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1200 New Jersey Ave, SE
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ATTN: Docket No. DOT-OST-2022-0096

Re: Enhancing the Safety of Vulnerable Road Users at Intersections

The American Society of Civil Engineers (ASCE) appreciates the opportunity to submit comments to the Department of Transportation (DOT) regarding the safety of pedestrians, bicyclists, and other vulnerable road users (VRUs) at intersections. Safety underpins every aspect of civil engineers' work. ASCE supports policies that account for the safety of all users—regardless of their mode of travel—in the design, construction, and operations of transportation networks. The input presented in this document is in response to a request for information (RFI) published by DOT in the Federal Register on September 16th.

Founded in 1852, ASCE is the nation's oldest engineering society. ASCE represents more than 150,000 members of the civil engineering profession in 177 countries. As the professionals who design, construct, and maintain critical aspects of the transportation system, including roadways and intersections, ASCE welcomes the opportunity to offer perspective on this subject. ASCE was a strong supporter of the Infrastructure Investment and Jobs Act (IIJA) and hailed its enactment as a once-in-a-generation investment in our nation's infrastructure with the potential to improve safety and modernize the transportation system. As projects funded by the IIJA begin to accelerate, considerations related to the safety of VRUs will be especially important. ASCE appreciates the opportunity to offer perspective on project prioritization and the Safe System approach, DOT's paradigm that focuses on preventing crashes before they happen and minimizing the harm caused by crashes that occur.

DOT's RFI expresses interest in the possibility of adapting existing and emerging automation technologies to accelerate the development of roadway intersection safety and warning systems for both drivers and VRUs. ASCE believes studying this subject is worthwhile, as there are several areas where technology can complement human performance and improve safety and mobility. As we continue to invest in our surface transportation infrastructure, we should look at opportunities to make smart investments that enhance growing technology.

ASCE would like to thank DOT for the opportunity to submit comments about the safety of transportation system users at intersections. We stand ready to answer any questions or lend additional feedback as the agency conducts this information collection process. For these comments, ASCE and its

members would like to highlight **implementation of the Safe System approach, the promotion of industry-driven technical material and standards, and technology.**

ASCE's 2021 Report Card for America's Infrastructure

Every four years, ASCE publishes its *Report Card for America's Infrastructure*, which grades the nation's major infrastructure categories using an A to F school report card format. The most recent report card¹, released in March 2021, evaluated 17 categories of infrastructure and reflected an overall C- grade.

Roads received a D on the Report Card, which found the country faces a \$786 billion backlog of road and bridge capital needs. The Report Card notes the need to improve safety on our roadways for both motorists and pedestrians, and identifies widened lanes and shoulders, center lane rumble strips, lane markings, and sidewalks as infrastructure improvements that could reduce fatalities. To raise the grade for roads, ASCE recommends increased funding from all levels of government and the private sector to address the condition and operations of the roadway system to maintain a state of good repair and ensure safety for all users.

Safe System approach and project prioritization

Improving the safety of all road users—not just the ones operating vehicles—is a key element of DOT's National Roadway Safety Strategy (NRSS), which was launched in January 2022 and outlines steps to address roadway fatalities. ASCE supports the objectives of the NRSS and recognizes the serious issue of safety on the country's roadways.

ASCE recognizes the Safe System approach design strategies² outlined by the Federal Highway Administration (FHWA), such as reducing the speed of vehicles, improving visibility at intersections, providing space for pedestrians and bicyclists, and minimizing conflict points, are known and agreed upon by practitioners. However, ASCE suggests existing project prioritization processes need to be better aligned with Safe System principles. The benefit-cost analysis methods³ outlined by FHWA and the variations used by state departments of transportation for funding these improvements sometimes lead to improvements based on the Safe System approach being deprioritized. A 2020 report⁴ by FHWA found that major Highway Safety Improvement Program (HSIP) features have only partial alignment with the Safe System principles. We believe a more holistic approach to project prioritization is needed to ensure that intersection design projects that implement a Safe System approach get their due consideration in the HSIP safety management process.

As part of the Safe System approach, FHWA has noted the need to use proactive tools to identify and address safety issues at intersections. Towards that end, proactive approaches for evaluating treatments (such as analysis of conflicts using video analytics) that do not require the use of long-term (three to five years) collision data need to be more broadly applied. A well-documented process and practitioner training effort is required to ensure that engineers and planners implementing Safe System approach strategies can document the benefits via an estimated reduction in intersection conflicts.

¹ <https://infrastructurereportcard.org/>

² <https://safety.fhwa.dot.gov/intersection/ssi/>

³ <https://safety.fhwa.dot.gov/hsip/docs/fhwasa18001.pdf>

⁴ <https://safety.fhwa.dot.gov/hsip/docs/fhwasa2018.pdf>

The issue of safety on roadways and at intersections is particularly pressing. Federal data suggests a negative trend in traffic fatalities. Estimates from the National Highway Traffic Safety Administration (NHTSA) indicate 42,915 people died in traffic crashes in 2021⁵. This estimate, which marks a 10.5% increase from the 38,824 traffic deaths recorded in 2020, is the highest number of such fatalities since 2005. Safety at intersections is particularly an issue. According to NHTSA, there were 10,626 traffic fatalities at intersections in 2020, deaths which included 1,674 pedestrians and 355 bicyclists. These deaths represent 27% of the road traffic fatalities recorded in 2020.

Safer roadway systems reduce loss of life and help keep the nation's economic network intact. ASCE believes safety initiatives must account for a variety of system users, such as pedestrians, bicyclists, and people who use wheelchairs in addition to motor vehicle drivers.

Promotion of industry-driven standards

ASCE engages in setting standards on a large scale and can serve as a useful source of technical information for government partners. ASCE Standards provide technical guidelines for promoting safety, reliability, productivity, and efficiency in the civil engineering profession. Accredited by the American National Standards Institute (ANSI), ASCE has a rigorous and formal process overseen by the Codes and Standards Committee (CSC). Standards are created or updated by a balanced volunteer standards committee, followed by a public review period. These standards are adopted by state and local jurisdictions and used in the designing of projects around the world.

One particular standard that can offer sound guidance for transportation engineering and roadway safety is ASCE 58, Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways (ASCE/T&DI/ICPI 58-16)⁶, which establishes guidelines for developing appropriate pavement structures for various traffic and subgrade conditions. This standard provides preparatory information for design, key design elements, design tables for pavement equivalent structural design, construction considerations, applicable standards, definitions, and best practices.

ASCE's discipline-specific institutes and technical groups, which bring together volunteers from around the world to advance the profession's expertise, may be useful sources of guidance for DOT. In particular, the Transportation & Development Institute and the Infrastructure Resilience Division represent professionals who could be appropriate points of contact for the agency.

Another area in which ASCE may lend expertise and perspective is the Manual on Uniform Traffic Control Devices (MUTCD). The IIJA, which ASCE strongly supported, requires the DOT to update the MUTCD every four years. The required update is meant to provide for the protection of vulnerable road users, support the safe testing of automated vehicle technology and any preparation necessary for the safe integration of automated vehicles onto public streets, and guide appropriate use of variable message signs. It also incorporates recommendations issued by the National Committee on Uniform Traffic Control Devices (NCUTCD) that have not yet been incorporated. As a sponsoring organization of the NCUTCD, ASCE is in a position to provide comments and information to DOT on this manual. ASCE believes a regular cycle of updates can be effective in keeping the manual current. Traffic control device

⁵ <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813298>

⁶ <https://ascelibrary.org/doi/book/10.1061/9780784414507>

standards and practices included in the MUTCD should be based on sound engineering practices and judgment supported through adequate peer-reviewed research and experimentation.

Technology

DOT's RFI notes the considerable development of automation and vehicle automation technologies over the past two decades, and suggests these technologies can enhance the safety of VRUs at intersections. ASCE agrees with this assessment, as technology can play a role in improving roadway safety by filling in the gaps of human performance. According to a Human Factors for Connected Vehicles study by NHTSA⁷, connected vehicle technologies have the potential to address up to 82% of crash scenarios with unimpaired drivers. These technologies could save a significant number of lives and prevent crash-related injuries, and help avoid tens of thousands of crashes each year.

ASCE supports continued deployment of Intelligent Transportation System (ITS) technology into traffic control systems to support overall traffic operations, preserve the integrity of transportation systems and drive investment. Additionally, ASCE supports the planning and integration of connected and automated vehicles (CAV) as part of a unified transportation infrastructure system. It is recommended that industry work cooperatively with federal, state and local governmental agencies to establish national standards for the planning, design, deployment, and maintenance of transportation infrastructure and operating systems needed to support CAV deployment, including protections for data privacy.

Conclusion

ASCE thanks DOT for the opportunity to submit a comment about intersection safety for VRUs. ASCE's members represent the professionals who design roads, sidewalks, and crosswalks, and we appreciate the opportunity to discuss the challenges and opportunities associated with intersection safety. We strongly believe in the safety and functionality of the transportation network for all system users, regardless of how they travel. ASCE is prepared to answer questions as the agency collects information.

⁷ <https://www.nhtsa.gov/sites/nhtsa.gov/files/812068-humanfactorsconnectedvehicles.pdf>