IN THE DRIVER'S SEAT

Traffic Safety Prevention as a Health Care Issue

By Mark Harris

Staying safe on the roads should be everyone's concern. With the United States' vast, complex national network of roadways and tens of millions of vehicles in use, traffic safety prevention represents a major public health challenge.

While our extensive roadway system is an essential part of modern life, drivers, passengers, cyclists, and pedestrians are also at risk of being severely injured or worse on American roads. Nearly 44,000 people died in motor vehicle crashes in 2022, according to the Centers for Disease Control and Prevention. That same year, over 2.6 million emergency department visits were related to vehicle crashes.[1]

With about 282,000,000 registered

motor vehicles in use in the United States and vehicle collisions an everyday occurrence,[2] perhaps a common assumption is that traffic fatalities and severe crash injuries are an unavoidable price of living in a heavily vehicle-dependent society.

However, traffic safety experts and advocates think we can do better. From roadway infrastructure design and vehicle safety engineering to public policy, safe driving education, emergency services, and more, improved roadway safety is a focus of wide-ranging public health expertise.

Vision Zero Network

A crucial initiative to address roadway safety in the United States is being led by the Vision Zero Network, a San Francisco–based nonprofit organization that collaborates with communities and stakeholders nationwide to address roadway safety issues.

The long-term goal of the Vision Zero Network is an ambitious one. "Vision Zero is a strategy to eliminate traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all people," says Tiffany Smith, MPH, the network's program manager. "Vision Zero recognizes that the approximately 40,000 people who die every year on our roadways across the country are needlessly killed. As an organization, the Vision Zero Network works to help interested communities across the country advance their Vision Zero goals. We believe we have the tools to improve roadway safety."

The Vision Zero Network is inspired by the original Vision Zero project implemented in Sweden in 1997, which has also been influential in other nations. Working with city and public municipalities, the Swedish Transport Administration, auto manufacturers, and other stakeholders, the Vision Zero initiative has helped to reduce traffic deaths in Sweden by 50% since the millennium.[3]

The Vision Zero Network promotes a Vision Zero innovation known as the Safe System Approach. This is an integrated, systems-based approach to roadway safety that was also adopted by the U.S. Department of Transportation.[4] Traditionally, safety efforts have focused on distinct aspects of roadway safety, such as driving education, enforcement (e.g., of speeding and driving under the influence laws), engineering projects, local emergency services, and more. The Safe System Approach strives to address roadway safety more holistically, with a particular focus on how people interact with roadway systems.

"The Safe System Approach is built on the recognition that people will inevitably make mistakes," explains Smith. "Humans are fallible; they're imperfect. And so, our transportation systems should be designed in ways that are forgiving and survivable when mistakes do occur. Our emphasis is on upstream, proactive strategies such as redesigning the built environment, making vehicles safer, [and] lowering speeds—but also having speed limits that match, encourage, and complement the design of the road. We have to use the infrastructure to complement the lower speed limit.

"In many ways, the Vision Zero strategy is representative of a paradigm shift from the status quo," adds Smith. "Our transportation system is built to prioritize vehicle throughput at the expense of safety. Vision Zero is saying we're going to prioritize safety over speed. We're going to prioritize people over vehicles and vehicle throughput."

In turn, policies should be established that help make safe driving behavior the easiest and most logical choice for people. "Traditionally, we're focused on slowing down those dangerous super speeders, whereas the Safe System Approach is focused on collectively lowering and managing speeds," says Smith. "It's a bit of a difference, looking more at the population level and asking how we slow down speeds for an entire population."

Smith says to consider a narrow, two-lane road with speed humps, protected bike lanes on both sides, sidewalks, crosswalks, and good signal timing that encourages drivers to maintain a certain speed. This traffic environment is more likely to encourage drivers to pay attention, slow down, and be more engaged and present behind the wheel. "We know the way that our built environment is set up will influence how people drive on the roadway," observes Smith.

Road Blocks

Admittedly, many challenges inhibit the improvement of roadway safety in the United States. In fact, U.S. traffic deaths increased nationally by 30% between 2014 and 2022. Additionally, pedestrian deaths in the United States reached a 41-year high in 2022, the highest among 28 high-income countries.[5]

Yet there are also measurable signs of progress within communities in improving roadway safety. Since its start more than a decade ago, Vision Zero Network has worked with more than 50 U.S. cities and communities on safety improvement projects. Early adopters of Vision Zero have demonstrated tangible safety improvements in various locales around the United States. For instance, New York City reduced traffic deaths by more than 12% and pedestrian deaths by 45% between 2013 and 2023. Some of the measures implemented include lowering speed limits citywide to 25 mph, adding speed safety cameras, retiming traffic signals, installing leading pedestrian intervals that provide pedestrians with a head start before the vehicle green light, and other safety redesign projects.[5]

Other major U.S. cities, such as San Francisco, Austin, Portland, Louisville, and Seattle have also begun adopting or integrating similar safety recommendations into their policies.[5] Of course, contending with an existing built environment that has long favored speed over safety, an automotive industry trend toward larger and heavier vehicles, and uncertain or lagging state and federal funding policies reflect just some of the hurdles facing safety advocates.

In a recent online report for the Vision Zero Network, Smith summarized progress toward safe system improvements as complicated but still encouraging. "Our top takeaway: progress is real but uneven," she wrote. "It's been slower and less dramatic than we all want, yet communities are seeing positive

change following Vision Zero commitments—often starting with quiet, foundational, internal shifts that set the stage for long-term results."[5] In fact, she reports that most early adopters of Safe System recommendations have achieved lower traffic death rates than the national average and safer conditions for future progress.[5]

Shifting Accountability

"When someone dies on a road, we call it an 'accident,' but an accident kind of implies it's an act of God and there's nothing that can be done about it. But we know with robust infrastructure and good planning, along with good safety policies—e.g., how speed limits are set and how vehicles are designed—as well as regulation and making sure [regulatory] policies are in alignment with safety, that we can improve safe outcomes."

—Tiffany Smith, MPH, Vision Zero Network

License to Learn

The health care system plays an essential role in preventing traffic deaths and injuries and aiding recovery from crashes. From a health system perspective, roadway safety is also a multifaceted challenge, encompassing expertise in public health, primary and adolescent care, emergency care, rehabilitation, research, and other areas.

An especially crucial responsibility is young driver safety, equipping young drivers with the skills and resources necessary for a lifetime of safe driving.

"For families that go through traffic crashes, particularly ones where someone was injured or killed, it's life-changing," says Flaura K. Winston, MD, PhD, founder and scientific director of the Center for Injury Research and Prevention at Children's Hospital of Philadelphia (CHOP). "Many of these crashes are largely preventable. At least 75% of crashes, if not more, are due to human errors. Many of these errors are also very manageable. We've done research on crashes and have found [that]—for teen drivers in particular, but it's also true for adults—primary prevention is about paying attention to the roadway, scanning well, and going the right speed and following distance for the road conditions.

"I think what people don't always think about is that the leading causes of death in young people are injury and violence," adds Dr. Winston. "Among the injury deaths, motor vehicle crashes are far and away the No. 1 cause. The number of children who die from cancer is extremely small compared to the number who die from injuries and violence. But when it comes to funding and what our medical systems or the [National Institutes of Health] focus on, the focus is largely on disease. Of course, we should be preventing disease, but in terms of where we can make the biggest difference in the lives of young people, it's in crash prevention."

Dr. Winston makes a salient point about reducing risks for newly licensed young drivers. "Teens go from the lowest lifetime risk of crashing as a learner, when they're in the car with an instructor or with their parent, to their highest lifetime risk of crashing in the months after they get their license. We have such an incredible opportunity to not only keep them safe in the riskiest time of their [lives] but also [to] give them the mobility that can give them independence. We can set them on a path of having a lifetime of safe skills if we prepare them for driving correctly."

Look Both Ways

Note the differences between approaches to traffic safety[8]:

Traditional Approach	Vision Zero
• Traffic deaths are *inevitable*	• Traffic deaths are *preventable*
• *Perfect* human behavior	• Integrate *human failing* in approach
• Prevent *collisions*	• Prevent *fatal and severe crashes*
• *Individual* responsibility	• *Systems* approach
• Saving lives is *expensive*	• Saving lives is *not expensive*

Test Drive

A newer resource in use in CHOP's primary care system is the Virtual Driving Assessment (VDA).[6] As a skills assessment tool, the VDA is a virtual driving experience that asks participants to follow a road course on a computer screen, while using a steering wheel, headset, and pedals. The assessment is usually done toward the end of a teen's learner phase and prior to the licensing exam and provides personalized feedback to participants on their crash avoidance skills.

The VDA is the result of many years of safety research, reports Dr. Winston: "For teen drivers, the VDA can be a particularly timely intervention. In that transition from learner to licensed driver, there is a licensing exam, which is necessary but insufficient for really testing their skills in common serious crash scenarios. This is because they're not exposed to them on the road, and it's dangerous. What we can do is expose teens in a self-guided way to the most common serious crash scenarios. It takes about eight or nine minutes to do the actual drive, but with instruction, the whole process is about 15 minutes."

The VDA is also a very practical teaching tool, emphasizes Dr. Winston. "We have shown that how a person does on the assessment is related to their risk of crashing in the first year of licensure," she explains. "The assessment breaks down the errors the person is making and how they can practice with their family or learn better to avoid those errors. For example, if they're tailgating, didn't scan well, or didn't identify a hazard, the assessment will provide a personalized plan for improving the driver.

This is emailed to the patient about 15 minutes after they leave the appointment."

As a component of adolescent care services, the VDA has become widely available throughout CHOP's primary care system since its start in 2021. "When a teen at the age of 15 or older comes to the Children's Hospital of Philadelphia, they are given the option to have a [VDA] as part of their adolescent care," says Dr. Winston. "It's in 28 of our practices now. It's a fabulous program. We've already done over 10,000 of these assessments as part of adolescent care."

Among other resources, CHOP also sponsors the online Teen Driving Plan to help parents better supervise their teens' driving practice.[7] The plan provides practical information and tools to improve the quality of driving practice and address potential skills deficits. These deficits include the inability to scan, identify, and react to hazards; difficulty managing speed appropriate to road conditions; and difficulty with distracted driving. Teens in families that used the Teen Driving Plan program were reported to be 65% less likely to make dangerous driving errors, according to a randomized controlled study.[7]

"The Teen Driving Plan is a way that parents and teens can structure practice to make sure they learn about the skills they need," remarks Dr. Winston. "In vehicle monitoring, it's important after each practice drive to keep track of what a teen is doing. For some teens, this can be very helpful."

Notably, Pennsylvania requires a pre-learner's permit medical examination. The requirement offers an opportunity for health care providers to review behaviors that can affect a teen's driving (e.g., drug and alcohol use), as well as medical conditions that might require more attention (e.g., attention-deficit/hyperactivity disorder and autism), notes Dr. Winston.

Youth Buckle In

All in all, the safe driving message permeates CHOP's adolescent patient care experience. "The adolescent visit starts with our adolescent health questionnaire," says Dr. Winston. "Among other questions, we ask our teens, 'Are you driving or do you plan to drive in the next 12 months?' This then allows the medical staff—whether it's the medical assistant, nurse, [physician], or whoever it is—to tailor messages around safe driving to our adolescent patients who we know are ready for this information."

"As part of the adolescent visit, we also find it helpful to promote Graduated Driver Licensing—GDL," reports Dr. Winston. "This program has been shown to reduce crashes and deaths in 16-year-olds by making sure that they do all the practice hours and that we restrict early, independent driving to lower risk conditions. We have a new driver packet that we give to patients that includes information about GDL and other information."

In turn, GDL's legal parameters for the learner's permit, intermediate license, and full licensure can be a helpful guide for families as they establish their own parent-teen contracts or agreements on driving rules for teens.

"We also have information in our electronic health record related to filling out the form for medical certification in Pennsylvania," adds Dr. Winston. "In the after-visit summary, we have our tips for families and where to go for more information about safe driving. Throughout the year, we also send out messaging in emails to families of 16-year-olds. And we have posters, brochures, and pamphlets along with the information that's on our website. It's really a holistic approach, just as you would expect for issues like taking vaccines or not smoking, but this is around safe driving. It's a very comprehensive and systematic approach to try to reach teens."

Notably, CHOP's clinic staff play a crucial role in promoting safe driving awareness and education. "Some of our most effective clinical champions for safe driving are the medical assistants who have such a strong connection with our patients," says Dr. Winston. "For each of our clinic sites, we have a patient champion, and many times it is the medical assistant who is making sure the teens are doing the [VDA] and getting the word out about teen safety. I think it's a role that medical assistants are really geared toward. They have that deep connection with the families.

"What is really important in our messaging is the repetition," she notes. "It is this idea of coordinated communication around these messages, both online and in person, that is helpful for families who are often very busy. I believe the staff and the medical assistants are crucial in this messaging. If it's only the physician talking about safe driving in the [examination] room, or it's only something you hear on a public service TV announcement every once in a while, it's not going to change behavior."

Driving Change

For individuals in need of driving rehabilitation due to recovery from surgery, illness, or other health conditions, health systems may offer driving rehabilitation services. These programs provide a comprehensive assessment of a person's driving readiness toward the goal of allowing a safe return to independent driving.

The Hospital for Special Care (HFSC), a leading provider of specialized medical care and rehabilitation services in New Britain, Connecticut, provides an array of driving assessment and rehabilitation services for individuals with diverse medical needs.

"At [HFSC], our approach to assessing driving readiness is truly comprehensive and

Rules of the Road

A Safe System Approach incorporates the following principles[4]:

- Death and serious injuries are unacceptable.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Safety is proactive.
- Redundancy is crucial.

individualized," says Carly Law, OTR/L, an occupational therapist with the hospital's driving rehabilitation program. "As occupational therapists, we look at the whole person—their physical, cognitive, visual, and psychosocial abilities and how those interact with the complex demands of driving. The process begins with a clinical evaluation in which we assess vision, including acuity, peripheral vision, and visual processing speed; cognition, such as attention, memory, and executive function; motor and sensory skills, including strength, coordination, and reaction time; and functional endurance and mobility, such as transferring in and out of the car and managing fatigue. If appropriate, the client then participates in a simulated driving assessment to observe more realistic driving performance."

As Law explains, the program works closely with referring physicians to help individuals regain their independence as drivers. "While our program does not medically clear individuals to drive, we provide comprehensive evaluation findings and recommendations that help the referring physician determine whether a patient is ready to resume driving, would benefit from additional [rehabilitation] or training, or may require adaptive driving equipment to do so safely."

A unique resource available in HFSC's program is the DriveSafety Driving Simulator, a sophisticated, fully immersive tool that prepares clients for community driving.

"The DriveSafety Driving Simulator is an advanced assessment and training system that recreates realistic driving environments from quiet suburban roads to busy intersections and highway conditions," says Law. "The simulator allows clients to safely experience and respond to various driving scenarios, including sudden hazards or complex traffic patterns. The system captures key data such as reaction times, speed management, and lane maintenance, helping us objectively measure driving performance in a controlled setting. It also allows clients to practice and build skills without the immediate risks of on-road driving.

"Alongside the simulation, we use standardized clinical assessments such as the Trail Making Test and the Bell's Cancellation Test to evaluate the underlying cognitive and visual skills related to driving," adds Law. "We also conduct adaptive equipment trials—for example, hand controls or a left foot accelerator, to ensure safety and comfort. These tools together help us develop individualized treatment plans that promote safe, confident, and independent community mobility."

How does the referral process work for those who might benefit from driving rehabilitation? "Many of our referrals come from physicians who want to ensure a patient is ready to drive after a medical event or a change in functional ability," says Law. "A typical scenario might involve someone recovering from a stroke or an individual with a traumatic brain injury who is eager to return to driving as part of their recovery journey. We also see individuals with autism spectrum disorder, intellectual disabilities, amputees, and spinal cord injuries."

Once a patient is accepted into the program, the occupational therapist can then assess the individual's specific rehabilitation needs. "At [HFSC], the process typically begins with a comprehensive evaluation session, which may be followed by additional sessions focused on skill building, simulation training, or equipment adaptation. The duration of the intervention varies. Some individuals need only a few sessions for equipment training, while others may work with us for several [sessions] over several weeks to rebuild cognitive or motor skills before reassessment. Ultimately, our goal is to ensure each person has the necessary skills, insight, and confidence to drive safely or to identify alternative community mobility options when driving is not recommended."

What are some common challenges for program participants? "One of the biggest challenges we see is limited self-awareness," says Law. "Many individuals may not fully recognize how their condition—whether a stroke or a neurological or chronic illness—has affected their driving skills. Helping clients develop insight into their abilities is a crucial part of the process. Other challenges include cognitive processing and attention deficits that make it harder to react quickly or manage multiple stimuli on the road. Physical limitations [may include] decreased range of motion or slower motor response, and emotional barriers [may include]

Resources

Children's Hospital of Philadelphia: Center for Injury Research and Prevention
https://injury.research.chop.edu

Hospital For Special Care: Driving Rehabilitation
https://hfsc.org/specialties/therapy-and-rehabilitation/driving-rehabilitation/

Vision Zero Network
https://visionzeronetwork.org

Fuel Up for Change

"We cannot achieve the goals of Vision Zero without also addressing the systems that result in disproportionate safety risks for some, particularly low-income and BIPOC [Black, Indigenous, and People of Color] communities. Given these unfortunate realities, policymakers, roadway safety professionals, and advocates have the opportunity—and responsibility—to recognize and address the equity disparities that show up in our work. With increased urgency to address both the nation's roadway safety crisis and the need to remedy historic and ongoing inequities, now is the time to make changes."[9]

anxiety, frustration, or fear of losing independence. We approach these challenges through education, simulation-based feedback, and supportive goal setting. We also work closely with families and care teams to ensure the recommendations are realistic and client-centered."

As a therapeutic intervention, HFSC's driving rehabilitation program serves a wide range of individuals with diverse medical needs, says Law: "With the older adults, they have more age-related changes in vision, reaction time, and cognition. Our focus will be more on maximizing safety through compensatory strategies, adaptive equipment, and targeted training. Sometimes that means helping clients transition to alternate forms of transportation to maintain independence when driving is no longer the safest option. For individuals with intellectual and developmental disabilities, we emphasize more of the readiness skills needed. So, attention, judgment, and understanding of traffic rules [are required] before introducing behind-the-wheel experience. The learning process is highly individualized and often includes repetition, visual supports, and collaboration with families, educators, and driving instructors. In every case, our approach is person-centered, meeting clients where they are, building on their strengths, and helping them achieve safe, meaningful mobility in their community."

A Two-Way Street

As a public health issue, roadway safety represents a large and complex societal challenge. But staying safe on the roads begins with the basic responsibility of every roadway user to remain alert to their surroundings. Whether as a driver, cyclist, or pedestrian, being aware and able to anticipate and avoid potential hazards is key.

"As a driver, it's so important to always be aware of your surroundings, because anything can change in the blink of an eye," says Amanda L. Hitchcock, CMA (AAMA), a medical assistant with MercyOne Genesis Health System in Moline, Illinois. This lesson in safety basics was directly reinforced for Hitchcock in a recent driving experience.

She recalls: "A while back, my daughter and I were driving home from grocery shopping. I was scanning the road from side to side, checking my mirrors every so often. As we're going up a hill, I saw a young man standing on the sidewalk near the curb. I noticed his behavior seemed very erratic. I thought, 'OK, Amanda, get ready; this is not normal behavior.' He looked like maybe he was inebriated. And then suddenly he just fell off the curb onto the road and hit the back of his head. It's a fairly busy road, so now he was lying right in the road.

"As soon as I saw that, I laid on the car horn to warn others and quickly turned my car around and stopped. I turned on the hazard lights, asked my daughter to call 911, and then jumped out of the car and ran out to the road, waving my hands to get the attention of other drivers. Another driver saw me and pulled over. I then started to assess the man to see if he was okay. Thankfully, he was okay enough, although I could see a bright red bump forming on his head. I helped him over to the sidewalk and had him sit down in case he was going to pass out. I put my knees behind his back as a brace and had my arm on his shoulder, holding him up. I also kept talking to him, trying to get him to be aware of his surroundings. When [emergency medical services] got there, his heart rate was so fast, and [his] blood pressure was very high. They recommended he go to the hospital, but he said no. He was feeling a little better and just wanted to go home. One of the paramedics then offered to walk him back to his nearby apartment, and that was that."

Hitchcock observes that if she had not been paying close attention to the road and her surroundings, she might not have been able to anticipate and react in a timely way to an urgent situation. "As a driver, if you're aware and paying attention, you might have that split second you need to stay safe and maybe even save your life or another person's life," she concludes.

From the Vision Zero strategy to eliminate traffic fatalities and severe injuries to the invaluable work of health care providers and the responsibilities of individuals as drivers and pedestrians, staying safe on the roads is a multifaceted public health challenge. And, it is a shared responsibility for all of us. ✦

The CE test for this article can be found on page 27.

References

1. About transportation safety. Centers for Disease Control and Prevention. November 19, 2024. Accessed February 15, 2026. https://www.cdc.gov/transportation-safety/about/index.html
2. Highway statistics 2022. US Department of Transportation: Federal Highway Administration. November 2023. Revised February 2025. Accessed February 15, 2026. https://www.fhwa.dot.gov/policyinformation/statistics/2022/mv1.cfm
3. Vision Zero—reducing road traffic casualties and injuries. Smart City Sweden. Accessed February 15, 2026. https://smartcitysweden.com/best-practice/408/vision-zero-reducing-road-traffic-casualties-and-injuries/
4. What is a Safe System Approach? US Department of Transportation. Updated January 14, 2025. Accessed February 15, 2026. https://www.transportation.gov/safe-system-approach
5. Smith T. A decade of Vision Zero: gauging progress & barriers. Vision Zero Network. November 6, 2025. Accessed February 15, 2026. https://visionzerotwork.org/a-decade-of-vz-gauging-progress-and-barriers/
6. Fiks A. Assessing young drivers in primary care. Children's Hospital of Philadelphia: Center for Injury Research and Prevention. September 13, 2022. Accessed February 15, 2026. https://injury.research.chop.edu/blog/posts/assessing-young-drivers-primary-care
7. Children's Hospital of Philadelphia: Center for Injury Research and Prevention. *Teen Driving Plan Practice Guide*. Accessed February 15, 2026. https://injury.research.chop.edu/sites/default/files/documents/teendrivingplan_practice_guide_0.pdf
8. Fox J. Where to start on the road to Vision Zero. Vision Zero Network. April 21, 2023. Accessed February 15, 2026. https://visionzeronetwork.org/where-to-start/
9. Prioritizing health equity in Vision Zero planning. Vision Zero Network. Accessed February 15, 2026. https://visionzeronetwork.org/healthequity/