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**New Car Assessment Program (NCAP)
Docket #: NHTSA-2021-0002**

This written submission is being submitted by Emergency Safety Solutions, Inc. (ESS), a Houston-based, advanced warning communication safety feature provider to the automotive industry, in response to the Request for Comments (RFC) issued by the National Highway Traffic Safety Administration (NHTSA) and published in the Federal Register on March 9, 2022, in which NHTSA requested comments on proposed updates to NCAP Performance Measures.

ESS appreciates the opportunity to publicly comment on the proposed updates to NCAP and a new technology, targeted to preventing rear-end collisions with disabled and other vulnerable vehicles sitting stationary on or alongside a roadway. The new technology also applies to the Roadmap for future additions and enhancements to NCAP as well as adding emerging vehicle technologies that can combat the issue of distracted driving.

ESS was created shortly after one of our co-founders, David Tucker, was nearly struck and killed while attending to his disabled vehicle in 2014. His vehicle was broken down and on the shoulder of a highway in Montana one evening. Dave had turned on his hazard lamps and climbed under the vehicle to assess a problem, when an oncoming 18-wheeler veered over, struck the side of the vehicle, and took off his sideview mirror – mere inches away from him.

SAFETY CASE

Unfortunately, the incident and near-tragedy that Dave experienced that evening happens far more often than most people realize. We commissioned Impact Research to perform an 11-year study of crashes whereby moving vehicles strike stationary, disabled vehicles and/or people attending to such vehicles, on or near the roadway across the US. At the conclusion of their data investigation, Impact Research published a peer-reviewed report, based on 11 years of NHTSA's FARS data and several years of relevant CRSS data; and unearthed a shocking set of revelations that had been previously hidden in NHTSA's data for decades. Between the years of 2016 and 2018, an average of 72,000 people were involved in preventable collisions between moving vehicles and stationary vehicles or people attending to them. For contextualized scale, that's about 200 people per day. These are folks who may have broken down, run out of gas, got a flat tire, have been in a crash and then were struck in a secondary collision while waiting for help to arrive, people involved in multi-vehicle pileups, and the like. Out of these 72,000 people, over 15,000 of them were either injured or killed in these incidents. That is over 40 people per day. (The complete peer reviewed Impact Research report can be viewed at:

https://uploads-ssl.webflow.com/60b5c894a4280bd54e3777b9/60e625868ab2ad5825b8e87c_Impact%20Research%20-%20Peer%20Reviewed%20US%20Safety%20Case.pdf.)

To put the fatality data into context, we are all familiar with the issue of emergency responders dying in struck-by collisions. In fact, according to Emergency Responder Safety Institute statistics, 2021 was the deadliest year on record for emergency responder struck-by incidents. Sixty-five brave emergency responders were killed last year while on scene and stationary, responding to an incident on the roadway. There are, rightfully, entire safety advocacy organizations and policy working groups who are singularly and passionately focused on solving the emergency responder struck-by death issue.

However, what is far less known, is that we also lose over 10 times this number of civilians in the SAME types of incidents. In other words, total number of struck-by collision deaths is over 11 times larger than everyone has historically thought. To make matters worse, this problem is growing at a steady rate of 10% per year.

We know all of this only because we spent tens of thousands of dollars and thousands of manhours to mine two separate databases – FARS and CRSS – to see how prevalent the issue of disabled vehicle crashes is across the population. Because the data in FARS is often inconsistent, Impact Research also had to access and review individual police reports to validate the results of their data queries. And because police reports do not capture all the necessary information – particularly the crucial ‘sequence of events’ data needed to determine whether a particular crash is relevant to the safety case, we know with certainty that our safety study is grossly understated.

DISPARATE IMPACT

Further investigation into the peer-reviewed safety statistics also uncovered an egregious equity issue, with an alarming disparate impact on lower income households, and on Black Americans in particular. Eighty percent (80%) of the victims of fatal crashes involving a disabled vehicle are from households that earn under the US median income. And, while African Americans represent just over 12% of the US population and 9% of the roadway population today, they represented 19% of the victims of these fatal disabled vehicle crashes during the studied period. This means that African Americans are twice as likely as the general population to fall victim to a FATAL disabled vehicle crash.

When you break the data down even further, African Americans are 2.5 times more likely than the general population to be struck and killed while attending to their disabled vehicle, such as changing a flat tire.

This is happening to African Americans because they are more likely than average to be economically-disadvantaged. As such, they are more likely to run out of gas, suffer engine failure, or have a flat tire. Furthermore, a disproportionate number of African Americans work in essential service jobs and shift work, that require them on the road for their commute after dark, which is when the overwhelming number of these incidents occur.

ROOT CAUSE

So, why is this happening? First and foremost, it took a long and expensive deep dive into the FARS, CRSS, and even police report data to even be able to quantify this safety case. No one realized that we had such a massive safety problem because it is masked by the way that data is reported and cut today. This analysis only happened because a private citizen, Dave Tucker, nearly lost his life, cared to look into it more deeply, and built a team that was willing to invest the resources into digging into the safety case. That needs to change. We should be collecting valuable information like this is normal due course, and it makes one wonder how many other, addressable safety cases may have been flying under the radar unnoticed like this.

In the case of disabled vehicle crashes, once we were able to understand and quantify the problem, we were able to create technology countermeasures, develop our policy advocacy objectives – especially around much needed improvements to Move Over Laws, and begin working with the auto industry and government to tackle this safety problem head on.

But what is the root cause for the fact that disabled vehicle crashes take so many more civilian lives than emergency responder lives is that we rely on one of the oldest and least effective features built into our cars today as our safety communication beacon: the hazard warning signaling system. This is a system that was invented in 1951 - over 70 years ago and only mandated as required equipment a little over a decade later. However, the story the statistics tells is that the currently mandated hazard warning system provides woefully inadequate warning to oncoming drivers. It is a 20th century warning system that was never rooted in sound human factors science but, rather, the technological limitations of incandescent bulbs and mechanical circuitry during the mid-1900's.

To make matters worse, we have already deployed technology on our roadways that is far superior to the 1 to 2Hz flash rate emitted by our hazard warning signaling systems. We protect our emergency responders, tow truck drivers, roadway workers, construction crews, snowplows and the like with advanced lighting. These advanced lighting systems flash lamps in patterns, frequencies, duty cycles, colors and intensities that are designed and scientifically proven to grab the attention of oncoming drivers and communicate a much higher sense of urgency than the inferior and inadequate hazard warning system.

The reason that the civilian crash, injury and fatality rates from struck-by collisions are 10 times greater than those of emergency responders is simple. It is the stark difference in efficacy between the federally mandated hazard warning signaling system on passenger and commercial vehicles and emergency lighting. This is not to downplay the unacceptable magnitude emergency responder struck-by collisions. Move-Over Law policies and the deployment of digital alerting technology to supplement emergency lighting represent tremendous opportunities to reduce emergency responder fatalities down to nearly zero.

We not only support these measures, fundamentally, but take the position that the same measures must be extended to the civilian population. When a person is sitting in a stationary vehicle on or alongside the roadway, or standing right outside of one, it should not matter if that person is wearing a uniform, a badge, a hard hat, or a little league soccer uniform. They are in a VERY dangerous position. Struck-by crashes are struck-by crashes. They are preventable, and the stakes could not be higher.

People are being killed every day simply because approaching motorists simply do not notice disabled vehicles on the roadway until it is too late to safely respond and avoid them. Until this safety issue is addressed, the National Roadway Safety Strategy's goal of eliminating deaths and serious injuries cannot be met.

SOLUTION

Now that we better understand the root cause of the safety case, what can we do to stop these preventable tragedies from occurring? The solution is straight-forward, extends proven technologies to currently unprotected roadway users, and uses equipment that is already being built into passenger and commercial vehicles today, which makes it incredibly affordable.

America's roadways are becoming more and more crowded and are full of cars driving at increasing rates of speed by drivers who are more distracted than ever before. However, if we employ better communication than 1950's technology, we can drastically improve the advanced warnings provided to oncoming drivers, using scientifically validated communication techniques that snap people out of distraction so they have a fighting chance to notice the 2+ ton stationary object full of human lives that they are approaching at deadly highway speeds, react, and safely avoid them.

At ESS, we have developed a solution that can be inexpensively and easily deployed as standard equipment on every new vehicle sold in the country that uses human factors-optimized, conspicuous lighting communication, as well as broadly distributed, platform-agnostic digital alerts to provide oncoming drivers with two forms of advanced warning of a disabled vehicle hazard on the roadway ahead, simultaneously.

The first prong of our solution is an advanced lighting feature set, called H.E.L.P.™ Lighting Alerts. H.E.L.P. Lighting Alerts were validated to comply with the requirements of FMVSS-108, via a NHTSA Interpretation letter last year. H.E.L.P. Lighting Alerts have also been proven to provide significant improvements to driver response efficacy when encountering a disabled vehicle on or alongside a roadway. An ON-ROAD study recently conducted by the Virginia Tech. Transportation Institute (VTTI) showed that approaching drivers decelerated at a greater rate and at a substantially further distance away than drivers approaching the same test vehicle using normal hazard lights. In addition, oncoming drivers decelerated at a greater rate and at a substantially further distance away than drivers approaching the same test vehicle using normal hazard lights. Finally, most approaching drivers decelerated and moved over a lane before crossing the farthest observation checkpoint of 360 meters, which translated to more than 12 seconds of observed advance warning / reaction time. (The full study can be found at: <https://ess-help.com/vtti-phase-2-study>.)

The VTTI study showed a significant driver response to that oncoming drivers slow down and move over a lane from as far as 350 meters out, which translates to 12 seconds of advanced warning. That is far superior to driver response to the standard hazard warning system.

The second prong is a digital alerting feature set, which leverages a cloud platform that is already being used by over 1,200 emergency responder fleets, federal fleets, and was developed in part through cooperation with DHS. This prong of our solution sends both audible and visual alerts to oncoming drivers' navigation apps and as pop-up messages in their vehicle's head unit and other in-dash displays. It has been tested, also ON-ROAD, by Purdue University to show an 80% reduction in hard-breaking events when in use. These alerts are received by oncoming drivers between 15 and 20 seconds from the stationary vehicles, beyond line of sight.

The combination of these two communication methods (visual and digital alerts) that provides two layers of communication – one beyond the line of site, and one within line of sight – that provides the advance warning to motorists approaching a disabled vehicle on the roadway ahead, that will save lives.

PATH FORWARD

We are currently working with automakers to implement this technology suite in future vehicles, which of course, cannot happen quickly enough for passionate safety champions like all of us. That is why, rather than waiting 7 to 10 years for rulemaking to take place to mandate a solution to the disabled vehicle safety case, we ensured our solution fits within the framework of FMVSS-108, complies with the traffic laws in all 50 states and can meet compliance with regulatory frameworks outside of the United States with some efficient effort. Efficiency in adoption of a solution to the disabled vehicle safety case is of paramount importance.

Of course, the drawback of going to market with a NHTSA Interpretation Letter, rather than a ruled mandate, is that automakers will not move nearly as fast to adopt non-required safety features - even though a solution, like ours, could cost less than \$50 per car to implement. They weigh that cost against the cost of adding a few more speakers to a sound system or adding a few more USB ports in the cabin - all features appreciated by customers. In the meantime, over 40 people are being killed or injured every day in a disabled vehicle crash, in the United States.

As a company with a mission that falls directly in line with the Safe System's objectives and framework; we encourage the Agency and call on the rest of industry to take immediate action to make the framework a reality.

We implore the Agency to consider the type of technology we have developed as an effective and efficient system that will prevent rear-end collisions with stationary vehicles on or alongside the roadway. We also need the Agency and auto industry to place a high priority on implementation of countermeasures when a safety improvement opportunity is uncovered.

Emergency Safety Solutions, Inc.
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Page 6

Written Submission re:
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Until we mitigate this massive safety issue, 40 people a day will not make it home safely.

Respectfully submitted,

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