Using Technology to Minimize Distracted Driving in Law Enforcement

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Abstract

This research paper discusses the issue of distracted driving and how it impacts law enforcement officers on patrol. The author discusses his literature review of the issues of distracted driving and some of the causes, to include the mounting location of laptops, the software graphics interface used by officers while driving, use of voice recognition software or devices and the use of heads up display units. The author discusses the results of a survey sent to state law enforcement officers. The author also offers recommendations that will help decrease the number of distractions law enforcement officers are susceptible to while driving.

Introduction

The inside of a modern patrol vehicle looks nothing like it did twenty years ago. Over the years, the introduction of certain law enforcement technologies such as radar devices, video cameras, computers, printers and phones have become standard equipment. Patrol vehicles have morphed into mobile offices which allow officers to access specialized databases and applications, print citations, and write reports without the need to return to the station.

Currently, forty-seven states have some type of distracted driving statutes in place. Many of these laws exempt police officers and other first responders. There is a belief that taking away the ability for first responders to access information in real time would have a detrimental effect on their job productivity and safety when responding to calls for service. Some Agencies have created policies and procedures on how and when officers can use technology while operating first responder vehicles while in motion.

This research paper is going to look at four separate areas that might help minimize the effects of distracted driving by first responders. The first area discusses where laptops are mounted within the vehicle. The second area discusses the Graphical User Interface (GUI) used by the Mobile Computer Terminal (MCT). The third area of discussion involves voice recognition software and/or devices that allow the first responder to use their voice to control the MCT and radio. The final area of discussion involves the use of heads-up displays in law enforcement vehicles. These devices project a small screen on the windshield of the vehicle allowing the operator to obtain information while also looking forward at the road.

Literature Review

Distracted Driving

Distracted driving can be divided into three categories: visual, manual and cognitive. Visual distraction involves the driver taking their eyes off the road. Manual distraction involves the driver taking their hands off the wheel and cognitive distraction involves the driver taking their mind off the task of driving (Citrowske et al., 2011).

A study conducted by Stephen M. James revealed that officer's driving performance is degraded by distraction. The simulated driving environment tested lane deviation, lane departures, braking latency, following distance, and collision while performing tasks that simulated driving and interacting with a Mobile Data Computer (MDC) simultaneously. The simulated driving tasks presented were generally less distracting than real world patrol driving and likely underestimated the impact of distraction on police driving (James, 2015).

Prior research has confirmed that use of technology in police vehicles cause driver distraction. In interviews of a large sample of officers, researchers found that all respondents confirmed using the mobile computer terminal while they were driving. The state of Texas examined emergency vehicle crashes from 2010 to 2014 and found that driver distraction/inattention was identified as an underlying factor in one thousand and twenty-one of those crashes. Another investigation by South Carolina Department of Public Safety recorded eight hundred and three emergency vehicle crashes from 2001 to 2010 where driver fatigue and distraction were identified as primary causes. The Austin (Texas) Police Department identified forty-eight patrol vehicle crashes from 2010 to October 2014 which were attributed to distracted driving. Of those, twenty-five were attributed to the officer interacting with the mobile computer terminal while driving, and another eight were attributed the officer was interacting with a cell phone or other in-vehicle equipment. In general, these reports confirm that distracted driving is a growing issue in patrol vehicles and that MCT and other technologies play a part of the problem (Zahabi & Kaber, 2018).

Mobile Computer Terminal (MCT) placement

Advancements in technology allow for workers to perform job functions while they are in vehicles, this allows workers to complete many tasks without the need to return to offices and enhances productivity for mobile workers. Most vehicles are not designed to incorporate a mobile computer and do not provide dedicated space for this item. Therefore the MCT is often located where there is space and does not take into account the drivers' computer performance, visibility, and/or safety while driving the vehicle (Saginus, Marklin, Seeley, & Freier, 2011).

A 2011 study was conducted to determine certain effects regarding the placement of the MCT and the perceived effects on the officer's discomfort level mainly involving their lower back and shoulders. The study used a vehicle simulator setup like the typical Ford Crown Victoria police vehicle and provided for five different placement locations for the MCT. A total of ten male officers and ten female officers were used in the simulations. During the simulations, the test subjects interacted with the MCT in different locations to

include a self-selected location. One set location was determined by using the mounting location used by a local law enforcement agency in the area (Mckinnon, Callaghan, & Dickerson, 2012).

The results of the study concluded that the standard location used by the police departments and self-selected locations resulted in the least lower back discomfort and right shoulder discomfort. Both of these locations are located close to the driver's body and near the center of the vehicle cockpit. The self-selected location was within six centimeters (approximately 2.5 inches) of the standard location (Mckinnon et al., 2012).

Another 2011 study was conducted to determine the optimal location for an MCT location to minimize musculoskeletal disorders (MSD). The study identified four different mounting locations in a vehicle cab and participants completed a series of tests to determine the optimum mounting location. The first mounting location placed the MCT over the passenger seat and did not allow for rotation or tilt of the MCTs base. The second location mounted the MCT over a stationary post located between the instrument panel and passenger seat. This mount configuration allowed for the driver to adjust the vertical tilt angle of the MCT base and display. The third mounting location used a Hub Data 911 MCT that had a separate monitor and keyboard design that is common in some law enforcement vehicles. The display is mounted on the instrument panel, to the right of the steering wheel and the keyboard is moveable. The forth mounting location was as close as possible to the right of the driver. The driver could tilt the MCT base and display to ensure that the steering wheel was not impeded. The participants in the study completed software tasks in each of the MCT locations to determine the ideal mounting location (Saginus et al., 2011).

Based on the results of the tests, the fourth mounting location was determined to be the best location to reduce the chance of MSD issues. The fourth location was closest to the driver's trunk area and gave the driver the most flexibility in movement. The mount should allow for movement within five cm (approx. two inches) in all directions to allow the driver to adjust the mount to their liking. With the mount in this location it also minimizes the mounts proximity to the air bag deployment zone found in most vehicles (Saginus et al., 2011).

Mobile computer terminal (MCT) software design

Research found that crashes involving police officer distraction due to in-vehicle technologies were more severe than crashes involving civilian driver distractions. In addition, in-vehicle technologies used in patrol vehicles are more complex and demanding than in non-pursuit vehicles. There have only been a few studies that focused on the visual and cognitive distractions caused by these high demand devices. A 2005 on-road study of single and double-crewed police vehicles and officer distraction due to interactions with the MCT determined that MCT use was incompatible with driving due to the level of distraction it causes. Follow-up studies have looked at different ways that the officer interacts with the MCT and its effect on distracted driving. A study conducted using an MCT that had built-in voice recognition showed that officers liked the voice recognition capabilities while driving and the standard graphics user interface while stopped or parked. Results also showed that conventional manual interaction with the software required more time and higher physical demand on the officer compared to voice

interface. The authors also concluded that the manual interface required significantly more eyes-off-the-road time than compared to the voice recognition interface (Zahabi & Kaber, 2018).

Although the above studies show benefits of using voice recognition interface while interacting with the MCT, another study assessed the effects of a speech-based email system on driver performance and found that reaction time increased. The study also found that voice recognition introduced a significant cognitive load on the driver. While this study did not use police officers and MCT software, it showed that using voice recognition might not always lower driver distraction (Zahabi & Kaber, 2018).

An eighteen-month, 2018 study conducted by M. Zahabi and D. Kaber used twenty police officers in a driving simulator to test a commercially-available MCT software that was currently being used by the test officers and an enhanced version. The baseline software displayed results of a vehicle tag query in a text-based layout of information returned. The enhanced version of the software displayed a summary page with possible violations highlighted in a different color, along with the text-based pages with an enhanced navigation function. The only MCT function used by the test subjects was the vehicle tag query, as this was determined to be the most demanding of MCT functions. All officers completed the simulated driving and interaction with one type of MCT after being trained in its use (Zahabi & Kaber, 2018).

The main objective of this study was to assess the effects of MCT interface design variations on officer driving performance. The findings confirmed that the use of the MCT appears to significantly degrade officer visual attention to the roadway as compared to not using the MCT. The results also showed that the basic usability changes to the MCT software substantially increased the officer's visual attention to driving. Another major finding of the study was the enhanced MCT significantly reduced secondary task assignment, allowing for more time with eyes on the road (Zahabi & Kaber, 2018).

The Carlsbad (California) Police Department implemented Project 54 in fifty of their patrol vehicles. Project 54 uses speech interface to control the police radio, lights, sirens, and allows the officer to perform license plate queries without taking their eyes off the road or hands off the steering wheel (Callander & Zorman, 2007).

Voice recognition interfaces have been used successfully in controlled environments where ambient noises are controlled, and the speech recognition grammar of the application is small. Most software companies that build applications for law enforcement, do not include voice recognition interfaces due to noisy ambient conditions and large and specific speech recognition grammar database needed. Carlsbad Police Department looked at two products that were available at the time, the first was Visteon TACNET and the second one was Project 54 (Callander & Zorman, 2007).

The testing completed by Carlsbad Police Department found that the two most work-intensive tasks included performing a vehicle license plate query and changing the radio channel. These two tasks accounted for a seven-hundred percent increase in workload. They also found that officers continued to perform simple manual tasks such as activating emergency lights and sirens manually. They found that officers found that turning on the emergency lights was easier done manually than using voice recognition (Callander & Zorman, 2007).

During the eighteen-month test period of the Project 54 study, Carlsbad Police Department only had one vehicle crash contributed to using a computer. The officer in

the crash was attempting to log off and back onto the system prior to the crash. The system did not allow for this task to be completed using voice recognition (Callander & Zorman, 2007).

Methods

The purpose of this research was to identify which technology items in the patrol vehicle officers believed to be most distracting and to develop ideas on confronting those distractions. The information gathered from the research can be used to field test software design changes and voice command technology.

Data was gathered through surveys given to sworn members of the Florida Fish and Wildlife Commission (FWC); Florida Highway Patrol (FHP); Department of Agriculture Office of Agriculture Law Enforcement (AgLaw); and Bureau of Fire, Arson and Explosives Investigations (CFO) in order to represent a cross section of duties and departments. All four state law enforcement agencies use the same MCT software and all have laptops mounted in their patrol vehicles. Survey questions were designed to elicit information from participant officers/agents to gather information on three main areas. The first area is the current mounting location of the laptop to determine if there is a more ergonomic place to mount the laptop. The second area involved the graphic user interface of the current MCT software to determine if changes from a text-based format to more of a summary format would reduce on the amount of time participants look at their laptop screen while driving. The third area is user interaction with in-car equipment to determine if voice commands could be used for routine tasks such as vehicle queries, changing of law enforcement radio channels, and this would lower the amount of distracted driving. The final area involved the use of heads-up displays where a small screen projected in a non-obstructed location on the windshield of the vehicle that allowed the user to safely observe the road.

The survey was anonymous to encourage responses and truthfulness. A weakness in the data collected is that participants were asked about changes to software and addition of voice commands that they could not visually see or test prior to the survey. In addition, lack of candor remains a concern on responses despite assurances of confidentiality and anonymity.

Results

The survey was sent out to two thousand eight hundred and forty-three state law enforcement officers in four different agencies. I received a total of six hundred and thirty-four responses, for a twenty-two percent response rate. Of those six hundred and thirty-four responses, some respondents chose to skip some of the questions in the survey.

Question 1: Which agency do you work for?

This question asked which agency the respondent works for: Florida Fish and Wildlife Conservation Commission (FWC); Florida Highway Patrol (FHP); Department of Agriculture Office of Agriculture Law Enforcement (AGLAW); and Bureau of Fire, Arson and Explosives Investigations (CFO). Six hundred and thirty people answered the question and four skipped it. Out of the respondents that answered the question, 320 (51%) work for FWC, 225 (36%) work for FHP, 65 (10%) work for AGLAW and 20 (3%) for CFO.

Question 2: What type of vehicle do you primarily drive while on duty?

This question was to determine the different patrol vehicle types that are being used. Six hundred and thirty people answered the question and four skipped it. Forty-six percent of the respondents identified that a pickup truck was their primary vehicle type. Thirty percent of respondents drive sedans and twenty-four percent drive a SUV type vehicle.

Question 3: In your opinion, how often do law enforcement officers get distracted when driving a duty vehicle?

This question asked for the respondent's opinion on how often law enforcement officers get distracted while driving. Six hundred and fifteen people responded and nineteen skipped the question. The responses were evenly split at thirty-eight percent who answered a great deal or a moderate amount. Twenty percent said occasionally, and four percent said rarely.

Table 1: Distracted When Driving
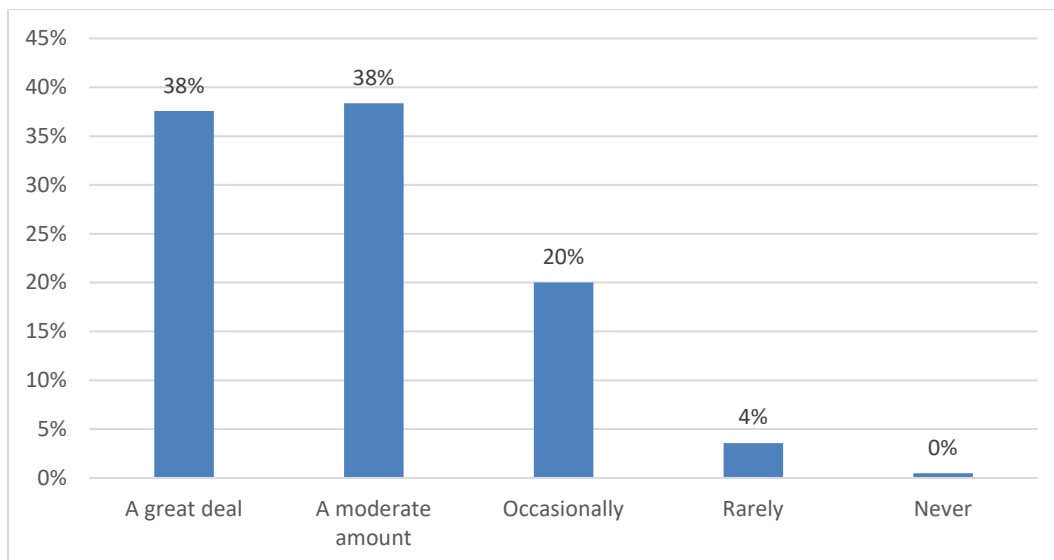
Question 4: Which devices do you feel causes the most distraction while driving?

This question asked the respondents which devices they feel cause the most distraction while driving. Six hundred and ten people answered the question and twenty-four people skipped the question. They were given six items to choose from and had to rank them from 1 being the highest to 6 being the lowest. Laptop computer/MCT software was the highest ranking with fifty-seven percent, followed by personal cell phone at seventeen percent.

Table 2: What causes distraction?
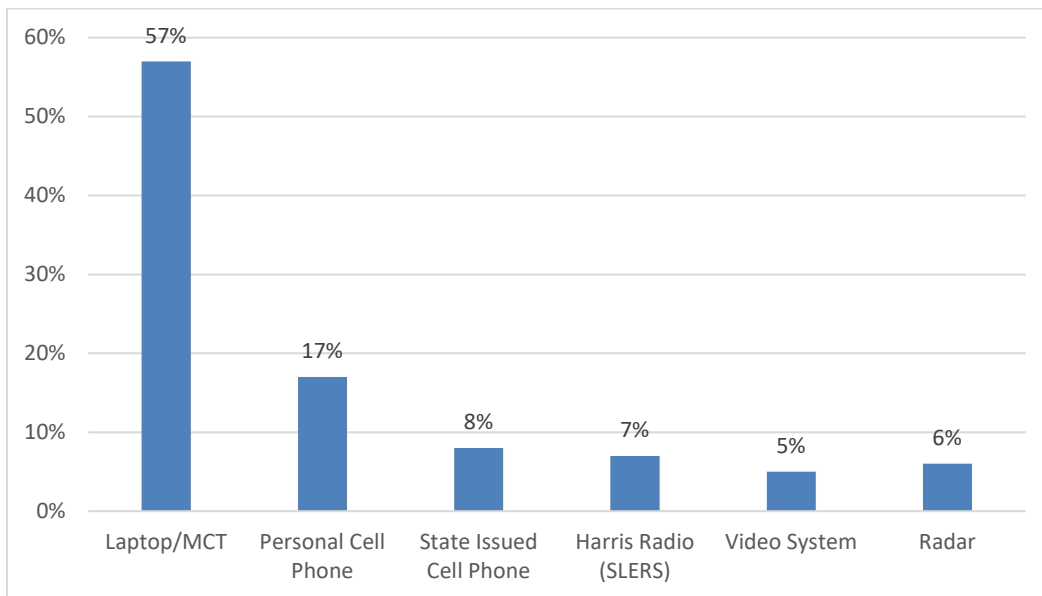
Question 5: Do you feel that the laptop is mounted in the best location in your patrol vehicle for user ergonomics (i.e. is the laptop easy to use)?

The purpose of this questions was to get feedback on the mounting location of laptops in the vehicle. Six hundred and fourteen answered the question and twenty people skipped the question. Seventy-six percent of respondents stated that the computer was mounted in the best location. Twenty-four percent stated it was not located in the best location. If the respondent selected yes, they were sent to question number seven. Those respondents that selected no were sent to question six.

Question 6: Please explain what mount configuration would have worked better for you.

This question was an open text field that allowed respondents to enter what they wanted to see in a mount configuration. One hundred and thirty-seven respondents entered information. The below chart shows the most common themes in their responses.

Thirty-one percent of respondents want to have a mount that is closer to the driver so that they do not twist as much to type on the computer. Twenty-five percent of respondents want the mounts to have more adjustments so that they can adjust the mount

to better suite their individual preferences. Eighteen percent want the laptop to be mounted in the center of the vehicle and ten percent want the ability to move the laptop directly in front of them when stopped to type reports. The sixteen percent categorized as other are a mixture of responses that were not relevant to the question. Most other responses were related to smaller computers that take up less room, tablet style devices, and having a keyboard that is separate from the laptop.

Table 3: Better Mount Configuration
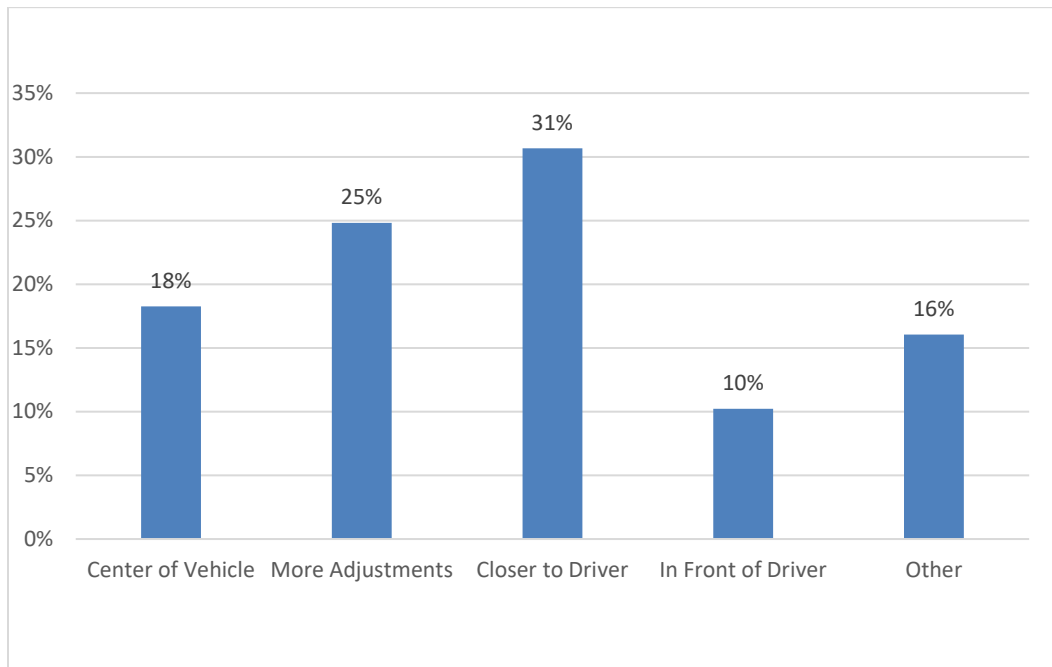
Question 7: How often do you use the touch screen of the laptop for entering information?

      The purpose of this question was to determine the number of users that use touch screen technology on their issued laptops Thirty-one percent of respondents never use the touch screen and twenty-nine percent rarely use the capability. Eight percent of users usually use it and only three percent always use it. Six hundred and fourteen people answered the question and twenty skipped it.

Question 8: Have you had any pain or discomfort due to the location of the laptop in your patrol vehicle?

      The purpose of this question is to determine if respondents have pain or discomfort that they attribute to the current location of the laptop. The question allowed for multiple selections, six hundred and eleven responded and twenty-three skipped the question. The respondents chose back pain and neck pain for the most pain or discomfort caused by the laptop location.

Table 4: Pain or discomfort due to laptop location
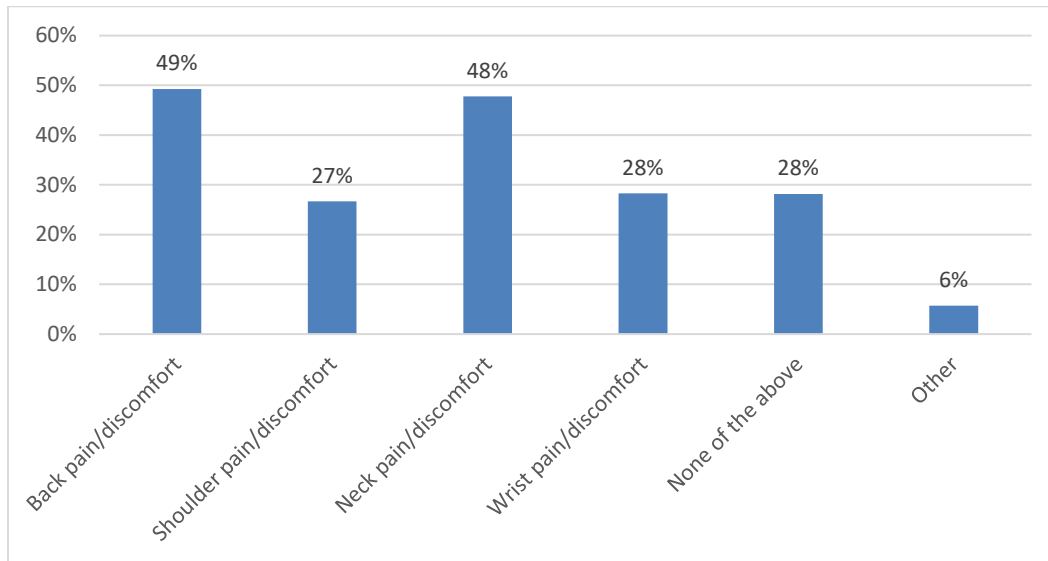
Question 9: Please check the picture for the mount that you prefer in your patrol vehicle.

The question asked respondents to look at two separate photographs and choose the lap top mount they think is a preferred mount location for their vehicle. Picture 1 is of the most common mounting location in police vehicles. Picture 2 depicts a newer dash mount that moves the computer more to the center of the vehicle and closer to the driver. Five hundred and seventy respondents answered the question and sixty-four skipped it. Most respondents, fifty-seven percent choose, picture 2 as the preferred mounting location.


Picture 1
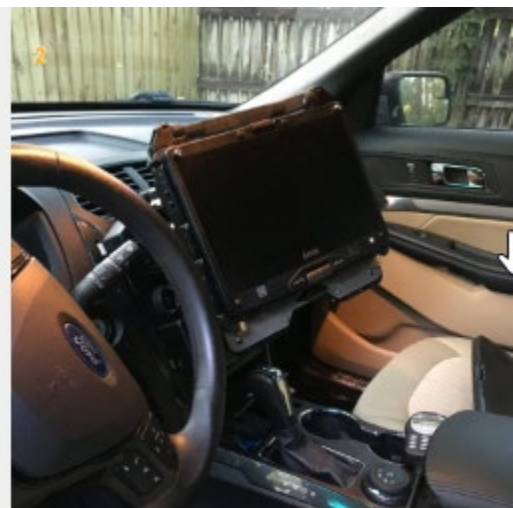
Picture 2

Question 10: What features of SmartCop MCT software do you use the most while driving?

This question asked respondents which features of the MCT software they use the most while driving. Five hundred and ninety-three respondents answered the question and forty-one skipped it. Most respondents, forty-seven percent, identified the mapping feature was used the most followed by vehicle queries at twenty-seven percent. CAD lookups and queries was identified as twenty-three percent.

Table 5: Most Used Features of the MCT Software
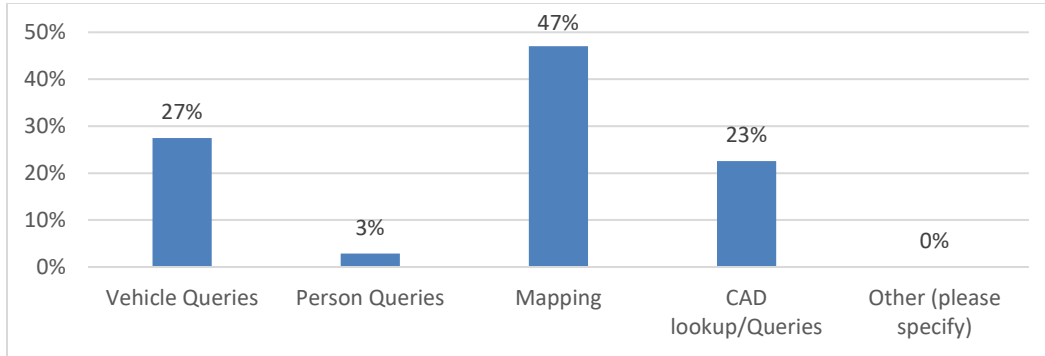
Question 11: Overall, how easy is it to read different query responses in MCT software while driving?

This question was asked to determine how easy it is for the respondents to read the text-based query responses on the MCT while driving. Six hundred respondents answered the question and thirty-four skipped it. Thirty-six respondents stated that it was difficult to read the responses. Thirty-two percent of respondents choose neither easy nor difficult, while only four percent of the respondents find the responses very easy to read.

Table 6: How Easy is it to Read MCT Responses
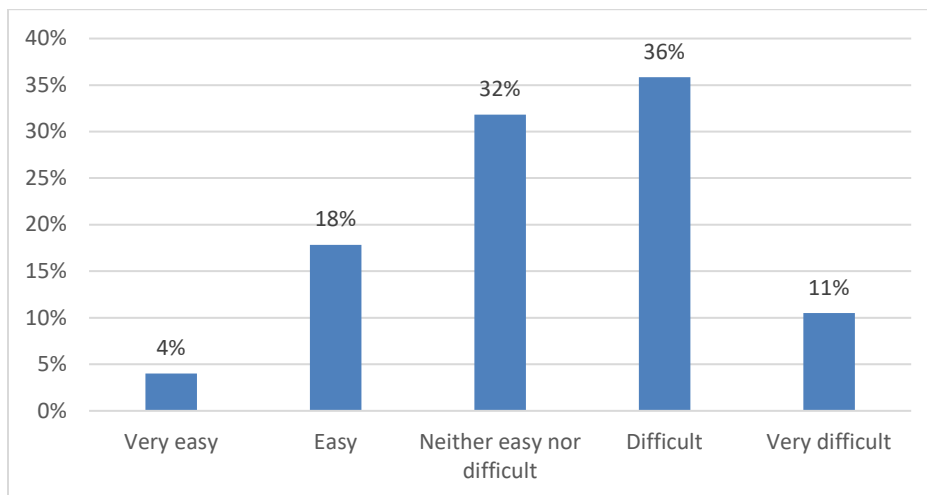
Question 12: How would the ease of reading the query response depicted here compare to the current query display?

This question showed respondents a mockup of a summary response of a vehicle query, where the text-based return was reorganized, and certain information was highlighted to make the response easier to read. Six hundred and four respondents answered the question and thirty respondents skipped the question. Sixty percent of respondents choose much easier to read and thirty-three respondents choose somewhat easier.
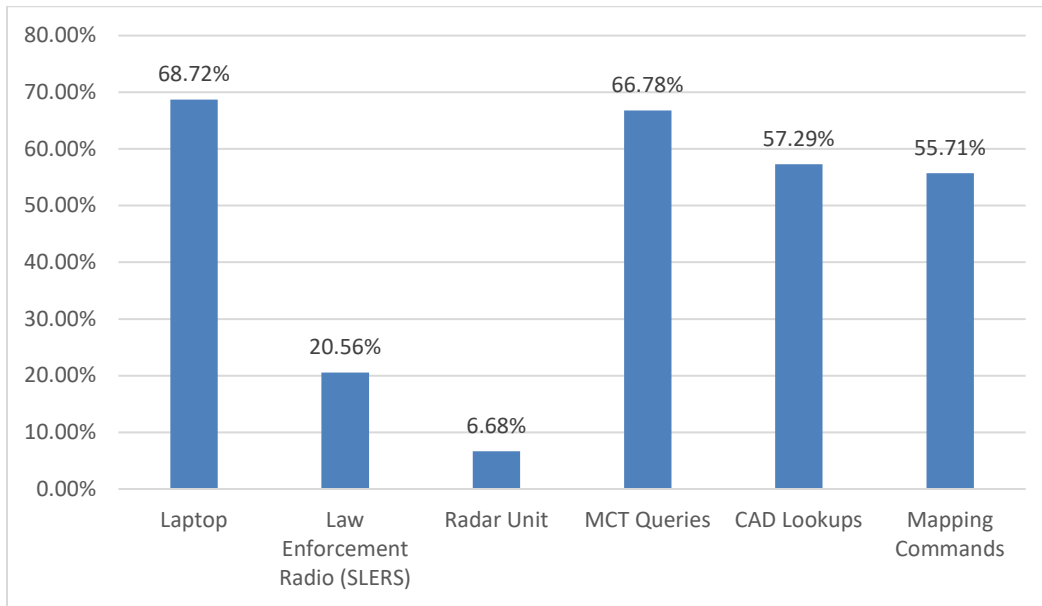
Table 7: How easy is it to read summary response
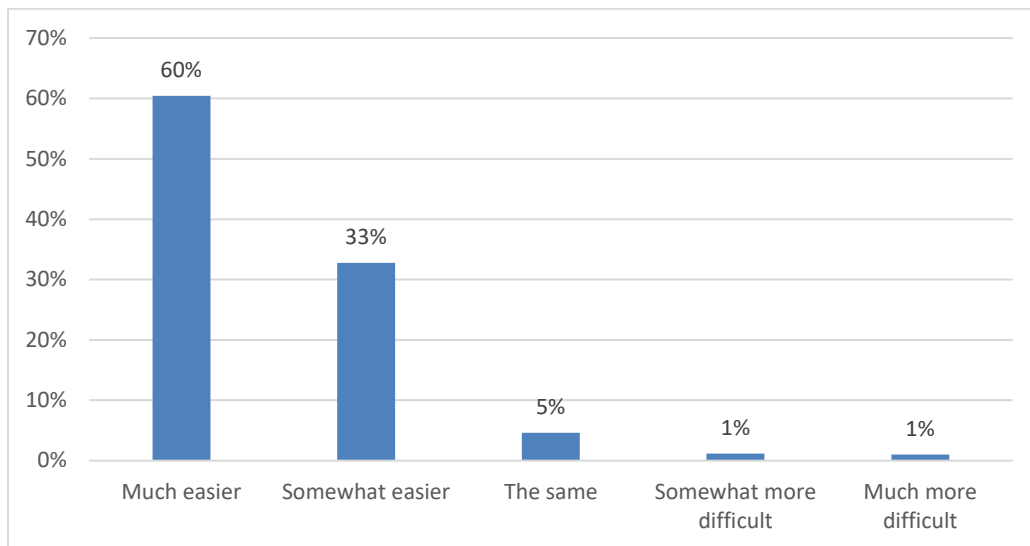
Question 13: How beneficial would it be to have the ability to use your voice to control different technology items in the patrol vehicle?

This question was asked to get feedback on the possibility of using voice recognition to control different technologies that are in the patrol vehicle. Six hundred and six respondents answered the question and twenty-eight skipped the question. A total of sixty-two percent of the respondents think it will be extremely or very beneficial to have this ability while twenty-six percent think it will be somewhat beneficial.

Question 14: Which technology items would you like to have the ability to control with spoken commands?

This question was to solicit ideas from the respondents on what they would like voice recognition to control. Five hundred and sixty-nine respondents answered the question and sixty-five people skipped it. Respondents could choose multiple items. Most respondents want the ability to control the laptop and features of the MCT software.
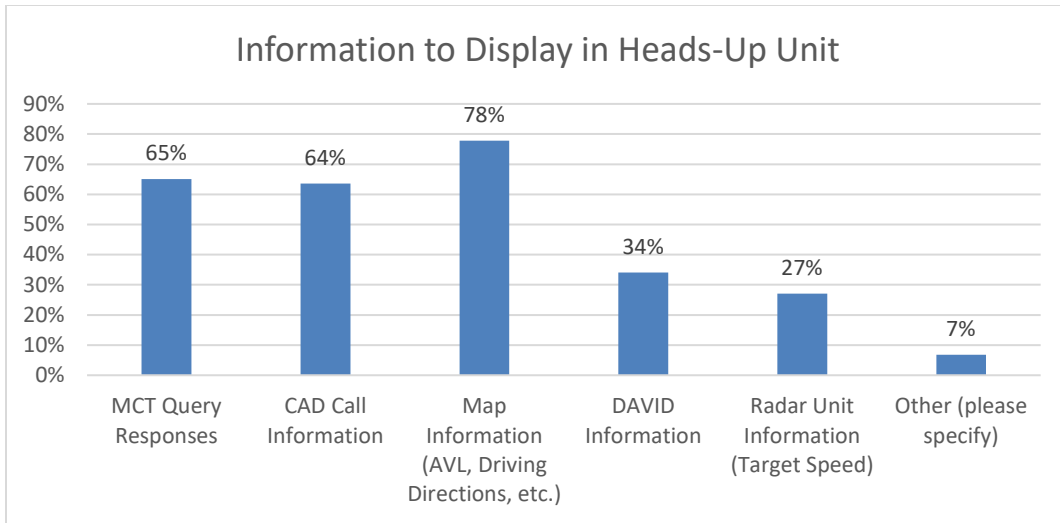
Table 8: Items to control with voice recognition

Bar chart showing percentages for items to control with voice recognition: Laptop 68.72%, Law Enforcement Radio (SLERS) 20.56%, Radar Unit 6.68%, MCT Queries 66.78%, CAD Lookups 57.29%, Mapping Commands 55.71%.

Question 15: How beneficial would it be to have a Heads-Up Display in your patrol vehicle while driving?

This question was asked to find out if the respondents think that a heads-up display would be beneficial in the patrol vehicle. Six hundred and five answered the question and twenty-nine skipped the question. Sixty-five percent of the respondents think that a heads-up display would be extremely or very beneficial and twenty-six percent think it would be somewhat beneficial.

Question 16: If you had a Heads Up Display unit in your patrol vehicle, what information would you want the ability to display?

This question was asked to solicit input on what the respondents would like to have displayed in a heads-up display unit. Five hundred and ninety respondents answered the question and forty-four skipped the question. Most respondents want to see information from the MCT displayed in the heads-up unit. Seventy-eight percent want map information while sixty-five and sixty-four percent want query responses and CAD call information, respectively.

Information to Display in Heads-Up Unit

Category	Percentage
MCT Query Responses	65%
CAD Call Information	64%
Map Information (AVL, Driving Directions, etc.)	78%
DAVID Information	34%
Radar Unit Information (Target Speed)	27%
Other (please specify)	7%

Discussion

Responses to the survey and research confirm the problem of distracted driving by law enforcement officers. A total of seventy-six percent of survey respondents say they are distracted a great deal or a moderate amount while driving. The largest identified item in the patrol vehicle that causes distraction is their agency issued installed laptop computer. This is causing not only an officer safety issue but also a safety issue for the public because officers are driving distracted.

Given that law enforcement has become accustomed to the readily available information provided by installed laptops, it would be difficult to eliminate this technology without discovering a safer alternative. Officers need to have instant access to information being supplied by the Computer Aided Dispatch (CAD) system to include wants and warrants information, map location of incidents, and officer locations. This information allows law enforcement to respond to calls for service faster with the essential real time information needed to safely and effectively do their job.

An option in minimizing distracted driving is moving the existing laptop mounts to a better location inside of the vehicle, thus allowing the officers to more easily see and interact with it. Most laptop mounts in vehicles are on a post mount that is attached to the passenger seat floor with bolts. This causes the laptop to be located to the right of the driver and, depending on the vehicle type, can cause the officer to have to stretch and contort to reach the laptop. For example, a laptop mounted in a pickup truck will be further away from the driver than a laptop installed in a sedan type vehicle. This type of mount requires the driver to look to the right and downwards taking their eyes off the road. By moving the mount to a more central and forward location in the vehicle will allow the driver to see the laptop screen and still see the road through their peripheral vision albeit not the safest solution when driving.

When respondents to the survey were shown two different computer mounts, one being a traditional mount location and one being center mounted over the dash, fifty-eight percent choose the second option as a better choice. Four hundred and thirty-nine of the respondents reported some type of pain or discomfort from using their laptops while

seated in patrol vehicles. The biggest complaints were back and neck pain and discomfort from twisting in the seat. A mount that is more centrally mounted and closer to the driver should cut down on the amount of twisting and stretching needed to interact with the laptop.

Another option to minimize distracted driving is to ensure that the software used while driving is easy to read and understand. All agencies that were surveyed use the same Mobile Computer Terminal software. The survey asked respondents which features of the software they use the most while driving and forty-seven percent choose mapping and twenty-seven percent choose vehicle queries. These two features need to be simplified to minimize the amount of time spent looking at the laptop screen or interacting with it to obtain necessary information.

The current mapping application in the software needs to be better optimized to allow the officer to quickly find what they are looking for. There also needs to be an easier way to create a driving route from the officer's current location to either a call for service or another officer. Making these changes will allow officers to safely arrive to a location faster while focusing more on the road rather than trying to read the map for their next turn location.

The most common query used while driving is the vehicle query. The query return is text based and takes time to learn how to read it quickly while driving. If the query return was displayed as a summary return while the vehicle is in motion and only displays the required information, it would be easier and faster to read. The summary return should return the necessary info and highlight important information like expired registration or an active want/warrant. This would allow the officer to keep their eyes on the road more while getting the necessary information prior to a vehicle stop or making the decision to stop the vehicle.

Another option to minimize distracted driving is to look at current and future technologies that can be adapted to the patrol vehicle. In recent years there have been a great deal of advancements on how computers operate and how we interact with them. The days of solely using keyboards and mice is giving way to touch and voice control.

One of the current technologies that is currently available is software that minimizes what can be done on a computer when it is motion. This technology is currently being used in commercial fleet settings and in some law enforcement agencies. The software works by either using an accelerometer or a GPS that plugs into the laptop. Once activated the software can control which software applications the user can access and interact with or make the laptop unusable while moving. The application is controlled by an administrator that sets up and controls which software applications can operate while driving. The biggest issue with these software applications is the configuration and finding the right balance between what information should and should not be accessible by the officer.

It is incumbent on the agencies to test and evaluate solutions that are available to minimize distracted driving. This will increase officer and public safety and lower liability to the agency in vehicle crash incidents.

Recommendations

Based on the results of this research paper the following recommendations are being made:

Explore changing the location of installed laptops in patrol vehicles. Every vehicle is different so a setup that works in one vehicle might not work in another. The ergonomics of officers needs to be considered to ensure that using the computer does not require them to twist or sit in uncomfortable positions to work on the laptop. Proper placement of laptops can alleviate pain and injury which will promote more usage by officers.

Effectively communicate concerns and issues with the agency's MCT vendor regarding changes to their software that would make it more user friendly and reduce the number of clicks to perform routine tasks while driving. Also look at changing the query results to make them easier to read while driving.

Explore existing technology that limits what can be done on the laptop while moving to see if it will work in the patrol environment. These types of solutions are usually software and hardware based. The software is configured by a central administrator that allows certain software to run or can make the laptop inoperative while the vehicle is in motion. The biggest issue with these solutions is the users ability to defeat the software by unplugging the device that senses when the vehicle is in motion.

A future technology that needs more work in a law enforcement setting is voice control. In past few years the use of voice assistants has increased exponentially, mainly in the home setting. These devices allow the user to play music, activate smart home devices, ask questions, etc. With more work, this technology can be moved into the patrol car and be used to control the laptop and associated software, change the radio channels on police radios, activate radar units, etc. Some MCT software currently allows the user to run tags by using voice control, but due to ambient noise and substandard microphones, the user must use a dedicated boom microphone to get good results. A computer manufacturer recently started adding additional microphones to their laptops to allow the laptop to better pick up voices. Using voice commands to run queries and interact with the mapping application will allow officers to keep their eyes on road.

Another future voice technology that is being developed is a heads-up display unit for patrol vehicles. The system uses a projector mounted to the roof of the vehicle and projects down on a special mirror suction cupped to the windshield. The system connects to the laptop which runs a special software that allows the user to define what applications it wants displayed on the screen. This system allows for the officer to keep looking forward out the windshield and still see a small display with needed information. The system also has voice control to allow the officer to change screens, run queries, etc. all without taking their eyes off the road.

Attend various technology and fleet conferences to be kept abreast of emerging and new technologies as they become available. These conferences allow you to see multiple vendors in one location and talk to them about changes in the marketplace without the pressure of purchasing.

Captain Chris Sella has worked for the Florida Fish and Wildlife Commission since 1994. He started as a Wildlife Officer in Broward County and was promoted to Investigator in 1998 in Miami-Dade County. In 2001 he was promoted to Lieutenant in Palm Beach County. In 2006 he moved to Tallahassee to work in the Support Services Section. He was promoted to Captain in 2013 and currently supervises the Technology Services Section for the Division of Law Enforcement.

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Appendix A

Survey Questions

Introduction:

The purpose of this survey is to understand State Law Enforcement Officers' perceptions about distracted driving and use of technology to minimize distraction. It should take just about 5 minutes to complete. The survey is anonymous and confidential, i.e., your identity will not link to your answers. Your participation is voluntary, there are no right and wrong answers, and you can skip any questions that you do not want to answer. Your response will be helpful for future planning of mounting equipment in vehicles and to explore future technologies.

1. Which agency do you work for?
     Florida Fish and Wildlife Conservation Commission
     Florida Highway Patrol
     Agriculture and Consumer Services
     Bureau of Fire, Arson and Explosives Investigations

2. What type of vehicle do you primarily drive while on duty?
     Sedan
     Pickup
     SUV
     Other

3. In your opinion, how often do law enforcement officers get distracted when driving a duty vehicle?
     A great deal
     A moderate amount
     Occasionally
     Rarely
     Never

4. Which devices do you feel causes the most distraction while driving? Please rank from 1 (high distraction) to 6 (little to none distraction)
     Laptop Computer/Mobile Computer Terminal (MCT)
     Personal Cell Phone
     State Issued Cell Phone
     Harris Radio (SLERS)
     Video System
     Radar

5. Do you feel that the laptop is mounted in the best location in your patrol vehicle for user ergonomics (i.e. is the laptop easy to use)?
     Yes
     No

6. Please explain what mount configuration would have worked better for you. (only asked if they answered no to question 5)

        Free text box for entering answer

7. How often do you use the touch screen of the laptop for entering information?

        Always
        Usually
        Sometimes
        Rarely
        Never
        N/A (issued laptop does not have touch screen capabilities)

8. Have you had any pain or discomfort due to the location of the laptop in your patrol vehicle? Check all that apply.

        Back pain/discomfort
        Shoulder pain/discomfort
        Neck pain/discomfort
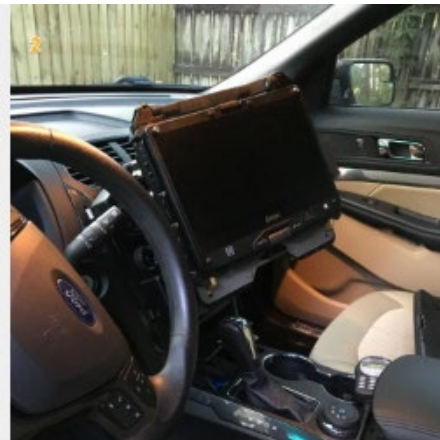   Wrist pain/discomfort
        None of the above
        Other (Please specify)

9. Please check the picture for the mount that you prefer in your patrol vehicle.

Picture 1

Picture 2

10. What features of SmartCOP MCT software do you use the most while driving?

        Vehicle Queries
        Person Queries
        Mapping
        CAD lookup/Queries
        Other (Please specify)

11. Overall, how easy is it to read different query responses in MCT software while driving?
> Very easy
> Easy
> Neither easy nor difficult
> Difficult
> Very Difficult

12. How would the ease of reading the query response depicted here compare to the current query display?
> Much easier
> Somewhat easier
> The same
> Somewhat more difficult
> Much more difficult

13. How beneficial would it be to have the ability to use your voice to control different technology items in the patrol vehicle?
> Extremely beneficial
> Very beneficial
> Somewhat beneficial
> Not so beneficial
> Not at all beneficial

14. Which technology items would you like to have the ability to control with spoken commands?
> Laptop
> Law Enforcement Radio (SLERS)
> Radar Unit
> MCT Queries
> CAD Lookups
> Mapping Commands

15. How beneficial would it be to have a Heads Up Display in your patrol vehicle while driving?
> Extremely beneficial
> Very beneficial
> Somewhat beneficial
> Not so beneficial
> Not at all beneficial

16. If you had a Heads Up Display unit in your patrol vehicle, what information would you want the ability to display?

> MCT Query Responses
> CAD Call Information
> Map Information (AVL, Driving Directions, etc.)
> DAVID Information
> Radar Unit Information (Target Speed)
> Other (please specify)

17. Thank you for taking the time to complete this survey. Do you have any additional comments or recommendation to help reduce distracted driving within law enforcement?

> Free text responses