



**THE TEXAS MOVE OVER ACT: DRIVER KNOWLEDGE,
UNDERSTANDING, AND COMPLIANCE**

prepared by
David H. Bierling
Assistant Research Scientist

and

Ying Li
Graduate Assistant Researcher

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DISCLAIMER

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CHAPTER 1: PROJECT OVERVIEW

1.1 INTRODUCTION

‘Move over laws’ are commonly referred to as those laws which are intended to protect the driving public, emergency responders, and transportation workers by requiring drivers to slow down and/or move over a lane when passing authorized emergency vehicles that have their lights activated. The laws differ from state-to-state as to the actions specifically required of drivers and the situations they apply in. According to the ‘Move Over, America’ webpage¹, 47 U.S. states have passed move over laws. Some states only require that drivers slow down and exercise caution, while others require that they slow down specified amounts or vacate the lane adjacent to the emergency vehicle. Some states require drivers to do this only when passing certain types of emergency vehicles (e.g., police, fire, and EMS vehicles) that have red and/or blue emergency lights while others include tow trucks and transportation vehicles that use amber lights. A detailed review of U.S. Move Over Laws has recently been published as part of FHWA’s *Traffic incident management quick clearance laws* report and is available at http://ops.fhwa.dot.gov/publications/fhwahop09005/move_over.htm.



Figure 1. The Austin Police Department Assists with Removing a Disabled Vehicle from the Roadway Shoulder on I-35.

Texas Transportation Code 545.157 defines the requirements of the Texas Move Over Act (TMOA). It requires that drivers vacate the lane adjacent to a stopped, authorized emergency vehicle that has its emergency lights on, or slow down to 20 miles per hour below the posted speed limit when the posted speed limit is at or above 25 miles per hour (or slow to 5 mph when the posted speed is less than 25 mph). This speed reduction requirement is similar to those of move over laws in Florida, South Dakota, and Wyoming.

¹ <http://www.moveoveramerica.com/#>

1.2 TEXAS' 'MOVE OVER ACT' AND ASSOCIATED LAWS

The Texas' 'Move Over Act' was passed by the 78th Texas Legislature, took effect September 1, 2003, and can be found in Texas Transportation Code 545.157. The law states:

§ 545.157. PASSING AUTHORIZED EMERGENCY VEHICLE.

- (a) On approaching a stationary authorized emergency vehicle using visual signals that meet the requirements of Sections 547.305 and 547.702, an operator, unless otherwise directed by a police officer, shall:
 - (1) vacate the lane closest to the emergency vehicle when driving on a highway with two or more lanes traveling in the direction of the emergency vehicle; or
 - (2) slow to a speed not to exceed:
 - (A) 20 miles per hour less than the posted speed limit when the posted speed limit is 25 miles per hour or more; or
 - (B) five miles per hour when the posted speed limit is less than 25 miles per hour.
- (b) A violation of this section is:
 - (1) a misdemeanor punishable under Section 542.401;
 - (2) a misdemeanor punishable by a fine of \$500 if the violation results in property damage; or
 - (3) a Class B misdemeanor if the violation results in bodily injury.
- (c) If conduct constituting an offense under this section also constitutes an offense under another section of this code or the Penal Code, the actor may be prosecuted under either section or under both sections.

Texas Transportation Code Section 541.201 defines an 'authorized emergency vehicle':

§ 541.201. VEHICLES. In this subtitle:

- (1) "Authorized emergency vehicle" means:
 - (A) a fire department or police vehicle;
 - (B) a public or private ambulance operated by a person who has been issued a license by the Texas Department of Health;
 - (C) a municipal department of public service corporation emergency vehicle that has been designated or authorized by the governing body of a municipality;
 - (D) a private vehicle of a volunteer firefighter or a certified emergency medical services employee or volunteer when responding to a fire alarm or medical emergency;
 - (E) an industrial emergency response vehicle, including an industrial ambulance, when responding to an emergency, but only if the vehicle is operated in compliance with criteria in effect September 1, 1989, and established by the Texas Industrial Fire Training Board of the State Firemen's and Fire Marshall's Association of Texas; or
 - (F) a vehicle of a blood bank or tissue bank, accredited or approved under laws of this State or the United States, when making emergency deliveries of blood, drugs, medicines, or organs.

Texas Transportation Code 547.702 defines lighting requirements for authorized emergency vehicles:

§ 547.702. ADDITIONAL EQUIPMENT REQUIREMENTS FOR AUTHORIZED EMERGENCY VEHICLES.

- (a) An authorized emergency vehicle may be equipped with a siren, exhaust whistle, or bell:
 - (1) of a type approved by the department; and
 - (2) that emits a sound audible under normal conditions at a distance of at least 500 feet.
- (b) The operator of an authorized emergency vehicle shall use the siren, whistle, or bell when necessary to warn other vehicle operators or pedestrians of the approach of the emergency vehicle.
- (c) Except as provided by this section, an authorized emergency vehicle shall be equipped with signal lamps that:
 - (1) are mounted as high and as widely spaced laterally as practicable;
 - (2) display four alternately flashing red lights, two located on the front at the same level and two located on the rear at the same level; and
 - (3) emit a light visible at a distance of 500 feet in normal sunlight.
- (d) A private vehicle operated by a volunteer firefighter responding to a fire alarm or a medical emergency may, but is not required to, be equipped with signal lamps that comply with the requirements of Subsection (c).
- (e) A private vehicle operated by a volunteer firefighter responding to a fire alarm or a medical emergency may be equipped with a signal lamp that is temporarily attached to the vehicle roof and flashes a red light visible at a distance of at least 500 feet in normal sunlight.
- (f) A police vehicle may, but is not required to, be equipped with signal lamps that comply with Subsection (c).

1.3 PROJECT GOALS AND REPORT CONTENT

There were three primary goals of this project:

1. Measure a baseline of Texas driver knowledge about the Texas Move Over Act (TMOA).
2. Measure a baseline of Texas driver compliance with the TMOA.
3. Develop a Communications Plan for increasing Texas driver knowledge of and compliance with the TMOA.

This report documents the results of the first two goals. Chapter 2 is a summary of the literature on factors associated with driver knowledge and understanding about traffic safety laws, behavior and compliance with traffic safety laws, and driving risk is presented. A summary of activities by other states and in Texas associated with their move over laws is presented in Chapter 3. The baseline of Texas driver knowledge about the TMOA as measured by a survey is discussed in Chapter 4. The baseline of Texas driver compliance with the TMOA as observed at simulated traffic stops is presented in Chapter 5. Chapter 6 presents a summary of the results discussed in this report. The Communications Plan is presented in a separate document.

CHAPTER 2: LITERATURE REVIEW

In recent decades, studies about driver knowledge about traffic laws and behavior in driving situations have increased. Although none of these studies focus on move over laws, they can provide information about drivers and driving tasks that may be related to move over law applications.

2.1 KNOWLEDGE AND UNDERSTANDING OF TRAFFIC SAFETY LAWS

Knowledge and understanding of traffic safety laws is a critical requirement of their compliance with those laws. Knowledge about traffic safety laws has been shown to be related to:

- Knowledge of how to correctly use of child passenger safety seats
- Knowledge about the rights of pedestrians in the right-of-way
- Understanding of bus stop laws
- Level of safety belt use
- Service of alcohol by bartenders to impaired patrons
- Perceived risks about drinking and driving

The following factors have been shown to be associated with driver knowledge about traffic safety laws:

- Age. For example, younger people in Virginia were more likely to have mistaken perceptions of pedestrian rights at intersections; drivers less than 30 years of age in California were less likely to know how to correctly use child passenger safety seats and believe that violation of traffic laws is a frequent behavior among other drivers. Increasing driver age has been shown to be related to increased belief that exceeding the speed limit is unsafe and perceiving delinquency among traffic law violators in Indiana, while drivers 65 or older or 21 and younger in Florida were less likely to correctly identify bus stop requirements than other drivers.
- Gender. For example, females in California were more likely than males to know how to use child passenger safety seats, have decreased knowledge about bus stop requirements in Florida, and believe that exceeding speed limits is unsafe in Indiana.
- Ethnicity. For example, Hispanics in California were less likely to know how to use child passenger safety seats and have knowledge about bus stop requirements in Florida. African Americans in Indiana were less likely to believe that speeding 10 miles per hour over the speed limit threatened safety.
- Level of driving education. For example, Hispanics in California who were educated in a class about child passenger safety seat use scored slightly higher on an associated knowledge test than those who were not. Exposure to driver safety education about Florida's school bus stop law decreased likelihood of incorrect answers on a knowledge test about the law.
- Level of formal education. For example, drivers with less than a high school education were more likely to provide incorrect answers on a knowledge test about the law.

2.2 BEHAVIOR AND COMPLIANCE WITH TRAFFIC SAFETY LAWS

Behavior and compliance with traffic safety laws has been studied for a wide range of topics, including:

- Drinking and driving
- Riding with impaired drivers
- Safety belt use
- Compliance with speed limits
- Use of mobile phones
- Pedestrian and driver behavior at crosswalks

The following factors have been shown to be associated with behavior and compliance with traffic safety laws:

- **Surveillance and Enforcement.** Visible surveillance of traffic by law enforcement has been shown to decrease the rate of traffic violations.
- **Age.** For example, in a random sample of 1000 U.S. drivers, younger males were more likely to report driving while intoxicated, while older persons were less likely to report drinking high levels of alcohol before driving. Traffic Safety Facts reported by NHTSA indicate that in 2007, the 16–20 age group accounted for 12 percent of alcohol-impaired driving crashes, the 21–34 age group accounts for 39 percent, the 35–64 age group for 42 percent, and the 65+ age group for 5 percent. In a random sample of over 240,000 U.S. adults respondents aged 65 and over were more likely to report wearing seat belts than adults aged 18–24. Drivers younger than 30 were less likely to be observed wearing safety belts in Michigan compared with drivers 30 years or older.
- **Gender.** Observation of driver safety belt use in Michigan showed that female drivers were more likely than male drivers to wear safety belts. Males tend to be more aggressive drivers than women, with a greater propensity to take risks, exhibit aggression, and have sensation-seeking behavior.
- **Ethnicity.** For example, in a random sample of over 240,000 U.S. adults, Hispanics and Asian/Pacific Islanders were more likely to report use of safety belts than Whites. Observation of driver safety belt use in Michigan showed that Black drivers were less likely than White drivers to wear safety belts.
- **Environment.** For example, rural drivers are less likely to use seat belts, drive at greater speeds, and drink before driving. Analysis of common traffic violations in Israel indicated that city drivers drove more carefully than drivers in smaller residential areas across all age groups.
- **Vehicle Type.** For example, observation of over 40,000 drivers in the United Kingdom showed that drivers of four-wheel-drive vehicles were more likely to break traffic safety laws on seat belt and mobile phone use.

2.3 DRIVING RISK

The primary reason for move over laws is protection of emergency responders and the driving public through avoidance of incidents and accidents. Risk of incidents and accidents while driving has been shown to be related to a number of factors:

- Age. For example, an analysis of FARS data indicated that older drivers and drivers aged 16–24 were more likely to be involved in fatal accidents than other drivers. Crash rates for older drivers have been shown to be lower than for younger drivers if calculated on the basis of the number of licensed drivers, but if crash rates are computed using an estimated distance traveled, overall crash rates are higher for older drivers. Drivers ages 19 or less and 70 or older were more likely to be involved in fatal stop sign and red light running accidents than other age groups.
- Gender. For example, an analysis of FARS data indicated that males had higher accident fatality rates than females, including fatal red light running accidents and excluding motorcycle and bus incidents. Males are also much more likely to receive traffic citations than females.
- Ethnicity. For example, analysis of FARS data indicates that Native Americans and Hispanic/Latinos has higher death rates due to motor vehicle accidents than other ethnic groups, and had higher rates of alcohol use in accidents with fatally injured drivers. Sober White drivers were more likely to be involved in fatal red light running accidents than sober Hispanic or African American drivers.
- Environment. For example, analysis of FARS data indicates that rural crash fatality rates are between three and five times the fatality crash rate in urban areas.

2.4 MOVE OVER-RELATED INCIDENTS

According to information from the National Law Enforcement Officers Memorial Fund, 184 law enforcement officers were killed between 1997 and 2008 after being struck by a vehicle in the line of duty. The annual number of deaths range from 10 in 1999 to 24 in 2001, with an average of 15.3 deaths per year. According to the National Fire Protection Association, 26 fire fighters were struck and killed by motorists in the line of duty from 1990 through 1999. According to the American Automobile Association, the organization saw six deaths and two injuries among their emergency roadside service providers who were struck while assisting stranded motorists in 2008; the number of deaths is twice as many as the number of emergency roadside service providers (three) who were killed in auto accidents during the same period.

A study was completed in Florida for the years 1996 through 2000, which estimated 1793 crashes into working law enforcement vehicles, resulting in 419 injuries and 5 deaths. Florida's Move Over Law was passed in 2002. The Florida Highway Patrol identified a total of 1068 crashes from 2002 through 2006 where parked emergency vehicles were hit (an average of 214 per year), resulting in 212 injured drivers (an average of 42 per year), 38 injured pedestrians (an average of 8 per year), and 1 killed pedestrian. These data suggest a large number of move over-related incidents nationally and in the state of Texas. However, we were unable to identify a comprehensive national information source of emergency responder injuries or deaths or injuries to vehicle occupants resulting from move over law violations.

CHAPTER 3: MOVE OVER LAWS AWARENESS AND ENFORCEMENT

3.1 MOVE OVER LAW AWARENESS AND ENFORCEMENT EFFORTS OF OTHER STATES

Table 1 lists awareness mechanisms, enforcement efforts, and associated metrics provided by state agencies in 30 other states regarding their move over laws. Information was provided by state transportation departments, state police/highway patrol departments, or both. This information is for state-level efforts and does not cover efforts by county or municipal agencies.

Public service announcements, such as news releases, media interviews, television, radio, video, websites, and songs were used in 20 out of 30 states to increase public awareness about their move over laws. Print media, such as brochures, fliers, push cards, etc., were also used in 20 out of 30 states. Road signs and billboards were used in 10 states. Other mechanisms used for move over law outreach mechanisms included mailings (Delaware), working with an insurance company for funding a television advertisement for educating the public about a move over law (Idaho), a telephone on-hold message system (Indiana), a glove-box document envelope (Kansas), working with an outreach agency (Nevada), printing a message on a state map (North Carolina), and speeches (Ohio).

Even though states used many different outreach methods for the laws, a mechanism to measure the success of these methods remains generally lacking. Most states did not provide information about whether or not outreach efforts were successful. Nine states—Alaska, Delaware, Kansas, Maine, Michigan, Missouri, North Carolina, Ohio, and Oregon—provided positive answers about the success. Louisiana and Vermont indicated a lack of success of outreach efforts and said more efforts were needed. Only Alaska responded with specific metrics regarding the message reaching the population. Based on this information, quantitative information about the effects of states' move over law awareness efforts on people's knowledge and understanding of those laws is generally lacking.

The State of Florida was identified as having one of the more-comprehensive and active approaches to promoting public awareness and compliance with their state's move over laws, and the state has conducted a range of efforts involving the Florida Highway Patrol (FHP) since it was passed in 2002. This includes brochures, posters, Internet promotion, and a television public service announcement (PSA) (since 2002); a billboard campaign (in 2004-2005); gas pump stickers (in 2005-2006); mail-outs with driver license renewal materials (since 2006); earned media initiatives including news stories and press releases; and cooperation with the Florida Department of Transportation to place messages on state maps and dynamic and static message signs at welcome centers, rest areas, service plazas, and major roadways. They have included the move over law as part of Florida's 'Be Smart, Drive Smart Florida!' campaign.

Enforcement in Florida has been conducted locally and statewide across agencies and through coordinated efforts—for example, operation Move Over Law Enforcement (MOLE) involved all law enforcement agencies focusing on the state's move over law for two days, resulting in issuance of over 200 citations. FHP partnered with a range of other entities to hold a workshop in February 2008 to discuss other ways of educating Florida drivers about the state's move over law. As a result of an accident resulting in serious injuries to a State Trooper in March 2008, the state again focused on public awareness and enforcement efforts.

Table 1. Move Over Laws Outreach and Enforcement Efforts in Other States.

State	Statistics?	Out-reach?	Outreach Method	Drivers Targeted	Time-frame	Success Measured?	Info. Source
AL	2358 citations from 10/01/07-10/1/08 for violation of MOL	Yes	News release; media interviews; print; TV; radio; road signs	--	Continuous	--	DPS
AK	No	Yes	TV ads	--	--	Yes (reached 88% of the licensed pop.)	DOT
AZ	No	Yes	News releases; press conferences; brochure	All	Continuous	N/A (no way to measure)	DPS
DE	N/A	Yes	Press conference; local radio; local newspaper; motor vehicle office; mailings, fliers, posters	All	Continuous	Yes (more people visit DMV)	DOT
FL	Yes (on quarterly basis)	Yes	Brochures; billboards; pup stickers; posters; fliers; TV; radio; PSAs, website	--	Continuous	--	DHS
ID	No (no officers injured or killed in recent years)	Yes	TV ads; worked with insurance company; news releases	--	--	N/A (have not done formal survey to ascertain)	SP
IL	4872 citations and 5002 warnings in 2007; 3385 citations and 2990 warnings in first 10 months of 2008	Yes	Brochure; PSAs; interviews; signs	All	--	--	SP
IN	No	Yes	Brochures; telephone on-hold system; news releases	--	Continuous	--	SP
IA		--	Signs, PSAs	--	--	--	

Table 1 (continued). Move Over Laws Outreach and Enforcement Efforts in Other States.

State	Statistics?	Out-reach?	Outreach Method	Drivers Targeted	Time-frame	Success Measured?	Info. Source
KS	No	Yes	PSA radio spot; info. cards; glove-box document envelope; press releases	--	2 years ago	Yes (more effective)	DOT
KY	No	Yes	Brochures	--	--	--	DPS
LA	No	Yes	Print, radio PSAs, TV PSAs	All	--	No (tremendous lack of compliance)	DOT
ME	No	Yes	PSAs on TV and turnpike	All	Couple days	Yes	SP
MI	No	Yes	Brochures; fliers; billboard; handouts	All	Continuous	Yes (positive effect)	SP
MN	No	Yes	Road signs (23); public announcement; brochure (layouts only); TV/radio PSAs; earned media; news releases; dash-cam video	All	--	--	DPS
MO	487 citations in 2006; 998 citations in 2007; 728 citations in first 10 months of 2008; 8 officers killed; no statistics on crashes	Yes	Video; PSAs; news releases; media campaigns; TV; websites; radio; leaflets	--	--	Significant	DPS
NV	No (no injuries)	Yes	Radio; PSAs; specific agency	--	--	--	DPS
NM	No (have no issues)	No	--	--	--	-- (Just amended law)	DOT
NC	N/A	Yes	Song; PSA; posters; TV; state map; roadside signs	All	--	Successful (very active group "FORS")	DOT

Table 1 (continued). Move Over Laws Outreach and Enforcement Efforts in Other States.

State	Statistics?	Out-reach?	Outreach Method	Drivers Targeted	Time-frame	Success Measured?	Info. Source
ND	N/A	Yes	Handouts with any violation and stop; radio	All	6 months	Not sure	DPS
OH	1322 citations in 2005; 1730 citations in 2006; 1629 citations in 2007	Yes	Video PSAs; road signs; news; speech; print media releases	--	> 1 year	Appears to be working	DPS
OR	5000 convictions annually	Yes	Highway signs; all forms of media outreach	All	Con- tinuous	Appears to be working	DOT
PA	No	Yes	Fliers only	--	1 year	Not sure	DOT
SD	No (new law)	Yes	Billboards; media releases	--	--	Not sure	DPS
TN	TN Highway Patrol: 1461 citations, 806 convictions in 2005; 1557 citations, 1507 convictions in 2006; 1375 citations, 1325 convictions in 2007;	Yes	Roadway sign; PSAs; bumper stickers; web page; billboards; print materials	--	--	--	DPS
VT	No	Yes	Brochures; press releases; PSAs	--	--	Not that successful; more efforts needed	DPS
VA	No	Yes	PSAs; brochures; newspaper	--	Con- tinuous	No measurement regarding success	SP
WA	No	Yes	TV, radio PSAs; press releases	--	--	--	
WV	No	Yes	Mainly signs and billboards on highway	All	--	N/A	SP
WY	No	Yes	Posters; handouts	--	Con- tinuous	--	DOT

3.2 MOVE OVER LAW AWARENESS EFFORTS BY OTHER ENTITIES

Different groups and individuals have taken up efforts to promote awareness of move over laws. “*Move Over, America*’ [emphasis added] is a partnership originally founded in 2007 by the National Safety Commission, the National Sheriffs' Association and the National Association of Police Organizations. Most recently, the partnership has also received the full support of the American Association of State Troopers. The campaign is the first nationally coordinated effort to educate Americans about "Move Over" laws and how they help protect the law enforcement officers who risk their lives protecting the public.” (<http://www.moveoveramerica.com>). The effort’s webpage features a public service announcement, statistics about move over laws awareness and fatalities, links to the laws of individual states, and other information. The webpage cites a national survey of U.S. drivers in which “71 percent of Americans have not heard of ‘Move Over’ laws.”

The American Automobile Association (AAA) has worked with a number of states to assist with their efforts to increase public awareness and compliance with move over laws. The AAA had enlisted a NASCAR driver “to assist AAA, law enforcement officers, firefighters, EMTs and tow truck drivers in supporting “Move Over” laws to increase safety for roadside workers and stranded motorists,” however, the organization is no longer sponsoring the driver and has not continued the campaign. AAA’s goal of enacting move over laws in all 50 states and promoting public awareness about the laws has been successful at the local and state levels through promoting implementation and enhancement of move over laws throughout the U.S. AAA's web page (<http://www.aaanewsroom.net/Main/Default.asp?CategoryID=4&ArticleID=583>) features PSAs, statistics on worker injuries, a summary of their previous initiative, and move over law links to other websites and content.

Individuals in several states have become involved with efforts to promote awareness about move over laws. These include people who have had family members or friends who were injured or killed as a result of move over law violations. Testimonials about the negative impacts resulting from deaths or injuries of loved ones are a powerful part of public service announcements, speaking or media campaigns, and other efforts. A group of such individuals which was involved in this effort for five years in North Carolina was Families fOr Roadside Safety (FORS), Inc. This group was founded by Ms. Lara Feinberg, wife of a NC State Trooper, after she attended funerals of two other troopers killed in Florida within 20-month periods as they were issuing traffic citations. The group's focus was motorist education and awareness about move over laws, and although they are no longer active, their web site (www.f-o-r-s.com/home/) was still active as of this report's publishing date. The web site contains information about their efforts, success stories, and related images and media. Another individual who has gotten involved in Florida is Ms. Tina Lambert, whose son was killed in 2006 at a traffic stop by a vehicle that failed to move over.

3.2 TMOA AWARENESS AND ENFORCEMENT IN TEXAS

3.2.1 Local-Level Efforts

Many local-level agencies are constrained by limited financial resources that can be applied toward increasing TMOA awareness in their communities, and by limited personnel resources that can be applied toward increasing enforcement of the TMOA. Enforcement of this law is logistically not a simple matter for many agencies. For a single law enforcement officer (LEO), going after a TMOA violator that passes the traffic stop would require the officer to interrupt the traffic stop. Officers can work in groups on specific roadway segments to ‘leap-frog’ each other. At least one officer observes another officer’s traffic stop to identify and pull over TMOA violators. As each officer finishes their traffic stop they continue to observe other traffic stops for TMOA violators, etc. These sorts of activities are simply beyond the scope of traffic enforcement efforts in many communities given the number of officers required and nature of traffic and patrol operations. In addition, comments made by LEOs to the project team suggest that not all LEOs are fully aware of the law’s requirements, given its recent history and complexity, although this can be corrected through briefings and other education tools.

Another potential enforcement mechanism is for LEOs to work as a single vehicle for TMOA violations. The law requires that drivers slow down or move over anytime a stationary, authorized emergency that is using visual signals discussed in Chapter 1. Thus, all that is needed is for a LEO to be stationary, on the roadway shoulder (for example), with its lights on, and observing traffic for TMOA violators. Although this enforcement can be conducted with one vehicle, the degree to which it is implemented will depend on the local agency’s desire to assign these activities as part of traffic officers’ efforts.

We attempted to contact police departments and municipal courts in most medium-to-large sized Texas communities regarding information about TMOA violations and associated local law enforcement activities. The number of responses received was limited, which suggests limited ability for enforcement and/or limited attention to the law by some local agencies. Further complicating our efforts to obtain TMOA enforcement activity information is a lack of a consistent citation coding nomenclature for traffic citations in different courts. While some courts are able to specifically identify TMOA violations, others cannot because citations associated with that law are grouped with others, such as failing to yield right-of-way to approaching emergency vehicles. This can also make it difficult for local agencies to track number of citations issued for this law over time.

The following discussions summarize local-level awareness and enforcement efforts in Texas for which we were able to obtain information.

- In the Travis County and Austin area, enforcement has been intermittent. The City of Austin Police Department's (APD's) highway traffic units have conducted enhanced Move Over Act enforcement efforts for one- to two-week periods every few months in recent years, and the Texas Department of Transportation has occasionally posted reminders on variable message boards along interstate and highway routes reminding drivers to slow down and move over for emergency vehicles. The Austin Municipal

Court maintains a detailed record of TMOA citations; between June 03, 2004, and November 25, 2008, APD issued 565 TMOA citations.

- In the Harris County/Fort Bend County Area, a region-wide two-week public awareness and enforcement effort was conducted jointly by 18 law enforcement agencies in mid-February 2009. This included one week of print, radio, and television media public service announcements, media ride-alongs, and citation warnings, followed by one week enforcement through citation issuance. Move Over Act-related messages were also placed on variable message boards in the Houston area associated with this effort. Print media flyers were produced in English (included in Appendix A) and in Spanish.

In addition, the City of Houston Police Department (HPD) continued to focus on TMOA enforcement after the initial campaign in a separate overtime initiative, funded by the City of Houston. During this 12-week effort which started in mid-April 2009, HPD officers wrote 3,525 tickets, (approximately 300 per week) over approximately 2,100 overtime hours. Messages about the TMOA requirements, such as shown on Figure 2, were posted on TxDOT variable message board signs. As a result of the initial and continued awareness/enforcement activities, HPD has observed a noticeable increase in drivers moving over from prior to those efforts. Compliance with moving over on major highways and freeways was estimated by a HPD Traffic Sergeant at approximately 75 percent by the end of the initiative.

- In the Brazos County and Bryan/College Station area, enforcement has been limited. The City of Bryan Police Department and City of College Station Police Department have conducted intermittent enforcement of the Texas Move Over Act as personnel resources permit, but there has not been a comprehensive and sustained effort to conduct enforcement or increase public awareness about the law in these communities. Brazos County Sheriff's Office has conducted minimal enforcement of the law due to limited deputy availability for traffic enforcement.
- The City of Wichita Falls has issued citations for TMOA violations, but officer resources limit the ability to focus on TMOA violations. Municipal Court records indicate five total citations for the TMOA between 2006 and 2008.
- The City of Lubbock Municipal Court records indicate four citations in 2008 for TMOA violations.
- The City of Corpus Christi Municipal Court indicated that they do not keep records on TMOA violations.

3.2.2 State-Level Efforts

The Texas Department of Public Safety (DPS), Texas Highway Patrol (THP) has conducted statewide enforcement of the Texas Move Over Act as scheduling and Trooper resource permit, including in the Austin, Bryan, and Houston areas. When the law was passed in 2003, THP Troopers issued warnings about the law and provided “push-cards”—cards with information about the law that could be handed out to inform the driving public about the law when they were stopped for other citation reasons or at Driver License Bureau offices. As of February 14, 2009, DPS Troopers had issued over 11,600 citations since September 2003 for TMOA violations.

The Texas Department of Transportation has, from time to time, placed messages about the TMOA on variable message boards in different metropolitan areas. Message placement has been intermittent, with content suggesting that drivers ‘Move Over or Slow Down’ for emergency vehicles or a similar message. Figure 2 is an image from a variable message board on the Sam Houston Beltway in February 2009 which was run in conjunction with the Harris County/Fort Bend County awareness/enforcement effort discussed in Section 3.2.1.

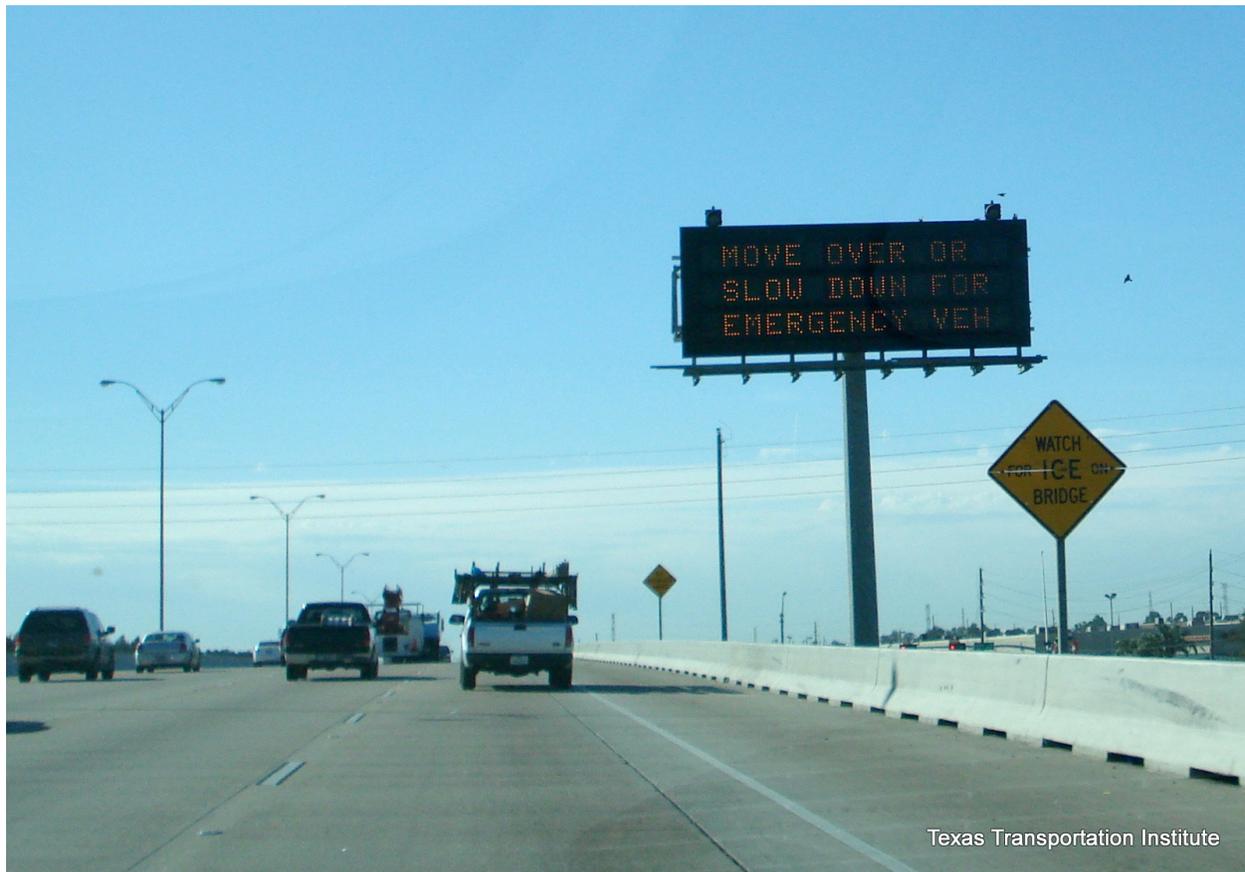


Figure 2. A TxDOT Variable Message Sign Instructing Drivers to ‘Move Over or Slow Down’ for Emergency Vehicles on the Sam Houston Beltway in Houston, Texas.

TxDOT has also developed a print information card for distribution in different media. The card is in English and Spanish and contains information about TMOA requirements. Figure 3 shows the English and Spanish versions of the card.



Move Over or Slow Down

Law enforcement officers, firefighters and emergency medical personnel often perform their jobs along busy streets and highways. Passing motorists are now required to either move one lane over or slow down to give public safety workers a safer work zone.



Aléjese o reduzca la velocidad

Los policías, bomberos y el personal médico de emergencia frecuentemente trabaja junto a calles y carreteras muy transitadas. Ahora se requiere que los conductores mantengan un carril de distancia o que disminuyan la velocidad para que el personal de seguridad pública pueda trabajar con seguridad.

HERE'S THE LAW 

When approaching an emergency vehicle that is stopped with its lights flashing, a driver must either:

- change lanes and move out of the lane closest to the emergency vehicle, or
- slow down to 20 miles an hour below the posted speed limit if the road does not have multiple lanes or if it is not possible to change lanes. Note: If the speed limit is 25 miles per hour or less, drivers must slow down to 5 miles per hour.

Violations can result in a fine of \$200 up to \$2000.

ÉSTA ES LA LEY 

Al acercarse a un vehículo de emergencia parado y con las luces de emergencia prendidas, los conductores deben:

- cambiarse de carril para alejarse del carril junto al vehículo de emergencia o
- reducir la velocidad a 20 millas por hora por debajo de la velocidad indicada si no hay más de un carril o no puede cambiar de carril. Nota: si el límite de velocidad es 25 millas por hora o menos, los conductores deben reducir la velocidad a 5 millas por hora.

Las infracciones pueden resultar en multas desde \$200 hasta \$2000.

 **Save a Life™**
Texas Department of Transportation

 **Salve una Vida™**
Departamento de Transporte del Estado de Texas

Figure 2. A TxDOT Print Information Card in English and Spanish about the TMOA.

CHAPTER 4: TEXAS DRIVER KNOWLEDGE ABOUT THE TMOA.

To measure Texas driver knowledge about the TMOA, we developed an 11-question survey. Two survey questions were directly associated with the TMOA. For survey Question 1, respondents were presented with a written and visual driving scenario about a move over-related situation, specifically what they should do when passing a law enforcement traffic stop. Although this is not the only type of situation for which a Texas driver in Texas would be required to follow the law's requirements (the law also applies to passing fire trucks and EMS vehicles), it was selected because of the relative frequency that most drivers are likely to encounter stopped police cars with lights activated as opposed to fire or EMS vehicles, along with the relative higher risk level associated with higher speed or congested major roadways as opposed to lower speed less congested residential roads. We will hereafter refer to this situation as the *TMOA driving scenario*.

The TMOA driving scenario situation description stated: "You are driving on a major city street, highway, or interstate, and ahead of you is a police car stopped on the side of the road. *Its emergency (red and blue) lights are on, and you are driving in the lane nearest the stopped police car.* The situation was also represented by an image showing a vehicle in the lane adjacent to a stopped police car (the image was patterned after but not identical to a Oregon State Police and Oregon Department of Transportation transit bus sign). Respondents were asked "What should you do?" in directed to indicate whether each of seven response options for the TMOA driving scenario situation were true or false. Each true or false response was mutually exclusive. Two of the seven responses are correct, and five are incorrect. The correct responses are:

- "You may drive at the speed limit, as long as you move over at least one lane from the stopped police car;" and
- "You may stay in the lane nearest the stopped police car, but must slow down to 20 mph below the speed limit."

Respondents were also asked to respond to the question "What do you know about the Texas Move Over Act?" by selecting one of the following options:

- "I have never heard of it"
- "I have heard something about it, but am not familiar with the details."
- "I am familiar with the requirements of the law but not by name."
- "I have heard of the Texas Move Over Act, and am familiar with its requirements."

The remaining survey questions covered driver experience and demographic information. A copy of the survey instrument is provided in Appendix B. The survey protocol was reviewed and approved by the Texas A&M Institutional Review Board. Five different survey versions were developed, each with a randomly generated order to responses for survey Question 1. The order of all other questions remained fixed. This was done to be able to account for effects that response ordering may have had on the respondent's ability to identify of correct actions for the TMOA driving scenario or reported knowledge of the law. Each survey was coded to indicate which of the five versions was completed.

4.1 SURVEY ADMINISTRATION

We administered the survey at Texas Driver License Bureau offices in the cities of Austin, Bryan, and Houston in Texas between late February 2009 and mid-April 2009. The surveys questions were printed on the front and back of a single sheet of paper and distributed on clipboards by trained survey administrators. The survey respondents were Texas drivers who were waiting in service lines at the offices and were willing to participate in the survey. The survey locations correspond to three different treatments of TMOA public awareness and enforcement activities by local agencies, as described in Section 3.2.1. The Texas Highway Patrol has conducted statewide enforcement of the Texas Move Over Act as scheduling and Trooper resource permit, including in the Austin, Bryan, and Houston areas, as described in Section 3.2.2.

4.2 SURVEY RESPONSE OVERVIEW

A total of 1656 valid survey responses were collected, including 406 in Austin, 541 in Bryan, and 709 in Houston. Most respondent groups appear to be well represented from the survey responses. Summary descriptive characteristics of the survey sample are listed in Table 2 by respondent group type.

Table 3 lists summary statistics for questions associated with driver knowledge of, understanding of, and citation experience with the TMOA. The large majority, over 92 percent, of survey respondents had not or did not know if anyone who had been cited for passing a stopped emergency vehicle that had its emergency lights on. Over 40 percent of survey respondents indicated they had heard of the TMOA, while only 9 percent indicated they had heard of it and were familiar with its requirements.

Table 2. Summary Descriptive Characteristics for Sample of Texas Drivers.

Characteristic	Percentage
Gender (N = 1601)	
Male	46.2%
Female	53.8%
Age range (N = 1601)	
16-20	15.1%
21-25	18.6%
26-35	22.3%
36-45	21.0%
46-65	20.6%
66+	2.5%
Ethnicity (N = 1576)	
African American/Black	18.1%
Asian	5.9%
Hispanic/Latino	22.8%
White/Anglo	49.1%
Other	4.1%
Formal education (N = 1571)	
Less than high school	9.2%
Finished high school	18.3%
Attended some college or trade school	29.6%
Finished associate's degree or trade school	10.1%
Finished bachelor's degree	19.7%
Finished graduate or professional degree	13.1%
Driver education (N = 1605)	
No formal driver education	21.7%
Took driver ed in high school	45.0%
Took driver ed from driving programs	14.5%
Took driver ed from someone else	9.7%
Took defensive driving	30.3%
Commercial driver license certification	6.1%
Received moving violation citation within past 3 years (N = 1593)	
No	64.8%
Yes/Maybe	35.2%
Survey version: order of Question 1 responses (N = 1656)	
Version a	19.7%
Version b	19.9%
Version c	20.2%
Version d	20.0%
Version e	20.1%
Time being a licensed driver in Texas (years)	
Mean (standard deviation)	13.2 (13.1)
Median	9.0
Zip code population density (1000 persons per square mile)	
Mean (standard deviation)	3.01 (2.71)
Median	2.78

Table 3. Summary TMOA Response Statistics for Sample of Texas Drivers.

Response	Percentage
Citation experience for passing authorized emergency vehicle (N = 1612)	
Don't know of anyone cited	92.1%
Respondent was cited in Texas	2.9%
Respondent was cited in another state	0.6%
Respondent knows someone who was cited in Texas	4.0%
Respondent knows someone who was cited in another state	0.9%
Respondent knowledge about TMOA (N = 1622)	
Never heard of it	42.5%
Heard something about it but not familiar with it	34.0%
Familiar with TMOA requirements but not name	14.1%
Heard of TMOA and familiar with its requirements	9.4%
Correct "True" responses to TMOA driving scenario question	
Drive at speed limit and move over at least one lane (N = 1611)	57.5%
Stay in the nearest lane but slow down to 20 mph below speed limit (N = 1603)	36.2%
Incorrect "True" responses to TMOA driving scenario question	
Stay in same lane at speed limit and don't do anything sudden (N = 1606)	20.9%
Stay in the nearest lane but slow down by 10 mph (N = 1604)	28.6%
Slow down by 10 mph regardless of lane (N = 1605)	33.9%
Move to the farthest lane and slow down by 20 mph (N = 1612)	36.4%
Slow down until 25 mph regardless of lane (N = 1590)	21.9%
Selection of correct and incorrect responses to TMOA driving scenario questions (N = 1655)	
No selection of correct responses for TMOA driving scenario questions	30.9%
Partial selection of correct responses to TMOA driving scenario questions	47.1%
Exactly correct responses to TMOA driving scenario questions	10.7%
Excessive responses to TMOA driving scenario questions	11.3%

4.3 TEXAS DRIVER KNOWLEDGE OF TMOA

While the summary responses in Table 3 provide some indication of Texas driver knowledge and understanding of the TMOA, the percentages by themselves do not necessarily apply to the Texas population as a whole because the survey was not conducted using a stratified or random sample of Texas drivers. To do so would have required an extensive survey effort, and instead we surveyed in three different locations as discussed previously that had different underlying demographics and treatments regarding TMOA public awareness and enforcement efforts.

We can, however, use statistical models to identify the factors that are significantly related to Texas driver knowledge and understanding of the TMOA, and use the model information to predict how Texas driver knowledge and understanding of the TMOA given certain conditions.

4.3.1 Texas Drivers Who Have Heard of the TMOA and are Familiar With Its Requirements

We used a binomial logistics regression model to identify the factors, based on the survey responses, that are significantly related to Texas drivers' having heard of the TMOA and being familiar with its requirements. This method allows us to identify whether or not a factor is

important while controlling for all other factors included in the analysis, without having to worry about the fact that a survey does not exactly match the entire Texas population's demographic characteristics. The binomial logistics regression model coefficients are presented in Appendix C, Table C.1 and discussed below.

Overall, only nine percent of survey respondents indicated that they had heard of the Texas Move Over Act and were familiar with its requirements. Factors that increased the likelihood that a Texas driver indicated they had heard of the TMOA and were familiar with its requirements are (in order of importance):

1. Have a commercial driver license (CDL)
2. Age 46-65
3. Increased time as a licensed driver in Texas
4. Age 26-35
5. Age 36-45
6. Completed associate's degree or trade school (ADTS)
7. Age 21-25 and has taken defensive driving

The model coefficients from Table C.1 can be used to predict the percentages of Texas drivers who have heard of the TMOA and are familiar with its requirements. Some examples are listed in Table 4. Formal education and driver education, combined with age and experience, result in substantive increases in the predicted percentages of Texas drivers who have heard of the TMOA and are familiar with its requirements.

For the youngest group, age 16–21, age and a lack of driving experience far outweigh the effects of any formal or driver education. For the 21–25 age group, the effects of lower driving experience are largely mitigated when the driver has completed the listed formal and driver education criteria. Having taken defensive driving is particularly important for this group. For the 46–65 age group, age and driving experience play a greater role in driver knowledge, along with formal and driver education factors, particularly having a CDL. Driver knowledge is predicted to decrease somewhat for the 66+ age group from the 46–65 age group.

Table 4. Predicted Percentages of Texas Drivers Who Have Heard of the TMOA.

Formal Education and Driver Education Factors			Predicted percentages of Texas drivers who have heard of TMOA and are familiar with its requirements, by age group and driving experience			
Driver Completed Associates Degree/ Trade School	Driver Took Defensive Driving	Driver Has CDL	Driver Characteristics: 16-20 age group; 3 years being a licensed Texas driver	Driver Characteristics: 21-25 age group; 7 years being a licensed Texas driver	Driver Characteristics: 46-65 age group; 30 years being a licensed Texas driver	Driver Characteristics: 66+ age group; 40 years being a licensed Texas driver
No	No	No	1%	4%	13%	9%
Yes	No	No	2%	7%	21%	14%
No	Yes	No	2%	13%	16%	11%
No	No	Yes	4%	10%	30%	21%
Yes	Yes	Yes	8%	43%	48%	37%

4.3.2 Texas Drivers Who Have Never Heard of the TMOA

We used a binomial logistics regression model to identify the factors that are significantly related to whether Texas drivers have never heard of the TMOA. Overall, over 40 percent of the Texas drivers we surveyed reported having never heard of the Texas Move Over Act. Appendix C, Table C.2 lists the binomial logistic regression model results for significant factors associated with these responses. A range of environmental, driver experience, education, and demographic factors are applicable. Factors that increased the likelihood that a Texas driver indicated they had never heard of the TMOA are (in order of importance):

1. Increasing population density of the Zip Code of residence
2. Completed survey version c, d, or e
3. Was cited in Texas for passing a stopped emergency vehicle that had its emergency lights on.
4. African American/Black ethnicity
5. Age 66 years or older
6. Increasing median value of owner-occupied housing in Zip Code of residence

Factors that decreased the likelihood that a Texas driver indicated they had never heard of the TMOA are (in order of importance):

1. Time being a licensed driver in Texas
2. Knows someone who was cited in Texas for passing a stopped emergency vehicle that had its emergency lights on
3. Has CDL certificate
4. Completed associate's degree or trade school
5. Has taken defensive driving
6. Completed bachelor's degree
7. Attended some college or trade school

The model coefficients from Table C.2 can be used to predict the percentages of Texas drivers who have never heard of the TMOA. Some examples are listed in Table 5. The model predicts that approximately half of Texas drivers meeting all of the following criteria have never heard of the Texas Move Over Act:

- Live in a Zip Code with a population density of 1333 persons per square mile,
- Have not attended some college or trade school, completed an associate's degree or trade school, or completed a bachelor's degree,
- Are African American/Black,
- Have 5 years experience as a licensed driver in Texas,
- Have not taken defensive driving, and
- Do not have a CDL.

The model predicts that only 10 percent or less of Texas drivers meeting the following all criteria have never heard of the Texas Move Over Act:

- Live in a Zip Code with a population density of 9.8 persons per square mile,
- Have completed a bachelor's degree,
- Are not African American/Black,
- Have 25 years experience as a licensed driver in Texas,
- Have taken defensive driving, and
- Have a CDL.

The range of values in the table account for order effects of different survey versions. Although this indicates some variability in the predicted percentage ranges, the use of a regression model controls for this by identifying significant effects of each variable assuming that all others are held constant.

Table 5. Predicted Percentages of Texas Drivers Who Have Never Heard of the TMOA.

Driver Education Factors		Predicted percentages of Texas drivers who have never heard of TMOA, by population density, formal education, ethnicity, and driving experience	
Driver Has CDL	Driver Has taken defensive driving	Driver Characteristics: Zip Code of residence has population density of 9.8 people per square mile Completed bachelor's degree Not African American/Black ethnic group 25 years as a licensed driver in Texas	Driver Characteristics: Zip Code of residence has population density of 1333 people per square mile Has not attended some college or trade school, completed associates degree or trade school, or completed bachelor's degree African American/Black ethnic group 5 years as a licensed driver in Texas
Yes	Yes	7–10%	22–32%
Yes	No	9–14%	28–39%
No	Yes	15–22%	41–53%
No	No	19–28%	49–61%

4.4 TEXAS DRIVER UNDERSTANDING OF TMOA

Over half (56 percent) of the respondents correctly indicated the appropriate ‘move over’ response to the TMOA driving scenario question (“You may drive at the speed limit, as long as you move over at least one lane from the stopped police car”), while only around one-third (36 percent) indicated the correct ‘slow-down’ response to the TMOA driving scenario question (“You may stay in the lane nearest the stopped police car, but must slow down to 20 mph below the speed limit”). For each of the incorrect TMOA driving scenario questions, between one-fifth and around one-third of respondents identified them as correct actions to take.

We used a binomial logistics regression to identify factors that are significantly related to Texas drivers’ understanding of the TMOA. We looked at Texas drivers who indicated that both of the correct TMOA scenario answers applied, and did not indicate that any of the incorrect TMOA answers applied. In other words, they provided “exactly correct” responses to TMOA driving scenario question. The binomial logistics regression model result is presented in Appendix D, Table D.1.

Although nearly half of the sample (47 percent) were able to correctly identify either one of the two correct actions to take, only 10 percent of survey respondents provided exactly correct responses to TMOA driving scenario question. Factors that increased the likelihood that a Texas driver provided exactly correct responses to the TMOA driving scenario question are: (in order of importance):

- Has heard of the TMOA and is familiar with its requirements
- Completed survey version c
- Is familiar with the requirements of the TMOA, by not name
- Has taken defensive driving

Factors that decreased the likelihood that a Texas driver provided exactly correct responses to the TMOA driving scenario questions are:

- African American/Black, Hispanic/Latino, or Other ethnicity

The model coefficients from Table D.1 can be used to predict the percentages of Texas drivers who would provide exactly correct responses to the TMOA driving scenario question. Some examples are listed in Table 6. The model predicts that between 28 and 53 percent of Texas drivers meeting the following conditions would provide exactly correct responses:

Are not African American/Black, Hispanic/ Latino, or Other ethnicity,

- Have taken defensive driving, and
- Have heard of the TMOA and are familiar with its requirements.

Conversely, the model predicts that between three and eight percent of Texas drivers meeting the following conditions would provide exactly correct responses:

- Are African American/Black, Hispanic/Latino, or Other ethnicity,
- Have not taken defensive driving, and
- Have never heard of TMOA, or have heard of it but are not familiar with its requirements.

The range of values in the table account for order effects of survey version c.

Table 6. Predicted Percentages of Texas Drivers Who Would Provide Exactly Correct Responses to TMOA Driving Scenario Question.

TMOA Knowledge	Driver Characteristics: African American/Black, Hispanic/ Latino, or Other ethnicity	Driver Characteristics: Not African American/Black, Hispanic/ Latino, or Other ethnicity
	Has not taken defensive driving	Has taken defensive driving
Driver has never heard of TMOA; or has heard of it but is not familiar with its requirements	3–8%	11–27%
Driver is familiar with TMOA requirements but not name of law	8–19%	25–49%
Driver has heard of TMOA and is familiar with its requirements	9–22%	28–53%

CHAPTER 5: TEXAS DRIVER COMPLIANCE WITH THE TMOA

We worked with a four law enforcement agencies—Brazos County Sheriff’s Office, the City of Austin Police Department, the City of Houston Police Department, and the Texas Department of Public Safety/Texas State Police—to measure Texas driver knowledge about the TMOA by collecting data about driver behavior at simulated traffic stops.

The simulated traffic stops consisted of a law enforcement vehicle stopped on the right side of the road with its emergency lights activated behind a stopped “civilian” vehicle. To comply with the Texas Move Over Act, a driver in the right-hand lane of traffic would have to either vacate the lane adjacent to the stopped authorized emergency vehicle and maintain the speed limit, or slow down to 20 miles per hour below the posted speed limit if they did not vacate the adjacent lane. Figure 4 and Figure 5 illustrate the simulated traffic stop position. Prior to their immediate approach (e.g., 10 to 30 seconds) to the simulated traffic stop, driver observation was obscured using roadway curves or crests.



Figure 4. View Behind Simulated Traffic Stop Location on SH-21 in Brazos County, Texas. Driver View is Obscured by Curve.



Figure 5. View Toward Simulated Traffic Stop Location on SH-21 in Brazos County, Texas. Simulated Traffic Stop Location is Past Large Truck.

The data were collected in February and March 2009, at the following locations, listed by agency.

With Brazos County Sheriff's Office:

- Monday, Feb. 2, 8 a.m.-11 a.m., Eastbound FM 60 at Kemp Road and Westbound FM 60 at Smith Road, Brazos County.
- Tuesday, Feb. 3, 11 a.m.-2 p.m., Eastbound Hwy 21 at Seth Ct and Westbound Hwy 21 at Luza Lane, Brazos County.
- Wednesday, Feb. 11, 1 p.m.-4 p.m., Eastbound Hwy 21 at Seth Ct and Westbound Hwy 21 at Luza Lane, Brazos County.
- Thursday, Feb. 12, 10 a.m.-1 p.m., Eastbound FM 60 at Kemp Road and Westbound FM 60 at Smith Road, Brazos County.
- Monday, Feb. 16, 8 a.m.-11 a.m., FM 2154 NB, south of Wellborn, Brazos County.
- Thursday, Feb. 19, 1 p.m.-4 p.m., FM 2154 NB, south of Wellborn, Brazos County.

With Texas Department of Public Safety:

- Wednesday, Feb. 4, 8 a.m.-12 p.m., Northbound and Southbound Highway 6 between Woodville Road and Texas Avenue intersections, Bryan.
- Thursday, Feb. 5, 8 a.m.-12 p.m., Northbound and Southbound Highway 6 between Woodville Road and Texas Avenue intersections, Bryan.
- Wednesday, Feb. 11, 8 a.m.-12 p.m., Northbound and Southbound Highway 6 between Woodville Road and Texas Avenue intersections, Bryan.

With City of Houston Police Department

- Tuesday, Feb. 24, 10 a.m.-4 p.m., US-59 (Eastex Freeway) Northbound between Hopper Rd. and Mt. Houston Rd overpasses, Houston.
- Wednesday, Feb. 24, 8 a.m.-2 p.m., I-45 (Gulf Freeway) Northbound between FM 2351 and El Dorado Blvd. overpasses, Houston.

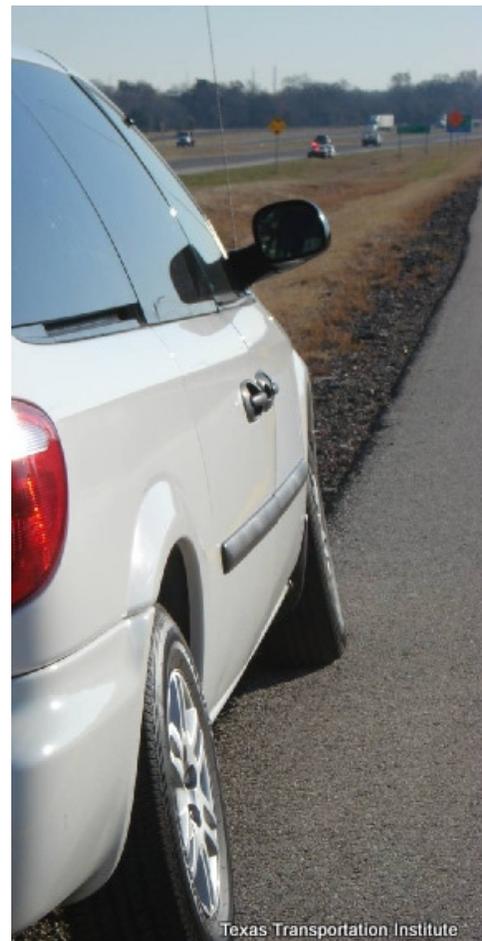


Figure 6. View toward Simulated Traffic Stop (in Background) from Data Collection Vehicle.

With City of Austin Police Department:

- Thursday, March 26, 10 a.m.-3:30 p.m. (scheduled – approximately 1.5 hours of data able to be collected due to weather), I-35 Northbound between Parmer Lane overpass and service road offramp, Austin.
- Tuesday, March 31, 10 a.m.-3:30 p.m., I-35 Northbound between Parmer Lane overpass and service road offramp, Austin.

At each location, data about Texas driver behavior including speed and lane use were collected before the driver could see the simulated traffic stop and at the point where they passed the authorized emergency vehicle. The speed data were collected using a Pro Laser III Infrared LIDAR System, Model # PL 24270 speed detector. Video recordings of lane use behavior were made using Sony DCR-TRV480 digital video camera recorders. To minimize modification of driver behavior their knowledge that they were being observed, data collectors were located well off of the roadway or off the roadway shoulder with the interior of the vehicles masked from outside view. The data collection protocol was reviewed and approved by the Texas A&M Institutional Review Board.



Figure 7. TMOA Data Collectors Use a Laser Speed Detector and Video

The video and speed data were compiled and video recordings were reviewed to identify driver license plate information and vehicle occupant information including driver ethnicity, approximate age, gender, and cell phone usage, as well as multiple vehicle occupants.

Driver license plate information was submitted to the Texas Department of Transportation, who provided information about the Zip Code of vehicle registration. U.S. Census Bureau demographic data for the Zip Codes were then compiled based on the corresponding Zip Code for each Texas license plate.

The data were evaluated using SPSS 17.0 statistical analysis software. Only the following data were included in the analysis:

- Only data for which the driver was initially in the right-hand (adjacent) lane before they could see the stopped law enforcement vehicle.
- Only data for which the driver was going at least 20 miles per hour below the speed limit or more before seeing the authorized emergency vehicle.
- Only data for roads with more than one lane in each direction.

Appendix E contains data collection location images and speed histograms for each location. The results indicate that for all locations, the average speed reduction was between six and seven miles per hour for drivers who maintained the lane next to the authorized emergency vehicle. The results also indicate that proportionately fewer drivers complied with the TMOA, either

through vacating the adjacent lane or through speed reduction, on higher Average Annual Daily Traffic (AADT) roads compared with lower AADT roads. For each location, Table 7 lists traffic volumes for the nearest roadway network location as provided by TxDOT for 2007, the posted speed limit and number of traffic lanes in each direction, the average the speed reduction for drivers that did not vacate the adjacent lane, percentage of observed driver compliance with the TMOA, and the total number of observations for each location.



Figure 8. Simulated Traffic Stop Location (with Data Collection Vehicle in Background) on SH-6 in Brazos County.

Table 7. Observed Percentages of Texas Drivers Who Complied with TMOA, by Location.

Roadway	County	2007 AADT	Posted speed limit; #. lanes each direction	Average speed reduction by drivers in adjacent lane	Percentage of observed driver compliance with TMOA	Total number of observations
FM-60	Brazos	9,600	70; 2	7.0	83.5%	236
SH-21	Brazos	12,500	70; 2	7.0	87.8%	156
SH-6	Brazos	17,400	70; 2	7.0	82.6%	350
I-35	Travis	161,000	65; 3	6.1	24.6%	349
I-45 (Gulf)	Harris	176,500	65; 3	6.9	33.2%	277
US-59 (Eastex)	Harris	225,000	60; 3	6.9	31.3%	316

A binomial logistics regression model was used to identify the factors that were significantly related to whether or not a driver initially in the adjacent lane complied with the TMOA. The model results are presented in Appendix F, Table F.1. The four factors are the AADT per traffic lane (log transformed), whether the next lane over was “blocked” (had another vehicle in the immediate vicinity), the size of the “group” a vehicle was travelling with (platooning), and whether the driver was initially in compliance with speed limit laws. Each of the variables are negatively related to compliance with the TMOA.

The model coefficients from Table F.1 can be used to predict the percentages of Texas driver compliance with the TMOA under various conditions. Some examples are listed in Table 8. The values in the table illustrate the range of predicted driver compliance with the TMOA based on different traffic conditions.

Table 8. Predicted Percentages of Texas Drivers Who Would Comply with TMOA, by Road and Traffic Conditions.

Traffic Level (AADT) and Road Type	Probability of TMOA Compliance (%)	
	Single Vehicle, Adjacent Lane Unblocked	Group of 5 Vehicles, Adjacent Lane Blocked
10,000 AADT, 4-Lane	92%	45%
150,000 AADT, 6-Lane	62%	10%

For the roadways included in the analysis, the model predicts that 92 percent of drivers will comply with the TMOA on a 4-lane road (2 lanes in each direction) with an AADT of 10,000 vehicles, in a group of only a single vehicle (their own) with the adjacent lane unblocked by another vehicle. When traffic levels increase to 6 lanes with an AADT of 150,000 vehicles, the same group/lane blockage conditions decrease the proportion of complying drivers to 62 percent. The model predicts that 45 percent of drivers will comply with the TMOA on a 4-lane road with an AADT of 10,000 vehicles, in a group of five with the adjacent lane blocked by another vehicle. When traffic levels increase to 6 lanes with an AADT of 150,000 vehicles, the same group/lane blockage conditions decrease the proportion of complying drivers to only 10 percent. The figures shown are calculated on the assumption that the driver was not initially in compliance with speed limit laws.

Other than whether or not a vehicle had multiple occupants, we were not able to identify vehicle occupant information such as gender, approximate age, ethnicity, or cell phone use for most of the observations. Including these factors in the models greatly reduced the number of observations able to be included. None of these factors were significant when included in the models, but ability to detect significant differences was likely reduced with lower number of cases. Secondary demographic indicators obtained from U.S. Census Bureau data for the Zip Code in which the vehicle was registered were not significant factors either.

CHAPTER 6: DISCUSSION AND RECOMMENDATIONS

6.1 MOVE OVER LAW AWARENESS AND ENFORCEMENT ACTIVITIES IN OTHER STATES AND IN TEXAS

Most other states use public service announcements (TV, radio, etc.) or printed materials as media to increase public awareness of their move over laws. While some states have reported a positive effect of public awareness efforts, there is little quantitative information about these effects.

Resource constraints and the nature of TMOA violations means that many local Texas law enforcement agencies can have a challenging time enforcing the TMOA. Further, there appears to be little consistency in tracking TMOA citations across different court systems. This makes a comprehensive evaluation of TMOA violations extremely difficult. Eighteen law enforcement agencies in the Harris County/Fort Bend County area conducted a coordinated public awareness and enforcement effort for the TMOA in mid-February 2009, and the Houston Police Department conducted a concentrated 12-week overtime enforcement starting on April 2009 which was observed by HPD traffic to have a noticeable improvement in driver compliance with the law. The City of Austin's traffic patrol units conduct intermittent focused enforcement activities for the TMOA. These types of efforts (coordinated and/or intermittent) may be ways that local jurisdictions can utilize limited traffic officer resources to increase TMOA enforcement.

As of mid-February 2009, the DPS Texas Highway Patrol had issued over 11,600 citations statewide for TMOA violations since the law was passed in September 2003. DPS Troopers were issuing 'push-cards' to increase public awareness about the law after its passage in 2003, but this practice appears to have declined since then. The Texas Department of Transportation has also intermittently posted messages reminding drivers to move over or slow down for emergency vehicles.

6.2 TEXAS DRIVER KNOWLEDGE AND UNDERSTANDING OF THE TMOA

The results of the survey about driver knowledge and understanding of the TMOA are generally consistent with previous studies of driver knowledge and understanding about traffic safety laws. Certain types of driver education were associated with increased knowledge and understanding. Defensive driving was shown to be positively related to both driver knowledge and understanding of the TMOA. Having a CDL was shown to be positively related to driver knowledge of the TMOA. These associations may be due to some aspect of the curriculums or drivers who have completed these trainings may be more generally aware of traffic laws.

According to Texas Administrative Code 176.1108: Driving Safety Courses of Instruction, inclusion of defensive driving curriculum on traffic laws and procedures regarding law enforcement and emergency vehicles is classified as “temporary until the need is substantiated by documentation from the DPS on the number of deaths or injuries involved because of improper procedures used by a citizen when stopped by a law enforcement officer.” This study

may support modification of that status. TEA staff indicated their belief that the majority of TEA courses cover the law at the time of this report.²

The survey results show that the youngest driving age group had the least knowledge about the TMOA, and including material about the law and its requirements in this curriculum may improve that level of knowledge. TEA staff indicated the plan to add the TMOA as a requirement "in the standards (Program of Organized Instruction for Driver Education and Traffic Safety) for driver education courses and as a rule requirement for our driving safety courses. The driving safety courses must have these updates in place by March 1, 2010 and the driver education programs by May 1, 2010....the inclusion of a test question concerning the 'Move Over Act' would still be up to each individual course provider or school."²

Certain types of formal education were associated with increased knowledge and understanding of the TMOA. In particular, respondents who had completed an associate's degree or trade school were more likely to have knowledge of the TMOA and be familiar with its requirements. This association may be due to some specific aspect of this type of curriculum, underlying factors (such as the employment field of ADTS graduates), or some other reason.

Belonging to certain minority ethnic groups was associated with decreased knowledge and understanding of the TMOA. This may be due to certain cultural factors associated with understanding of traffic laws— for example, English as a second-language for many Hispanic/Latinos, or other underlying factors. These results suggest that awareness campaigns oriented toward minority groups and implemented in ways those groups are likely to be reached, may be particularly beneficial.

Belonging to the youngest (16–20 years) or oldest (66+ years) age groups is associated with decreased knowledge about the TMOA. Knowledge increases through the 46–65 years age group. These effects are independent of the number of years of driving experience, which is positively associated with knowledge about the TMOA. These results suggest that awareness campaigns oriented toward younger and older age groups, and implemented in ways those groups are likely to be reached, may be particularly beneficial.

Although the location that the survey was conducted in was not a significant predictor of knowledge of the TMOA, population density of the respondent drivers' Zip Code area was. Texas drivers who live in more densely populated (urban) areas were significantly more likely to indicate they had never heard of the TMOA than drivers who live in less densely populated (rural) areas. This suggests that environmental, rather than context of location may be important to knowledge of traffic safety laws, or perhaps public awareness and enforcement efforts in the two urban treatment locations (Austin and Houston) were concentrated in lower population density Zip Code areas, or some other underlying factor. While decreasing knowledge of the TMOA was associated with residence in more affluent Zip Codes, the magnitude of this effect was only marginal.

² E-mail communication from Ms. Nina Saint, Manager, Driver Training Division, Texas Education Agency, to David Bierling on October 2, 2009.

The study results indicate that reported level of knowledge about the TMOA is positively related to a driver's ability to correctly identify appropriate TMOA driving scenario response actions. Drivers who indicated they had never heard of the TMOA or were not familiar with its requirements were less likely identify correct response actions to TMOA driving scenario questions than drivers who indicated they were familiar with the law's requirements but had never heard of it, and even more-so for drivers who indicated they had heard of the law and are familiar with its requirements. These results suggest that awareness campaigns that result in increased driver knowledge of the TMOA and its requirements will correspondingly increase driver knowledge of what they should do in those situations.

Through the use of statistical models, the study established a baseline of Texas driver knowledge and understanding of the TMOA for different factors including population density of residence area, age and ethnic groups, driving experience, driver education, and formal education.

6.2 TEXAS DRIVER COMPLIANCE WITH THE TMOA.

We showed that driving environment plays a large role in whether or not a driver complies with the TMOA. This includes general level of traffic, adjacent lane blockage, and group behavior. Data limitations prevented us from ruling out the importance of individual demographic factors. Measuring individual driver knowledge of the TMOA in association with observed driver behavior would have been extremely cost-prohibitive. Observation of driver behavior on congested, high traffic roadways suggests that the inability for drivers to move into adjacent lanes, coupled with the law's 20 mile-per-hour reduction in speed for drivers that are unable to move over, creates very hazardous conditions for the driving public. Through the use of statistical models, the study established a baseline of Texas driver compliance with the TMOA for different roadway and traffic characteristics.

Of the two highly urbanized areas we collected compliance data in, driver compliance with the TMOA was observed to be slightly higher at the Houston locations (over 30 percent) compared with Austin (approximately 25 percent), although these differences were not statistically significant in the driver behavior model. Driver compliance with the TMOA was observed to be between 80 and 90 percent in the Bryan/College Station area. Drivers who were initially in compliance with speed limits were actually less likely to comply with the TMOA, although it was the least influential of the four significant factors. This may be due to some underlying demographic of these drivers, or the possibility that they were going slower than drivers in adjacent lanes creating difficulties for merging.

6.3 RECOMMENDATIONS

Information from other states' efforts, along with the results of the survey and measurements of driver compliance are being used for the development of a Communications Plan (in a separate document) to increase Texas driver knowledge and understanding of, and compliance with, the TMOA.

Although they have not quantified the information, a number of other states have indicated success with increasing driver compliance with move over laws associated with public outreach and enforcement mechanisms. The results of the survey indicate that the minority of Texas

drivers who know about the TMOA or its requirements are more likely to correctly indicate what they should do in a TMOA driving scenario. The results of the compliance measurement indicate a substantially greater lack of compliance with the TMOA in urban, high-traffic settings. Thus, ***a primary recommendation of this study is to implement a public outreach and awareness campaign***, such as that described in the Communications Plan for this study.

There are several additional recommendations:

- Standardization of State traffic codes for use in different municipalities.
- Defining and distributing best practices for local law enforcement about how they can effectively conduct individual and partnering approaches to TMOA enforcement.
- Conducting studies about driving public and emergency responder injuries associated with TMOA violations, as well as violations of other traffic safety laws. This would be a key element for defining associated risks and costs.
- Revision of Texas Administrative Code 176.1108: Driving Safety Courses of Instruction, to make as a permanent requirement for defensive driving curriculum on traffic laws and procedures regarding law enforcement and emergency vehicles.
- Inclusion of the TMOA and its requirements in recommended driver education course materials, including course content and optional videos, as planned by TEA.
- Further study about the safety and efficacy of the TMOA's requirement of a 20 mile-per-hour reduction in speed for drivers that are unable to move over from the lane adjacent to a stopped emergency vehicle due to traffic congestion. A lower speed reduction requirement may accomplish the same result while lowering driver safety risks and/or disruptions to traffic flows.

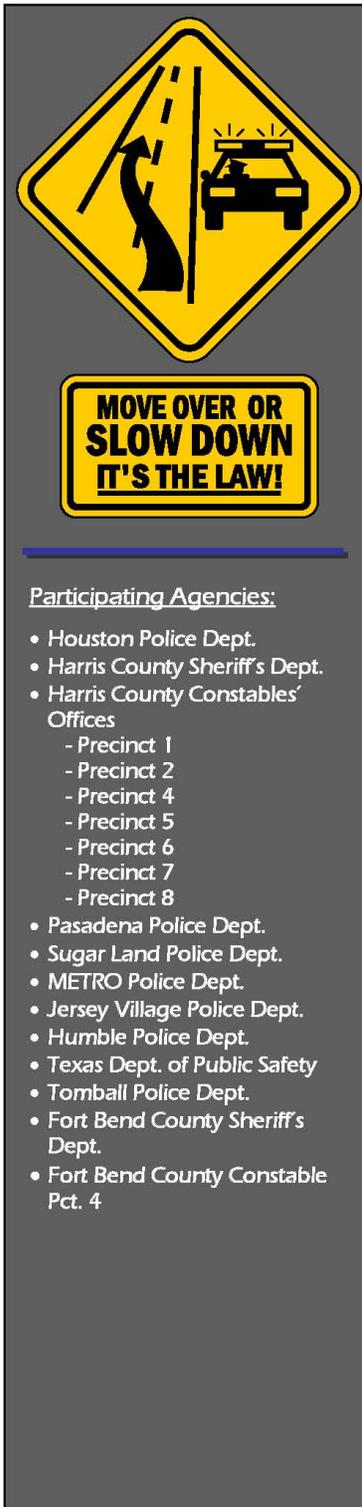
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APPENDIX A

**TMOA PUBLIC AWARENESS FLYER (ENGLISH)
FOR HARRIS AND FORT BEND COUNTIES**



Move Over or Slow Down, It's The Law!



**Awareness Week in Harris County/Fort Bend County Area
– February 9 – 13, 2009**

**Enforcement Week in Harris County/Fort Bend County Area
– February 16 – 20, 2009**

Peace Officers throughout Harris County and Fort Bend County will be intensively enforcing Texas Transportation Code Sec. 545.157 "Passing Authorized Emergency Vehicle," also known as the "Move Over or Slow Down" law. During the week of February 9th – 13th, local law enforcement agencies as well as local media will work to educate the public about this important law.

During the week of February 16th – 20th, law enforcement officers will be vigorously enforcing this law by writing citations. This effort is being undertaken to enhance officer safety during traffic stops on local freeways.

Under Texas law, drivers approaching a stationary emergency vehicle using visual signals (emergency lights) are required to either vacate the lane closest to the emergency vehicle (if a lane is available) or you must slow to a speed not to exceed 20 miles per hour below the posted speed limit. When the posted speed limit is 25 miles per hour or less, the driver must slow down to five miles per hour.

A violation of this section is a Class C Misdemeanor (\$1 to \$200 fine); or a Class B Misdemeanor if someone is injured.

On October 1, 2007; while on a traffic stop, Precinct 5 Deputy Constable Jason Norling was struck and killed when a sports utility vehicle swerved onto the shoulder of the Westpark Toll Road.

According to FBI statistics, in 2007, 83 law enforcement officers died as the result of accidents that occurred in the line of duty.

Of the 12 officers struck by vehicles, 7 were involved in traffic stops or roadblocks and 5 officers were directing traffic and assisting motorists.

A media press conference will be held on Thursday, February 13th at Houston TranStar located at 6922 Old Katy Road. The press conference will start at 2pm. For additional information, you may call (281) 584-7500.

Participating Agencies:

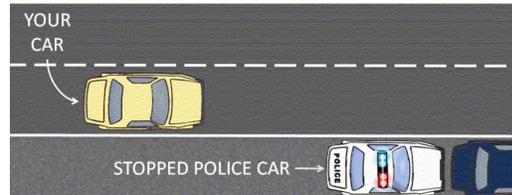
- Houston Police Dept.
- Harris County Sheriff's Dept.
- Harris County Constables' Offices
 - Precinct 1
 - Precinct 2
 - Precinct 4
 - Precinct 5
 - Precinct 6
 - Precinct 7
 - Precinct 8
- Pasadena Police Dept.
- Sugar Land Police Dept.
- METRO Police Dept.
- Jersey Village Police Dept.
- Humble Police Dept.
- Texas Dept. of Public Safety
- Tomball Police Dept.
- Fort Bend County Sheriff's Dept.
- Fort Bend County Constable Pct. 4

APPENDIX B
TMOA KNOWLEDGE SURVEY INSTRUMENT

The Texas Transportation Institute is conducting a survey to find out what Texas drivers do in response to emergency vehicles that are stopped on the side of the road. We would greatly appreciate your answers to the following 11 questions.



Situation: You are driving on a major city street, highway, or interstate, and ahead of you is a police car stopped on the side of the road. *Its emergency (red and blue) lights are on, and you are driving in the lane nearest the stopped police car.*



1. What should you do? Indicate whether the following actions are correct in this situation by circling true (T) or false (F) for each statement.

- T F You must slow down by 10 mph, regardless of the lane you are in.
- T F You must slow down until you're going 25 mph, regardless of the lane you are in.
- T F As long as you're going the speed limit and don't do anything sudden, you may stay in the same lane, even if you will pass right next to the stopped police car.
- T F You must move over to the farthest lane from the stopped police car, and slow down by 20 mph.
- T F You may stay in the lane nearest the stopped police car, but must slow down to 20 mph below the speed limit.
- T F You may drive at the speed limit, as long as you move over at least one lane from the stopped police car.
- T F You may stay in the lane nearest the stopped police car, but must slow down by 10 mph.

'Slow down/move over' laws define what drivers should do when passing emergency vehicles—police cars, fire trucks, or ambulances—that are stopped on the side of the road with their emergency lights on. Texas passed its version of this law, the 'Move Over Act', in 2003.

2. What do you know about the Texas Move Over Act? Check one box for your answer.

- I have never heard of it.
- I have heard something about it, but am not familiar with the details.
- I am familiar with the requirements of the law, but not by name.
- I have heard of the Texas Move Over Act, and am familiar with its requirements.

Over ...

3. Have you or anyone else you know ever been cited (received warning or ticket) for passing a stopped emergency vehicle that has its emergency lights on? Check all that apply.

- No/Not that I know of
- Yes, I did in Texas
- Yes, I did in another state
- Yes, someone I know did in Texas
- Yes, someone I know did in another state

4. What type of driver training have you had? Check all that apply.

- No formal driving education
- Took driver ed in high school
- Took driver ed from a commercial driving program
- Took driver ed from someone else through 'parent-taught' program
- Have taken defensive driving or some other driver improvement course
- Commercial driver license (CDL) certification

5. Have you received any moving violation citation (warning or ticket) within the past 3 years?

- No
- Yes
- Maybe/Not sure

For comparison purposes and to describe our sample, we are asking a few background questions. All information is anonymous.

6. How long have you been a licensed driver in Texas? _____ years

7. What race/ethnicity do you consider yourself?

- African American/Black
- Asian
- Hispanic/Latino
- White/Anglo
- Other

8. What is your age range?

- 16-20
- 21-25
- 26-35
- 36-45
- 46-65
- 66+

9. What is your education level?

- Less than high school
- Finished high school
- Attended some college or trade school
- Finished associate's degree or trade school
- Finished bachelor's degree
- Finished graduate or professional degree

10. What is the Zip Code where you currently live? _____

11. What is your gender? Female Male

a

APPENDIX C

TMOA *KNOWLEDGE LOGISTIC* REGRESSION MODEL COEFFICIENTS

Table C.1: Binary Logistic Regression Coefficients Estimating Odds of Texas Driver Having Heard of Move Over Act and Familiar with It.

	B	Exp (B)						
Driver Education								
Took defensive driving	0.638† (0.183)	1.893	0.447* (0.189)	1.563	0.401* (0.189)	1.493	0.233 (0.206)	1.262
Has CDL certificate	1.087† (0.274)	2.966	1.060† (0.278)	2.886	1.026† (0.280)	2.791	1.028† (0.281)	2.794
Completed associate's degree or trade school	0.666** (0.247)	1.945	0.644* (0.250)	1.903	0.583* (0.251)	1.792	0.537* (0.252)	1.71
Driver Experience								
Time being a licensed driver in Texas			0.031† (0.006)	1.031	0.024* (0.010)	1.024	0.025** (0.010)	1.025
Demographics								
21-25 age group					1.427* (0.630)	4.166	1.012 (0.677)	2.750
26-35 age group					1.465* (0.623)	4.329	1.493* (0.622)	4.449
36-45 age group					1.454* (0.637)	4.282	1.503* (0.637)	4.495
46-65 age group					1.712* (0.662)	5.541	1.746** (0.662)	5.730
66+ age group					1.003 (0.891)	2.728	1.030 (0.890)	2.800
Interaction								
21-25 age group and took defensive driving							1.086* (0.520)	2.962
Constant	-2.701† (0.130)	0.067	-3.112† (0.165)	0.045	-4.394† (0.584)	0.012	-4.365† (0.584)	0.013
Hosmer and Lemeshow Significance	0.677		0.633		0.322		0.555	
Model/Base % Correct	90.7/90.7		90.8/90.7		90.8/90.7		90.6/90.7	
Nagelkerke R-Squared	0.048		0.081		0.098		0.104	
Model Chi-Squared	33.031		56.182		68.572		72.930	
-2 Log Likelihood	885.286		862.135		849.745		845.387	
N	1484		1484		1484		1484	

Note: Standard errors are in parentheses. Null hypothesis test of coefficient equal to zero, †p<0.001, **p<0.01, *p<0.05

Table C.2: Binary Logistic Regression Coefficients Estimating Odds of Texas Driver Never Having Heard of Move Over Act.

	B	Exp (B)	B	Exp (B)	B	Exp (B)	B	Exp (B)
Survey Version								
Completed survey version c, d, e	0.450† (0.114)	1.568	0.478† (0.116)	1.613	0.495† (0.118)	1.640	0.499† (0.120)	1.647
Driver Experience								
Was cited in Texas for passing stopped emergency vehicle			0.756* (0.353)	2.130	0.914* (0.365)	2.494	1.041** (0.367)	2.832
Knows someone cited in Texas for passing stopped emerg. vehicle			-1.341† (0.373)	0.262	-1.298** (0.376)	0.273	-1.282** (0.379)	0.278
Time being a licensed driver in Texas			-0.029† (0.005)	0.971	-0.025† (0.005)	0.976	-0.027† (0.005)	0.973
Driver Education								
Took defensive driving					-0.366** (0.131)	0.694	-0.331* (0.133)	0.718
Has CDL certificate					-0.935** (0.275)	0.393	-0.894** (0.277)	0.409
Attended some college or trade school					-0.267 (0.138)	0.766	-0.286* (0.140)	0.752
Completed associate's degree or trade school					-0.566** (0.208)	0.568	-0.555** (0.211)	0.574
Completed bachelor's degree					-0.290 (0.158)	0.748	-0.352* (0.162)	0.703
Demographics								
African American/Black ethnicity							0.371* (0.154)	1.449
66+ age group							0.942* (0.393)	2.566
Population density (1000 people/square mile)							0.098† (0.024)	1.103
Median value of owner-occupied housing in Zip Code(\$10,000s)							0.019* (0.008)	1.019
Constant	-0.680† (0.090)	0.507	-0.307** (0.106)	0.736	-0.024 (0.127)	0.977	-0.624** (0.180)	0.536
Model Fit Statistics								
Hosmer and Lemeshow Significance			0.018		0.151		0.704	
Model/Base % Correct	60.0/60.0		63.7/60.0		64.5/60.0		63.6/60.0	
Nagelkerke R-Squared	0.015		0.075		0.105		0.137	
Model Chi-Squared	15.878		79.259		112.538		148.058	
-2 Log likelihood	1851.218		1787.838		1754.558		1719.038	
N	1387		1387		1387		1387	

Note: Standard errors are in parentheses. Null hypothesis test of coefficient equal to zero, †p<0.001, **p<0.01, *p<0.05

APPENDIX D
TMOA UNDERSTANDING LOGISTIC REGRESSION MODEL
COEFFICIENTS

Table D.1: Binary Logistic Regression Coefficients Estimating Odds of Exactly Correct Responses to TMOA Driving Scenario Questions.

	B	Exp (B)						
Survey Version								
Completed survey version c	1.033† (0.174)	2.81	1.094† (0.178)	2.986	1.094† (0.180)	2.987	1.085† (0.181)	2.961
Knowledge of TMOA								
Is familiar with TMOA but not by name			1.026† (0.207)	2.789	0.932† (0.209)	2.540	0.953† (0.210)	2.592
Has heard of TMOA and is familiar with its requirements			1.217† (0.234)	3.378	1.116† (0.237)	3.052	1.118† (0.241)	3.059
Driver Education								
Took defensive driving					0.646† (0.173)	1.909	0.593** (0.174)	1.810
Demographics								
African American/Black, Hispanic/Latino, or Other ethnicity							-0.803† (0.188)	0.448
Constant	-2.392† (0.103)	0.091	-2.761† (0.128)	0.063	-2.968† (0.145)	0.051	-2.659† (0.156)	0.070
Hosmer and Lemeshow Significance			0.844		0.885		0.526	
Model/Base % Correct		89.2/89.2		89.2/89.2		89.2/89.2		89.2/89.2
Nagelkerke R-Squared	0.042		0.092		0.109		0.133	
Model Chi-Squared	32.721		71.964		85.608		105.296	
-2 Log likelihood	1024.93		985.688		972.044		952.356	
N	1542		1542		1542		1542	

Note: Standard errors are in parentheses. Null hypothesis test of coefficient equal to zero, †p<0.001, **p<0.01, *p<0.05

APPENDIX E
SIMULATED TRAFFIC STOP LOCATION IMAGES AND SPEED
HISTOGRAMS

FM-60, Brazos County, Texas

Figure E.1. View of FM-60 Traffic Lanes Leading to Simulated Traffic Stop Location.

Figure E.2. Speed Histogram of Observed FM-60 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.3. Speed Histogram of Observed FM-60 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.1

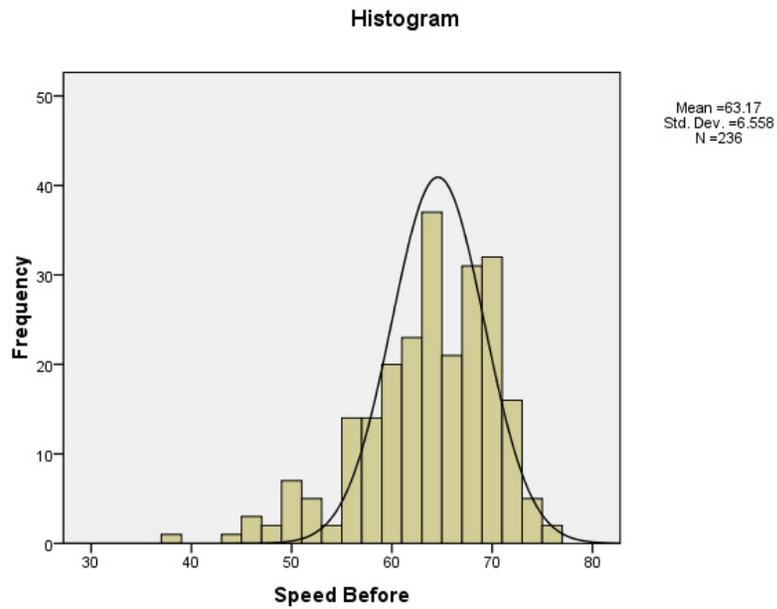


Figure E.2

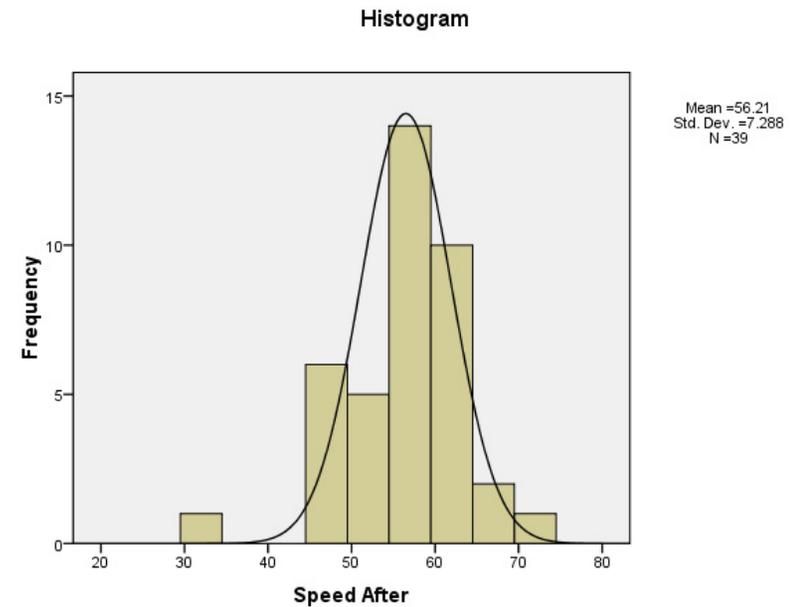


Figure E.3

SH-21, Brazos County, Texas

Figure E.4. View of SH-21 Traffic Lanes Leading to Simulated Traffic Stop Location.

Figure E.5. Speed Histogram of Observed SH-21 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.6. Speed Histogram of Observed SH-21 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.4

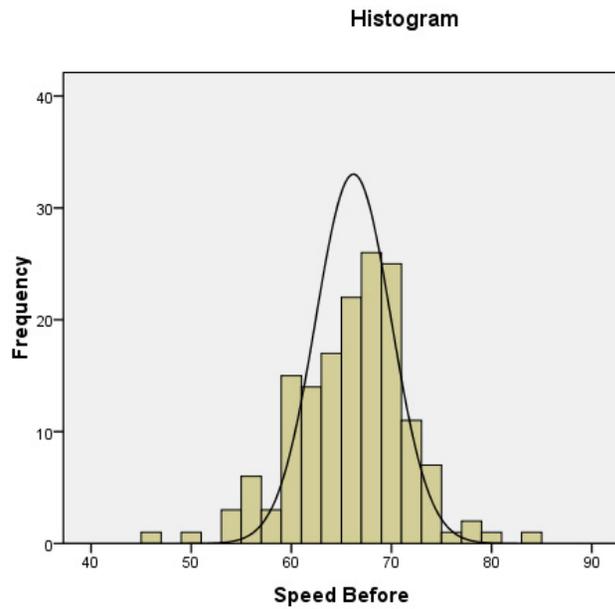


Figure E.5

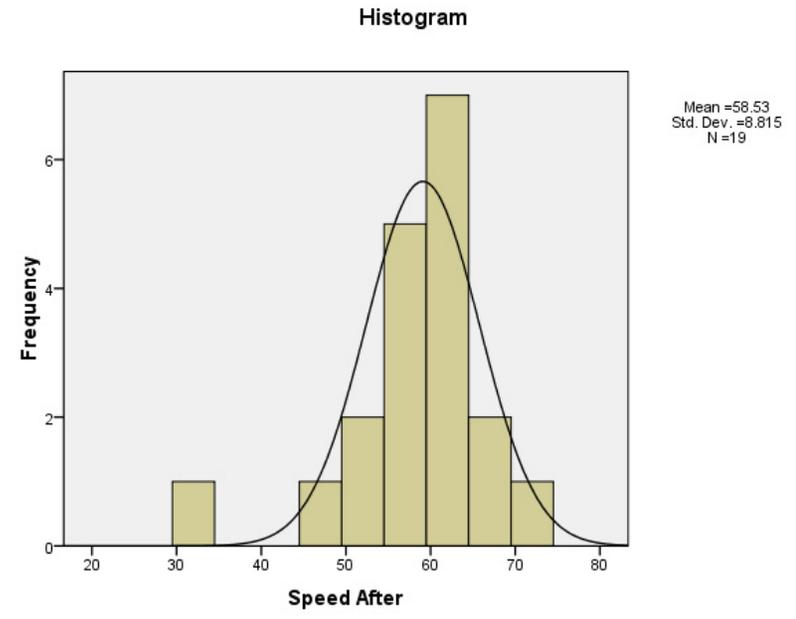


Figure E.6

SH-6, Brazos County, Texas

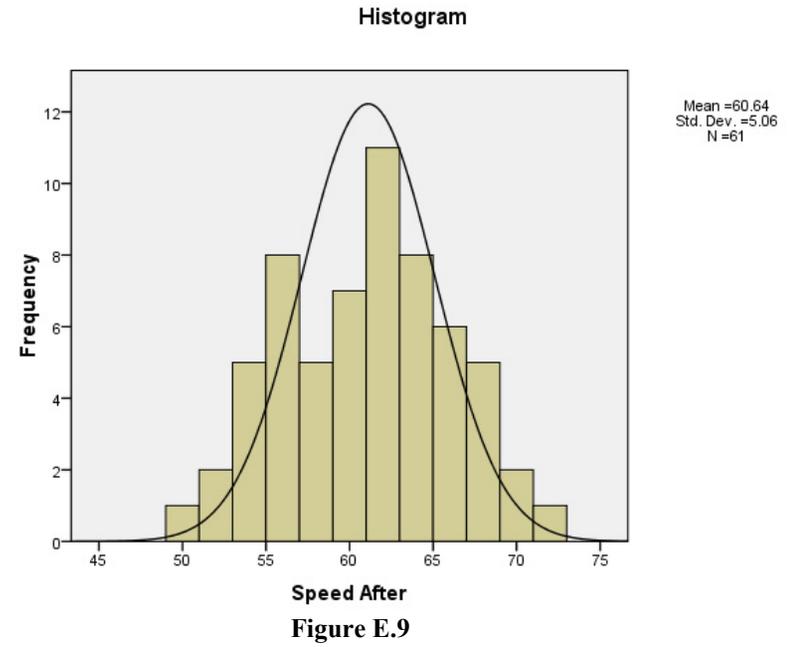
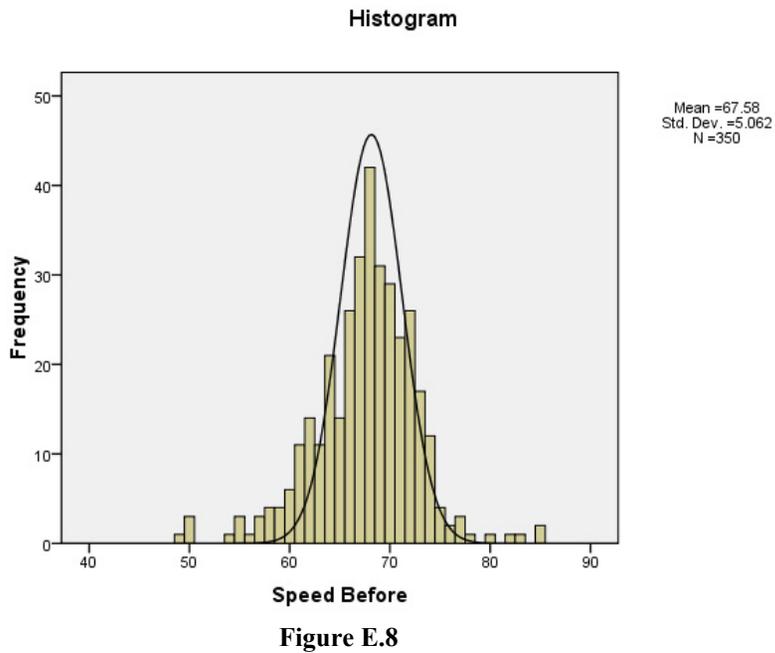
Figure E.7. View of SH-6 Simulated Traffic Stop Location.

Figure E.8. Speed Histogram of Observed SH-6 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.9. Speed Histogram of Observed SH-6 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.7



I-35, Travis County, Texas

Figure E.10. View of I-35 Traffic Lanes Leading to Simulated Traffic Stop Location.

Figure E.11. Speed Histogram of Observed I-35 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.12. Speed Histogram of Observed I-35 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.10

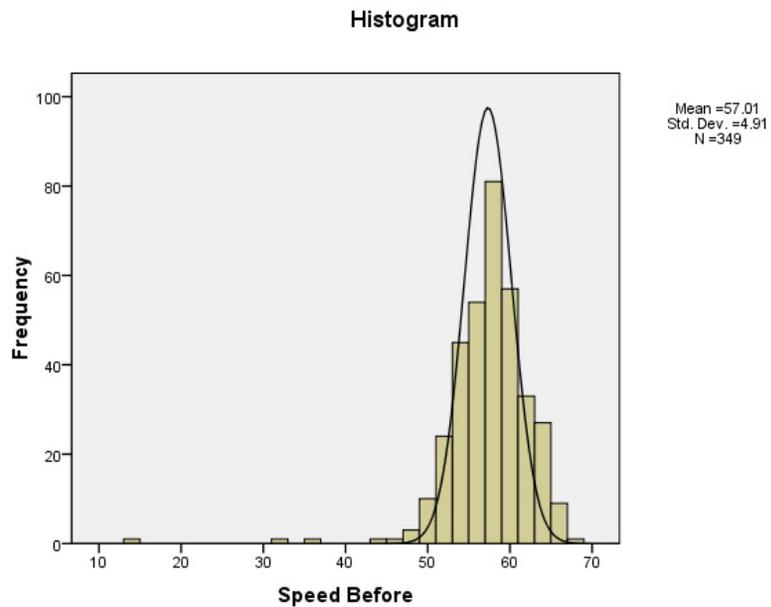


Figure E.11

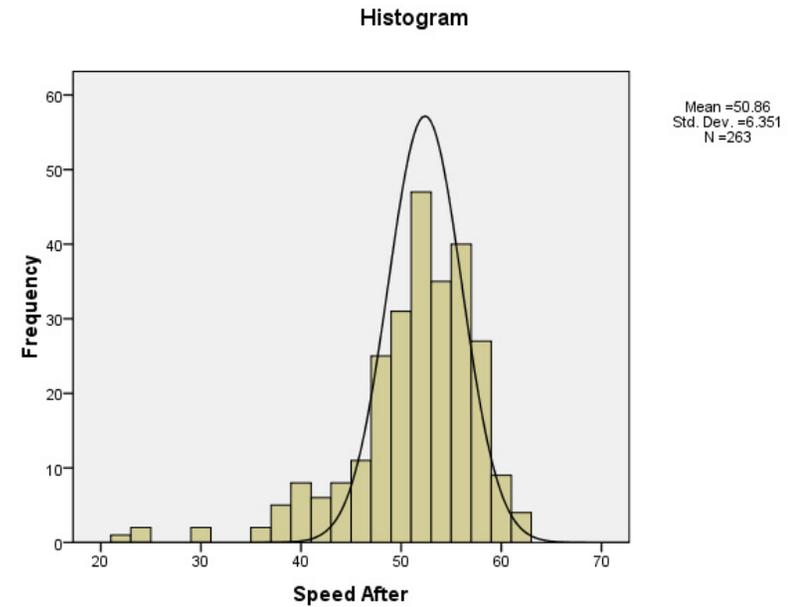


Figure E.12

I-45, Harris County, Texas

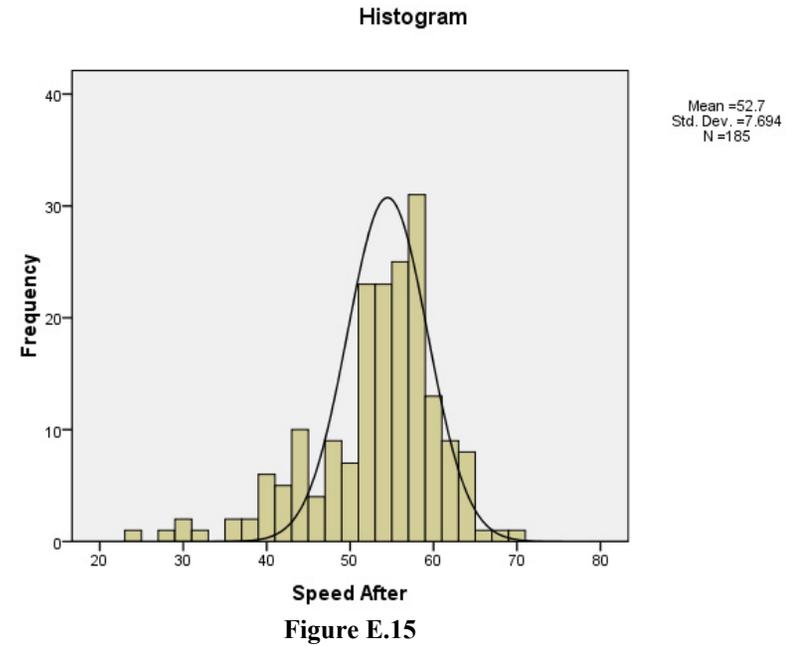
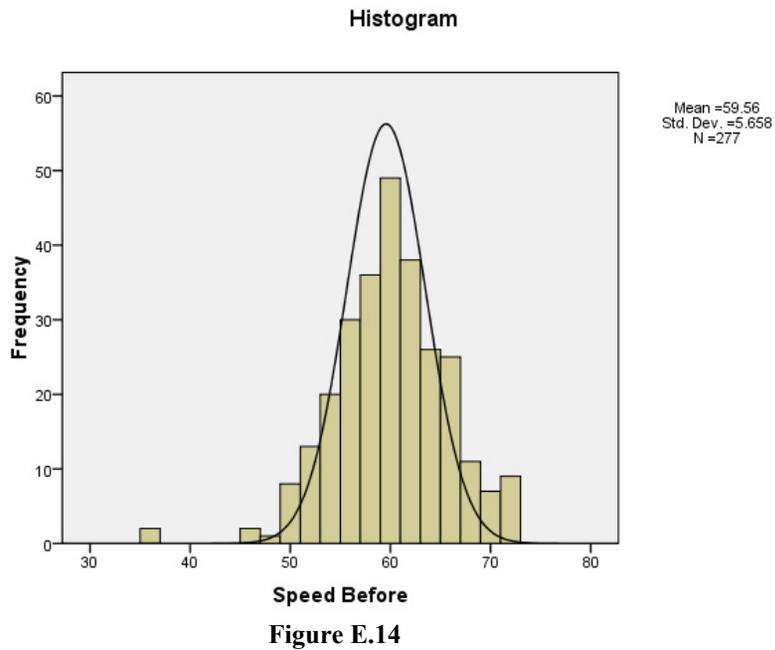
Figure E.13. View of I-45 (Gulf Freeway) Traffic Lanes Leading to Simulated Traffic Stop Location.

Figure E.14. Speed Histogram of Observed I-45 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.15. Speed Histogram of Observed I-45 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.13



US-59, Harris County, Texas

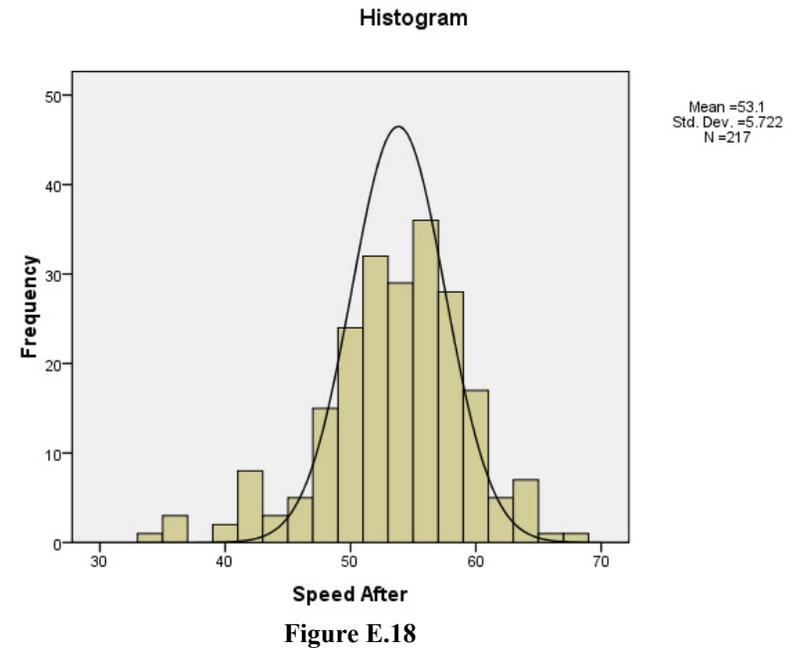
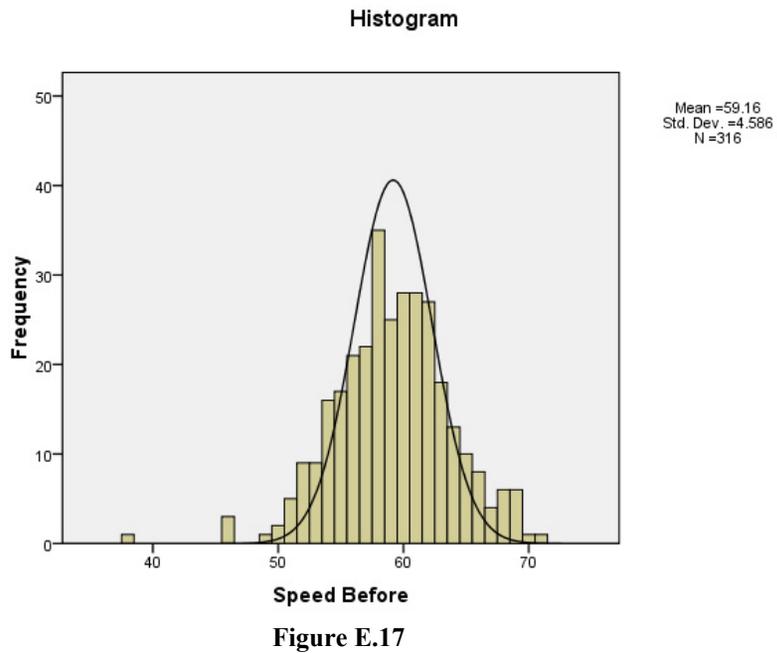
Figure E.16. View of US-59 (Eastex Freeway) Traffic Lanes Leading to Simulated Traffic Stop Location.

Figure E.17. Speed Histogram of Observed US-59 Drivers in Outside Lane prior to Seeing Simulated Traffic Stop.

Figure E.18. Speed Histogram of Observed US-59 Drivers in Outside Lane at Simulated Traffic Stop.



Figure E.16



APPENDIX F
TMOA COMPLIANCE LOGISTIC REGRESSION MODEL
COEFFICIENTS

Table F.1: Binary Logistic Regression Coefficients Estimating Odds of Texas Drivers' Compliance with Move Over Act.

	B	Exp (B)
Log Traffic (AADT) Per Lane	-1.994† (0.144)	0.136
Inside Lane Blocked (Yes = 1)	-2.270† (0.279)	0.103
Group Size (No. vehicles)	-0.100** (0.034)	0.905
Initial Compliance (Yes = 1)	-0.446** (0.162)	0.64
Constant	9.379† (0.608)	11839.04
Hosmer and Lemeshow Significance	0.495	
Model/Base % Correct	73.6/57.8	
Nagelkerke R-Squared	0.371	
Model Chi-Squared	528.538	
-2 Log likelihood	1703.763	
N	1639	

Note: Standard errors are in parentheses. Null hypothesis test of coefficient equal to zero, †p<0.001, **p<0.01