NATIONAL SAFETY COUNCIL

Position/Policy Statement

Safe System Approach

The policy position will supersede #149. The National Safety Council initially passed a Safe System approach policy position following the development of the Road to Zero coalition report. Since that time, the Safe System approach has been incorporated into federal statute, adopted by some states, and become the foundation of the 2022 National Roadway Safety Strategy.

POSITION / POLICY:

The National Safety Council supports the adoption and implementation of the Safe System approach to road safety in local, state, federal, and private sector transportation policies, programs, and strategies.

DEFINITION:

The Safe System approach is a roadway safety strategy that focuses on five action areas: safe roads, safe speeds, safe road users, safe vehicles, and effective post-crash care. The approach takes into account all factors of the roadway transportation system and is founded on the principle that while humans make mistakes, those mistakes should never lead to death. A Safe System approach requires the participation of all participants in the roadway transportation system in safety efforts, and seeks to strengthen safety in all aspects of the roadway transportation system so that if one part fails, the others will still protect people from death or serious injury on the roadways.

JUSTIFICATION:

Over 40,000 lives[1] are lost in the United States each year to traffic violence. It is the leading cause of death for people between the ages of 5 and 24.[2] There is an economic toll to traffic violence as well. In the United States, crashes and collisions on the roadways cost an estimated $473.2 billion per year, accounted for over 4.8 million injuries[3] in 2020. These figures are unacceptable and indicate that existing efforts to ensure roadway safety are insufficient.

Roadway crashes can be the result of an array of factors, to include: human error, at-risk

[1] https://injuryfacts.nsc.org/motor-vehicle/overview/introduction/
[2] https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812297
[3] https://crashstats.nhtsa.dot.gov/Api/Public/Publication/813266

driving behaviors, infrastructure design and operations, vehicle design and technology, and environmental conditions, among others. A responsible approach to roadway safety must take all of these potential risk factors into account. The Safe System approach has been used by other countries to mitigate risk factors on the roadways with great success. Countries that have utilized the Safe System approach achieved both the lowest rates of traffic fatalities and the largest reductions in traffic fatalities over a 20- year period.[4] The World Resources Institute has calculated "[m]ore than one million deaths could be avoided every year if the rest of the world achieved levels of road safety comparable to these best-performing countries."[6] Some areas of the U.S. have also implemented the Safe System approach with promising results.

BACKGROUND:

In recent past, there was a substantial decline in the number of roadway deaths in the United States.[7] Recently, however, this progress has reversed. In 2021, NHTSA projected that 42,915 people died due to traffic violence, a 10.5% increase from 2020 and the highest number of deaths since 2005.[5] NSC estimates that roadway deaths continue to remain high in the first 6 months of 2022.[6] The burden of this trend is not felt equally, with people walking and biking experiencing higher rates of fatality and communities of color dying at higher rates than their white counterparts.[7]

Motor vehicle crashes are the leading cause of death for people ages 5-24. The roadway death rate in the United States was more than twice the average of other high-income countries in 2013.[12] The Safe System approach has been successfully utilized to reduce roadway fatalities in countries like Sweden, the Netherlands, and New Zealand. More recently, an increasing number of cities in the U.S. have integrated the Safe System approach into their roadway safety and transportation policies. To make truly meaningful progress towards the goal of zero traffic deaths, however, the Safe System approach needs to be implemented nationwide by all components of the transportation system.

The Safe System Approach

The Safe System approach was used as the basis for the 2022 U.S. Department of Transportation National Roadway Safety Strategy.[8] It acknowledges humans are fallible and the roadway system can be created to make sure that when mistakes happen, they are not deadly. The Safe System approach five key areas to address traffic safety include: safe road users, safe vehicles, safe speeds, safe roads, and effective post-crash care. Additionally, it is grounded in six overarching principles[9]:

- Death and serious injury is unacceptable
- Humans make mistakes
- Humans are vulnerable
- Responsibility is shared
- Safety is proactive

[4] http://wriorg.s3.amazonaws.com/s3fs-public/17_Report_Safe_Systems_final.pdf
[5] https://www.nhtsa.gov/press-releases/early-estimate-2021-traffic-fatalities
[6] https://injuryfacts.nsc.org/motor-vehicle/overview/preliminary-estimates/
[7] https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf
[8] https://www.transportation.gov/NRSS
[9] https://www.transportation.gov/NRSS/SafeSystem

- Redundancy is critical

Taken together, these principles advocate for a multi-sector, multi-pronged approach to traffic safety that encourages the involvement of all participants in the roadway system, to include, but not be limited to, people like: planners, engineers, parents, public health officials, policy makers, enforcement officers, educators, utility providers, insurers, vehicle manufacturers and importers, car seat manufacturers, the media, policymakers, fleet managers, road users, and many more.[10] The Safe System approach emphasizes that only with a priority for safety and a multi-layered approach will we reach our goal of zero traffic deaths.

Proven Results

Countries that have implemented transportation policy based on the Safe System approach have seen significant improvements in roadway safety. For example, in the 1990s, Sweden routinely experienced well over 500 traffic fatalities a year, but since implementing Safe System policies, they have seen a significant decrease to just 253 fatalities in 2017.[11] The Netherlands also adopted the Safe System approach, and studies by the SWOV Institute for Road Safety research "suggest a positive effect on the number of crashes and casualties in the Netherlands."[12]

The Safe System approach has since realized much wider adoption, with numerous countries incorporating the tenets of the Safe System approach into their transportation policies and practices in recent years. The World Resources Institute analyzed traffic fatalities in 53 countries between 1994 and 2015 and found that countries that have adopted a Safe System approach had both the lowest rates of fatalities per 100,000 inhabitants and the fastest rate of change in traffic fatality levels.[13] Both the World Health Organization and the Organization of Economic Cooperation and Development recommend that all countries implement the Safe System approach.[14]

Five Action Areas

A comprehensive policy to promote safety in the roadway transportation system that is consistent with the Safe System approach involves action in all five key areas: safe roads, safe speeds, safe road users, safe vehicles, and effective post-crash care.[14] The Safe System approach requires participants in the roadway transportation system to do their part to improve safety in areas where they act and have influence. The Safe System approach creates a forgiving roadway transportation system because when human error occurs in one area (which the Safe System principles acknowledge is inevitable), safety measures in the other areas will compensate and mitigate the risk of injury. For instance, if a driver exceeds the speed limit, safe roadway designs, in-vehicle driver assistance technologies such as intelligent speed assistance, and effective post-crash care would still combine to lessen the likelihood of a crash, or mitigate potential injury or death in the event of a crash.

Improving safety in each of the five actions areas can take many different forms, and

[10] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811346
[11] https://www.trafa.se/en/road-traffic/road-traffic-injuries/GetMoreDownloadItems/?pageTake=2
[12] https://www.swov.nl/sites/default/files/publicaties/rapport/r-2005-05.pdf
[13] https://www.wri.org/publication/sustainable-and-safe-vision-and-guidance-zero-road-deaths
[14] http://www.brake.org.uk/facts-resources/15-facts/1484-safe-systems-facts-page

implementation will vary according to the unique needs and context of a location. Below is a sampling of policies, strategies, and technologies have been demonstrated to be particularly effective at improving safety within each action area.

Action Area 1: Safe Roads

Planners, engineers, and policymakers must design and operate roads that reduce the likelihood of crashes and limit the potential for injuries or death when crashes do occur. A variety of mechanisms can be used to help achieve this goal, including:

- Separating different types of road users and vehicles (i.e. bicyclists, pedestrians, roadway workers, and drivers, including transit operations) using dedicated travel lanes protected by physical barriers such as bollards and raised curbs.
- Installing crash barriers and other physical measures to separate traffic moving in opposite directions or at different speeds. Importantly, these measures must be designed to give in the event of a crash, so that injuries are minimized.
- Using appropriate work barriers to protect roadway, construction and emergency response workers from vehicle traffic.
- Using consistent signage, road markings, and lighting to give clear instructions to road users, so that they know what is expected of them and to create adequate visibility.
- Incorporating rumble strips, wider shoulders, and safety barriers on roadways to better accommodate driver error.
- Replacing intersections with roundabouts, which reduce vehicle speeds and force all vehicles to move in the same direction, thereby lessening the severity of collisions.
- Cleaning debris from roadways.
- Design roads in a way that reduce the number of potential points of conflict between modes of transportation, including vulnerable road users.

Figure 1: Protected bike lanes and traffic circles are two examples of safer road design.[15]

Action Area 2: Safe Speeds

Speed is a leading cause of serious injuries and fatalities on the roadways. Managing speeds for safety is a core tenet of the Safe System approach. Well-proven strategies include:

- Establishing safe and appropriate speed limits that take into account road function and design (including road construction), all modes of traffic (including biking and walking), land usage, and the physical tolerances of road users.

[15] http://www.pacts.org.uk/safe-system/

- Enforcing speed limits, including with the use of automated traffic enforcement.[16]
- Encouraging the adoption of driver assistance technology to maintain safe speeds, such as intelligent speed assistance.
- Designing roadways for safe speeds so that they are self-enforcing This may include installing traffic calming measures to reduce vehicle speeds (e.g. speed bumps, median islands, and curb extensions) and narrowing lanes. Where traffic and vulnerable road users interact it is critical to lower speed limits as well as reduce potential points of conflict as identified in the Safer Roads section.
- Educating road users about speed limits and the potential dangers of speeding with clearer signage and public information campaigns.

Figure 2: Median islands and curb extensions are two examples of traffic calming measures.

Action

Area 3: Safe Road Users

Individual road users also play a critical role in roadway safety, and the Safe System approach suggests several strategies for promoting safer road use by individuals, such as:

- Reducing traffic on roadways by providing and encouraging multi-modal transportation options including walking, biking, and taking transit
- Educating drivers about roadway risks and the dangers of driving while impaired, drowsy, distracted, speeding, or engaging in other unsafe behaviors.
- Utilizing advanced transportation technology, such as intelligent speed assistance or lane departure detection, to provide safety feedback to drivers and identify potential risks like driver drowsiness or other impairments.
- Improving new driver education to incorporate instruction on sharing the road with other vehicles and modes including commercial vehicles, people walking, biking, and taking transit.
- Emphasizing to all road users the role they play in creating a safe environment for all community members.
- Establishing programs to address repeated unsafe driving offenses such as mandating additional driver safety trainings and preventative measures like ignition interlocks.
- Establishing policies, funding, and community support to improve mobility options to and from schools for children, including identifying safe routes to walk, bike, and role,

[16] https://www.iihs.org/media/431e551b-3f64-4591-8e30-ad35a069f41f/cF4n4g/News/2021/050621%20auto%20enforcement/AE-checklist-May-2021.pdf

providing crossing guards, safety patrols, and other professionals to help children navigate streets, and exploring alternatives like bike buses and walking school buses to increase active transportation. [17]
- Ensuring frequent drivers (including professional drivers, commercial drivers, and fleet managers) and those driving large vehicles are well-trained, well-rested, fit for duty, and are provided with appropriate safety equipment.
- Ensuring protection of roadway workers like construction workers, first responders, trash and recycling workers, tow truck operators and others.

Action Area 4: Safe Vehicles

The Safe System approach recognizes the importance of safe vehicles for both minimizing the occurrence of crashes and improving collision survivability. As with all components of the transportation system, responsibility for safe vehicles is shared by various stakeholders, including state and federal government, vehicle manufacturers, personal vehicle owners and corporate fleet managers. Strategies for improving vehicle safety include:

- Developing, improving, and requiring vehicle safety features like seatbelts, airbags, and the latest ADAS technologies including AEB, impairment detection technology, blind spot monitoring, lane departure detection, intelligent speed assistance, and others. These safety features should be included as standard equipment on all new vehicles.
- Educating vehicle buyers, including fleet operators, about the need to purchase vehicles with safety technology included.[18]
- Purchasing vehicles equipped with the best available safety features as an interim measure until they are required to be included as standard equipment.
- Maintaining vehicles to ensure they meet the highest standards of roadworthiness and safety, including checking for and addressing recalls.
- Providing efficient and timely independent government oversight of the development, testing, and implementation of new safety technologies, including through the new car assessment program (NCAP) and federal motor vehicle safety standards (FMVSS) development.

Continuing to research and communicate about the dangers of over-sized vehicles and advocating for changes that can address the issue.

Action Area 5: Effective Post-Crash Care

The Safe System approach acknowledges human fallibility and therefore accepts that some collisions are inevitable. As a result, a final but equally important component of the Safe System approach is effective post-crash care. A variety of new technologies and policies can improve outcomes for road users involved in collisions, including:

- Equipping vehicles with automatic crash notification systems that can transmit critical information about the vehicle, occupants, and crash immediately, so that dispatchers can provide first responders with more detailed information prior to arriving on scene.

[17] https://www.saferjourneys.govt.nz/about-safer-journeys/the-safe-system-approach/
[18] www.mycardoeswhat.org

- Improving medical records management systems so that critical information can be seamlessly transmitted to pre-hospital care providers and health care providers at the hospital even if the patient is unresponsive.
- Automatically dispatching drones to crash scenes to provide first responders with a video feed of the accident scene to allow quicker and better scene assessment.

An Adaptable Framework

The action items proposed in this policy represent merely a sampling of the innovative and proactive strategies that can be pursued to increase roadway safety within each of the five key action areas of the Safe System approach. Depending on the specific safety challenges and transportation needs of a given jurisdiction, specific policies might vary. However, all transportation policies must prioritize safety of all roadway users in all action areas in order to be consistent with the Safe System approach.

Strong Laws

While not called out as one of the five elements of the Safe System approach, strong laws and publicity of these laws reduce roadway fatalities and are an important strategy to reach zero. The United States experiences recurring fatalities in the following areas where more can be done to equitably enforce existing laws:

- Impaired driving is responsible for about one-third of roadway fatalities in the U.S. and has been stubbornly stuck at this level for years. Please view the NSC policy on lowering the blood alcohol concentration and additional recommendations to address all impaired driving to reduce fatalities, here.
- Speeding is responsible for about 30% of fatalities on roadways. Here are hyperlinks to the NSC policy positions on speeding and automated enforcement.
- About half of all roadway fatalities are unbelted. Primary enforcement of seat belt laws saves lives.

Conclusion

Aggressive action is needed to improve safety on American roadways, and the holistic Safe System approach to roadway safety provides a blueprint for this action. By emphasizing a comprehensive approach to roadway safety in which all participants in the roadway system work actively to improve safety across five key action areas, the Safe System approach creates a forgiving roadway system that mitigates injury and death. Besides being theoretically sound, the Safe System approach has a record of proven effectiveness in other countries. As a result, the National Safety Council strongly supports the adoption of a Safe System approach to roadway transportation safety at all levels of government in order to achieve a vision of zero roadway fatalities.

This position statement reflects the opinions of the National Safety Council but not necessarily those of each member organization.

Adopted by the National Safety Council, August 2023.