

**Optimization of VDOT Safety Service Patrols to Improve VDOT Response to Incidents**

(Technical Paper)

**Social Responsibility to Investigate Radicalized Posts in Online Chat Forums**

(STS Paper)

**A Thesis Prospectus Submitted to the**

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On my honor as a University Student, I have neither given nor received  
unauthorized aid on this assignment as defined by the Honor Guidelines  
for Thesis-Related Assignments

## **Introduction**

On September 1, 2019, the number of mass shootings in the United States in the year was greater than the number of days in the year. On this day, there had been 283 mass shootings over 244 days, averaging 1.16 mass shootings a day (Silverstein, 2019). Mass shootings have become an increasingly large problem in the United States, and throughout the world, through radicalized views of individuals who decide to act on these views. If there was more of a social responsibility on individuals, the government, gun manufacturers and regulators, and the administrators of radicalized chat forums to investigate alarming posts that pass a certain threshold of likelihood to act, mass shootings could be mitigated before they take place. Additionally, if the public was brought into a discussion of why or how individuals joined these chat rooms and through what methods they were radicalized or radicalized others, the behavior could be controlled or better understood. This includes understanding individuals' backgrounds or history, individual traits or relationships with others (Costello, 2019). The STS topic proposal will focus on understanding the social responsibility of individuals and groups to investigate radicalized posts on online chat forums that have a strong likelihood to be acted upon.

The second topic of this proposal is the technical capstone which works with Virginia Department of Transportation in their Safety Service Patrol department to improve traffic and traffic control in the state of Virginia. Through optimization of the Safety Service Patrol vehicles through major highways in the state of Virginia, the response time to arrive at disabled vehicles and the clearance time to get these vehicles back on the road will be minimized. The update of these routes will ideally take current Safety Service Patrol routes that are largely based off of conjecture and transform them to the most ideal routes. In turn, traffic delays will be minimized, and travelers on the roads in the state of Virginia will spend less time in transport.

## **Technical Topic**

The Virginia Department of Transportation manages all aspects of transport throughout the state, from roadways to bridges, maintenance to new development. The department receives funding from the state and works with other agencies to maintain safety across the state. VDOT funded Safety Service Patrol Vehicles to assist in traffic control and general safety assistance. The purpose of the SSP program is “to promote the efficient and effective flow of traffic through effective incident detection, verification, and notification to appropriate agencies to initiate rapid clearance of an incident,” (Edara, 2006). SSP patrols in areas with high motorist density and fast-paced traffic patterns put greater emphasis on the benefits associated with reduced travel delays and number of secondary incidents. Patrols in rural regions direct greater efforts towards improved safety for motorists in distress while maintaining a high standard of upholding safety for incident responders and improved transportation system security. While geographic differences lead to unique priorities of their mission set, SSP programs are outfitted to conduct a core set of five functions, defined as: detection/verification and response, scene management, traffic management, incident clearance, and motorist information (Edara, 2006).

Today, the VDOT SSP program is comprised of five operating regions, with a fleet of 168 vehicles covering approximately 846 miles of major interstates, including I-95, I-64, I-81, and I-66 (Virginia, 2019). A patrol is tasked with servicing a designated range of roadway for the duration of the 8-hour shift period, and will receive and respond to reported incidents via the traffic operations center. The SSP vehicle program faces inefficiencies and constraints in their route selection and scheduling process. With their core function to assist traffic control and help travelers navigate the scene safely, VDOT measures the performance of their program using metrics of how quickly they can arrive on the scene and how quickly they can clear the scene.

The team must use these metrics to help create an optimal schedule wherein response time to a scene and roadway clearance is minimized while the number of incidents responding to is maximized (Porter, 2019). This new schedule will help VDOT use their resources efficiently and keep Virginia moving.

The team will approach the route optimization in two phases of analysis. In the first phase, the team will evaluate the current SSP routes based on Response Time and Roadway Clearance Time. The evaluation will include an investigation on where the accidents are primarily occurring and their detection sources. The comparative analysis of current and previous routes will help foster new insights surrounding route optimization. Given Response Time is in control of VDOT personnel, the team will use this metric to measure performance of the routes. Additionally, one of the core goals of the SSP program is to help minimize incident duration through traffic management (Truitt, 2019). Therefore, the team will also use Roadway Clearance Time as a secondary metric. In cases of more severe incidents, VDOT personnel largely serve to assist emergency responders and state police with traffic management (McCann, 2019). Roadway Clearance Time is not purely a reflection of SSP performance in these situations and thus will not be prioritized as heavily as Response Time.

In the second phase of analysis, the team will work towards an SSP schedule with one driver on each route. This new schedule will account for gaps in current routes and recommend routes in order to minimize the median response time. It will also identify areas of high Response Times and locations with a high volume of incidents, both indicators of greater SSP demand. The recommended schedule will break Interstate 95 into patrol routes that minimize median Response Time of an SSP to an incident. Patrol routes will be described by mile markers, and time of operation will specify the hours of the day in which one SSP vehicle will

be on patrol. VDOT will be provided with an evaluation of their current route and proposed route and schedule updates to minimize traffic and delays in Virginia.

### **STS Topic**

The number of mass shootings, specifically in the United States has risen dramatically over the past decade (Densley, 2019). In this paper, a mass shooting is defined as four or more people shot or killed, not including the shooter (General Methodology, 2019). In addition to mass shootings becoming more common, there has also been an increase in the number of deaths per shooting. According to the National Institute of Justice, “sixteen of the 20 most deadly mass shootings in modern history occurred in the last 20 years” (Densley, 2019). Many mass shooters are referred to as having mental problems; for example, the Las Vegas shooter was described as “a sick man, a demented man, lot of problems, I guess” or they are described as “very, very sick individual[s]” (Trump, 2017). The news and other forms of media often describe these shooters as people who are sick and one day decide to snap. In reality, the mass shootings in recent years, such as the shootings in Christchurch and El Paso, are extensively planned out and manifestos are even posted online with intent and description (Arango, 2019). With increased awareness of demographics of people that are more vulnerable to radicalized language and behavior, people will start to understand this behavior and be more aware of how they relate to it themselves. Individuals will also be able to understand how the media can have an impact on their opinions through things like response to terror attacks and inflammatory language by political figures that may be misconstrued and be cautious of the resources they are using for news (Kaakinen, 2018).

There are multiple stakeholders in mass shootings that reach far beyond just the shooter themselves. Firstly, the government has the ability to intervene with policy laws if they choose to do so and government influencers, such as the president, have the ability to respond to the acts in

a way that will set the tone for the American people. It is clear that in some online scenarios, the rhetoric of the shooters echoes the language of the current president, Donald Trump, indicating that his influence has reached groups of extremists (Baker, 2019). Secondly, social media and news coverage of the events act as some level of influence in the event. For example, in the case of the El Paso shooting, “the manifesto was reposted and mentioned on 8chan and other fringe social media sites more than 750 times, according to Storyful, a social media analytics company” as well as being mentioned at least 77,000 times on more mainstream sites (Wells, 2019).

Thirdly, administrators and system providers of the online forums where the manifestos are posted and hateful radicalization festers have an ability to control what is posted on their sites. The founder of 8chan, Frederick Brennan, suggested that the new owner “shut the site down” after the El Paso shooting was directly linked to the shooting. Though the new owner of 8chan did not initially shut the site down, there are other stakeholders involved in keeping the site up, such as service providers like Cloudflare with 8chan (Roose, 2019). Though these sites may stop the radicalization for the moment, it cannot stop the language entirely as users can move from one chatroom freely to the next, and perhaps even to a chat room that is private or encrypted, where the general public does not have the ability to see warnings about the rhetoric. Additionally, the gun manufactures and those involved in protecting gun rights are stakeholders, such as groups like the National Rifle Association. Lastly, are those others on the online forums that are radicalized themselves and offer praise and perhaps motivation to the shooters. The comments these people make include praises for getting a certain number of kills or mockery for not shooting more of a certain demographic of people or number (Wells, 2019).

Actor Network Theory is a method of understanding the relationships between actors within a defined network (Cressman, 2009). When applying the Actor Network Theory to mass

shootings, all of these actors (government, social media, system administrators, gun manufacturers and legislators, and extremists) each play a role as actors in the network. Online forums act as the network through which many of those with radicalized views interact and gun act as the object, or perhaps actor, through which the shooter performs the act.

While Actor-Network Theory can be helpful in framing the use of online forums in mass shootings, there have been some critiques of the theory in recent years framed as Post-ANT. Some of these critiques suggest that the framework of ANT is not concerned with morality, which is particularly important when applied to the topic of mass shootings. Gad and Jensen note that there is an “apparent dissolution of independent actors with morality and intentions in a “play of forces” in which no change through human intervention seems possible” when applying the ANT framework (Gad, 2009). Through this research, perspective will be gained on what are some of dispositions that individuals have towards acting this way and where the social responsibility can be emphasized to minimize the behavior of hateful radicalism that leads to mass shootings.

### **Research Question and Method**

Is there a method to keep people with radicalized views who post about them online from becoming radicalized in the first place to the point that they will act, and if it is possible to prevent them from being radicalized, radicalizing others? Additionally, on what level should the responsibility lie to intervene when hateful rhetoric is being used that sounds like it is going to be acted on? What steps should be taken by those responsible people, whether it be on a governmental level or interpersonal level, and what are indicators of this radicalization?

Through interviews with professors at the University of Virginia, such as David Nemer, who studies Alt-Right movements and social media, insight will be revealed on why these

radicalized people act and how and why there is a following behind these individuals. This interview will discuss why the movement has gained a following on chat forums specifically, what the greater social implication from and causes for the movement are, and what policies or procedures he sees as beneficial to minimizing the number of shootings going forward.

Additionally, historical case studies of individual mass shooting events will be explored to understand those individual the shooters motivations and processes. Specifically, in the case of the El Paso mass shooting, the shooter posted on the online chat forum 8chan about the intent of his actions beforehand (Glaser, 2019). The Dayton shooting, which took place within a day of the El Paso shooting, will be investigated individually and in connection to the El Paso shooting. The Christchurch shooting, which also was posted about on 8chan will be investigated. Policy analysis will be used to understand what the legalities are of intervening in hateful rhetoric online, where the government has the ability and right to step in, and what role of the administrators of website that support the chat forums are. Much of this discussion will likely explore the reality that is the freedom of speech on the internet and the right to protest in the United States (Internet Speech, 2019).

## **Conclusion**

The capstone team will deliver an optimized route to the Virginia Department of Transportation that will utilize the Safety Service Patrol vehicles to minimize traffic. This project is twofold, first, by looking at the current schedule of SSP vehicles and gaining a current understanding of incidents. Secondly, the team will create new routes to minimize Response Time and Roadway Clearance Time and apply these routes to individual SSP vehicles that can use them for their daily or weekly scheduled routes. The optimization will minimize travelers



time spent on major 95 highways through the state of Virginia through minimizing traffic, accidents, secondary accidents, and getting individual motorists back on the road faster.

The STS project will investigate of the impact of online forums on mass shootings and how different groups can respond. Insight will arise on who should take on the social responsibility of radicalized behavior. Additionally, an understanding will be gained about how radicals views become radicalized through disposition to the behavior or history, why these people go to the internet, and how the behavior spreads.

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