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The Cult of Bike Helmets

The history—and danger—of a modern safety obsession.

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Last year, health officials in Seattle decided to [stop requiring](#) bicyclists to wear helmets. Independent research found that [nearly half of Seattle’s helmet tickets in recent years](#) went to unhoused people, while Black and Native American cyclists in the city were [four times](#) and two times more likely, respectively, than white cyclists to be cited.

Whether people *should* wear helmets was not the motivation behind the repeal, King County Councilmember Girmay Zahilay [said at the time](#). “The question is whether a helmet law that is enforced by police, on balance, produces results that outweigh the harms the law creates.” For lawmakers, the answer was clear: The potential benefits of a helmet mandate were not worth the harms it did to marginalized Seattle residents.

But some local bike advocates [argued](#) that there was a second advantage: Repealing the law could make riding *more* safe. Helmet mandates intimidate potential riders, they argued, by framing cycling as an activity so dangerous it necessitates body armor. That, in turn, can suppress ridership, and take away the safety benefits of riding in numbers. The more bicyclists take up space on the road, the more visible they become to drivers. And as cars more regularly contend with bikes, the more consideration bikes will get in conversations about transit safety and road infrastructure.

Other jurisdictions have done away with their helmet mandates too: In 2020 [Tacoma, Washington](#), repealed its requirement; in 2014 [Dallas](#) did the same for adults. These repeals push back at the notion that bike safety starts and ends with helmets and suggest that helmet laws might actually pose a risk to cyclists. Now some avid cyclists are going so far as to loudly proclaim [forgoing helmets](#) on principle.

I feel unsafe, always, on my bicycle—and for sound reason.

I have been a bike commuter in every city I’ve lived in as an adult, including Minneapolis, Milwaukee, Chicago, Columbus, and New York City. I travel on two wheels for the exercise and fresh air, for environmental reasons, and for independent, efficient mobility.

In exchange, I feel unsafe, always, on my bicycle—and for sound reason. I’ve gotten doored in Times Square. I’m forced to weave in and out of bike lanes to avoid the vehicles that constantly park and loiter there. I hold my breath when a passing truck leaves only a few inches between my shivery flesh and its metal flanks.

I do what I can to protect myself. I use front and rear lights. I gravitate toward roads with designated bike lanes. I signal turns with my arms and ding my handlebar bells to attract the attention of inattentive drivers. And I never, ever leave home without my neon yellow helmet.

But as with many cyclists and lawmakers, I've increasingly found myself wondering: How much does my helmet help me, really? *Are* there costs to our single-minded devotion to it?

In the past 50 years, as helmet designs have become more sophisticated, adult cycling deaths in the United States have not declined—they've [quadrupled](#). As I dug into the history of these humble foam-and-plastic shells, I learned that helmets have a far more complicated relationship to bike safety than many seem ready to admit.

In 1883 the League of American Wheelmen paraded in Manhattan to celebrate the group's third anniversary.

At the time, the [penny-farthing's](#) supersized front wheel offered more cycling efficiency than its predecessor, the [velocipede](#)—and also threatened taller falls for riders. Face-dives were a common hazard. A significant-enough number of American Wheelmen took “headers” during their Fifth Avenue procession for the New York Times [to notice](#): “Twenty bicycles were broken in this process but no one suffered anything worse than a good shaking,” the paper remarked.

As mass production made bicycles cheaper and more commonplace, the need for head protection grew increasingly obvious. Cyclists' earliest choice was a single-use, plant-based [pith helmet](#) (basically, a safari hat) that broke upon impact. Next up, a leather halo padded with wool or cotton—referred to as a “hairnet”—did little more than protect a cyclist's ears and face “from dragging the ground when sliding across pavement,” as the product review website [Gearist](#) put it.

It wasn't until 1975 that the first modern bike helmet, the “Bell Biker,” emerged, with an expanded polystyrene liner and stiff plastic shell. The modern helmet, unlike its predecessors, was designed to cushion collision impacts, absorbing shock so the human head didn't. This made it potentially lifesaving in slow-speed crashes—for example, if a biker hit a pothole and flew off the handles. “The primary way they protect your head is by their own self-destruction,” said David Halstead, a biomechanical engineer at the University of Tennessee and founder of the Southern Impact Research Center, a private testing company. “I would never ride without one.”

The “bicycle boom” was underway, with an estimated 60 million bikes in use by 1972—a trend kindled by an increase in environmental consciousness, a national energy crisis, and the growing popularity of physical fitness, [scholars wrote in a 2020 paper on the history of helmet mandates](#). Though helmets had not yet emerged as bike safety's primary symbol, their design evolved. They became lighter, thanks to polyethylene terephthalate (or PET, as in a soda bottle or clamshell plastic) and other novel, thin-but-strong plastics. New nylon straps and plastic buckles helped keep everything in place.

Not long after, fueled by concern about head injuries among bike-riding children, jurisdictions around the country began implementing the first mandatory helmet laws for minors, according to the 2020 paper. By the 1980s, cycling advocates, news outlets, and medical literature alike encouraged widespread helmet use, the scholars chronicled. “I am alive today because I was wearing a helmet,” New York state's bicycle coordinator [told](#) the New York Times in 1986 about his collision with a taxicab years prior. In 1999 the U.S. Consumer Product Safety Commission [voted unanimously](#) to create mandatory federal safety standards for bike helmets.

Those [standards](#) require that helmet manufacturers evaluate their product's safety performance by dropping a helmeted dummy head made of magnesium about 6.5 feet onto a variety of steel anvils. Accelerometers and gyroscopes inside the dummy measure the impact's kinetics. The drop test lasts less than two seconds total; the impact itself happens in a third of the time it takes to blink.

You can't predict a bicycle accident the way you can expect collisions in a football game.

This test, while crude, partially captures the dangers to an unprotected head, which can suffer a life-threatening skull or intracranial fracture after falling from a height of just 18 inches. "The energy's got to go somewhere—it can be your head, or your helmet," said Steve Rowson, a biomechanical engineer and director of Virginia Tech's [Helmet Lab](#), which aims to decrease the incidence of injuries, and in particular concussions, in everything from sports to military contexts.

But lab tests of helmeted dummies in vertical free fall do not capture how most people hit their heads while bicycling.

Studying "real world"-like bike crashes in an artificial setting is itself a scientific challenge. You can't predict a bicycle crash the way you can expect collisions in a football game, for example; there are simply more variables on the road than on a playing field. (To get around this, Rowson's lab reverse-engineers the dynamic by acquiring helmets from real bike crashes, CT scanning them to [create](#) 3D models of the damage, and replicating crash conditions such as velocity, angle of impact, and surface conditions by plastering the drop-test anvil with adhesive sandpaper and other materials to imitate asphalt or gravel roads.)

Lab tests also fail to capture a whole body in motion, which some experts argue underestimates impact forces. It's rare in the real world for someone to fall directly onto the top of their head; hitting the ground somewhere between a 30-degree and 60-degree angle is far more typical.

And standard drop tests, critically, don't factor in the rotational forces at play as a rider falls not only down but forward. These forces—which are akin to bouncing a bobblehead—have been long associated with life-threatening or disabling traumatic brain injury. Among sports-related concussions, including contact sports, "cycling's normally near the top of the list," Rowson said. In recent years, helmet manufacturers have developed new "anti-concussion" technologies to reduce rotational forces' impact on the head; experts are [divided about the extent](#) of this extra protection.

Outside the lab, researchers struggle to study the population-level protection conferred by bicycle helmets.

"The data around bicyclist crashes is very limited," said Elise Omaki, an epidemiologist at the Johns Hopkins Center for Injury Research and Policy. It's also often incomplete or biased.

Most crash data come from traffic-safety monitoring systems that happen to catch motor-vehicle-related bike injuries and fatalities. Medical records from bike-crash victims focus on diagnosis, treatment, and outcome, while typically leaving out details of the circumstances of the crash itself; they also fail to capture people who cycle without ever needing medical attention. Insurance claims and police reports catalog some bicycle crashes, but miss plenty: One study by San Francisco's public health department [found that 39 percent](#) of bicyclists who required ambulance transport were not documented in police records. The United States can't even accurately tally [overall bike helmet use](#).

In this absence, several meta-analyses have pooled together existing studies to gauge the protective effect of bike helmets.

One—a [roundup](#) of 55 studies between 1989 and 2017—found that helmet use reduced serious head injury by 60 percent, mild head injury and traumatic brain injury by about 50 percent, and the total number of seriously injured or killed cyclists by 34 percent. But its author, Alena Høyve, a traffic-safety researcher at the Institute of Transport Economics in Norway, had some major caveats. For one, Høyve pointed out, helmets offer more injury protection in single-bicycle crashes. “Bicycle helmets have only limited potential to protect from serious head injury in high energy impacts or when a cyclist is overrun by a motor vehicle,” she wrote. Høyve also noted that many studies concluding that people who wear helmets are less likely to suffer a head injury don't account for the simple fact that helmet-wearers may be more generally cautious. (The opposite is true too: Non-helmeted cyclists are more often under the influence of alcohol or riding without light in the dark, and are more likely to be involved in single bicycle crashes.)

Epidemiologists [who have studied](#) mandatory helmet laws have drawn mixed conclusions, with some showing a reduction in overall head injury rates and others suggesting that those trends may be better explained by improvements to cycling infrastructure, as well as educational safety campaigns that provide free helmets or teach defensive-biking techniques.

More than a decade ago, Ian Walker, an environmental psychologist at Swansea University in the U.K., set out to study the effect of helmets on *drivers*.

His [experimental series](#) involved riding around in a variety of cycling outfits, including a “long feminine wig” meant to stand in for female riders, a stereotypical spandex cyclist suit, and a vest embossed with “Novice Cyclist.” In each, Walker measured how much space passing cars afforded each rider “type.”

Walker—who was struck by buses and trucks alike during his research—found that traffic passed significantly closer when he rode farther from the road's edge, and that it gave more space to “female” riders (again, Walker in a wig). Notably, Walker discovered, motorists and commercial truck drivers in particular afforded less space—not more—to helmeted cyclists. In his second experiment, the only outfit that widened the average passing distance granted by motorists was a vest that prominently featured the word “Police” and warned that the rider was video-recording their journey.

Helmets, we know at the very least, are not an adequate safeguard for protecting riders from the most dangerous threat they'll encounter on the road.

Cyclists are [statistically](#) more likely to die in urban areas, if alcohol is involved, and if they are male. In 2020 [two-thirds](#) of bicyclist deaths in the United States occurred in motor-vehicle traffic crashes, according to National Center for Health Statistics mortality data. That year, [938 cyclists were killed in traffic crashes](#), up almost 100 deaths from the year before; in 5 out of every 6 crashes with a single vehicle, the car, truck, or bus first hit the cyclist from behind—likely without spotting the rider until it was too late.

“Looking at helmets as a solution is very shortsighted,” said Alison Dewey, the League of American Bicyclists’ education director. “It’s like a tertiary, or even farther down of a level, to keep you safe.”

After a drunk driver going 60 mph in his 3,500-pound BMW hit and killed cyclist Eric Ng, the New York Times [pointed](#) out that he had been helmetless. “Mentioning whether or not Eric wore a helmet is akin to blaming an egg for cracking against a pan,” wrote Ng’s friend and journalist Jessie Singer in their 2022 book *There Are No Accidents*. Cycling advocates have long argued that finger-wagging over helmet use unfairly shifts blame onto the most vulnerable people on the road instead of targeting risks at their source.

“What’s really kind of lurking over everything is that you are exposed to danger from private motor vehicles,” said Robert Davis, chair of the U.K.-based cycling advocacy group Road Danger Reduction Forum. “You go out there and it’s your job to watch out. It’s your job to grab hold of some product.”

From a zoomed-out perspective, helmets are simply not the road-safety panacea we want them to be. Several [analyses](#) suggest that U.S. riders are more likely to wear helmets compared with cyclists in other countries—all while suffering the highest fatality rate per distance traveled. Research shows that among a 14-country cohort, the Netherlands enjoyed the lowest bicyclist fatality rate per mile traveled. The Dutch also largely eschew the helmet: 73 percent of adults and 84 percent of children in the Netherlands report they never wear a helmet while bicycling. There’s a simple reason for that. Surveys show that Dutch residents feel safe biking, and attribute that sense of security to the country’s long-standing cycling culture and network of dedicated cycling lanes.

“We have this unquestioned idea that the roads are there for cars.”— Robert Davis

“They made it safe so that people don’t feel the need to wear helmets,” Davis said. “They think of cycling as a normal activity,” not as one that is inherently dangerous. This Dutch helmet paradox demonstrates the scale—cultural and infrastructural—of problem-solving required to address traffic safety.

But in cultures where transit prioritizes convenience for motorists, that’s a hard sell. “Our roads and systems were really designed around car users,” Omaki said. Davis agreed from his side of the Atlantic. “We have this unquestioned idea that the roads are there for cars,” he said.

Putting the responsibility of safety solely on individual shoulders all but guarantees failure, said Kathleen Bachynski, an assistant professor of public health at Muhlenberg College, in Allentown, Pennsylvania, who has studied bike helmet and sports injuries. “It’s an enormous burden,” she said. Asking individuals to spend money on helmets, lights, and reflective gear without investing in better transit culture ignores the fact that the real danger to cyclists comes from behind the wheel, not from behind handlebars.

“We can talk about bike helmets because it’s something we can blame for individual decision-making,” said Alison Bateman-House, an ethicist and medical historian at New York University who has studied mandatory helmet laws.

In 2019 the National Transportation Safety Board released a [report](#) analyzing bicyclist safety—something it hadn’t done for 47 years. It targeted many recommendations at changing driver behavior and road infrastructure.

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For one, the NTSB suggested reducing traffic speeds, pointing to data that show that bicyclist crashes at locations with speed limits of at least 50 mph were more than five times as likely to result in fatal or serious injuries than were crashes in speed-limit zones of 25 mph or less. The safety board also encouraged federal motor-vehicle standards to require evaluating headlights in real-world settings, and for the auto industry to modify collision avoidance systems to detect bicycles. It encouraged municipalities to invest in bicycle-compatible drainage grates and maintenance-hole covers, as well as to repurpose traffic lanes into separate travel lanes for cyclists, more pedestrian space, or additional street parking.

Increases in cycling transit—prodded by bike-share programs and the growing adoption of tricycles as well as recumbent, tandem, and foldable bikes—could also transform our car-centric culture into one that is safer for all road users, Dewey said. “To many motorists, it’s often forgotten that that’s a person,” she said. “The more we can open that tent and bring people in, the more, I think, empathetic that person will be as a motorist.”

When it comes to the dangers threatening cyclists, wearing a helmet is like bringing a knife to a gunfight. America’s top-selling vehicle model, the Ford F-Series, weighs up to 7,500 pounds. Its hood stands 4.5 feet tall—at the height of my chin. The fear that I feel biking in cities isn’t actually a fear of biking; it’s a fear of cars. Only a suite of infrastructure changes can combat the deadliest risk to cyclists. Not helmets alone. As a spokesperson for helmet-maker Giro [told](#) a cycling trade magazine in 2020: “There are many misconceptions about helmets, unfortunately,” adding: “We do not design helmets specifically to reduce chances or severity of injury when impacts involve a car.”

Regardless, experts I spoke to were unanimous about what these flaws *don’t* mean: that helmets are useless. They all believe you should wear one. “Every time I see someone on a bike in New York City without a helmet, it makes me sick to my stomach,” said Bateman-House. (For my part, I agree.) It may not save you from a car crash, but in a slow-moving fall, “it can be the difference between life and death,” said Rowson, who runs the Helmet Lab.

During the COVID-19 pandemic, public-health experts popularized the “Swiss cheese” harm-reduction model: the notion that imperfect protection stacked together can provide more safety than any single layer could on its own.

For infectious diseases, this ideally means combining individual measures such as mask-wearing and hand-washing with broader policies such as paid sick leave, widespread remote work, and universal access to tests, treatments, and vaccines. For bike safety, this would mean a combination of personal behaviors, like wearing helmets and using bike lights, and infrastructure, like protected bike lanes and reduced speed limits.

During the pandemic, much of the U.S. showed resistance to this kind of profound social and structural change, which would have saved lives but would have also required money, sacrifice, and consensus. “We chose not to do that,” Bateman-House said. We’re approaching bike safety, for the time being, with the same attitude. And those of us waiting for a safer ride are left to don our plastic shells and hope for the best.

Update, Jan. 18, 2023: This piece has been updated to attribute research to a 2020 paper on bicycle helmets.