



Seat Belts

The Issue

Seat belt use, reinforced by effective safety belt laws, is a proven lifesaver. Seat belts serve as the first line of defense against injury or death for vehicle occupants when crashes occur. According to the National Highway Traffic Safety Administration (NHTSA), the combination of an airbag plus a lap and shoulder belt reduces the risk of death in frontal crashes by 61 percent, compared with a 50 percent reduction for belts alone and a 34 percent reduction for airbags alone.¹

In states with primary enforcement all-occupant seat belt laws, police officers may ticket the driver if any occupant is unbelted or may ticket the unbelted occupant. In states with secondary enforcement laws, police officers may issue a citation for a seat belt violation only if the vehicle has been stopped for another (non-seat belt) traffic infraction. States with primary enforcement seat belt laws have higher (92 percent) front seat belt use than states with secondary enforcement (89.5 percent).²

The Impact

- There were 42,939 motor vehicle crash fatalities on U.S. roads in 2021, the most since 2005.³ Early projections for 2022, show traffic fatalities remain high.⁴ Among passenger vehicle occupant fatalities in 2021, it is estimated that half were unrestrained.⁵
- In 2021, more than 26,000 passenger vehicle occupants died in motor vehicle crashes, a 10 percent increase from 2020.⁶
- For passengers who survived fatal crashes in 2021, only 15 percent were unrestrained, compared to 50 percent of those who died.⁷
- NHTSA has identified a lack of seat belt use as one of “three major behavioral factors” that explain some of the increase in crash fatalities between 2020 and 2021.⁸
- Sixty-five percent of respondents to a January 2022 opinion poll indicated they are “very” or “extremely” concerned with the lack of use of seat belts or child safety seats.⁹

The Facts

- From 1975 to 2019, seat belts have prevented over 403,000 fatalities and saved society approximately \$2.5 trillion in economic costs.¹⁰
- 11,813 unrestrained occupants died in passenger vehicle crashes in 2021 alone.¹¹
- The use of seat belts in passenger vehicles saved an estimated 14,653 lives nationwide in 2019. An additional 2,398 lives would have been saved in 2019 if all unrestrained vehicle occupants had worn their seat belts.¹²
- In 2020, among passenger vehicle occupant fatalities with known restraint use, 50 percent seated in the front row and 59 percent of those in the second row were unrestrained.¹³
- In fatal crashes in 2020, 82 percent of passenger vehicle occupants, who were totally ejected from the vehicle, were killed. Only one percent of the occupants reported to have been using restraints were totally ejected, compared with 26 percent of the unrestrained occupants.¹⁴

Rear Seat Belt Use

- Rear seat passengers are more than twice as likely to die in a crash if they are unbelted.¹⁵
- Adults are not buckling up in the rear seat as much as they are in the front seat, with rear seat belt use 10 to 15 percent lower than in the front seat, according to a study by the Insurance Institute for Highway Safety (IIHS) and the Children’s Hospital of Philadelphia (CHOP).¹⁶

- Rear seat belt use by passengers in fatal crashes was lower than front seat belt use in almost every state and was substantially lower in many states.¹⁷
- Unbelted rear seat passengers pose a serious threat to the driver and other vehicle occupants as well as themselves. Unbelted rear seat passengers are referred to as “back seat bullets” because they can be thrust at high rates of speed into the driver resulting in loss of control of the vehicle, and into other occupants causing fatalities and serious injuries. The chance of death for a belted driver seated directly in front of an unrestrained passenger in a serious head-on crash was 2.27 times higher than if seated in front of a restrained passenger.¹⁸
- An IIHS poll found nearly 40 percent of people surveyed sometimes did not buckle up in the rear seat because no law requires it. If such a law existed, 60 percent of poll respondents said it would convince them to use seat belts in the back seat.¹⁹

Seat Belt Use and Costs

- NHTSA estimated needless deaths and injuries resulting from non-use of seat belts cost society more than \$11 billion annually in medical care, lost productivity and other injury-related costs based on 2019 data.²⁰ When adjusted solely for inflation, this would equate to more than \$13 billion.²¹
- Non-restraint use cost employers \$7.4 billion in 2018 (expressed in 2019 dollars), \$5.7 billion of which was attributed to off-the-job non-restraint use.²²
- The average inpatient costs for crash victims who do not use seat belts are 55 percent higher than for those who use them.²³
- Regarding personal choice and individual rights in relation to highway safety laws, the U.S. District Court for Massachusetts held in a decision affirmed by the U.S. Supreme Court that, “...from the moment of injury, society picks the person up off the highway; delivers him to a municipal hospital and municipal doctors; provides him with unemployment compensation if, after recovery, he cannot replace his lost job; and, if the injury causes disability, may assume the responsibility for his and his family’s continued subsistence.”²⁴

The Solutions: Laws, Technology and Roadway Safety Infrastructure

Primary Enforcement Seat Belt Laws

- Seat belt use is higher in states with primary enforcement laws compared to those with secondary enforcement laws or with no seat belt use law.²⁵ Some states have experienced a 10-15 percent increase in seat belt use rates when primary laws were enacted.²⁶
- If every state with a secondary seat belt law upgraded to primary enforcement, about 1,000 lives and \$4 billion (2005 US\$) in crash costs could be saved every year.²⁷ When adjusted for inflation, the cost is nearly \$6.28 billion.²⁸
- While numerous studies report primary enforcement seat belt laws do not result in increased ticketing of people of color, the potential for harassment is an ongoing concern not limited to, nor created by, these laws.
 - **Meharry Medical College Study:** Overall rates of seat belt compliance improved in states with primary laws compared to those with secondary laws, an 18 percent and 15 percent increase among black and white motorists, respectively. The study concluded that “black-white disparities in seat belt use were mitigated in states with primary seat belt laws,” and that “enacting primary laws in other states might reduce or eliminate racial disparities in seat belt use.”²⁹
 - **Meharry Medical College Study:** In secondary law states, black motorists were only 67 percent as likely to wear seat belts in urban areas as white motorists.³⁰
 - **American Journal of Preventive Medicine:** Studies of states that changed from a secondary to a primary law found either no difference in the rate of white versus non-white drivers ticketed, or they found a greater increase in the proportion of white drivers ticketed after the enactment of a primary law.³¹

- **NHTSA Study of the change to primary enforcement laws in Oklahoma, Maryland and the District of Columbia made the following determinations:**
 - “...citation data that identified race confirmed there was either no difference in non-white versus white ticketing, comparing secondary to primary enforcement, or a greater increase in ticketing went to whites following the change to a primary enforcement law.”
 - “Non-whites more than whites reported feeling the threat of receiving a ticket for not wearing a safety belt, even though there was no significant relationship between race and those who actually received a safety belt ticket.”³²
- **NHTSA Study:** The relationship between primary enforcement belt laws and minority ticketing, the share of citations for Hispanics and African Americans changed very little after states adopted primary enforcement belt laws. There were significant gains in seat belt use among all ethnic groups, none of which were proportionately greater in any minority group.³³
- **2021 NHTSA Study, *Seat Belt Use, Race, and Hispanic Origin*:** Support for primary enforcement seat belt laws is strong across races including Asian, Black, Hispanic, Multiracial and White.³⁴ A range from 69 percent (Multiracial) through 89 percent (Asian) agreed that “police should be allowed to stop a vehicle if they observe a seat belt violation when no other traffic laws are being broken.”³⁵

Rear Seat Safety Improvements Lagging Behind Front Seat

- Front seat safety improvements in recent model vehicles have closed the gap that formerly made rear seats safer than the front. Advances in safety technology have lagged in the rear seat.³⁶
- Current regulation does not require an evaluation of injuries to rear seat occupants in frontal crashes. In terms of frontal crashes, only the strength of seat belts is evaluated in the rear seat, unlike regulations for the front seat, which ensure occupants do not suffer bodily harm by evaluating injuries of the head, neck, chest, pelvis and legs.³⁷
- To ensure rear seat safety improvements and testing are consistent with the front seat, the creation of a rear seat crashworthiness rating is needed as well as safety technology upgrades such as inflatable seat belts, rear seat belt reminders, seat belt pre-tensioners and load limiters.
- The Moving Ahead for Progress in the 21st Century Act (MAP-21) required the U.S. Department of Transportation (DOT) to issue a final rule on rear seat belt reminders by 2015.³⁸ The rulemaking process remains incomplete as of May 2023.³⁹
- The Economic Commission for Europe of the United Nations (UN/ECE) updated Regulation 16 in 2018 to require rear seatbelt reminders in all rear seating positions in passenger vehicles, pickup trucks, and vans beginning in late 2022.⁴⁰

Safety Technologies and Safety Standards Can Protect Vehicle Occupants and Other Road Users

DOT must use its authority to advance minimum performance standards for vehicle safety technologies, which 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 the technology responds to and benefits all road users and 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) or 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.⁴¹
 - The Infrastructure Investment and Jobs Act ([IIJA, Pub. L. 117-58](#)), signed into law November 15, 2021, directs 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). However, the law does not ensure the technology will be capable of responding to pedestrians, bicyclists and other road users; does not include a date certain for issuance of a final

rule and compliance for ADAS in passenger vehicles; and does not include Class 3–6 trucks for the AEB requirement.⁴²

- **Rear Seatbelt Reminders (RSBRs)**
 - Congress mandated in the Moving Ahead for Progress in the 21st Century (MAP-21) Act (Sec. 31503) that NHTSA issue a standard requiring rear seat belt reminder systems by October 2015. This rule has been languishing for more than a decade after the Congressional directive.
 - This is not new technology that needs to be invented. According to Consumer Reports, 30 percent of its rated model year 2021 vehicles were equipped with rear seat belt reminder systems.⁴³
 - The European Union has required rear seat belt reminders since late 2022.⁴⁴
 - Rear seat belt reminder systems must include occupant detection to improve accuracy, minimize false positive alerts, and effectively capture all potential rear seat occupants including children (and those in child restraint systems).

Road Safety Infrastructure Improvements and The Safe System Approach⁴⁵

The Safe System Approach (SSA) assumes 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 (drivers of vehicles, motorcycle riders, pedestrians, bicyclists, micromobility riders, wheelchair users and others) and minimize impact forces when they do occur to prevent fatalities and serious injuries.

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](#) and installing roundabouts.⁴⁶
- **Prioritizing infrastructure to promote safety:** This includes changes such as adding lighting and improving sight lines, leading pedestrian interval for crosswalks, pedestrian hybrid beacons, curb extensions, accessible sidewalks, rumble strips, protected intersections, separated bike lanes and road separations, which take into account 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 IIA includes multiple provisions to advance the SSA, including expanded funding for safety infrastructure upgrades. It also provides support and guidance for localities planning to apply for such upgrades, permits use of certain federal funds for automated enforcement programs in school and work zones, directs requirements for vehicle safety improvements including crash avoidance technologies, and ensures funds are used to improve vulnerable road user safety.

May 2023

¹ Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012, Passenger Cars and LTVs, With Reviews of 26 FMVSS and the Effectiveness Of Their Associated Safety Technologies in Reducing Fatalities, Injuries, and Crashes; NHTSA, Jan. 2015, DOT HS 812 069, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812069.pdf>

² Traffic Safety Facts: Research note, Seatbelt Use in 2022 – Overall Results, NHTSA, Jan. 2023, DOT HS 813 407, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813407>.

³ Overview of Motor Vehicle Traffic Crashes in 2021, NHTSA, Apr. 2023, DOT HS 813 435. Available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813435>; [Overview 2023].

⁴ National Center for Statistics and Analysis. (2023, April). Early estimate of motor vehicle traffic fatalities in 2022 (Crash•Stats Brief Statistical Summary. Report No. DOT HS 813 428). National Highway Traffic Safety Administration.

⁵ Overview 2023.

⁶ Overview 2023.

⁷ Overview 2023.

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- ⁸ Overview 2023.
- ⁹ Public Concern About Roadway Safety, Engine’s Caravan Survey, [Public Opinion Poll](https://saferoads.org/wp-content/uploads/2022/01/Advocates-January-2022-Poll-Report-Final.pdf), Jan. 2022, available at <https://saferoads.org/wp-content/uploads/2022/01/Advocates-January-2022-Poll-Report-Final.pdf>
- ¹⁰ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb 2023, DOT HS 813 403; [Economic Impact 2019]
- ¹¹ Overview 2023.
- ¹² Economic Impact 2019
- ¹³ Traffic Safety Facts: 2020 Data, Occupant Protection in Passenger Vehicles, NHTSA, DOT HS 813 326, Oct. 2022, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813326>; [Occupant Protection 2020]
- ¹⁴ Occupant Protection 2020.
- ¹⁵ Rear Seat Belt Use: Little Change in Four years, Much More To Do, Governors Highway Safety Association, November 2019, available at <https://www.ghsa.org/resources/RearBeltReport19>.
- ¹⁶ Status Report, Safety Gains Ground, Vol. 49, No. 11, “Thinking About Safety in the Back Seat”, IIHS, December 23, 2014, available at <https://www.iihs.org/api/datastore/document/status-report/pdf/49/11>.
- ¹⁷ Unbuckled in Back: An Overlooked Issue in Occupant Protection, Governors Highway Safety Association, November 2015, available at http://www.ghsa.org/sites/default/files/2016-11/RearBelts_FINAL.pdf.pdf
- ¹⁸ Mayrose, James, *Influence of the Unbelted Rear-seat Passenger on Driver Mortality: “The Backseat Bullet”*, Academic Emergency Medicine, Volume 12, Issue 2. Article first published online: 28 June 2008, available at <https://onlinelibrary.wiley.com/doi/10.1111/j.1553-2712.2005.tb00850.x>.
- ¹⁹ Status Report, Unbelted, Vol. 52 No. 5, “Adults admit they often skip belts in rear seats”, IIHS. August 3, 2017, available at <https://www.iihs.org/api/datastore/document/status-report/pdf/52/5>.
- ²⁰ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb 2023, DOT HS 813 403.
- ²¹ CPI Inflation Calculator, US Bureau of Labor Statistics, https://www.bls.gov/data/inflation_calculator.htm. Inflation values form Jan. 2019 to Jan. 2023
- ²² Cost of Motor Vehicle Crashes to Employers 2019; Network of Employers for Traffic Safety, available at <https://trafficsafety.org/road-safety-resources/public-resources/cost-of-motor-vehicle-crashes-to-employers-2019/>.
- ²³ Crash Outcome Data Evaluation System (CODES) Project Seat Belt and Helmet Analysis, Research Note (Revised), National Center for Statistics and Analysis, NHTSA, February 15, 1996.
- ²⁴ *Simon v. Sargent*, D.C.Mass.1972, 346 F.Supp. 277, affirmed 93 S.Ct. 463, 409 U.S. 1020, 34 L.Ed.2d 312.
- ²⁵ Traffic Safety Facts Research Note, Seat Belt Use in 2022—Overall Results, NHTSA, Jan. 2023, DOT HS 813 407, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813407>
- ²⁶ Economic Impact 2019
- ²⁷ The Nation’s Top Strategies to Stop Impaired Driving: Primary Seat Belt Laws, NHTSA, Feb. 2007, DOT HS 910 712.
- ²⁸ CPI Inflation Calculator, US Bureau of Labor Statistics, https://www.bls.gov/data/inflation_calculator.htm. Inflation values form Jan. 2005 to Jan. 2023
- ²⁹ Briggs, N.C., Schlundt, D. G., Levine, R.S., Goldzweig, I.A., Stinson, N., Warren, R.C., Seat Belt Law Enforcement and Racial Disparities in Seat Belt Use, *American Journal of Preventive Medicine*, 2006; 31(2), available at <https://europepmc.org/article/med/16829330>.
- ³⁰ Briggs, N.C., Schlundt, D. G., Levine, R.S., Goldzweig, I.A., Stinson, N., Warren, R.C., Seat Belt Law Enforcement and Racial Disparities in Seat Belt Use, *American Journal of Preventive Medicine*, 2006; 31(2).
- ³¹ Dinh-Zarr, T. Bella, PhD, MPH, Sleet, David A., PhD, *Reviews of Evidence Regarding Interventions to Increase the Use of Safety Belts*, *American Journal of Preventive Medicine*, Volume 21, Number 4S, 2001, available at <https://www.thecommunityguide.org/sites/default/files/publications/mvoi-AJPM-evrev-seat-belts.pdf>.
- ³² Evaluation of Maryland, Oklahoma, and the District of Columbia’s Seat Belt Law Change to Primary Enforcement, Final Report, National Highway Traffic Safety Administration, DOT HS 809 213, March 2001.
- ³³ Determining the Relationship of Primary Seat Belt Laws to Minority Ticketing, NHTSA, Sep. 2011, DOT HS 811535.
- ³⁴ Seat Belt Use, Race, and Hispanic Origin, NHTSA, June 2021, DOT HS 813 142.
- ³⁵ *Ibid.*
- ³⁶ Sahraei at al. Reduced Protection for Belted Occupants in Rear Seats Relative to Front Seats of New Model Year Vehicles, *Proc AAAM*, 2010, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3242548/>.
- ³⁷ 49 CFR 571.208, 209, 210.
- ³⁸ Moving Ahead for Progress in the 21st Century Act (MAP-21), Sec. 31503, Pub. L. 112-141 (Jul. 6, 2012), available at <https://www.govinfo.gov/content/pkg/PLAW-112publ141/pdf/PLAW-112publ141.pdf>.
- ³⁹ Advocates for Highway and Auto Safety (Advocates): Overdue and At-Risk Safety Regulations, January 2022, available at: <https://saferoads.org/wp-content/uploads/2022/04/Unified-List-of-Regulations-Delayed-and-At-Risk-of-Delay-Jan-2022.pdf>
- ⁴⁰ Regulation No 16 of the Economic Commission for Europe of the United Nations, April 27, 2018, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:42018X0629>
- ⁴¹ Benson, A., Tefft, B.C., Svancara, A.M. & Horrey, W.J., September 2018. Potential Reduction in Crashes, Injuries and Deaths from Large-Scale Deployment of Advanced Driver Assistance Systems (Research Brief). Washington, D.C.: AAA Foundation for Traffic Safety, Available at: <https://aaafoundation.org/potential-reduction-in-crashes-injuries-and-deaths-from-large-scale-deployment-of-advanced-driver-assistance-systems/>.
- ⁴² Infrastructure Investment and Jobs Act (IIJA, Pub. L. 117-58), November 15, 2021, Sections 24208 and 23010, available at: <https://www.govinfo.gov/content/pkg/PLAW-117publ58/pdf/PLAW-117publ58.pdf>.
- ⁴³ See: <https://www.consumerreports.org/cars/car-safety/better-car-seat-belt-minders-could-save-lives-iihs-study-a6862787411/#:~:text=A%20decade%20later%2C%20there%20is,equipped%20with%20rear%20belt%20reminders>
- ⁴⁴ UNECE Regulation 16 (Apr. 27, 2018). See: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.109.01.0001.01.ENG&toc=OJ.L:2018:109:TOC
- ⁴⁵ “Recommendations of the Safe System Consortium,” Johns Hopkins University Center for Injury Research and Prevention, May 2021. Available here: <https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-injury-research-and-policy/our-impact/documents/recommendations-of-the-safe-system-consortium.pdf>.
- ⁴⁶ Federal Highway Administration, Road Diets. Available here: <https://highways.dot.gov/safety/other/road-diets>