



MEETING HIGHLIGHTS:

Lane Departure Crashes and the Safe System Approach

Friday, October 1, 2021

10:00 AM – 12:00 PM

Presented Via Zoom; 46 attendees

All presentations and related meeting handouts are located on the RSTF Website:

www.dvRPC.org/Committees/RSTF

Welcome Remarks

The meeting was called to order at 10:00 AM by Marco Gorini, DVRPC, and Patricia Ott, MBO Engineering, LLC and RSTF co-chair.

Ms. Ott first reiterated the goal of the RSTF: to reduce roadway crashes and eliminate serious injuries and fatalities from crashes in the Delaware Valley. Ms. Ott echoed a sentiment that has been discussed in previous RSTF meetings: this event is part of a continuing conversation at DVRPC and that all previous meeting summaries can be found on the DVRPC webpage. The Strategies discussed in the previous RSTF Strategies session will be incorporated into the Transportation Safety Analysis & Plan (TSAP). Additionally, Ms. Ott encouraged all participants and RSTF partners to engage with RSTF materials via social media, especially as the full TSAP Storymap will be published early next year.

Kevin Murphy, DVRPC, presented an overview of the Killed and Serious Injury (KSI) trends that have been discussed in previous RSTF meetings and introduced the emphasis area of Lane Departure Crashes. Mr. Murphy highlighted the unusual trends in crash rates that emerged in 2020, with a significant spike in fatalities despite significantly fewer cars on the road. He also discussed analysis on lane departure crashes in the region, which account for the greatest proportion of killed and severe injury crashes in Bucks, Burlington, and Chester counties. Mr. Murphy then introduced the presenters: Marshie Agee, Insurance Institute for Highway Safety (IIHS), and Maxwell Moreland and Ethan Peterson, Minnesota Department of Transportation (MnDOT).

Presentation 1: Marshie Agee, Insurance Institute for Highway Safety

Ms. Agee began her presentation with the statistic that 94% of collisions are caused by human error, which informed the basis for the assumption that switching to driverless vehicles would therefore drastically reduce crashes. Ms. Agee then reflected on how the industry has overestimated their timelines for integrating driverless cars into public use. In the meantime, the Insurance Institute for Highway Safety has improved safety measures through a Top Safety Pick awards system that effectively incentivized 20 manufacturers (99% of the market) to meet the autorebreak standard by 2022, years ahead of federal

regulations (autobreak is designed to avoid collisions by safely engaging the brakes when a potential collision is detected). Now, vehicles at all price points have automated safety measures, including lane departure technology.

Ms. Agee used insurance data to demonstrate how automated safety measures reduced insurance claims in every category except for lane departure warnings. This may be explained by the nature of lane departure crashes ($\frac{1}{3}$ of lane departure crashes are due to incapacitation, which technology cannot fix) or due to an underutilization of the lane departure technology. This underutilization is the topic Ms. Agee explored through the question “what can we do to increase the use of these systems?” The answer included suggestions like: promoting the purchase of vehicles equipped with the technology, educating consumers on how to use and how to benefit from the technology, and designing systems to encourage greater use. Design changes may include a switch to tactical warning systems from the traditional auditory warning system, or increasing the steps it takes for the driver to turn the safety systems off. Ms. Agee concluded the presentation by bringing awareness to the current challenges of safety systems and proposed some data-driven recommendations to address them.

Presentation 1 Q&A

After concluding the presentation, Ms. Agee answered some questions from the chat, with Mr. Gorini's help moderating. The first question asked for an explanation on auto brake technology, to which Ms. Agee explained that the system applies brakes gradually with an eventual stopping point before the vehicle hits a perceived obstacle. These systems use a combination of radar and lidar to recognize hazards. The second question touched on the topic of the expense of this technology. Ms. Agee reiterated that these safety technologies were initially restricted to luxury vehicles, but the Insurance Institute for Highway Safety's advertisement of rating safety systems encouraged manufacturers to make the tech more widely available to the broader market. Additionally, the Insurance Institute for Highway Safety provides a platform for consumers to look up safety ratings by vehicle class and price points. A final question asked if there is any existing discussion on eliminating the driver's option to turn off various safety features. Ms. Agee agreed that there would be some in favor of such an elimination, but the driver acceptance wouldn't be very high and therefore it wouldn't be feasible.

Presentation 2: Maxwell Moreland and Ethan Peterson, Minnesota Department of Transportation

Mr. Moreland opened this two-part presentation with an overview of “Deployment Requirements, Design Elements, and Effectiveness of Various Rumble Designs.” He presented data collected by MnDOT’s recent evaluation of rumble strips on rural roads, including the frequency and context of crashes. Some limitations of this study included limited mileage of sinusoidal rumbles within MnDOT jurisdiction - most lane departure crashes, for example, occur in rural county-maintained roads - and lack of general knowledge of existing rumble installations. The results of the study do suggest that rumbles are a low-cost solution to lane departure crashes for all roads and should be prioritized in center lanes where there is heavier use and traffic.

Mr. Peterson continued the presentation by exploring the engineering perspective on different rumble strip types and standards. MnDOT conducted a noise evaluation on sinusoidal rumbles, which are designed to

minimize the ambient noise associated with the traditional rumble strip design. The noise evaluation of different rumble designs revealed the differences in noise within and outside the vehicle. Sinusoidal rumbles were concluded to be more suitable for urban or residential areas. An additional study for Sinusoidal Rumble Design Optimization evaluated different wavelengths/widths, noise, and motorcycle/bicycle traversability. Mr. Peterson concluded the presentation with the announcement that rumble standards and guidance will soon be released by MnDOT via PDF.

Presentation 2 Q&A

Gustave Scheerbaum opened with a question asking if there is data showing greater lane departure crashes depending on night and highway lighting situation. Mr. Moreland responded that in Minnesota, head-on crashes typically occur during the day and run-off road crashes occur equally at night and day, with roughly half of night-time crashes occurring in situations with low or no lighting. Currently, fatal lane departure crashes do not include data on lighting conditions. Sharang Malaviya of PennDOT asked if there have been any maintenance issues between sinusoidal versus corrugated rumble strips. The response was that it is hard to maintain pavement marking within rumble grooves, though Minnesota's use of recessed pavement markings (in effort to improve longevity with snow plow use) works well with the recessed sinusoidal rumble strips.

Special Strategies Breakout Rooms

Each of the four breakout groups discussed potential “action items,” with a focus on the Safe Systems Approach, that each person could take on to support the RSTF’s goal of reducing lane departure crashes in the region. These action items will be recorded and tracked by DVRPC, which will check in on the progress before future meetings. Discussion lasted approximately 30 minutes and began by discussing reactions to the presentations, following with discussion on potential action items.

In reaction to the presentations, breakout groups reiterated the importance of the following points:

- Encouraged and inspired by MnDOT’s leadership on rumble strips, especially with the consideration of noise production and ease of use for motorcyclists and bicyclists
 - Rumble strips as a preventative measure in contrast to safety edges designed to help post-crash recovery
 - Need to form better understanding of rumble logistics (noise and installation) within the context of PA/NJ since Minnesota is very different.
- IIHS has made considerable progress in contributing to the increased safety of new vehicles, but there is still more work to be done to ensure all models are able to stay within lanes even when there are inadequate markings for the technology to read. Additionally, this particular strategy of making roads safer is longer-term and dependent on consumer purchases and behaviors.
 - After-market systems that can be added to vehicles post-production (like Mobile Eye, an Israeli company) may provide a bridge from short to long term avoidance technology.
- It is important to consider drivers as users of lane departure and other crash prevention technology. The perception of the technology informs how drivers will or won’t use it, and these behaviors dictate how useful the deployment of this tech truly is at making roadways safer.

- A holistic approach would consider how factors like trust or demographics like age and gender may contribute to the use of these technologies.
- There may be opportunities to include tax incentives or insurance incentives to encourage user behaviors.

Some of the proposed action items included:

- Educating drivers on why it's important not to disengage safety features
- Researching examples of fleets where drivers could not disengage the safety features, like in fleets used by government, private companies, rental vehicles, and public transit systems. New Zealand was one such suggested case study.
- Identifying the safest and most efficient locations for rumble installations to reduce lane departure crashes in the region
- Conducting a post-deployment study of rumble strips, including a review of MnDOT work
- Requesting partnership with New Jersey's Strategic Highway Safety Plan for the Lane Departure Emphasis Area
- Highway Safety Improvement Program application for run-off-the-road crashes.
- Promoting National Injury Prevention Day (Nov. 18th)
- Promoting the "Stop The Bleed Program" – a post-crash care strategy. The program trains approx. 1,000 people a year.

After the sessions were finished, RSTF members left the breakout groups and returned to the main session.

Closing Remarks

After the strategy sessions, Sharang Malaviya, PennDOT, concluded the program with gratitude to the participants for participating in the program. The next RSTF meeting is scheduled for December 2021.

Meeting Attendee List

Marshie Agee, IIHS
William Beans, MBO Engineering
Edward Boothman, Highway Safety Network
Michael Boyer, DVRPC
Dana Dobson, City of Philadelphia
Brian Donovan, Chester County Planning Commission
Liz Feinberg, Public Participation Task Force
Maridarlyn Gonzalez, DVRPC
Keith Hamas, NJTPA
Morgan Hugo, PPTF/Liberty Resources
Benita Ikirezi, PCPC
Mohammad Islam, NJDOT
Mohammad Jalayer, Rowan University
Krys Johnson, PennDOT
Shari Leichter, NJMVC
Doris Lynch, Port Richmond Neighborhood Association
Kelvin MacKavanagh, DVRPC
Sharang Malaviya, PennDOT
Betsy Mastaglio, DVRPC
Mike Mastaglio, Urban Engineers, Inc.
Darrell Merritt, PennDOT
Maxwell Moreland, MnDOT
Kevin Murphy, DVRPC
Frank Neary, NJ DHTS
Tracy Nerney, Jersey Shore Regional Trauma Center
Christine Norris, Center for Injury Research and Prevention at Children's Hospital of Philadelphia
Suzanne O'Hearn, NJ DHTS
Patricia Ott, MBO Engineering, LLC
Ethan Peterson, MnDOT
Kaylen Phillips, DVRPC
Rena Pinhas, Montgomery County Planning Commission
Joseph Rapp, NJDOT
Lily Reynolds, City of Philadelphia
Moriah Richardson, Sam Schwartz Engineering
William Riviere, NJDOT
Judith Robinson, 32nd Ward RCO
Gustave Scheerbaum, City of Philadelphia
Ian Schwarzenberg, DVRPC
Laureen Sendel-Grant, Montgomery County Planning Commission
Jeevanjot Singh, NJDOT
Shereyl Snider, East Trenton Collaborative
Cathy Spahr, DVRPC
Tom Stanuikynas, Burlington County Bridge Commission
Mark Washington, City of Philadelphia
James Weist, Cherry Hill Police Department
Kelley Yemen, City of Philadelphia
Matthew Zochowski, Mercer County Department of Planning