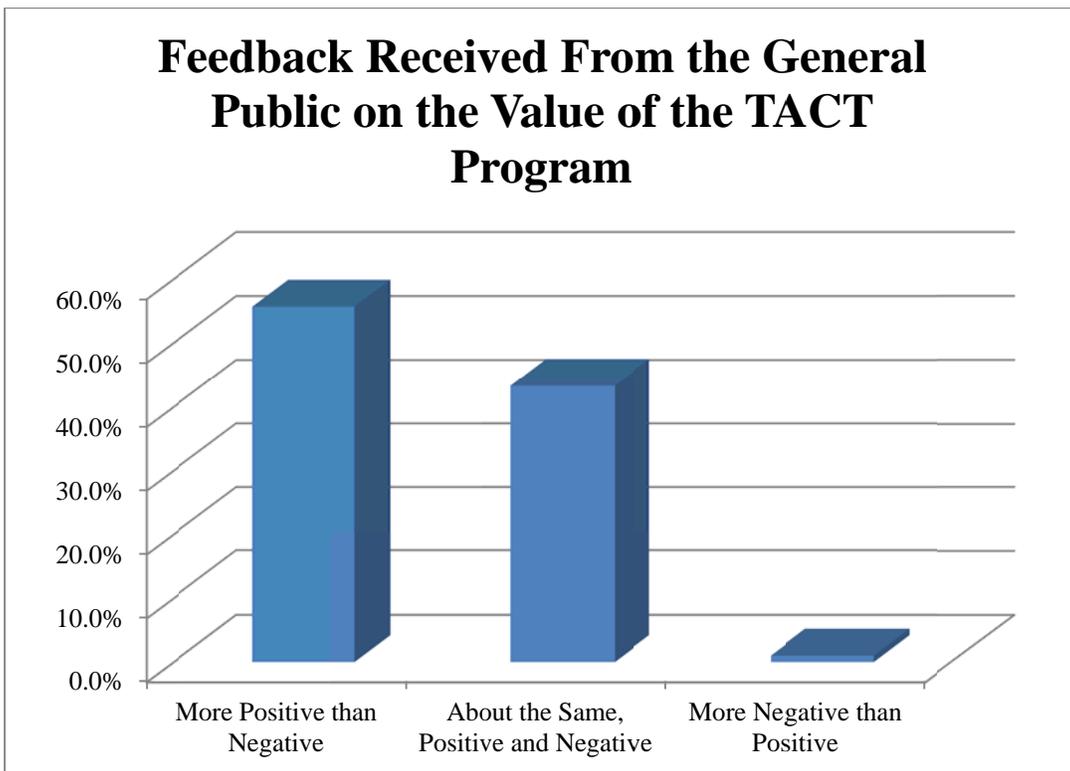
Interestingly, the majority (60%) of responding officers indicated that TACT type enforcement is best performed at the discretion of individual officers as opposed to being conducted as part of a Statewide TACT program.

Respondents were asked about their opinion of the feedback they received from both truck drivers and the general public regarding the TACT program. The results are summarized in Display 6.3.1.1d and 6.3.1.1e, respectively.

Display 6.3.1.1d



Display 6.3.1.1e



Displays 6.3.1.1 d and 6.3.1.1e indicate an overall positive opinion of the TACT program. Overall, the officers' attitudes toward the TACT program were general positive as well. The only possible exception would be to the question with regard to whether TACT was best run as a statewide program or left for individual officers to enforce. Although more officers responded they could best perform TACT-related activities on their own, over half indicated that awareness of car and truck interactions led to more citations after conducting the TACT program.

6.3.1.2 Recent Trucker Surveys

Truck drivers were also encouraged to complete an internet-based survey on the TACT program. The participation in the survey was completely voluntary and anonymous. The survey for the Truck drivers was also placed on the Safe Home Alabama website and the link was e-mailed to various trucking companies that operate in Alabama. Display 6.3.1.2 shows a screenshot of the Truck Driver survey.

Display 6.3.1.2 Truck Driver Survey

Trucker Survey

Please answer the following questions regarding the TACT program.

1. My participation in the TACT program was as:
 a truck driver
 a trucking company administrator
2. My participation in the program involved:
 no exposure to TACT public service announcements
 a few observations of these announcements
 several observations of these announcements
 seeing announcements almost every day during the program
3. To what extent did the TACT program change the way that you view four-wheelers?
 Not very much different at all
 Somewhat different
 Quite a bit different
 Completely different
4. I believe that the problem of car drivers not driving properly around trucks can best be addressed by:
 methods other than TACT that have been used in the past
 implementing a coordinated statewide effort, like the TACT program
5. Since being exposed to the TACT effort, I have been more aware of the traffic offenses that involve interactions between cars and trucks:
 True

There was an overall positive attitude expressed toward the TACT conveyed via the trucker survey. There were only fifteen responses to the online trucker survey, and of these the majority was from administrators (i.e., owners and managers) not drivers. The results indicated industry support for TACT. Specifically, 94% of the respondents indicated the program was positive and 100% indicated they felt the enforcement was fair. Interestingly, the trucker survey indicated more support for large-scale programs such as TACT as opposed to more ad hoc, individual officer based enforcement.

Two thirds of the trucker survey respondents indicated they had been exposed to the PI&E campaign, while the remaining third indicated no awareness of the current program. More importantly, 60% of the respondents indicated the PI&E in some way changed the way they view cars on the road. Most all of the respondents indicated that the best way to address cars driving improperly around trucks was through a large-scale campaign such as TACT, 75% reported that they were more aware of the potential traffic offenses involving car-truck interaction as a result of the program. A quarter of the respondents stated they know of at least one trucker who received a citation as part of the TACT campaign. And finally, 87% of truckers surveyed believe that the TACT campaign accomplished its objective of changing driving behavior around trucks.

6.3.1.3 Recent Driver Survey

Surveys were issued to each of the study locations in February, April, June and July with the intention of covering the various study periods (*Before, PI&E, PI&E+E and After*). The final survey materials were obtained from the various driver licensing stations in mid-August 2011, about six weeks after the TACT project.

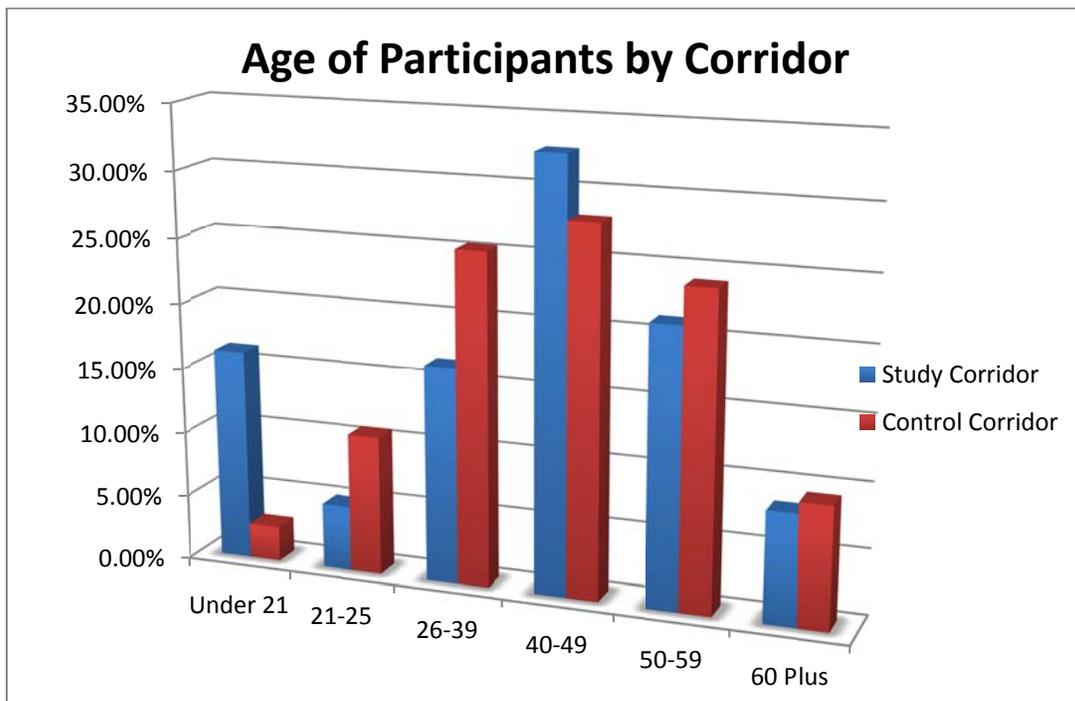
A total of 1,400 surveys were distributed and 232 survey responses were gathered from both the study and control corridors. Assuming that there was sufficient traffic in the Drivers' License Renewal Offices (DLROs) to support the completion of this number of forms, this indicates a 17% response rate. Display 6.3.1.3 shows the breakdown of survey responses for each study period within the study and control corridors.

Display 6.3.1.3 Surveys Distributed by Counties for each Study Period

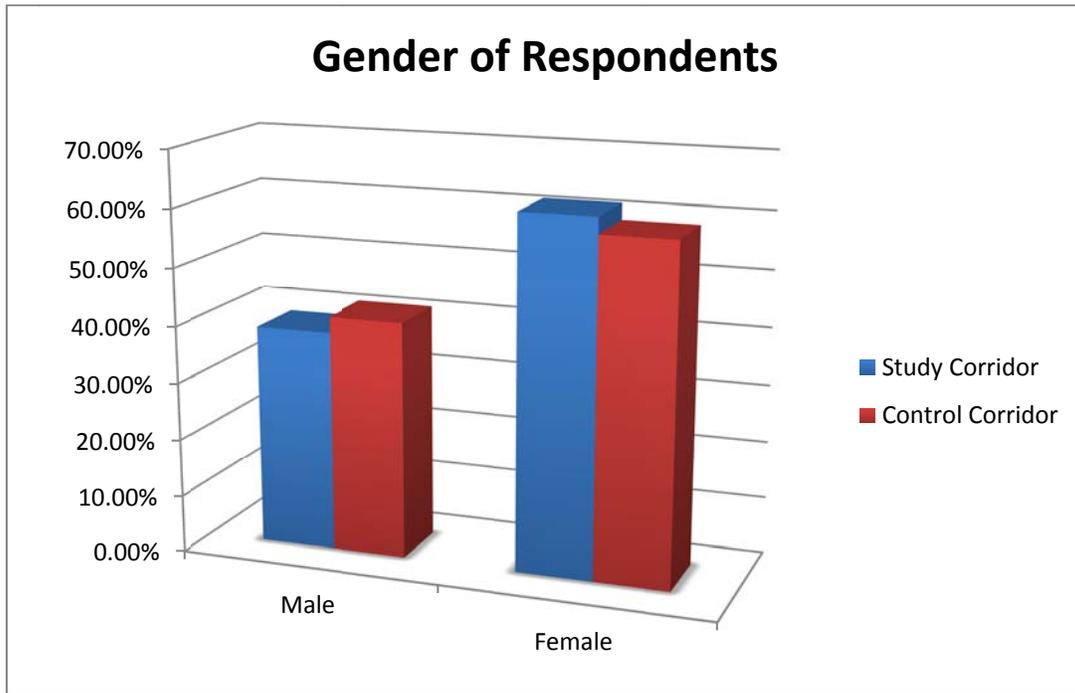
CORRIDOR	DLRO	BEFORE	PI&E	PI&E+E	AFTER	TOTAL
Study	Shelby	32	37	12	25	106
	Tuscaloosa	26	9	1	13	49
	Total Study	58	46	13	38	155
Control	Lee	12	25	9	13	59
	Macon	1	10	6	1	18
	Total Control	13	35	15	14	77
Total by Study Period		71	81	28	52	232

The demographics of the survey respondents were analyzed to discover if there were major differences among the DLROs, the test and control areas, and to get a feel for the respondents in general. Display 6.3.1.3a indicates more females responded to the survey than males. Interestingly, the relative percentages were roughly the same for both the study and control corridors. Display 6.3.1.3b shows the ages of the survey respondents. It is clear that a range of ages were surveyed at both locations. There were substantially more younger drivers (< 21 years old) surveyed in the study corridor.

Display 6.3.1.3a



Display 6.3.1.3b

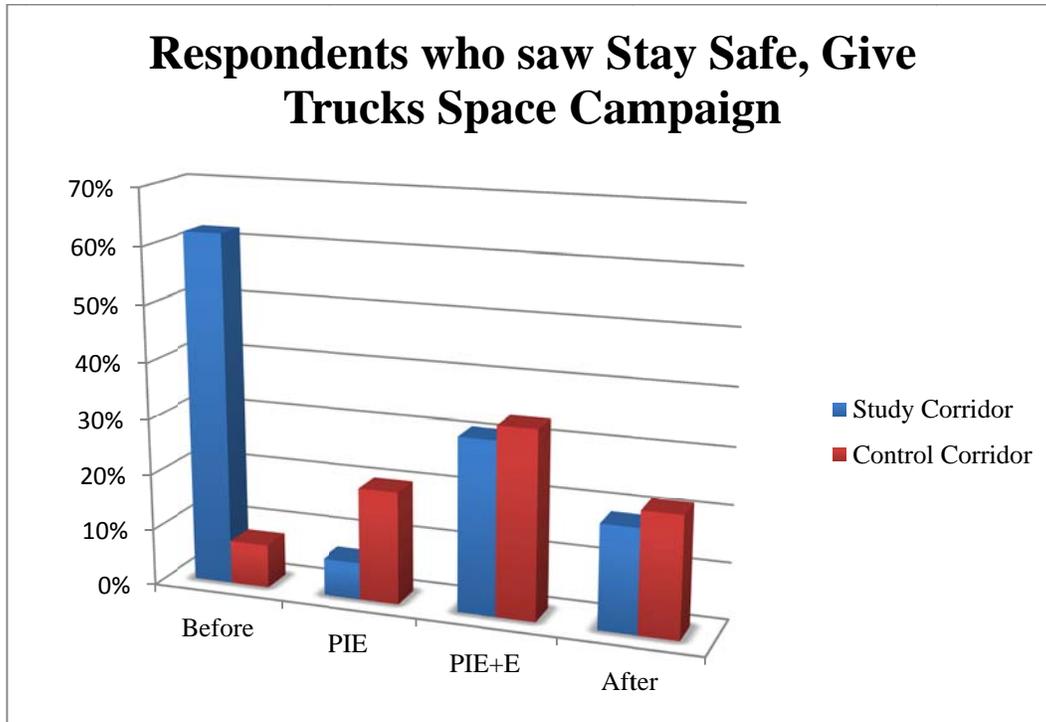


The majority (88%) of respondents indicated that they drove a passenger vehicle (car, mini-van, SUV, etc.). Less than 1% indicated they drove a motorcycle while 3% indicated they drove a large truck and another 3% indicated they drove a full-sized van. Roughly 25% indicated they drove between 5,000 and 15,000 miles per year, 25% indicated 15,001 to 20,000 and 25% responded that they drove more than 20,000 miles per year. Less than 15% indicated that they drove less than 5,000 miles per year and 6% stated they did not drive at all. This information was considered to be “richness” data as it was intended to allow a richer analysis of responses by driver type. Ultimately, no trends among these driving characteristics emerged or correlated with any group of responses to other questions.

6.3.1.3.1 Exposure to TACT Campaign

The first part of the driver survey was intended to measure whether or not respondents had been exposed to the PI&E materials. In order to measure this, the responses from the study corridor (where the PI&E campaign was targeted) were compared with responses from the control corridor (where no PI&E was directed). Unfortunately, the quality of some of the survey responses is suspect. For example, Display 6.3.1.3.1 shows the percent of respondents in each corridor indicating that they had seen the PI&E information during each of the four study periods.

Display 6.3.1.3.1

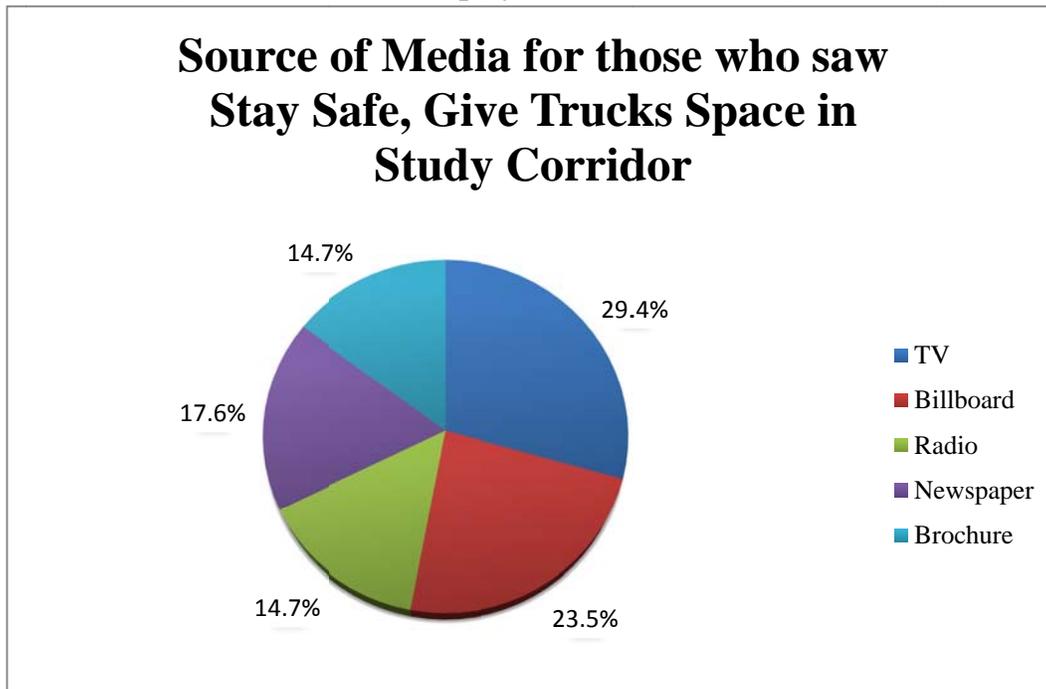


Display 6.3.1.3.1a indicates that some 60% of respondents in the study corridor had seen the PI&E materials during the study period. Of course, this is impossible as the PI&E materials had

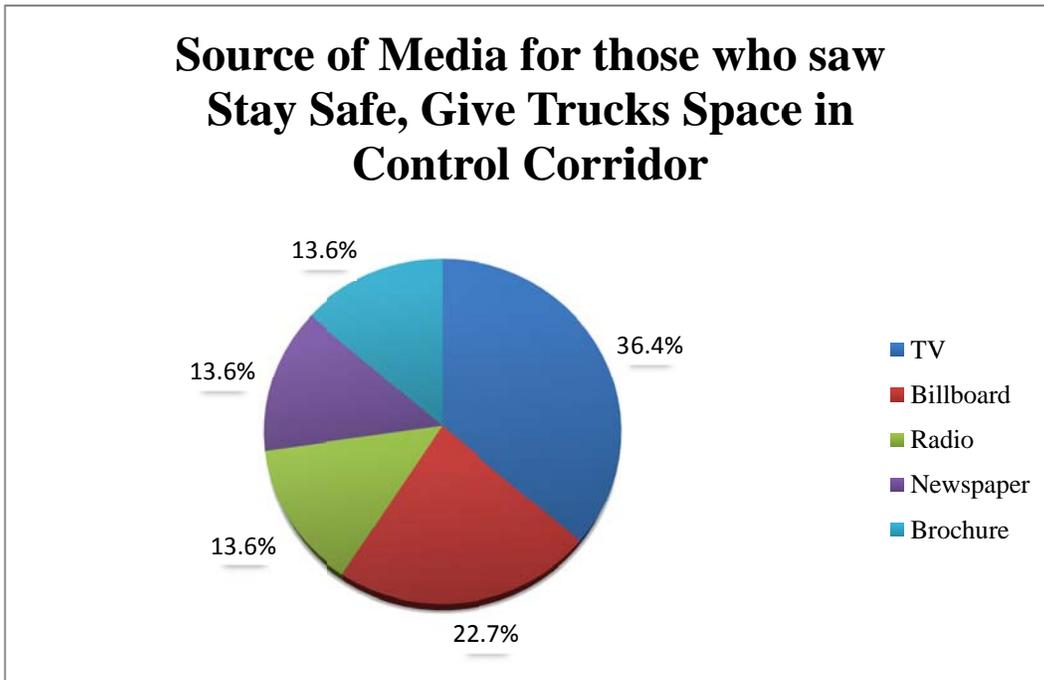
not yet been deployed. Such results might have been interpreted as indicating some linger awareness of previous PI&E campaigns but then it would be expected that the control corridor results would have been similar. Furthermore, the results for the PI&E period indicate that a larger percentage of respondents in the control corridor had seen the PI&E materials than in the study corridor where they were deployed. Again, these results defy expectation. Interestingly, the percentages are both similar and higher for the PI&E+*E* and *After* periods. While it is still unexpected that the percentage for the study periods would be less than that for the control corridor, it should be noted that by the time the PI&E+*E* period began, the earned media coverage (radio and television) had started. Thus it could be expected that the overall awareness could have increased and that, due to the nature of the earned media coverage, it extend well beyond the study corridor.

The survey was also used to determine how respondents were exposed (or believed they were) to the PI&E materials. Displays 6.3.1.3.1b and 6.3.1.3.1c present a breakdown of how respondents indicating that they saw the PI&E materials reported that how were exposed to it. Display 6.3.1.3.1b shows results from the study corridor whereas Display 6.3.1.3.1c presented results from the control corridor.

Display 6.3.1.3.1b



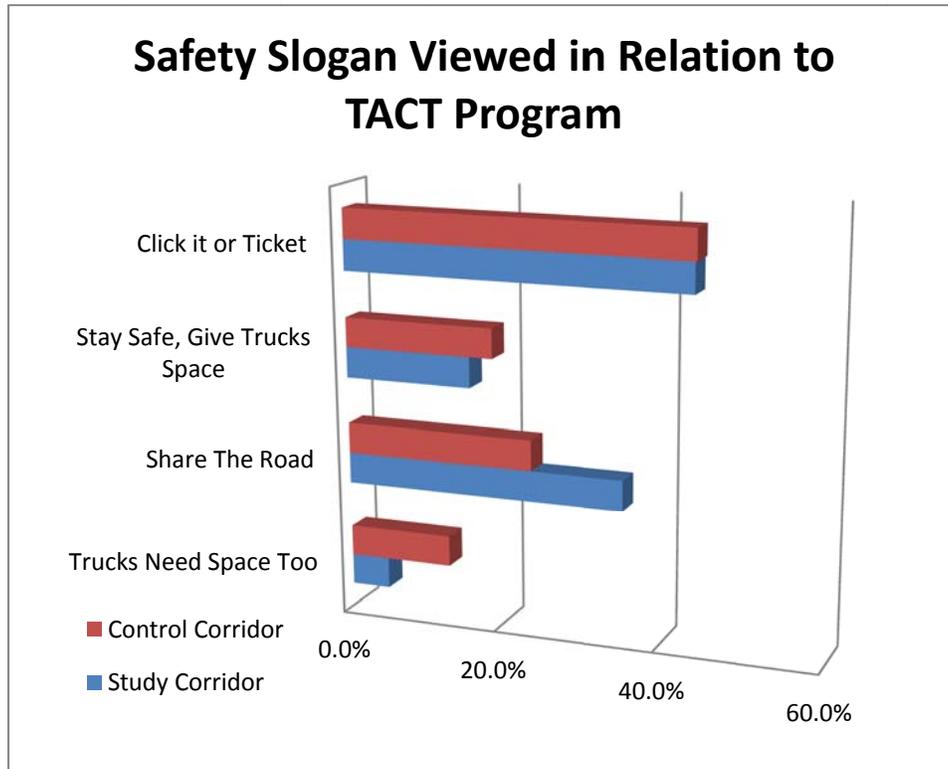
Display 6.3.1.3.1.c



The results indicate that the majority of exposure is attributable to the TV coverage. Interestingly, the billboards represented almost a quarter of the reported exposure in both corridors. While a unexpected result, perhaps it indicates some underlying mobility of Alabama drivers on the Interstate system.

Respondents were asked to identify the name of the truck safety program to which they had recently been exposed. The results are summarized in Display 6.3.1.3.1.d.

Display 6.3.1.3.1.d

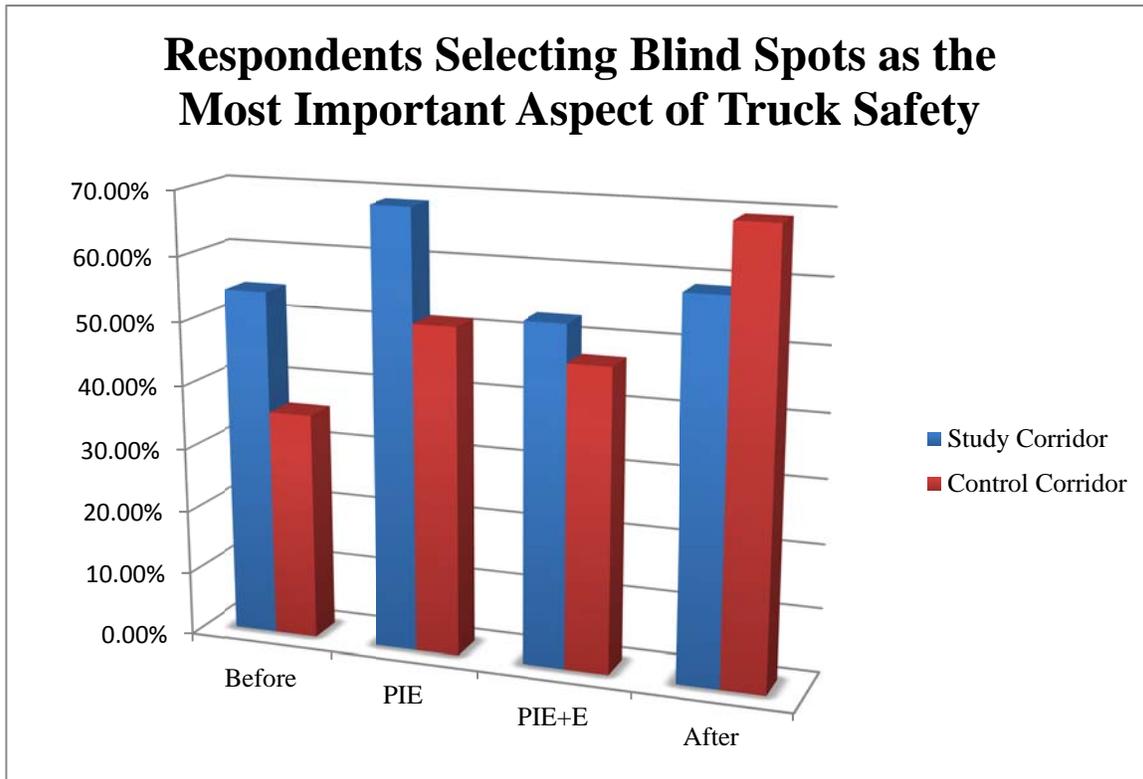


Display 6.3.1.3.1d does not indicate any meaningful recognition of the slogan used for the TACT campaign, “Stay Safe, Give Trucks Space.” However, it does demonstrate that established programs such as “Click It or Ticket” and “Share the Road” have made a lasting impression. This is not to say that there was any problem with the slogan; just that it had not had enough exposure at this point to compete with these others which had been in place for some time.

6.3.1.3.2 Measuring Response to TACT Program

Ultimately, the intent of the PI&E was to positively affect driver behavior. As explained in previous sections, the initial crash analyses indicated that blind spot was involved in the majority of CMV-related crashes. Therefore, the PI&E campaign specifically addressed the issue of driving in the blind spot of a truck. Survey respondents were asked their opinion of what was the most important unsafe driving act to avoid with regard to driving around large trucks. The specific question was: “**Which of the following do you think is important when driving around large trucks? (Check one).**” The possible responses included; “Do not pull in front of a truck and slow down,” “Do not tailgate trucks” and “Stay out of the truck driver’s blind spots.” Display 6.3.1.3.2 indicates that over half of the respondents in the study corridor consider driving in the blind spot as most important. Overall, Display 6.3.1.3.2 indicates an increasing trend of respondents choosing “the blind spot” as the most important unsafe act.

Display 6.3.1.3.2



A simple statistical analysis was conducted to show how the MS Excel Binomial Distribution function described in the Methodology Manual could be used to test before and after conditions. Display 6.3.1.3.2 shows a larger percentage of respondents in the before period indicating driving the blind spot as the most important safety factor around trucks. A statistical test was conducted to see if the increase was significant. The results of the test are summarized in Display 6.3.1.3.2a.

Display 6.3.1.3.2a Statistical Analysis of Before and After Responses on Important Factors around Trucks

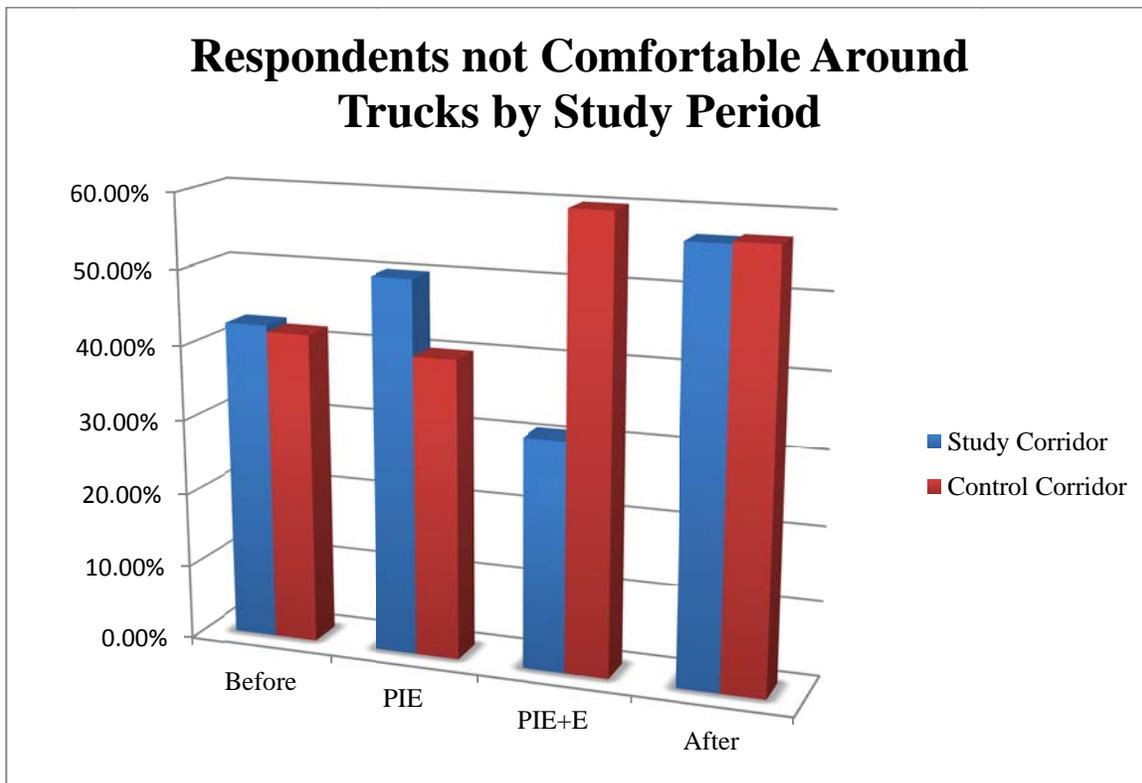
CHANGE IN DRIVERS IDENTIFYING IMPORTANT UNSAFE AROUND LARGE TRUCK - STUDY CORRIDOR	AFTER TACT		BEFORE TACT		PROB Before < After
	Number	%	Number	%	
Lane Change	14	30.43%	90	30.61%	0.5547
Tailgating	5	10.87%	44	14.97%	0.9880
Blind Spot	27	58.70%	160	54.42%	0.0769*
SUBSET TOTALS	46	100.00%	294	100.00%	1.0000
GLOBAL TOTALS					

* Significant at the 0.10 alpha level

Display 6.3.1.3.2a shows that there was a significant increase in the percentage of respondents indicating the blind spot as the most important safety factor around large trucks. Such results imply that the PI&E campaign had a positive impact, since it specifically focused on the issue of blind spots. Unfortunately, no similar analysis could be done meaningfully for the control corridor as the number of responses was too small.

In addition to investigating any self-reported behavior changes, the survey attempted to gauge any attitudinal impacts of the TACT campaign. Respondents were asked whether or not they were comfortable driving around large trucks. Display 6.3.1.3.2b shows the percentage of respondents during each study period indicating they were not comfortable driving around large trucks.

Display 6.3.1.3.2b

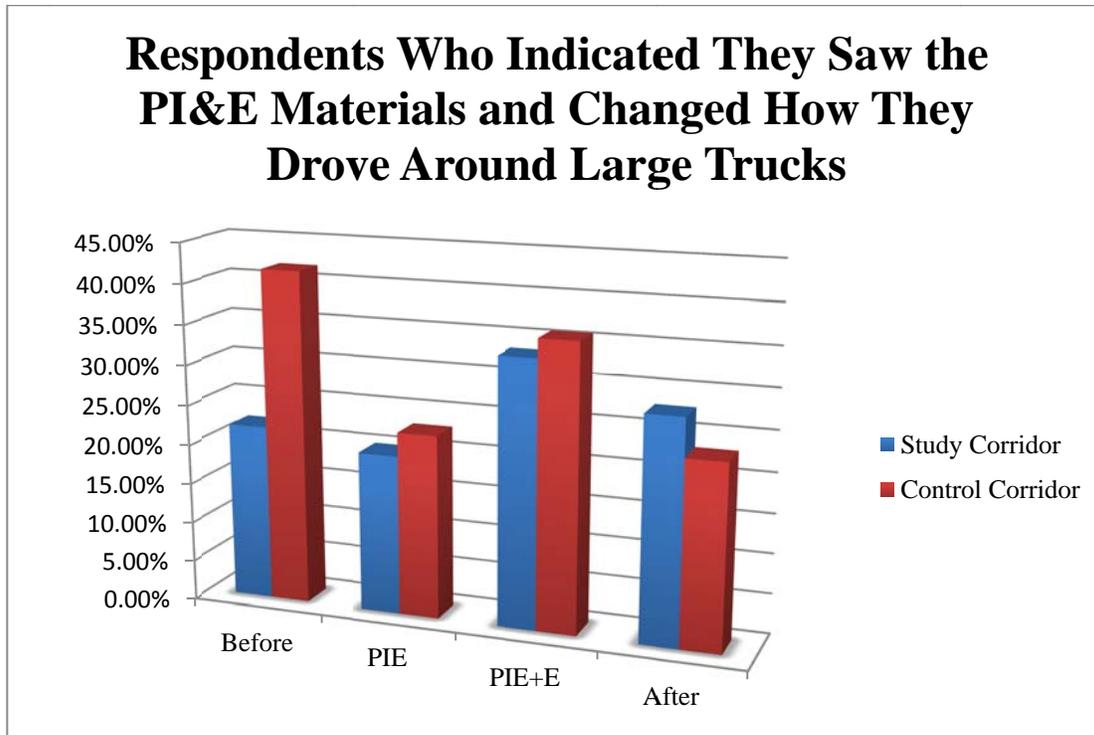


The most interesting observation from Display 6.3.1.3.2a is the fact that there was a substantial increase in the percentage of respondents not comfortable around trucks between the *Before* and *After* periods. The interpretation, however, is not clear. Perhaps the results indicate that the TACT campaign raised awareness of safety around large trucks, which had the effect decreasing comfort. If indeed this is the case, it may well be construed as a positive impact of the campaign.

The surveys elicited responses on self-reported behavior changes for each of the study periods in attempt to ascertain any effects of the PI&E and enforcement campaigns. Display 6.3.1.3.2c

shows the percentage of respondents who indicated seeing the PI&E materials indicating that they changed their driving behavior during each of the study periods.

Display 6.3.1.3.2c

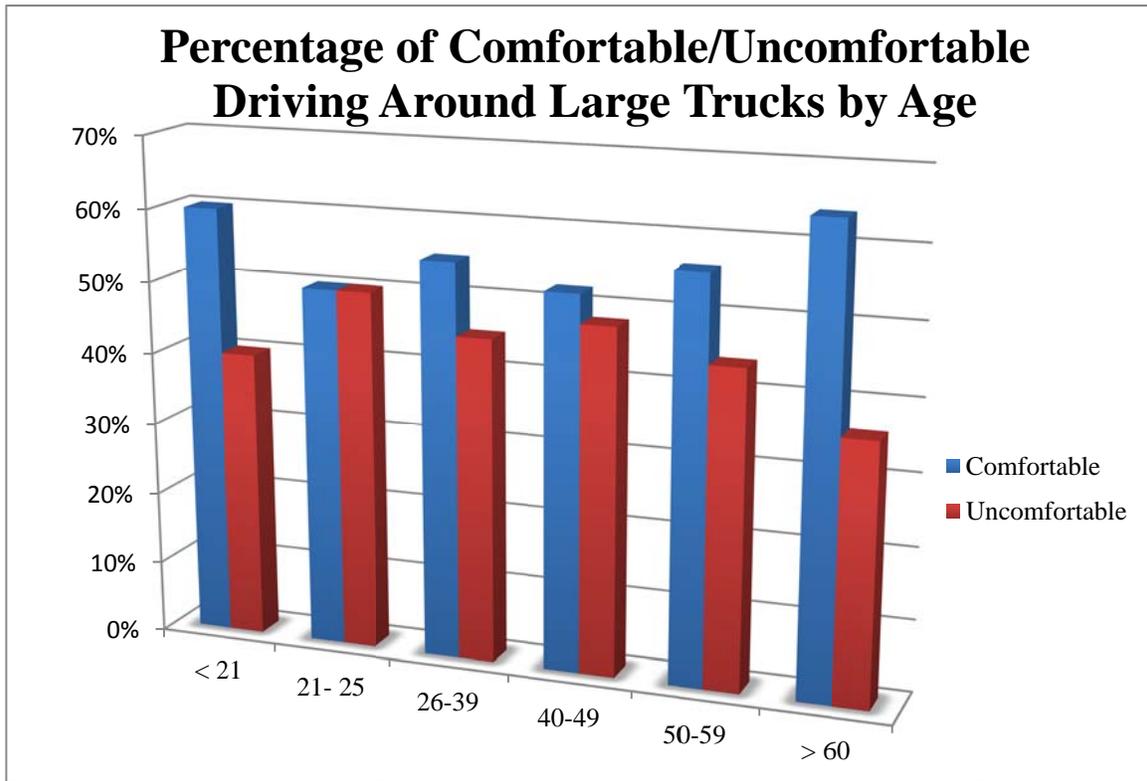


Again, if the data for the *Before* period is ignored, the results are interesting. Display 6.3.1.3.2c indicates a higher percentage of self-reported behavior changes after the PI&E campaign began. Furthermore, the data indicate more changes in self-reported behavior in the study corridor than control corridor after the study period that included PI&E and enforcement.

6.3.1.3.3 Summary of Driver Surveys

Interestingly, among the twelve total respondents that indicated they drove a large truck, ten indicated they were comfortable driving around large trucks. Additionally, respondents who drove more than 20,000 miles per year were much more likely to respond as being more comfortable around large trucks. Pick-up truck drivers showed a general trend of being more comfortable around truck but no other differences emerged. Finally, Display 6.3.1.3.3 shows that most respondents indicated they were comfortable driving around large trucks. Of particular interest is the relatively larger percentage of younger drivers who indicate they are comfortable around large trucks. This tends to substantiate the need to focus PI&E on younger drivers to increase awareness among this age group.

Display 6.3.1.3.3



Overall, the survey of the general driving population yielded some interesting results. Doubtless the results would have been more meaningful and it would have been possible to identify more trends and response patterns had there been better response rates, especially being more consistent among locations. Nonetheless, this exemplifies how a simple survey can be utilized to measure the exposure of drivers to a TACT campaign and the self-reported changes in driving behavior attributable to it.

6.3.2 Analyses of Original Surveys from the First Tact Project

Two post-TACT program surveys were conducted as part of the original TACT effort in Alabama – one for participating officers and one for truckers. These are covered in the next two sections. These surveys were conducted after the fact, and thus no before-after comparison could be performed. While this approach is not recommended, in some cases where there was inadequate provisions made for a “before” survey to be conducted, there may be no choice to only perform the survey after the fact. The examples presented here

6.3.2.1 Original Officer Survey

The officer survey was placed on line about a month after the TACT program had been completed. The participation in the survey was completely voluntary and totally anonymous.

All participating officers were encouraged to complete the survey. The following displays present the survey questions and summarize the responses.

1. My participation in the TACT program was as: [Create Chart](#) [Download](#)

		Response Percent	Response Count
a field enforcement officer		88.4%	38
an administrator		11.6%	5
answered question			43
skipped question			0

2. The extent of my participation was: [Create Chart](#) [Download](#)

		Response Percent	Response Count
less than five hours		16.3%	7
5-10 hours		9.3%	4
11-20 hours		14.0%	6
21-50 hours		23.3%	10
over 50 hours		37.2%	16
answered question			43
skipped question			0

3. To what extent do you see TACT activities to be different from your normal patrol activities? [Create Chart](#) [Download](#)

		Response Percent	Response Count
not very much different at all		27.9%	12
somewhat different		55.8%	24
quite a bit different		9.3%	4
completely different		7.0%	3
answered question			43
skipped question			0

4. I believe that it is best to perform TACT type of enforcement: [Create Chart](#) [Download](#)

		Response Percent	Response Count
on my own		48.8%	21
as part of a coordinated statewide TACT program		51.2%	22
		answered question	43
		skipped question	0

5. Since being involved in the TACT effort I have been more aware of traffic offenses that in-volve interactions between cars and trucks: [Create Chart](#) [Download](#)

		Response Percent	Response Count
True		69.8%	30
False		30.2%	13
		answered question	43
		skipped question	0

6. Being more aware of traffic offenses that involve interactions between cars and trucks has led me to issue more citations for these types of offenses even after the TACT program was over: [Create Chart](#) [Download](#)

		Response Percent	Response Count
True		67.4%	29
False		32.6%	14
		answered question	43
		skipped question	0

7. Feedback that I have received from truckers as to the value of the TACT program has been: [Create Chart](#) [Download](#)

		Response Percent	Response Count
more positive than negative		67.4%	29
about the same positive and negative		30.2%	13
more negative than positive		2.3%	1
	answered question		43
	skipped question		0

8. Feedback that I have received from the general public as to the value of the TACT program has been: [Create Chart](#) [Download](#)

		Response Percent	Response Count
more positive than negative		44.2%	19
about the same positive and negative		53.5%	23
more negative than positive		2.3%	1
	answered question		43
	skipped question		0

9. Do you believe that the traffic law enforcement effort associated with the TACT program accomplished its objectives of changing driving behavior and saving lives? [Create Chart](#) [Download](#)

		Response Percent	Response Count
Yes		92.9%	39
No		7.1%	3
	answered question		42
	skipped question		1

The following is a discussion of the survey results, by question:

1. The vast majority (88.4%) of the respondents were enforcement officers; the remaining 11.6% were law enforcement administrators.
2. Only a little over 25% of the respondents had 10 hours or less participation in the TACT program, while over 60% had more than 20 hours, and 37.2% had over 50 hours. This indicates that the respondents generally had extensive experience with the TACT program.
3. Generally speaking the officers did not see the TACT program as being a major deviation from their normal activities. Only 26.3% of them responded with “quite a bit different” or “completely different,” but almost the same proportion responded “not very much different at all.” The majority (55.8%) responded with “somewhat different.” The positive aspect of this response is that TACT was not perceived to cause a major disruption of officer activity. The downside is that some definitive changes in approach were expected. Apparently from the eCite comparisons there were major changes in the citations issued. Apparently officers did not perceive this to be a major change in their approach.
4. Officers were not unified as to whether a TACT program was needed or whether this could be done as effectively by individual independent activity on their part. They were split almost evenly on this question.
5. As opposed to Question 4, there was over a two to one majority who believed that due to the TACT program they are now more aware of traffic offenses that involve interactions between personal and commercial vehicles.
6. This response effectively reflects that of Question 5. Apparently those who felt that they were made more aware of certain offenses acted on that awareness by issuing more of these types of citations even after the TACT program was over.
7. This was an extremely one-sided response indicating the belief that the feedback that the officers got from truckers was positive to the TACT program. This can be compared to the responses from the truckers covered in the next section.
8. This question was an interesting contrast to the previous one. The question was effectively the same but instead of it being feedback from truckers it is feedback from the general public. Perhaps the feedback being referenced here is that when receiving a citation, which would not be expected to be very positive. Generally only about 6% of the citations were given to CMVs, so it is reasonable that CMVs would be more favorably disposed to the TACT program as opposed to the truckers.
9. The bottom line question of whether the TACT program saved lives received a very positive response of almost 93%.

In summary, it is clear that the officers’ attitudes toward the TACT program are generally quite positive. The only possible exception was the question regarding whether the same thing could be accomplished without a statewide organized program. That was close to a 50-50 split, so it

cannot be considered to be either positive or negative toward the TACT program. The officers also indicated their support of the program in stating that they changed their approach as to what offenses they were more aware of and thus issued more citations in these areas.

6.3.2.2 Original Trucker Survey Analysis

The trucker survey was placed on line about a month after the TACT program had been completed. The participation in the survey was completely voluntary and totally anonymous. The AMA encouraged its members to participate. The following displays present the survey questions and summarize the responses.

1. My participation in the TACT program was as:		Create Chart	Download
		Response Percent	Response Count
a truck driver		4.7%	2
a trucking company administrator		95.3%	41
<i>answered question</i>			43
<i>skipped question</i>			0

2. My participation in the program involved:		Create Chart	Download
		Response Percent	Response Count
no exposure to TACT public service announcements		14.0%	6
a few observations of these announcements		53.5%	23
several observations of these announcements		27.9%	12
seeing announcements almost every day during the program		4.7%	2
<i>answered question</i>			43
<i>skipped question</i>			0

3. To what extent did the TACT program change the way that you view four-wheelers? [Create Chart](#) [Download](#)

		Response Percent	Response Count
Not very much different at all		41.9%	18
Somewhat different		23.3%	10
Quite a bit different		25.6%	11
Completely different		9.3%	4
	<i>answered question</i>		43
	<i>skipped question</i>		0

4. I believe that the problem of car drivers not driving properly around trucks can best be addressed by: [Create Chart](#) [Download](#)

		Response Percent	Response Count
methods other than TACT that have been used in the past		2.3%	1
implementing a coordinated statewide effort, like the TACT program		97.7%	42
	<i>answered question</i>		43
	<i>skipped question</i>		0

5. Since being exposed to the TACT effort, I have been more aware of traffic offenses that involve interactions between cars and trucks: [Create Chart](#) [Download](#)

		Response Percent	Response Count
True		67.4%	29
False		32.6%	14
		answered question	43
		skipped question	0

6. I believe that the TACT program: [Create Chart](#) [Download](#)

		Response Percent	Response Count
was biased toward the private vehicle drivers		4.7%	2
was trying to be fair in addressing offenses of both cars and trucks		86.0%	37
was biased toward truckers		9.3%	4
		answered question	43
		skipped question	0

7. My feeling as to the overall value of the TACT program is: [Create Chart](#) [Download](#)

		Response Percent	Response Count
more positive than negative		81.4%	35
about the same positive and negative		18.6%	8
more negative than positive		0.0%	0
		answered question	43
		skipped question	0

8. Feedback that I have received from the general public as to the value of the TACT program has been: [Create Chart](#) [Download](#)

	Response Percent	Response Count
more positive than negative	53.5%	23
about the same positive and negative	39.5%	17
more negative than positive	7.0%	3
answered question		43
skipped question		0

9. I know at least one trucker who received a ticket as a result of the TACT program. [Create Chart](#) [Download](#)

	Response Percent	Response Count
True	14.0%	6
False	86.0%	37
answered question		43
skipped question		0

10. Do you believe that the traffic law enforcement effort associated with the TACT program accomplished its objectives of changing driving behavior and saving lives? [Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	67.4%	29
No	32.6%	14
answered question		43
skipped question		0

The following presents a discussion of the results of the trucker survey, by question:

1. The vast majority (95.3%) of the trucker surveys were completed by trucking company administrators as opposed to truck drivers. This could possibly be due to computer

literacy or perhaps the reluctance of truck drivers to get involved. The Alabama Trucking Association was instrumental in getting the word out on the availability of the survey.

2. This response indicates that there was either a lack of involvement on the part of the respondents or a lack of public service announcements.
3. It is clear from this question that the TACT program had much more of an impact on the involved law enforcement officers than it did on the trucking administrators. The major proportion of the respondents (65%) indicated that their view of four-wheelers had not changed very much at all due to the TACT program.
4. This question can also be contrasted with the comparable officer's question. While the officers were split almost 50-50 as to whether a TACT program was preferable to individual action, the vast majority (97.7% ... all except one respondent) favored the TACT approach over other methods used in the past. This shows almost unqualified support on their part for the TACT program.
5. The response as to whether the respondent is more aware of offenses that involve car-truck interaction is almost identical to that of the officers – a two to one statement that they were more aware.
6. It is clear that the majority (86%) felt that the TACT program was fair in addressing offenses of both cars and trucks. In addition, over 9% felt that they were biased toward the truckers, so only 5% had negative feelings with regard to the bias of the officers.
7. The overall feeling of the representatives from the trucking industry was positive – none indicated any negative feelings toward the program, and 81.4% indicated a more positive than negative feeling.
8. While still being positive, the feedback that they received from the general public was not nearly as favorable as their own. This could be due to some feedback coming from those who received citations.
9. The purpose of this question was to determine if the respondents' survey responses might have been biased by citations that they or their employees received. Since 86% of them did not know any truckers who received citations, it can be concluded that this was not a major factor in determining their responses.
10. The question as to whether TACT saves lives is essentially the same bottom line question that was asked of the law enforcement officers. Their response was 92.9% positive, while the response here is 67.4% positive. It can be concluded that law enforcement had a significantly higher positive feeling toward the TACT program than did the trucking administrators.

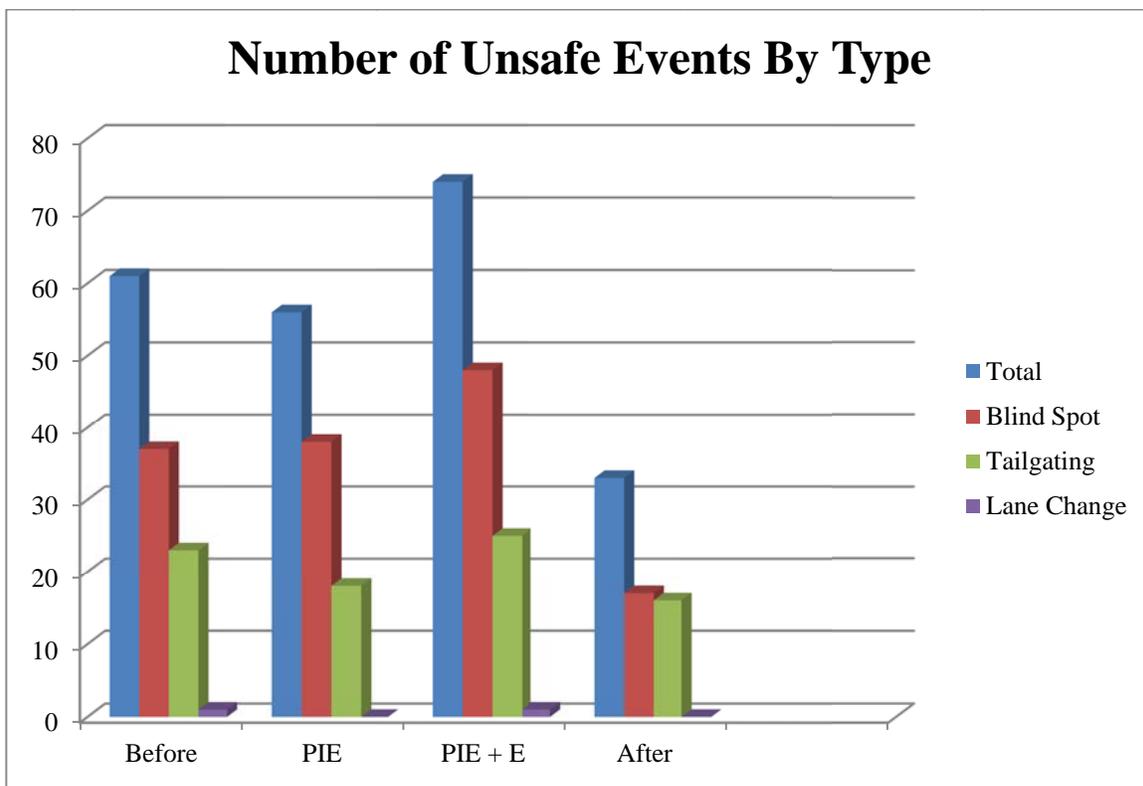
In summary, this survey given after the original comprehensive TACT project indicates an overall positive attitude toward the TACT program being expressed by the truckers, although the truckers' responses were not as positive in several aspects as that of law enforcement. The one notable exception was Question 4 in which the vast majority (97.7%) of truckers indicated that the TACT approach was preferable to other approaches used in the past. The law enforcement

response to this was about an even split. The truckers felt like law enforcement officers implementing TACT were generally fair, and, if anything, they perceived it to be a bit biased toward the truckers. They indicated a strong positive feeling for the TACT program, and their belief that the general public also supported it.

6.4 Observational Data Analysis

As discussed in Section 3.1.4.2.3, each of the four study periods were evaluated considering 150 events each. Recall that the four study periods were before anything, PI&E only, PI&E plus enforcement, and after; these will be referenced as: *Before*, *PI&E*, *PI&E+E* and *After*. The purpose of the evaluations was to determine whether any change in driving behavior occurred over the four study periods. The evaluations were based on fifty events observed from videos representing morning, midday and afternoon traffic conditions for each study period. Therefore, 600 total events were evaluated as safe or unsafe. Display 6.4 presents a summary of the unsafe events observed in each study period.

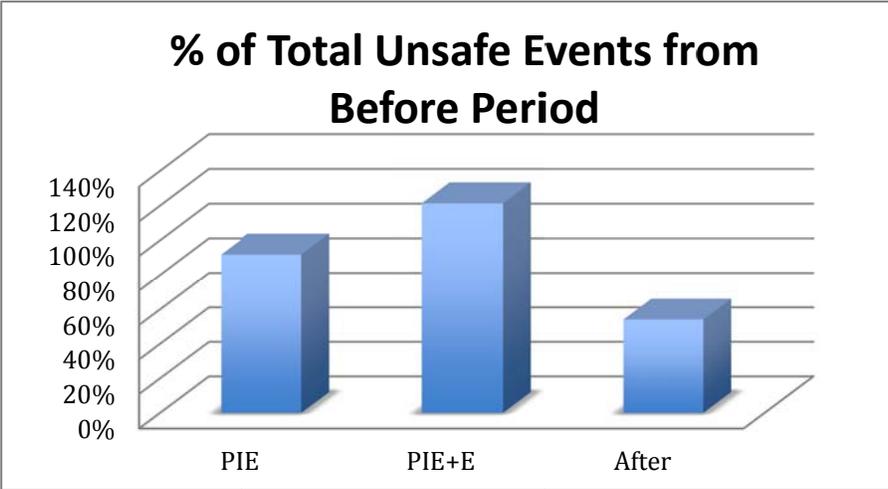
Display 6.4



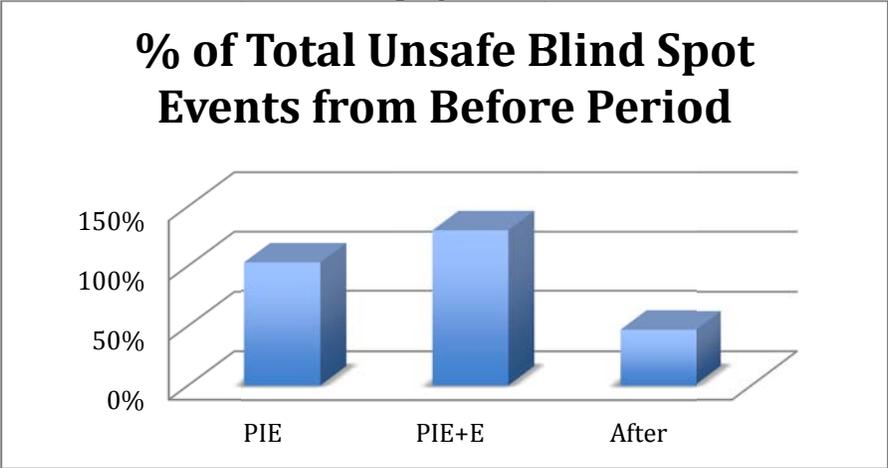
6.4.1 Comparison among Study Periods

Display 6.4 seems to indicate fewer unsafe events in the *PI&E* and *After* periods and an increase during the *PI&E+E* period. In order to investigate these trends further, Displays 6.4.1, 6.4.1a and 6.4.1b show the level of unsafe events in the *PI&E*, *PI&E+E* and *After* periods as a percentage of the number observed during the *Before* period.

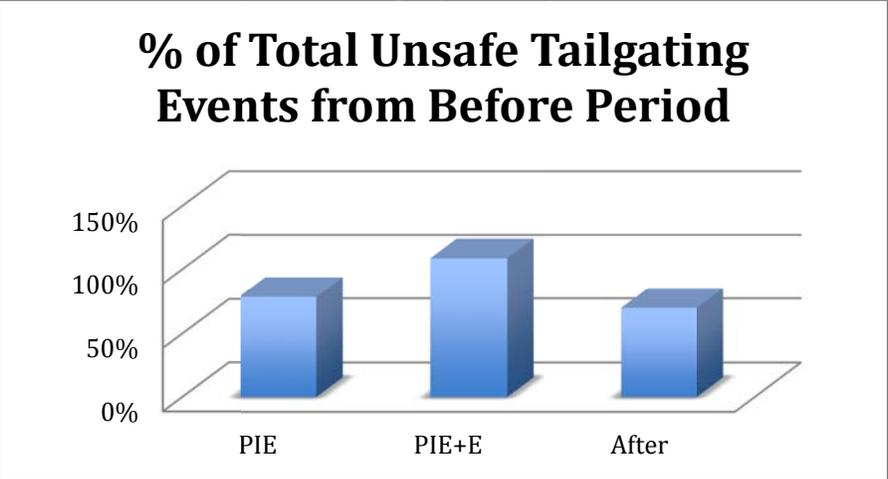
Display 6.4.1



Display 6.4.1a



Display 6.4.1b



Display 6.4.1 confirms the trend of fewer unsafe events during the *PI&E* and *After* periods and an increase during the *PI&E+E* period. Displays 6.4.1a and 6.4.1c show similar trends for the blind spot related events and tailgating events, respectively. Of particular interest, Display 6.4.1a shows that the blind spot-related events during the *After* period are less than 50% of the total observed during the *Before* period. Display 6.4.1b indicates that the number of observed tailgating events did not decrease as much as blind spot events between the *Before* and *After* periods. There was only one observed lane changing unsafe event during the *Before* period and none were observed during the *After* period.

A simple statistical analysis was conducted, which illustrates how the MS Excel Binomial Distribution function described in the Methodology Manual could be used to test before and after conditions. Displays 6.4.1a and 6.4.1b appear to indicate a larger decrease in blind spot events than tailgating events between the *Before* and *After* periods. A statistical test was conducted to see if the decrease was significant. The results of the test are summarized in Display 6.4.1c.

Display 6.4.1c Statistical Analysis of Before and After Observed Unsafe Event

CHANGE IN OBSERVED UNSAFE EVENTS BETWEEN BEFORE AND AFTER	AFTER TACT		BEFORE TACT		PROB Before < After
	Number	%	Number	%	
Lane Change	0	0.00%	1	1.64%	1.000
Tailgating	16	48.48%	23	37.70%	0.966
Blind Spot	17	51.52%	37	60.66%	0.097*
SUBSET TOTALS	33	100.00%	61	100.00%	1.000
GLOBAL TOTALS					

* Significant at the 0.10 alpha level

Display 6.4.1c indicates that the decrease in observed unsafe blind spot events is indeed statistically significant.

6.4.2 Accounting for Traffic Conditions

It is reasonable to expect that the number of occurrences of unsafe events would be a function of traffic levels. As indicated in Section 3.1.4.2.2, observational data was taken during morning, midday and evening peaks over the course of each of the study periods. Display 6.4.2 shows the number of total unsafe events observed during each study period, the peak hour (two-way) traffic volumes and percent trucks counted during the observation period. Using the methodology¹ set out in the 2010 *Highway Capacity Manual* (TRB, 2010), the peak hour traffic was converted to a passenger car equivalency (PCE). The number of unsafe events observed was then divided by the peak hour PCE to allow comparison among periods.

¹ Level terrain was assumed resulting in a truck equivalency factor (E_t) of 1.5 trucks per passenger car.

Display 6.4.2 Relationship Between Observed Total Unsafe Events and Traffic

STUDY PERIOD	TIME-OF-DAY	# OF UNSAFE EVENTS	HOURLY TRAFFIC VOLUME	% TRUCKS	UNSAFE EVENTS/PCE
Before	Morning	18	3386	18	0.0049
	Midday	26	3348	14	0.0073
	Evening	17	4172	16	0.0038
PI&E	Morning	17	3162	21	0.0049
	Midday	14	3135	24	0.0040
	Evening	24	5342	11	0.0043
PI&E+E	Morning	29	4970	10	0.0056
	Midday	20	3302	19	0.0055
	Evening	25	4298	15	0.0054
After	Morning	11	4856	12	0.0021
	Midday	9	2888	19	0.0027
	Evening	13	3264	14	0.0032

Display 6.4.2 confirms trends observed in Displays 6.4, 6.4.1 – 6.4.1b. Namely, there appears to be an overall reduction between the *Before* and *PI&E* periods, a slight increase during the *PI&E+E* period and then a larger decrease during the *After* period. It is worth noting that during the *PI&E+E* period, there was a work zone roughly two miles upstream of the observation area. Traffic was reduced from three lanes to one lane. It is likely the case that vehicles discharging from the work zone were driving in closer proximity than they were during the periods where no work zone was present. This may account for the higher number of observed unsafe events during the *PI&E+E* period when compared to the other study periods. A similar analysis was conducted on the blind spot events. The results are summarized in Display 6.4.2a.

Display 6.4.2a Relationship Between Observed Unsafe Blind Spot Events and Traffic

STUDY PERIOD	TIME-OF-DAY	# OF UNSAFE BLIND SPOT EVENTS	UNSAFE BLIND SPOT EVENTS/ PCE
Before	Morning	12	0.0035
	Midday	15	0.0045
	Evening	10	0.0024
PI&E	Morning	13	0.0041
	Midday	7	0.0022
	Evening	18	0.0034
PI&E+E	Morning	15	0.0030
	Midday	17	0.0051
	Evening	16	0.0037
After	Morning	6	0.0012
	Midday	4	0.0013
	Evening	7	0.0019

Display 6.4.2a indicates that the observed blind spot events follow similar trends to the total observed unsafe events. These results support the more conclusive statistically significant findings presented in Display 6.4.1c. Thus, it can be reasonably concluded that the occurrence of unsafe blind spot events decreased over the course of the current TACT campaign.

6.4.3 Summary of Observational Analyses

The previous sections presented the results of the analysis of observational data from traffic cameras located in the study corridor. The analysis was conducted to determine whether any change in driving behavior could be identified in the corridor that could be attributable to the TACT campaign. The results indicated that there had indeed been a reduction in unsafe blind spot-related events. As with any comparison of this kind, it is impossible to know that the observed reduction is the direct result of the TACT campaign. Nonetheless, the results are encouraging as the PI&E campaign was specifically designed to emphasize raising the awareness of the dangers of remaining in the blind spot of a truck.

7.0 Remarks on Drawing Conclusions

There were a number of conclusions drawn in the examples above. Some were quite favorable to the TACT projects as implemented in Alabama and elsewhere. Others showed no significant differences in metrics where some crash frequency or severity reduction were expected. It is important that all results be retained and that those performing evaluations as well as the administrators who they report to be objective and properly use the results not only for future project justification, but also to improve future programs.

7.1 Accomplishing the Evaluation Objectives

The following are evaluation objectives that were accomplished during the examples illustrated in this document:

- *To generally confirm the benefits of TACT programs and to establish the best estimate of its effectiveness in terms of reduced crash frequency and severity.*
 - The large comprehensive TACT project was found to reduce an estimated rounded average reduction in crashes during its implementation of three fatality crashes, six injury crashes and a total of 20 crashes (all severities).
 - Crash reductions on the smaller projects done in the interim tended to confirm the validity of these estimates.
- *To find at least one weakness in each of the TACT components.*
 - The timing of projects and especially PI&E during tornado season.
 - Not having resources available at the time when conditions were finally favorable to the evaluation.
 - The first TACT project and the interim projects did not have any PI&E except that which was obtained by media coverage.
 - Crash effectiveness on the smallest project was difficult to determine due to the low sample sizes.
- *To overcome these weaknesses by formulating recommendations for future TACT projects.*
 - Plan and launch the projects earlier in the funding cycle so that there is ample time for performing the project and the evaluation despite unexpected delays.
- *To seek out and establish, if possible, new and creative strategic approaches toward reducing the frequency and severity of CMV involved crashes.* There were two strategies that were suggested during these projects that might have merit for future consideration:
 - The use of social media as a method for getting through to younger drivers, and
 - The use of certain video footage that was obtained during the evaluation to be worked into future PI&E efforts.

7.2 Proper Use of Qualifiers

Qualifiers in this context are facts that might tend to mitigate or further explain the results of the evaluation studies. The following possible examples are presented for the studies that were used to illustrate the evaluation procedures above.

A major qualifier of the first project is the fact that very few states implement their TACT projects on a total-force-dedicated basis, and it is questionable as to whether Alabama will do this again in the future. Both state and federal funds were used in this effort, which was conducted for many purposes, not the least of which was to measure the effectiveness of such an approach. It was also the judgment of DPS management who were in authority at that time to utilize all funds for increases in officer participation as opposed to PI&E. While some level of PI&E came from news releases and earned media, most authorities agree that some minimal level of funding would probably multiply the overall effectiveness of the selective enforcement effort.

During the Interim period, the change of crash reporting had major impacts on the types of analysis that could be considered valid. In this case, there was an entirely new crash reporting form, together with an all new electronic crash reporting system. While the new form and the electronic reporting system both represent significant improvements in crash reporting in the state, these types of changes can have a major impact on the data being collected for analysis. In this case, there was a significant rise in the reported CMV crashes, due in large part to automatic checks in the eCrash software to determine if a vehicle is to be considered Commercial. Care should be taken to insure that even smaller scale changes in reporting are not invalidating the analysis.

As a result of the complications in reporting above the only approach that could be used to evaluate the effectiveness of the interim projects from a crash point of view was the one that was used, i.e., a comparison between the TACT and non-TACT months. Since the changes in reporting were essentially completed prior to the interim period, there was a consistent way of measuring CMV-involved crashes. This was the best that could be done, but it is highly recommended that prior year months be used for comparison if at all possible, as was done for the first TACT evaluation.

Another issue in using 2009 for a “before” period would have occurred even if there was not a change in the reporting method since 2009 was not a non-TACT year. Questions could arise as to the validity of comparing two years in which TACT projects were in effect. Of course, the non-TACT months could have been used had all other things been equal.

This poses another question concerning the two approaches. Assuming that both have validity the question could be asked as to why the two crash-data-based evaluations produced results that

were so close to each other. Is it possible that a greatly reduced set of TACT projects can produce statewide results that are as great as the comprehensive nature of the original project? The answer is in the affirmative, especially if the possibility of carry-over from the initial project is considered. There is no assertion, however, that this is the case. Nonetheless, the possibility should be noted as a possible qualifier in explaining the results. But it does seem reasonable that an initial thrust that pulls out all of the stops followed up by very carefully targeted smaller efforts could be a very effective way to implement a TACT approach over time.

As a final example qualifier, it should never be assumed that the addition of one patrol officer will always produce a linear decrease in crashes. There is a minimal level of both selective enforcement and PI&E that is necessary to produce any measurable impact at all. Above that, the addition of resources will tend to increase effectiveness, as was observed in the correlation between hours of effort and reduced crashes reported above. For example, it could be that a doubling of the effort, say from 200 to 400 hours per month will significantly increase the benefits obtained. However, economists recognize that most programs can only utilize a given increased level of resources effectively, after which added resources will begin to diminish the marginal effects. In the worst case the increase in resources can have a zero marginal effect, or it can even be counterproductive to the entire program. A proven example of this is in software development, where adding programmers to a project above a given level not only produces a zero marginal effect, but actually decreases the total overall performance of the entire team. The concept of diminishing returns also applies to law enforcement resources and is a concept that should be one that is understood by every decision-maker. This is especially true when there is a clear downside to allocating too many resources to a given purpose – that being the drawing away of resources that might better be utilized elsewhere.

8.0 Annotated Literature Review

The following documents are numbered according to their referencing in this report.

1. Penny, N. et al, “*Ticketing Aggressive Cars and Trucks (TACT) in Washington State: High Visibility Enforcement Applied to Share the Road Safely,*” Report Number DOT HS 810 603, May 2006.
<http://www.nhtsa.gov/people/injury/aggressive/tact/pages/techsummary.htm>
Very comprehensive study involving several evaluation metrics, including observed violations and observed violation rates per observation hour.
2. “TACT Quarterly eUpdates,” published quarterly
<http://www.fmcsa.dot.gov/documents/safety-security/TACT-Newsletter-Sept09-508.pdf>
Contains list of countermeasures tried in other states and some effectiveness metrics.
3. FMCSA, TACT “Ticketing Aggressive Cars and Trucks,”
<http://www.fmcsa.dot.gov/safety-security/tact/index.htm>
This web site provides information and resources regarding:
 - TACT [background, purpose, and mission](#)
 - [Action Planning](#) tips for starting a TACT program
 - Participating [TACT States](#)
 - Industry affiliates and Federal and State [safety partners](#)
 - [Guidelines](#) for conducting a TACT high-visibility traffic enforcement program
 - [Funding](#) and grant opportunities for TACT
 - Relevant [research](#) about passenger and commercial motor vehicle safety
 - [Useful Tips](#) for motorists and professional truck drivers
4. FMCSA, “Share the Road Safely Program,”
<http://www.sharetheroadsafely.org/tact/tact.asp>
This web site is devoted to educating drivers on sharing the road.
5. NHTSA, “Ticketing Aggressive Cars and Trucks in Washington State,”
<http://www.nhtsa.dot.gov/people/injury/aggressive/tact/pages/Intro-TACT-Model.htm>
One of the first web sites and thus somewhat dated (2005).
6. Institute for Transportation Research and Education at NC State University, “TACT web reference page,” <http://itre.ncsu.edu/VAMS/cmv/tact.html>
Contains a reference list to several articles on TACT alternative approaches:
 - Automated capture of vehicle speeds and following distances
 - Focusing on avoiding real risk rather than a ticket (examples given)
 - Technological approaches – variable signs.
7. Hughes, R. G., “Recommendations to Enhance the Effectiveness of the FMCSA Program, TACT,”
http://itre.ncsu.edu/VAMS/cmv/documents/ITRE_Imp_TACT_Prog.pdf
One of the articles from the ITRE recommendations.

8. US Government Account Office, "Truck Safety: Share the Road ...," <http://www.gao.gov/products/GAO-06-916> and <http://www.gao.gov/new.items/d06916.pdf>
Dated evaluation (2006). Recommendations: find the most cost-effective methods.
9. Kentucky State Police, "KSP Kicks Off TACT Enforcement Program," http://www.kentuckystatepolice.org/hsp/news_release/2008/10_07_08.htm
Similar to other kick-off web pages.
10. Green, Eric R., "Evaluation Plan for the TACT Program in Kentucky," http://www.ktc.uky.edu/Reports/KTC_10_02_KSP1_10_1F.pdf
Very good summaries of the evaluations performed.
11. Green, E. R., "Evaluation Plan for the TACT Program in Kentucky," TRB, TRIS, (Abstract only: <http://tris.trb.org/view.aspx?id=917360>), Kentucky
Kentucky Transportation Center Research Report KTC-10-02/KSP1-10-1F, February 2010.
12. Nevada Department of Public Safety, "Badge on Board," <http://www.badgeonboard.nv.gov/>
Some good background information.
13. Alabama Media Portal 2.0, FMCSA Safety Grant Funds Trooper Efforts, <http://media.alabama.gov/pr/pr.aspx?id=2127>
News release from Alabama September 9, 2009.
14. Federal Register, Vol. 71, No. 57, Friday, March 24, 2006, Notices, http://www.cvsa.org/documents/news/fmcsa_grant_notice.pdf
Enabling legislation for the TACT programs.
15. F. Dennis Thomas, et al, Evaluation of a high visibility enforcement project focused on passenger vehicles interacting with commercial vehicles. Journal of Safety Research 39 (2008) 459-468.
http://www.inspectieloket.nl/Images/20%20Evaluation%20of%20a%20high%20visibility%20enforcement%20project%20focused%20on%20passenger%20vehicles_tcm296-282204.pdf
Summary of very rigorous evaluations of TACT in Washington State. "Media activities included television, radio, and newspaper advertisements as well as posters, banners, flyers, road signs, and large trucks wrapped in TACT banners that traveled up and down the intervention corridors." Other key observations and findings:
 - "The Click it or Ticket model is a well known selective traffic enforcement model and is associated with an impressive increase in safety belt use across the nation."
 - "A selective traffic enforcement model typically relies heavily on enforcement of a state's traffic safety laws and is supported by intensive paid publicity that focuses on enforcement."
16. TACT State Details web site (FMCSA),

- <http://www.fmcsa.dot.gov/safety-security/tact/stateOverView.htm>
Pages for participating states: GA, KY, NC, PN, WA, AL, TX, NV, OR, IA, MT, NJ.
17. Checklist of Requirements for a TACT Program (FMCSA)
<http://www.fmcsa.dot.gov/safety-security/tact/check-list.htm>
 18. NHTSA, "TACT in Washington State – Evaluations,"
<http://www.nhtsa.gov/people/injury/aggressive/tact/pages/Eval-Spec-Exp.htm>
Specific Evaluation Methods and Results – summary.
<http://www.nhtsa.gov/people/injury/aggressive/tact/pages/contents.htm>
Table of contents for the entire report.
 19. NHTSA, "ACT in Washington State – complete report."
<http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810603.pdf>
Complete study, contains data collection forms and statistical explanations as well as results. Saved.
 20. FMCSA TACT web sites.
<http://www.nozone.org/tact/tact.asp> (the NoZone program)
<http://www.fmcsa.dot.gov/safety-security/tact/index.htm> (general TACT)
 21. Summary of TACT program in Alabama.
http://caps.ua.edu/outreach_tact.aspx
References to problem identification and route selection techniques.
 22. NTIS Web Page:
<http://www.ntis.gov/search/product.aspx?ABBR=PB2010102650>
Reference to the Pennsylvania evaluation report of their TACT program (fee charged).
 23. Ralph Craft, "The Large Truck Crash Causation Study,"
<http://www.fmcsa.dot.gov/facts-research/research-technology/analysis/fmcsa-rra-07-017.htm>
 24. Steil, Dana et al; TACT Ticketing Aggressive Cars and Trucks Evaluation Report; Center for Advanced Public Safety, March 1, 2010.
http://www.safehomealabama.gov/articles/TACT_2009_Evaluation_Report-17-Final.pdf
 25. Cunningham, C. M., et al, "Is TACT Effective in Changing Driver Behavior: Evidence from North Carolina TACT III Effort," Submitted for consideration for publication and presentation at the 90th Annual Meeting of the 41 Transportation Research Board, January 23-27, 2010. This study is discussed in Section 3.1.4.1.
 26. Parrish, A. S., et al, "CARE: An Automobile Crash Data Analysis Tool," IEEE Computer, 0018-9162/03, June, 2003.
 27. Brown, D. B., et al, CARE Web Page, Safe Home Alabama,
<http://www.safehomealabama.gov/category.aspx?cat=54>
 28. USDOT Federal Motor Carrier Safety Administration www.fmcsa.dot.gov/safety-security/tact/tactactionplanning.htm. From this report: "As part of the TACT program design, a State should gather relevant crash and fatality data to identify high-risk areas. ... The evaluation plan should detail how the TACT research plan will be determined- data collection methods, segments and measurement criteria."

29. NHTSA, Guidelines for Developing a Municipal Speed Enforcement Program, <http://www.nhtsa.gov/people/injury/enforce/program.htm>. The following summarizes this report:

- “Select a traffic safety issue to serve as the program's focus.
- Select zones within the community on the basis of speed-related crashes and citizen complaints of speeding.
- Devote considerable, high visibility enforcement effort to the special zones for at least six months.
- Collect relevant data to be able to evaluate program effects.
- All special traffic safety enforcement efforts should be accompanied by vigorous publicity programs to achieve the maximum general deterrence effects. In fact, it might be the publicity as much as the enforcement that causes any objective improvements in measures of traffic safety. A committee of concerned local citizens can be organized to direct this effort, and to provide other assistance with the program.
- The most effective programs are characterized by close cooperation between police and committee personnel. The process should be one in which police help with the publicity program and committee members assist police in their special enforcement efforts.
- Newspapers are the greatest source of public awareness of special enforcement programs, but the program activities must be newsworthy to receive news coverage. Any effort to enhance the "newsworthiness" of a program or activity will contribute to free publicity, and ultimately, to public awareness.”

30. US DOT Federal Motor Carrier Safety Administration, Report to Congress on the Large Truck Crash Causation Study, March 2006. The following were reported regarding crash events and associated factors:

- “Most common factors for both truck and passenger drivers in crash events were driving too fast for conditions, making an illegal maneuver, legal drug use, unfamiliarity with the roadway, and fatigue.
- Fatigue was recorded for the passenger vehicle driver twice as often as for the truck driver
- There was very little illegal drug use or alcohol use assigned to truck driver, but more of both recorded for passenger vehicle drivers.
- Additional analysis of specific crash risk factors that can be subjected to countermeasures by the government and the public.”

31. The Unsafe Driving Acts of Motorists in the Vicinity of Large Trucks, Stuster, Jack; Anacapa Sciences, Inc. February 1999; <http://www.fmcsa.dot.gov/documents/udarepo.pdf>. The unsafe acts listed in this study were summarized as follows:

- Driving inattentively (e.g., reading, talking on the phone, fatigue),
- Changing lanes in front of a truck, then braking (for traffic, toll gate, exit, etc.),

- Changing lanes abruptly in front of a truck,
 - Driving in the “no zones,”
 - Unsafe passing, primarily passing with insufficient headway,
 - Unsafe turning, primarily turning with insufficient headway,
 - Unsafe Crossing (i.e., pulling out in front of an approaching truck),
 - Merging improperly into traffic or failing to permit a truck to merge,
 - Pulling into traffic in front of a truck without accelerating sufficiently,
 - Maneuvering to the right of a turning truck,
 - Crossing a lane line near the side of a truck (while passing or changing lanes),
 - Driving between large trucks,
 - Failure to discern that the trailer of a turning truck is blocking the roadway, and
 - Nearly striking the rear of a slowly moving, stopped, or parked truck.
32. Aggressive Driving; <http://www.nhtsa.gov/Aggressive>; contains a number of definitions related to aggressive driving and links to other resources, e.g., *Stop Aggressive Driving Toolkit*.
33. A Guide for Planning and Managiing the Evaluation of a TACT Program, USDOT, FMCSA; <http://www.fmcsa.dot.gov/documents/safety-security/guide-evaluation-tact.pdf> (no date); the following summarizes the contents of this document:
- Introduction
 - Definition of the TACT model: “By combining high-visibility enforcement with extensive paid and earned media ***about the enforcement***, a significant increase in a driver’s perceived risk of a ticket for a specific violation can be generated. This, in turn, creates the desired general deterrence of unsafe behaviors and improves safety.”
 - The Washington State TACT project was described very briefly.
 - The need for ongoing evaluation.
 - Appropriate Evaluation
 - For improvement as opposed to proving a point.
 - Creating a closed-loop system.
 - Integration throughout the project.
 - Value of problem identification.
 - Need for detailed planning and quantitative objectives.
 - Finding an Evaluator
 - TACT Evaluation Components and Techniques
 - Measures of effectiveness and data to obtain these measures.
 - Experimental design for effectiveness measures.
 - Necessity for administration evaluation – documenting what was done.
 - Surveys.
 - Behavioral observational measurements.
 - Crash reduction measurements.

- Key Points (paraphrased from the report:)
 - Evaluation should be an integral part of a TACT project since it can contribute to an improved project from the proposal to the final report.
 - TACT evaluation requires the involvement of a trained and experienced evaluator or evaluation team.
 - Each evaluation must be tailored to the objectives, scope, approach, and resources of the particular project.
 - The Washington State TACT project evaluation is a good *example*, but it is not a fixed *model* that must be repeated by all other TACT projects.
 - The evaluator must be viewed and performs as an integral member of the TACT project team.
 - TACT projects and their evaluations should be fully consistent with the STEP approach.
 - The general deterrence model provides good guidance for selecting appropriate TACT evaluation measures of effectiveness and data collection techniques.
 - Evaluation Measurement Techniques (Appendix A) – this is an excellent listing of the process and performance metrics that should be considered.
 - Washington State TACT Survey (Appendix B)
34. Frequently Asked Questions: TACT;
<http://www.fmcsa.dot.gov/safety-security/tact/faqs.aspx> – contains extensive basic information on TACT, as well as links to other FMCSA TACT topics.
35. TACT e-Toolkit; <http://www.fmcsa.dot.gov/safety-security/tact/e-toolkit.htm> – this is an operational TACT advisory page as opposed to one that centers on evaluation; it provides a number of tools to get a TACT program started.
36. Alternative Approach to TACT Evaluation (and “Treatment”): Some Additional NCSU/ITRE Thoughts and Suggestions;
http://itre.ncsu.edu/vams/cmv/documents/Alt_TACT_Eval.pdf -- documentation summary of findings from (6 and 7).
37. Evaluation of the Ticketing Aggressive Cars and Trucks (TACT) Program in Pennsylvania (071408); August 14, 2009;
ftp://ftp.dot.state.pa.us/public/pdf/BPR_PDF_FILES/Documents/Research/Complete%20Projects/Smart%20Transportation%20Solutions/TACT%20Project%20Report%20Final.pdf
 This is an excellent and comprehensive review of the Pennsylvania TACT that took place in the southern part of that state in late 2008. It was based on surveys and did not involve crash or citation records.