ADVOCATES FOR HIGHWAY & AUTO SAFETY

Child Passenger and Road User Safety

The Issue:

The best way to protect child passengers is to place them in the back seat, restrained by a properly installed child safety seat, booster seat or safety belt, as appropriate for their age, size and development. Child passenger safety laws should include provisions to ensure infants and toddlers remain rear facing minimally through age two, to support relatively large heads on weak neck musculature. After children have outgrown the forward-facing safety seat, states should mandate all children be secured by a booster seat until they can be properly restrained by a safety belt, which usually occurs around 57 inches in height and ages 8-12, as recommended by the American Academy of Pediatrics (AAP) and others.[1]

Booster seats are intended to provide a platform that lifts the child up off the vehicle seat to improve the fit of the child in a three-point adult safety belt. An improper fit of an adult safety belt can cause the lap belt to ride up over the stomach and the shoulder belt to cut across the neck, potentially exposing the child to serious abdominal and neck injury. A seat belt fits properly when the lap belt is across the upper thighs (not the stomach) and the shoulder belt is across the center of the shoulder and chest (not across the neck or face). Once a child has outgrown a child safety seat and can properly use the vehicle's seat belt, they should remain buckled in the rear seat through age 12.

In addition to risks associated with not wearing a proper restraint, child occupants are also at risk of injury and death due to pediatric vehicular heat stroke, known as "hot car" incidents and seatback collapse (when the front seat collapses during a crash, posing risk of death and serious injury to an occupant seated directly behind the front seat passenger), among other issues. When outside of a vehicle, children are vulnerable as road users (pedestrians, pedalcyclists) and around vehicles in other settings such as in driveways and parking lots. They are less visible due to their size, are less likely to have the appropriate situational awareness and are less likely to know the rules for safe actions around vehicles and on the roads.

The Impact:

- Motor vehicle crashes are among the leading causes of death for children ages one to 14 in the U.S.[2]
- In 2024, 1,032 children, defined as age 14 and younger, were killed in traffic crashes. Of these fatalities, 244 were children ages four through seven, and 246

children were age three and younger. [3] This equates to approximately three children killed each day on average.
- An estimated 160,850 children were injured in traffic crashes in 2024, which equals about 441 each day on average.[4]
- In 2024, 172 child pedestrians were killed in traffic crashes, and 6,615 were injured. In the same year, 56 child pedalcyclists were killed, and 6,497 were injured.[5]

The Facts:

- Across all age groups, injury risk is lowest (less than 2%) when children are placed in an age-appropriate restraint in the rear seat.[6]
- When used properly, child safety seats reduce fatal injury by 71% for infants and 54% for toddlers in passenger cars.[7]
- At least 325 lives were saved by child restraints for children four and younger in passenger vehicles in 2017 (the last year for which this calculation is available from the National Highway Traffic Safety Administration (NHTSA).[8]
- Appropriate child safety seats and restraints are very effective in preventing fatalities and injuries:[9]
    - 47% effective in preventing fatalities for ages 1-3 in all crashes
    - 43% effective in preventing fatalities for ages 3-5 in all crashes
    - 67% effective in preventing serious to critical injuries for ages 5-8 in all crashes
- According to the American Academy of Pediatrics (AAP), infants and toddlers are at a particularly high risk of head and spine injuries in motor vehicle crashes because of their relatively large heads and structural features of the neck and spine. By supporting the entire head and spine, a rear-facing car seat provides optimal support during a crash.[10]
- Using a booster seat with a seat belt instead of a seat belt alone reduces a child's risk of injury in a crash by 45%, according to the Center for Injury Research and Prevention, Children's Hospital of Philadelphia, and the Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania.[11]
- In 2024, 62 unrestrained passenger vehicle occupants under four years old were killed (when restraint use was known).[12]
- Of the 112 children killed in passenger vehicles in 2024 in which the driver was alcohol-impaired, 40% of them were unrestrained (when child restraint use was known).[13]
- A 2024 poll commissioned by Advocates for Highway and Auto Safety (Advocates) found that 84 percent of Americans are "concerned," with 62 percent "extremely" or "very" concerned about lack of seat belt or child safety seat use.[14]

The Solutions: Laws, Technology and Roadway Safety Infrastructure

Comprehensive State Laws to Incentivize Proper Child Safety Seat Use

- According to the Insurance Institute for Highway Safety (IIHS), expanded child restraint laws covering children through at least age seven were associated with:[15]
    - 5% reduction in the rate of children with injuries of any severity

- 17% reduction in the rate of children with fatal and incapacitating injuries
- Children being nearly three times as likely to be in child restraints
- 6% increase in the number of booster-seat aged children seated in the rear seat of the vehicle where children are better protected

Vehicle Safety Technologies and Improved Safety Standards Can Protect Children and Other Road Users

The U.S. Department of Transportation (DOT) must expeditiously use its authority to advance minimum performance standards for vehicle safety technologies that can prevent or mitigate crashes and protect vehicle occupants and road users. These safety technologies should be standard, not optional, equipment in new vehicles. This action will achieve safety equity by both ensuring that the technology responds to and benefits all road users and that consumers buying new vehicles are not charged extra for the technology. Moreover, requiring equipment as standard can reduce the base cost of technology due to economies of scale.

Advanced Driver Assistance Systems (ADAS):

- According to the AAA Foundation for Traffic Safety, equipping all cars, pickup trucks, vans, minivans and SUVs with forward collision warning (FCW)/automatic emergency braking (AEB) which respond to pedestrians/bicyclists as well as vehicles could prevent 1.9 million crashes, nearly 900,000 injuries, and more than 4,700 deaths annually.[16]
- The Infrastructure Investment and Jobs Act (IIJA, Pub. L. 117-58) directs the U.S. DOT to issue Final Rules on minimum performance standards and requirements for ADAS technologies including AEB, FCW, lane departure warning (LDW) and lane keeping assist (LKA).[17]
    - In May 2024, U.S. DOT issued a Final Rule to require passenger vehicles be equipped with AEB that detect pedestrians.[18] NHTSA estimates that this action will save 362 lives and mitigate over 24,000 injuries annually. It is estimated to result in yearly cost benefit of between $5.8-$7.2 billion.[19] In July 2023, DOT issued a NPRM to require heavy vehicles weighing over 10,000 pounds to be equipped with AEB.[20] A second NPRM may be issued in 2026.[21]
- A 2025 study found that AEB systems in modern vehicles (model years 2021-2023) reduced front-to-rear crashes by 52%.
    - The same study found that Pedestrian AEB systems in vehicles (model years 2015-2023) reduced single-vehicle frontal crashes with non-motorists by 9%.[22]

Occupant detection and alert technology to prevent hot car incidents:

- Nearly 1,200 children have died in hot cars since 1990 and at least another 7,500 survived with varying types and severities of injuries.[23] Inexpensive safety systems to end these incidents are currently available and should be required in new passenger vehicles. These systems must be required to detect the presence of an occupant in the passenger compartment to ensure that children who access a vehicle on their own or who are left in a vehicle are saved from injury or death. While

the IIJA includes a directive for a reminder system, it does not require the system to detect the presence of an occupant in the entire passenger compartment.[24]

Rear seat belt reminders:

- Children and teens constitute a large proportion of rear seat occupants in crash data.[25] Between 2015 and 2024, approximately 900 unbelted second row occupants of passenger cars and light trucks died in crashes on U.S. roads annually.[26]
- Between 2018 and 2023, on average nearly 14,700 unbelted second row occupants were injured annually.[27] Considering the effectiveness of seat belts and that more than half of all fatally injured rear seat occupants in passenger cars and light trucks were unbelted during that time,[28] rear seat belt reminders and seat belt use could have helped to eliminate or mitigate a large portion of these fatalities and injuries.
- IIHS estimates that improved seat belt alerts could increase belt use by as much as 34%, preventing an estimated 1,500 front seat occupant fatalities every year.[29]
- The U.S. DOT issued a Final Rule to require seat belt reminders in the front passenger seat and rear designated seating positions in January 2025.[30] In response to several petitions for reconsideration of the Final Rule, NHTSA issued an Interim Final Rule in April 2026 delaying the compliance date to September 1, 2028.[31]

Preventing frontovers:

- Children, small adults, people in wheelchairs and who use other assistive devices, recumbent bicycle riders, and others may not be visible to a driver who may inadvertently hit them and/or run over them with a vehicle. Technology to prevent such incidents must be identified by the U.S. DOT and required in all new vehicles. Upgrading the hood and bumper standards to better protect those outside the vehicle should also be accomplished.

Preventing seatback failure:

- Children who are properly restrained in the rear seat of a vehicle are being killed and are suffering serious injuries when the seat back of the front seat fails. The federal standard for seat backs has remained relatively unchanged since 1967 and is known to be insufficient. The U.S. DOT issued an Advance Notice of Proposed Rulemaking (ANPRM) in July 2024 regarding updating the standards.[32]

Side impact protection for children:

- Front and side impact crashes account for most child occupant fatalities. Side impacts affecting the passenger area are especially dangerous because of a lack of energy-absorbing structures compared to front or rear-end crashes.[33] A NHTSA rule issued on June 22, 2022, originally required in MAP-21 and due in 2014, makes child passengers safer by adding a side impact test using child-sized anthropomorphic test devices, also referred to as crash test dummies. However, the rule only applies to child seats designed for children weighing up to 40 pounds or up to 43.3 inches tall.[34] In May 2025, NHTSA issued a NPRM reconsidering several issues involving the 2022 Final Rule including delay of the compliance date.[35] In July 2025, NHTSA indicated that the agency would not take enforcement action against regulated entities for failing to comply with Federal Motor Vehicle Safety Standard (FMVSS) No.213a, Child restraint systems—side impact protection until the publication of any Final Rule completing NHTSA's May 2025 NPRM.[36]

Road Safety Infrastructure Improvements and the Safe System Approach

The Safe System Approach (SSA) assumes that humans will make mistakes and that we must anticipate this and make accommodations to account for limited human injury tolerances through five elements: Safe Vehicles, Safe Road Users, Safe Roads, Safe Speed and Post-Crash Care. By improving the design and operation of roadways to accommodate all road users safely, the SSA seeks to avoid conflicts between road users, especially for those outside the vehicle, and minimize impact forces when they do occur to prevent fatalities and serious injuries. [37]

Infrastructure improvements consistent with the SSA to limit conflicts include:

Curbing speed:

- This can be accomplished by reducing speed limits, employing automated enforcement to augment traditional enforcement, adding speed humps, using real-time speed feedback signs, performing road diets (narrowing roadways) and installing roundabouts.

Prioritizing infrastructure to promote safety:

- This includes changes such as adding lighting and sight lines, leading intervals, pedestrian hybrid beacons, road narrowing (road diets), curb extensions, accessible sidewalks, rumble strips, protected intersections, separated bike lanes, and road separations that consider all users.

Localities can advance these and other infrastructure improvements systemically by requiring their adoption as appropriate in all road design and maintenance projects.

The next surface transportation reauthorization must continue to support SSA improvements including expanded funding for safety infrastructure upgrades, permit use of certain federal funds for automated enforcement and intelligent speed assistance (ISA) programs, set safety standards for proven vehicle safety technologies and meaningfully address vulnerable road user safety, among necessary safety priorities.

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