

DANGEROUS BY DESIGN

2021



National Complete
Streets Coalition



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The National Complete Streets Coalition, a program of Smart Growth America, is a non-profit, non-partisan alliance of public interest organizations and transportation professionals committed to the development and implementation of Complete Streets policies and practices. A nationwide movement launched by the Coalition in 2004, Complete Streets is the integration of people and place in the planning, design, construction, operation, and maintenance of transportation networks.

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Our current approach to addressing the rising number of people struck and killed while walking has been a total failure.

It needs to be reconsidered or dropped altogether.

EXECUTIVE SUMMARY



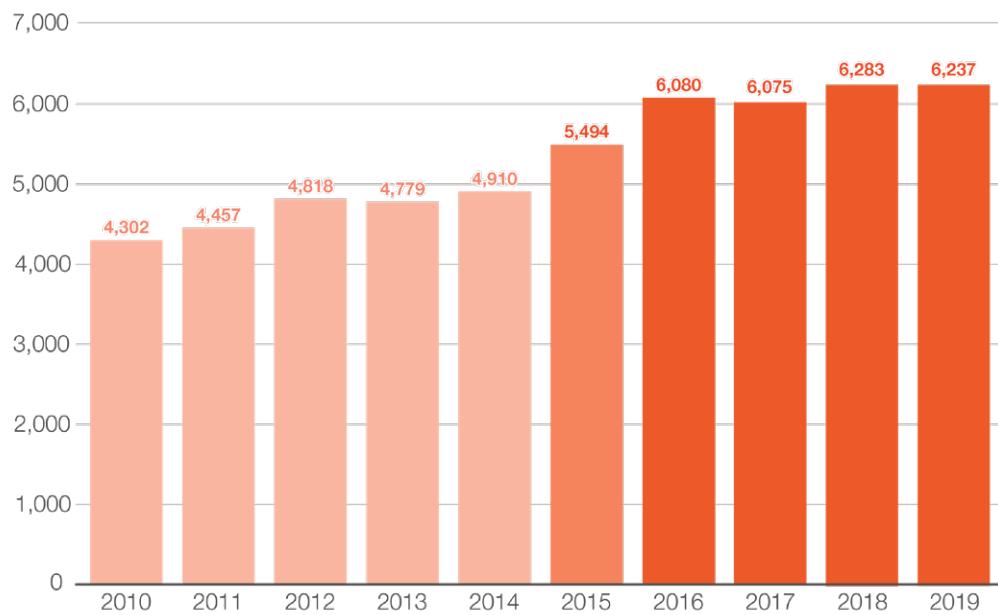
Smart Growth America
Improving lives by improving communities



Between 2010 and 2019, **drivers struck and killed 53,435 people** while walking throughout the United States, more than 14 people per day on average.

It has been more than a decade since the first edition of Dangerous by Design, and the problem has only gotten worse: drivers strike and kill thousands of people walking every year, and the annual death count continues to climb with each new edition of this report.

Pedestrian fatalities are up 45 percent from 2010 to 2019



***Note:** NHTSA released a report in December 2020 with fatality numbers in 2018 and 2019 (6,374 and 6,205) that differ compared to the raw Fatality Analysis Reporting System (FARS) data used in Dangerous by Design (6,283 and 6,237). Finding no way to reproduce NHTSA's numbers within the comprehensive FARS data, Dangerous by Design 2021 includes the numbers found in that raw, publicly accessible data. This discrepancy does not impact the overall trend in rising fatalities, and will be corrected if NHTSA releases updated raw data that are accessible to the public. View NHTSA's report: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813060>.

The number of people struck and killed each year has grown by **45 percent** between 2010 and 2019, and 2018 and 2019 saw the highest numbers of pedestrian deaths since 1990.*

Our streets are getting more dangerous—this edition finds that almost **every single state in the U.S. has grown more dangerous for people walking since the last edition of Dangerous by Design.** (49 of 50)



Photo from Jackson, MS courtesy of Dr. Scott Crawford

This report also highlights ongoing disparities in which groups of people are at greatest risk of dying while walking. Older adults, Black or African American and American Indian or Alaska Native people, and people in low-income communities continue to be disproportionately represented in fatal crashes involving people walking.

We know many of the factors responsible for these deaths. Policymakers are choosing not to address them. We continue to design and operate streets that prioritize the speedy movement of vehicles at the expense of safety for all people who use them. There are core tenets of acceptable roadway design that actively put people at risk and increase the likelihood that people walking and moving actively using assistive devices such as wheelchairs, walkers, sight canes, prosthetics, and scooters will continue to pay the price. These street design practices can also set drivers up to fail by making mistakes easier and the consequences of them more deadly, even when following the rules.

Our current approach to addressing these deaths needs to be reconsidered or dropped altogether—it is not working. Many states and localities have spent the last ten years focusing on enforcement, running ineffectual education campaigns, or blaming the victims of these crashes,

while often ignoring the role of roadway design in these deaths. Meanwhile the death count has continued to climb year after year. States and localities cannot simply deploy the same playbook and expect this trend to change—they need a fundamentally different approach to the problem. They need to acknowledge that their approach to building and operating streets and roads is contributing to these deaths.

This problem continues to get worse. 49 states and 84 of the 100 largest metro areas have become more dangerous compared to the decade of data covered in *Dangerous by Design 2019*.

It is past time for policymakers to take responsibility for stopping these preventable deaths. With discussions currently underway about the next reauthorization of our federal transportation bill, federal policymakers in Congress have an opportunity—and an obligation—to act now to make streets safer for everyone. Congress should create policy to change how we fund, design, and measure the success of our streets to prioritize the safety of all people who use them, especially people walking and traveling actively. The Complete Streets Act of 2021, which would do many of these things, was reintroduced in this Congress in February 2021. It should be supported and wholly incorporated into the next transportation authorization.

The U.S. Department of Transportation has an equal responsibility to ensure these changes take place by instructing states to set targets to reduce injuries and fatalities, improving current national data, and changing the standards that contribute to hostile conditions for people walking in federal manuals for roadway design and operations. USDOT also needs to set better motor vehicle safety standards that protect people walking. Traffic fatalities

overall have declined thanks partially to better safety standards for vehicle occupants, but federal decision-makers have failed to protect people walking from the impacts of larger and larger personal vehicles like SUVs. There is no shortage of other concrete, tangible actions that the new leadership at USDOT could take right now, many of which were outlined in Smart Growth America's transition recommendations (see p.15). President Biden's talented team at USDOT has much to do if they want to turn their words on safety into action.

We also call on states, the main builders and managers of our transportation system, to take responsibility for the safety of people walking on their streets. They must go beyond the ineffective education campaigns that have failed to stem the tide of fatalities, and make fundamental changes to how they design roads. We have to stop thinking that we can educate or enforce our way out of a problem largely created and exacerbated by streets designed to treat people outside of a car as afterthoughts at best and with outright neglect or hostility at worst. **And we call on all levels of government**—states, regions, and localities—to prioritize protecting the most vulnerable people using our streets.

This ten-year increase in deaths is a failure of our government at nearly all levels. We have been producing this report for more than a decade. During those ten-plus years, this report has documented the slow, steady, and terrifying increase in the number of people struck and killed while walking each year in this country—even as overall traffic fatalities have been trending downward.

We are tired and saddened to produce yet another edition of this report without any positive change to show for it. We must do more to reduce the number of people that die while walking every day on our roadways, and more to protect older adults, Black or African American and American Indian or Alaska Native people walking, and people walking in lower income areas. This is a matter of life and death. We hope the next edition of Dangerous by Design will tell a different story, but without some fundamental changes in the near term, the problem will only get worse, and thousands of Americans will pay with their lives.

Stephen Lee Davis / Smart Growth America



DANGEROUS BY DESIGN

Our approach to building and operating streets and roads is directly contributing to these deaths.

Introduction

Throughout the United States between 2010 and 2019, **drivers struck and killed 53,435 people while walking**, more than 14 people per day on average. The number of people struck and killed each year has been on a steady and inexorable rise over this decade, growing by **45 percent between 2010 and 2019.**¹ 2018 and 2019 saw the highest numbers of pedestrian deaths since 1990.^{2,3}

If these statements feel familiar, it's because they are. It has been more than a decade since the first edition of *Dangerous by Design*, and the problem has only been getting worse. Drivers strike and kill thousands of people while walking every year, and the annual death count continues to climb with each new edition of this report. Over the years, we have compared the magnitude of those deaths to everything from a jumbo jet crashing every month to more than sixteen times the deaths caused by natural disasters. We are running out of comparisons.

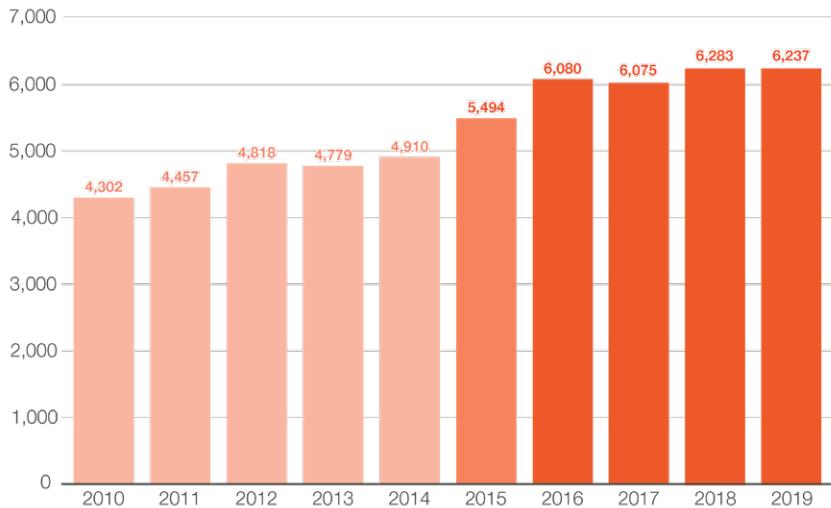
We would love to stop releasing *Dangerous by Design* because policymakers have finally heard the urgent need and taken action to fix the problem. Yet our streets are only getting more dangerous. Unlike our last report in 2019 when 13 states were improving, forty-nine out of fifty states in the U.S. became more dangerous for people walking since the last edition of this report using our "Pedestrian Danger Index" (PDI) metric, which puts these deaths in the context of states' populations and walking rates.

Our current approach to addressing these deaths is not working.

Many states and localities have spent the last ten years focusing on enforcement, running ineffectual education campaigns, or blaming the victims of these crashes, while ignoring or actively distracting people from the role of roadway design in these deaths. States and localities cannot simply deploy the same playbook and expect this trend to change—they need a fundamentally different approach to the problem. They need to acknowledge that their approach to building and operating streets and roads contributes to these deaths.

Like previous editions, this report ranks the most dangerous states and metropolitan areas for people walking across the United States, using a metric that allows us to fairly compare states and metro areas to one another. It also exposes continued disparities in which groups of people are at greatest risk of dying while walking: older adults, Black or African American and American Indian or Alaska Native people, and people walking in low-income communities. This report calls on leaders at the federal, state, and local level to do more to ensure streets are designed and operated to protect the safety of all people who use them.

The number of people struck and killed while walking has grown by 45 percent over the last decade



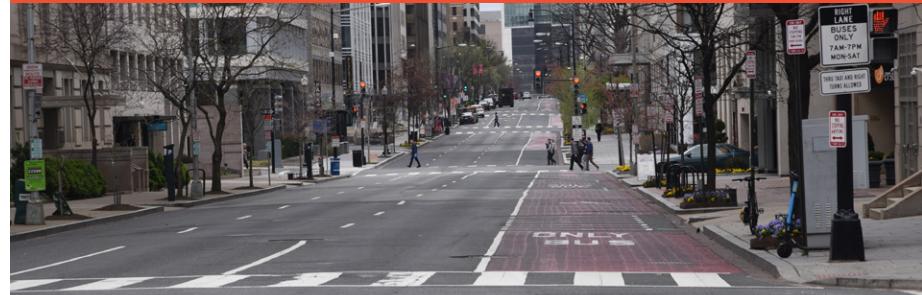
It's long past time for policymakers to take responsibility for these preventable deaths

Every single one of these deaths is tragic—even more so because many are avoidable. Policymakers have allowed this trend to continue. This report may sound like a broken record, but it hasn't always been this way. The national surge in pedestrian deaths is a relatively recent phenomenon. The number of people fatally struck while walking decreased steadily for three decades before starting to rise at an alarming rate beginning in 2009.

The impacts of COVID-19 on traffic safety

While the federal government has only released national data on pedestrian deaths through 2019 at the time of this report, we know the COVID-19 pandemic has profoundly impacted daily travel, particularly in the early stages of lockdown in early 2020. Driving initially declined significantly as people followed stay-at-home orders; but with fewer cars on the road, speeding went up. All of the 25 largest metro areas in the U.S. saw an increase in average travel speeds early in the pandemic, some by as much as 65 percent.⁴

While we don't yet know the full consequences of that speeding for people walking, we know the rate of traffic deaths overall skyrocketed even as driving plummeted. The National Safety Council estimates a 24 percent spike in (all) traffic fatality rates in 2020—the biggest increase in 96 years—a year when miles driven overall was down 13 percent.⁵ One way to take this is that typical levels of congestion and delay on our roads—which transportation agencies typically try to eliminate at almost any cost—are perhaps placing a crucial role in preventing thousands more traffic fatalities, for people walking *and* driving. Put another way, for states and metros that are unwilling to commit to designing roads for safety over speed, congestion might be their most effective (though accidental) safety tool. See page 17 for a closer look at what we know about 2020.





From 2010 to 2019:



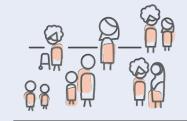
Pedestrian deaths
increased by

45%

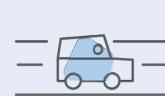


Traffic deaths
among motor
vehicle occupants
increased by

3.7%



Walking as a
share of total trips
stayed steady
around



Vehicle miles
traveled
increased by

10.5%

↑ 9.6%

*From 2009-2017

This staggering increase of people fatally struck has far outpaced motor vehicle occupant deaths. While the number of people struck and killed by drivers while walking increased by 45 percent between 2010 and 2019, driver and passenger fatalities increased by just 3.7 percent.⁶

This isn't a clear byproduct of any major shift in how people travel—especially not a change in walking. The percent of people walking to work dropped slightly and total annual vehicle miles traveled (VMT) increased by only 9.6 percent.⁷

National travel surveys from 2009 and 2017—the closest available years—show that walking as a share of all trips held steady at around 10.5 percent.⁸

We know many of the factors responsible for these deaths.

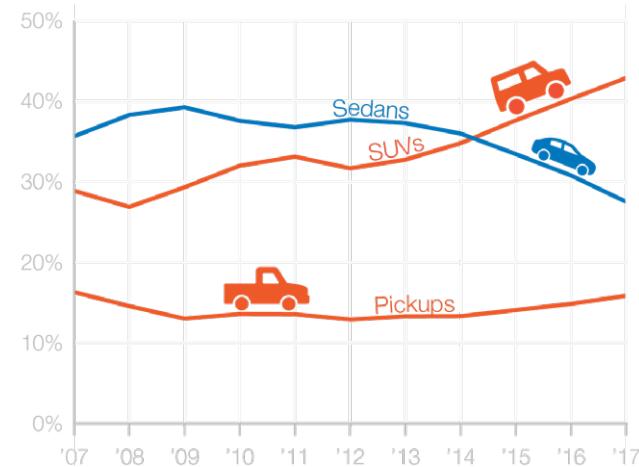
Policymakers are choosing to ignore them. We continue to design streets that are dangerous for all people, especially people walking and moving actively using assistive devices such as wheelchairs, walkers, sight canes, prosthetics, and scooters. Yet no matter how many times we (and countless other advocates and researchers) say it, federal and state decision-makers have failed to change the policies, standards, and funding mechanisms that produce roads that prioritize high speeds for cars over safety for all people. In doing so, policymakers are choosing to let these deaths continue.

The federal government has failed to act when it comes to the deadly impacts of ever-larger vehicles

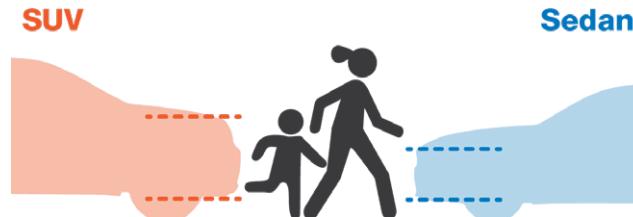
We know more people are driving trucks and SUVs (sport utility vehicles), which are two to three times more likely than smaller personal vehicles to kill people walking in the event of a crash.⁹ Recent research from the University of Wisconsin-Milwaukee found the share of pedestrian deaths involving trucks, vans, and SUVs has increased from 22 to 44 percent since the mid-1980s.¹⁰ The size of larger vehicles has also increased dramatically over the past several decades: pickup trucks in particular are nearly 1,256 pounds (32 percent) heavier than they were in 1990.¹¹

The National Transportation Safety Administration issued recommendations in 2018 to revise motor vehicle safety standards to better protect pedestrians, but federal policymakers have so far failed to make changes.¹² This is directly contributing to the deaths of people walking, but it also sets drivers up to make mistakes that bring devastating impacts to them: failing to see a child walking until it is too late because of the vehicle size, or killing a person walking in a crash that could otherwise have resulted in injury with a smaller, safer vehicle. For every pedestrian killed, at least three people are forever changed: a victim who dies, the people who loved them, and the person who has to live with the knowledge that they killed someone.

Percent U.S. annual market share of new vehicles, by type



The graphic above shows the change in the makeup of the US vehicle fleet. At the top right, a comparison of truck sizes from 20 years ago vs more recent models, and the height of a new 2021 truck model on display at the Washington Auto Show. Below, a simple graphic shows why people struck by larger vehicles are more likely to die in a collision. Top, Flickr photo by Norman Walsh, bottom Stephen Lee Davis / Smart Growth America



An alarming number of states have abdicated their responsibility to improve safety, suggesting that the rising death count is a consequence of factors outside their control. Beginning in 2018, the federal government required states to set a combined target for the number of non-motorized deaths and serious injuries, which includes people walking, biking, using wheelchairs, and riding scooters and other non-motorized vehicles. In that first year—shown in the graphic below—18 states accepted the current trend line and set targets for more people traveling outside a vehicle to be killed and injured compared to the most recent year of data reported at the time. And unfortunately, six of those states exceeded those grim targets to increase fatalities and serious injuries in 2018.¹³ In 2020, more states threw their hands up at the problem: 20 states set “safety” targets for more deaths and serious injuries than the previous year.¹⁴ These states need to accept the role their roadway design practices play in these deaths and actively participate in the solution, starting with setting performance targets to reduce the number of people killed while walking and funding projects to make it happen.

In 2018, 18 states set targets for more people to die

States that set targets to improve safety	States that set targets to increase deaths and serious injuries
Delaware	Michigan
Iowa	Minnesota
Kansas	Vermont
Maine	Wyoming
Alabama	North Dakota
Massachusetts	Oklahoma
New Mexico	Rhode Island
New York	Utah
Alaska	Oregon
Arizona	Pennsylvania
DC	South Carolina
Hawai'i	Tennessee
Idaho	Texas
Illinois	Virginia
Kentucky	Washington
Louisiana	West Virginia
Arkansas	Georgia
California	Indiana
Colorado	Nebraska
Connecticut	Nevada
Florida	South Dakota

Note: Injury data not reported in Wisconsin



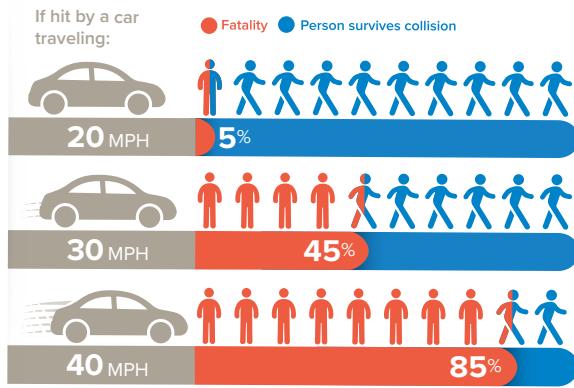
Courtesy of Andy Boenau



Courtesy of Angie Schmitt

Speed kills

Designing roads for high speeds dramatically increases the likelihood that a person struck while walking will be killed. At 40 miles per hour, 85 percent of crashes involving a person walking are fatal.¹⁵ Designing streets for slower speeds is directly connected to improving safety and reducing deaths.



National Traffic Safety Board (2017) Reducing Speeding-Related Crashes Involving Passenger Vehicles. Available from: <https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf>

Lower speeds save lives, and good design reduces both speed and driver error

It's not just about the presence or lack of sidewalks and crosswalks—other aspects of roadway design lead directly to higher speeds and more deadly streets. Most drivers have experienced that momentary shock of looking down at their speedometer and discovering they are well above the posted speed limit. Drivers follow visual cues and the majority drive at a speed that feels safe. The “design” speed of a road may be far higher than the speed limit.

Conventional wisdom used by federal and state safety offices attributes most crashes to driver or pedestrian error, but rarely to designer error. Yet good design leads to better driving behavior, fewer mistakes, and mistakes with less

deadly impacts. A recent research scan from the Journal of Planning Education and Research indicates street design and other physical characteristics of the surrounding environment prime drivers' expectations about potential conflicts or hazards and risk response, playing a direct role in many of the human errors that result in crashes.¹⁶

The illustrations on the following page explain how roadway design contributes to the preventable deaths of people walking and how better design can shape driver behavior, lower speeds, and make people safer.

Good design also means less enforcement

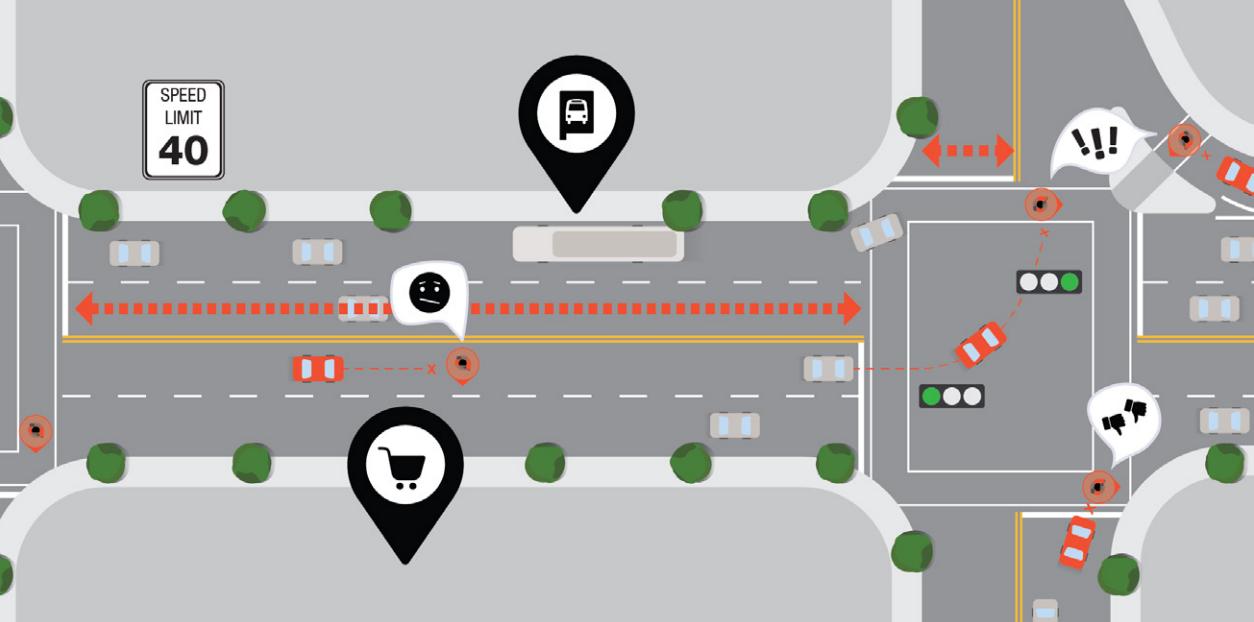
Designing roads for slower speeds that are self-enforcing also reduces the need to rely on law enforcement, which can pose disproportionate financial and legal burdens on lower-income people. This also saves money and prevents potentially deadly encounters with police for Black and Brown people. Designing to prioritize the safety of people walking also helps mitigate risky pedestrian behavior and can make the “crime” of jaywalking obsolete. **Our goal with design should be to make dangerous behavior difficult and safe behavior easy.**

Safer design can even make distracted driving collisions less deadly.

While some media outlets have pointed to distracted driving as a potential cause of rising deaths among people walking, recent research from Ohio State indicates road design plays an important role in curbing the most dangerous consequences of distracted driving by reducing the severity of those crashes. It finds crashes involving a distracted driver are less severe in urban areas where street design and other visual cues are more likely to encourage slow speeds and awareness of people walking, particularly certain states like Florida, North Carolina and North Dakota. It also finds these crashes are more severe when high speeds are involved.¹⁷

Dangerous by design

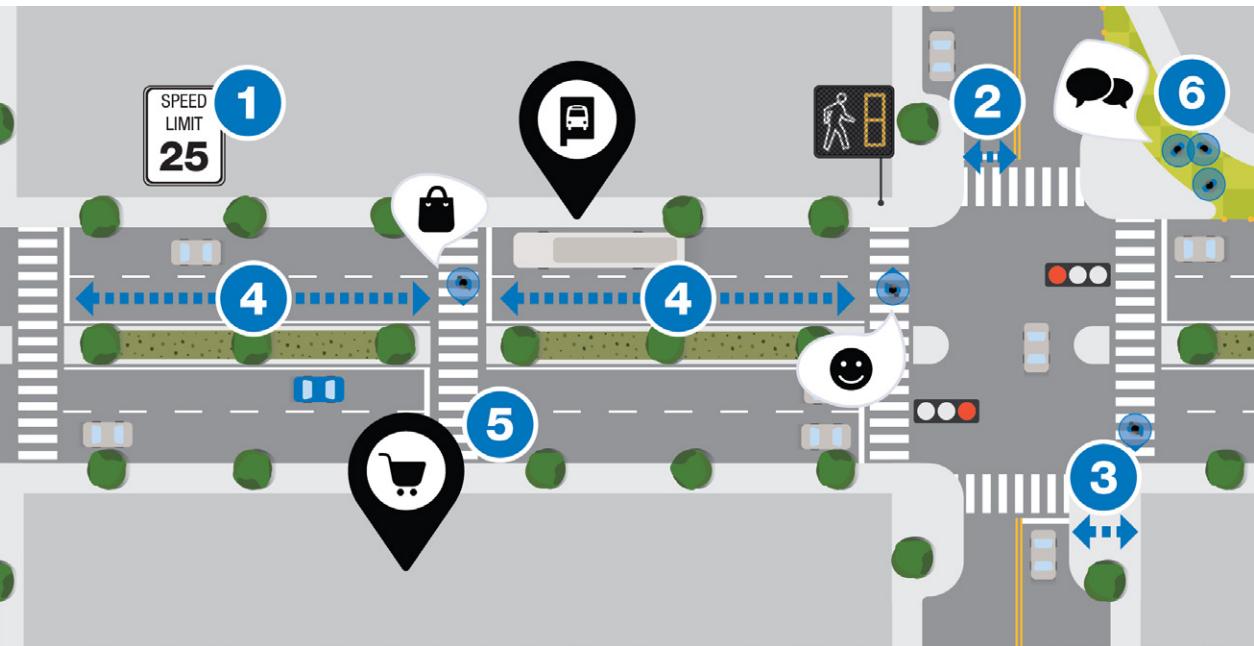
Streets that have wide lanes that allow room for mistakes, lack high-visibility crosswalks, have wide intersections that encourage drivers to make turns without slowing, and have long distances between intersections, encourage higher speeds—regardless of how low speed limits are set. Yet people will cross even in dangerous conditions when the nearest safe crosswalk requires a long detour, especially when there are destinations or transit stops along the road.



Safer by design

- ① While important to lower speed limits, safe design gives drivers other visual cues to slow down.
 - ② Narrower travel lanes naturally slow traffic,
 - ③ high-visibility, signalized crosswalks make drivers more aware of pedestrians, and extended curbs shorten the distance required to cross the street.
 - ④ Decreasing the distance between intersections also helps reduce speeds.
 - ⑤ Adding signalized crosswalks in the middle of long blocks slows traffic and provides valuable new connections where people already want to walk.
 - ⑥ Eliminating right turn “slip” lanes in favor of right-angle turns produces slower, safer turns and shorter crossing distances for pedestrians.

(See p.16)



Addressing the problem—what can be done

Federal policymakers in Congress have an opportunity—and an obligation—to act now to make streets safer for all people, with discussions currently underway about the next reauthorization of our federal transportation bill. Congress should create policy that changes how we fund, design, and measure the success of streets nationwide to make safety our highest priority, especially the safety of the most vulnerable people. The next federal transportation reauthorization bill should incorporate a focus on safety over speed throughout all federal programs. The INVEST Act passed by the House of Representatives in June of 2020 was a great start.¹⁸ This isn't just about safety—our federal policy and funding systems should prioritize investments that improve access to jobs and necessities for everyone, including those who cannot drive or afford a vehicle, and making streets safer for people walking is a necessary step to doing that. And Congress must hold states accountable for making reductions in serious injuries and fatalities.

Congress should also pass the Complete Streets Act, which sets aside funding for complete streets technical assistance, planning, and construction. Any reauthorization or infrastructure legislation must include a strong federal Complete Streets policy that requires state departments of transportation to consistently plan for and construct projects for all people who use the street, including the most vulnerable, and that opens the door for more innovative, flexible design guidance.

We also need more and better data on the street conditions where fatalities occur, the demographics of the victims, and other conditions of the crash. While we know some of the factors likely responsible for this decade's sharp increase in fatalities of people walking—like the increasing share of SUVs and larger vehicles on the road—limitations and inconsistencies in the data prevent a fuller picture. More research is needed to identify all the factors behind this terrible trend. At the national level, the Fatality Analysis Reporting System (FARS) is the most comprehensive dataset on traffic fatalities we have, but

there is a considerable delay in its release; we don't know how many people died in a given year for a full year afterwards.

In addition, the disability data reported by FARS is incomplete, and inappropriately groups wheelchair and scooter users with skateboarders, roller skaters, baby carriages, and more. We also need standards for better race and ethnicity data at the time of crashes, which are often missing or inadequately recorded. And after years of leaving it out, FARS has finally moved toward including national injury data—a longstanding gap—but those data are not yet comprehensive.

If we don't fully understand who is being killed and where in great detail, how will we ever comprehensively address this problem?



The U.S. Department of Transportation (USDOT) has an equal responsibility to ensure these changes take place. We recently released recommendations for President Biden's administration with immediate actions USDOT should take: requiring that states stop setting negative injury and fatality targets, improving current national data, and updating federal manuals for roadway design and operations to change standards that contribute to hostile conditions for people walking.¹⁹ The National Highway Traffic Safety Administration (NHTSA) should also update its guidance and approach to deprioritize traffic enforcement and revise vehicle safety standards to better protect pedestrians. USDOT has substantial authority to act, and many of these steps are actions the agency could and should have taken years ago.

Failing to act is consenting to the result.

States must implement performance measures to reduce the number of people killed while walking. One way to make safety a higher priority is to deprioritize or get rid of roadway design metrics focused exclusively on minimizing how often cars need to slow down. This emphasis on reducing traffic "delay" as the number one goal produces some of the most dangerous roads—roads where drivers travel at high speeds, aren't expecting to need to slow down, and aren't looking for people walking. States can also provide their engineers with the most up-to-date training and education on implementing Complete Streets and update policies and decision-making frameworks to support Complete Streets.

And all levels of government—states, regions, and localities—should prioritize projects that bring the greatest benefits to those who are suffering disproportionately. Traffic deaths impact every community in the United States, but this report shows that people living across the southern continental United States, older adults, people of color, and low-income communities bear a larger share of this harm.



Photo courtesy of Andy Boenau

**Failing to act is
consenting to
more preventable
deaths.**

How does speed get prioritized over safety?

Slip lanes, those short right-turning lanes at intersections that allow vehicles to turn without slowing down, demonstrate how we could improve safety through design, if safety were truly the highest priority. Slip lanes were created to solve one specific set of problems: **vehicle speed and delay.**

They were borne of the simple realization by traffic engineers that cars turning right—even on a green light—can produce congestion because slowing down to a safe turning speed in a travel lane can delay traffic traveling straight. Slip lanes prioritize vehicle speed over the safety of everyone who uses the road by 1) increasing the distance required to cross a street, 2) putting people walking into the very spots that can have the worst visibility for a driver, and 3) encouraging drivers not to slow down when approaching an intersection and a crosswalk—the precise moment they should be the most careful.

For drivers turning right in the images below, all the design cues are directing them to blaze through their turn right into the precise spot where engineers have said that a pedestrian should “safely” cross.

We already know how to design a safer intersection, but all the embedded practices of the agencies in charge prioritize keeping cars moving by default. Slip lanes are found everywhere across the country in rural, urban and suburban areas, designed and built with federal money and guidance over the last 50 years. Better education and enforcement will not fix this problem.

Even the Federal Highway Administration (FHWA) knows efforts to make slip lanes “safer” will always be limited, because their created purpose—keeping traffic moving—is fundamentally opposed to safety for people walking:

“While right-turn slip lanes are generally a negative facility from the pedestrian perspective due to the emphasis on easy and fast vehicle travel, they can be designed to be less problematic.”²⁰

A small change to a road in Arlington, Virginia (noted on the following page) is a great example of prioritizing safety over speed. Unfortunately, Arlington is in the minority. **Most states and cities will not change their practices unless Congress and USDOT sends a directive that the lives of people who die as a result of traffic fatalities are more important than a few seconds of delay.**





Before

Back in 2009, this slip lane in Arlington, VA made it possible for drivers to zoom onto a neighborhood street without so much as a tap on the brakes, right into a crosswalk. But changes were subsequently made to narrow the lanes, eliminate the slip lane, convert the right turn into a sharper turn that requires drivers to slow down before turning, and move the crosswalk to the safest and shortest point of the intersection where pedestrians will be the most visible. Perhaps there's some additional vehicle delay today as cars now have to slow down to turn right, but that's what it looks like in practice to prioritize safety over vehicle speed or delay. Imagery from Google Street View.



After

What we saw in 2020

The coronavirus pandemic has had unprecedented impacts on daily life, including the trips people take for work and leisure. And while the federal government likely won't release full 2020 national data on people struck and killed while walking until late 2021, new data estimates and broader highway safety trends paint a troubling picture.

During lockdown, traffic fatality rates shot up, even as driving dropped precipitously. The fatality rate from April-June increased by 32 percent to its highest level in 15 years, according to data from the National Highway Traffic Safety Administration (NHTSA). While the overall number of traffic deaths (including motor vehicle occupants, people walking, and others) decreased slightly during that period compared to the same three months of 2019, driving dropped by 26 percent.²¹ Once the initial stage of lockdown ended and driving began to increase back toward pre-COVID levels, the raw number of traffic fatalities also began to climb again, increasing 13.1 percent in July-September compared to the same three months in 2019, according to a later NHTSA report.²²

With fewer drivers and less congestion on the road, speeding went up. A number of states and cities reported higher instances of speeding in the first few months of the pandemic, and preliminary national research supports those findings. A report from INRIX found average speeds increased in all 25 of the largest metropolitan areas in the U.S during April-July 2020, in some cases by nearly 65 percent, like in Philadelphia and San Francisco.²³ This is likely a factor in the sharp rise in the traffic fatality rate early in the pandemic—and something that designing roads for slower speeds could have helped prevent.

The trend for the full year tells a similar story: driving went down and traffic fatality rates spiked. The National Safety Council is estimating the biggest increase in traffic fatality rates in 96 years in 2020—a 24 percent spike—during a year when miles driven overall was down 13 percent. This

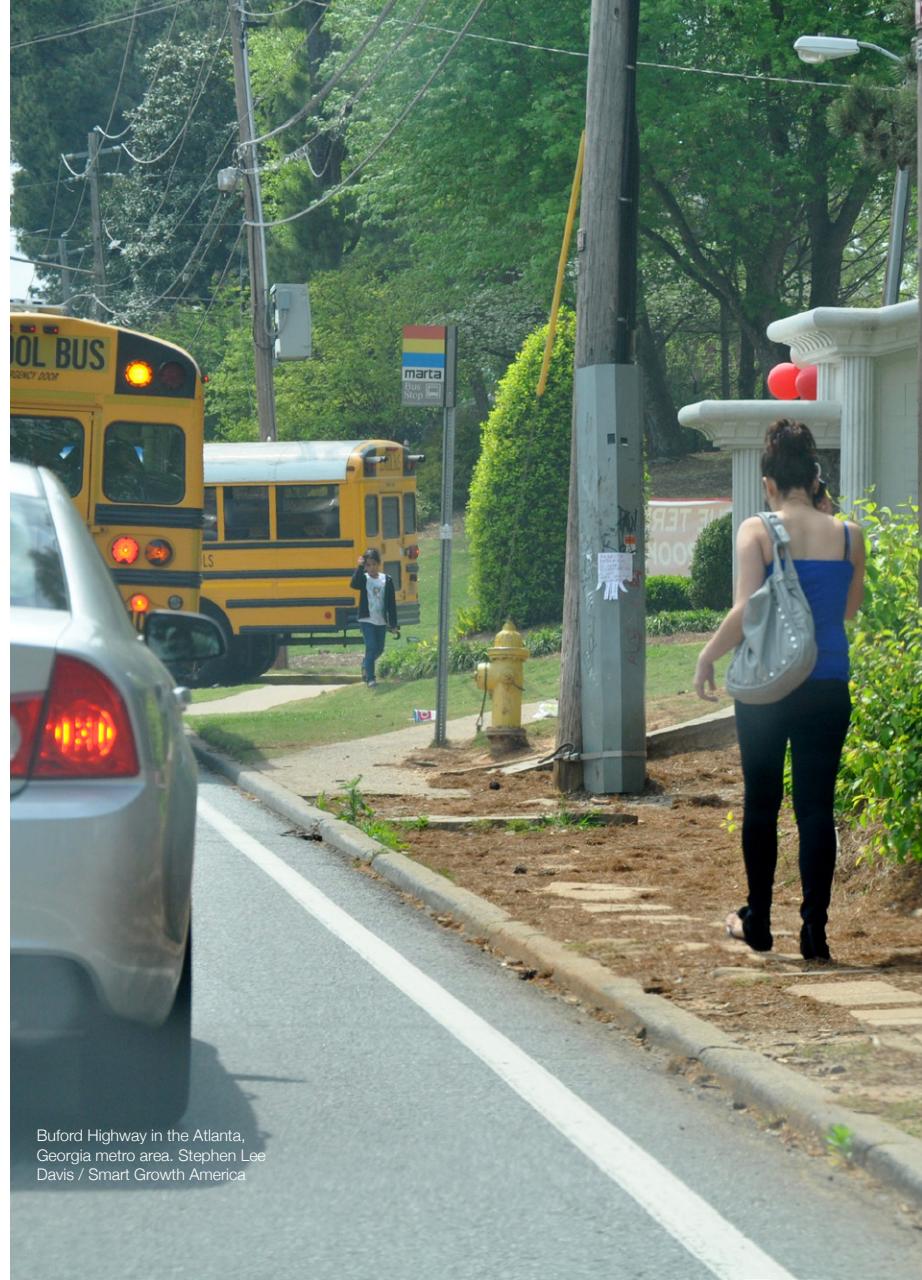
shows that typical levels of congestion and delay on our roads—which transportation agencies typically try to eliminate at almost any cost—is perhaps playing a crucial role in preventing thousands more deaths of people driving or walking. Put another way, for the states and metros that are unwilling to commit to prioritizing safety over speed and a holistic approach to safety, congestion might be the most effective (and unintentional) safety tool that they have.

There's no clear story yet about people killed while walking in 2020.

While we don't have national data on people killed while walking in 2020, some state departments of transportation, like Massachusetts and Washington State, provide publicly available safety data portals with relatively current information.^{24,25} Several others—Connecticut, Colorado, Louisiana, and Washington, DC—offered preliminary crash data from 2020 at our request. These states all deserve recognition for their transparency and willingness to be a partner in addressing the problem.

These states' combined data don't tell a clear story yet. In most of them, preliminary data show that the raw number of people struck and killed while walking over the first ten months of the year remained similar in 2020 to 2019, though there are exceptions: the number of people killed while walking in Louisiana spiked in 2020, while people killed while walking dropped nearly in half in Massachusetts. However, significant data cleaning occurs between initial police reports and the final numbers released in FARS. These preliminary death counts are subject to change and it is difficult to draw final conclusions. Congress and USDOT should actively seek ways to speed the sharing of these data, as 9-10 months is too long to wait for it.

These pedestrian deaths will also need to be taken in the context of other changes to travel behavior in 2020, including where and how frequently people walked in 2020. And it will be crucial to dig into who the victims of these crashes were in 2020, whether the same groups continue to be most vulnerable, and whether any disparities grew even more pronounced as work and leisure trips shifted during the pandemic.



Buford Highway in the Atlanta, Georgia metro area. Stephen Lee Davis / Smart Growth America

Oakland, CA was one city that piloted approaches to make streets safer during COVID

At the beginning of the pandemic, a number of local governments partially or fully closed certain segments of streets to vehicles to provide more space for residents to safely exercise outdoors and move around the city. While many cities focused on closing residential streets to traffic to improve safety for exercise and play, the City of Oakland's "Slow Streets" program stands out for also emphasizing safe access to essential places, addressing high-crash streets, and focusing on vulnerable communities.

Oakland initially launched their Slow Streets Program in April 2020 to support physical activity and reduce overcrowding on trails, parks, and sidewalks during the pandemic by closing over 20 miles of streets to motor vehicles. After implementation, the city set out to evaluate the program and gather feedback from residents.

City staff heard that traffic safety is a more important issue during COVID-19 than creating space for physical activity for many Oaklanders, especially those in East Oakland and in high priority neighborhoods where fewer workers are able to telecommute. In response, the City launched a new stage of the program, "Slow Streets: Essential Places," in May, installing temporary intersection improvements to support safe access to grocery stores, food distribution sites, and Covid-19 test sites. The city overlaid these essential places with its High Injury Network, where just 6 percent of city streets account for over 60 percent of severe and fatal traffic crashes, as well as the highest-priority neighborhoods according to equity indicators like race and income. Oakland installed its first Slow Streets: Essential Places project near a neighborhood grocery store at

the intersection of Avenir and Bancroft avenues, using traffic cones and signage to create a temporary median and upgraded crosswalks to rapidly reduce the risk of traffic crashes. Between May and July, the city installed 14 additional projects.

In October, again in response to community feedback, the city kicked off another new phase of the Slow Streets program and partnered with Oakland-based artist Jonathan Brumfield to make the purpose of the temporary installations clearer and the installations themselves more attractive and reflective of the surrounding neighborhoods. Oakland received funding support for Blumfield's time through Smart Growth America's ongoing Arts & Transportation Rapid Response initiative, which seeks to pair transportation agencies with artists to develop creative solutions to COVID-related transportation challenges.²⁶





Flickr photo by Andrew Bossi

The most dangerous places to walk in the United States

Our “Pedestrian Danger Index” (PDI) calculates how deadly it is for people to walk in a state or metropolitan area based on the number of people killed by drivers while walking, controlling for the number of people that live in that state or metro area and the share of people that walk to work. Among limited datasets about walking, the share of people who walk to work is the best nationally available approximation of the total number of people who walk for all trips. This approach allows for a balanced comparison by accounting for places that may have higher numbers of fatalities simply as a function of higher numbers of people traveling on foot overall. For example, the New York City metropolitan area saw the largest number of people struck and killed while walking between 2010-2019 by a large margin, yet also has a very large population and incredibly high rates of walking to work. PDI allows us to fairly compare it to a metropolitan area like Orlando, which also has fairly high fatality numbers but a lower population and far lower rates of walking to work.

The 2021 calculations include traffic deaths that occurred between 2010 and 2019 from the Fatality Analysis Reporting System (FARS). Mode share and population data are taken from the U.S. Census Bureau’s 2019 American Community Survey five-year estimates. For PDI by race, and ethnicity, we use walking rates from the American Community Survey Public Use Microdata Sample (PUMS). Consult the Appendix for a more detailed description of our methodology.

This report calculates PDI for all 50 states and for the 100 largest metropolitan statistical areas (MSAs) nationwide (inclusive of the Washington, D.C. region), highlighting the places that are especially deadly for people walking. Since the previous edition of *Dangerous by Design*, which looked at traffic deaths between 2008 and 2017, states have gotten worse. In our 2019 report, 13 states got less deadly compared to the previous edition, but this time **PDI scores have increased in 84 of the top 100 MSAs and forty-nine out of fifty states**. In the remaining state, Rhode Island, it stayed the same.

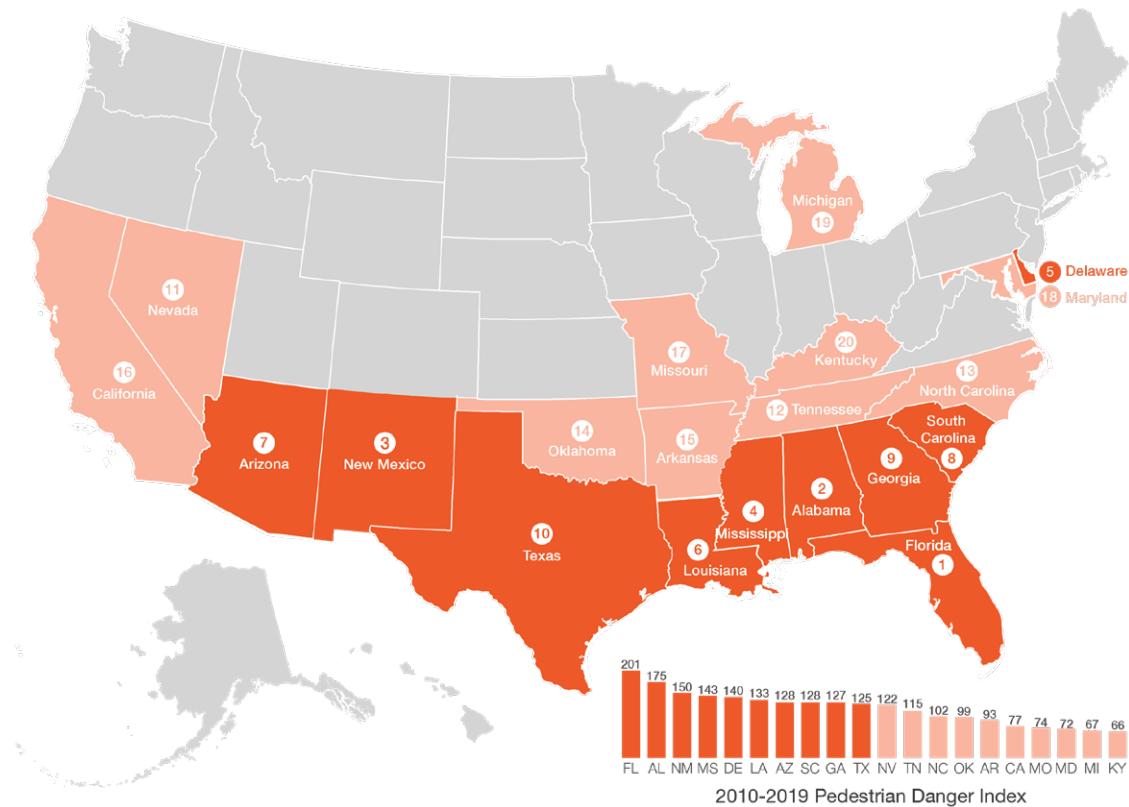
The graphic on this page highlights the top twenty most dangerous states for people walking based on PDI scores.

Nine of the top ten most dangerous states fall across the southern continental U.S., as do many of the top twenty most dangerous states. Much of the growth and development in southern states occurred after World War II as car ownership became widespread, and those states still face that legacy today in the form of spread out, driving-scale development with wider roads and long blocks. Those conditions make it more dangerous to travel outside a car and more difficult to make design changes that improve safety.

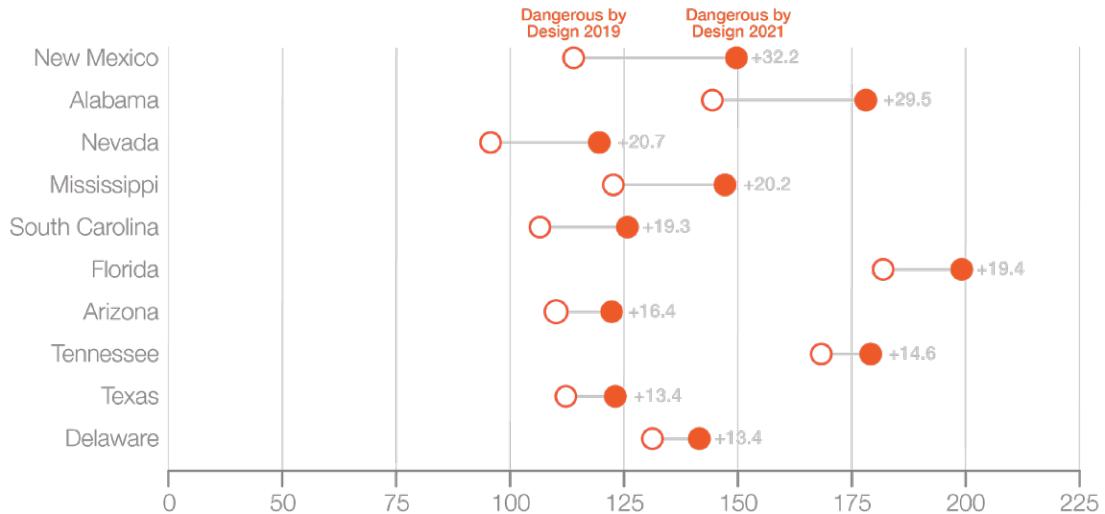
The ten most dangerous states for people walking in this report are the same ten states that topped the list in *Dangerous by Design 2019*, although some rankings within the top ten have shifted (consult Appendix A for a comparison of rankings). While improving safety requires a long-term commitment to retrofitting infrastructure and changing the practices that lead to these dangerous roads, any state can make immediate progress today. There is no excuse not to take action now.

THE TOP 20

Most dangerous states for pedestrians (2010-2019)

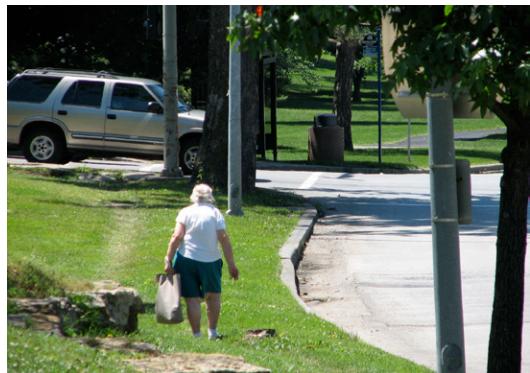


States with largest increases in 10-year PDI scores

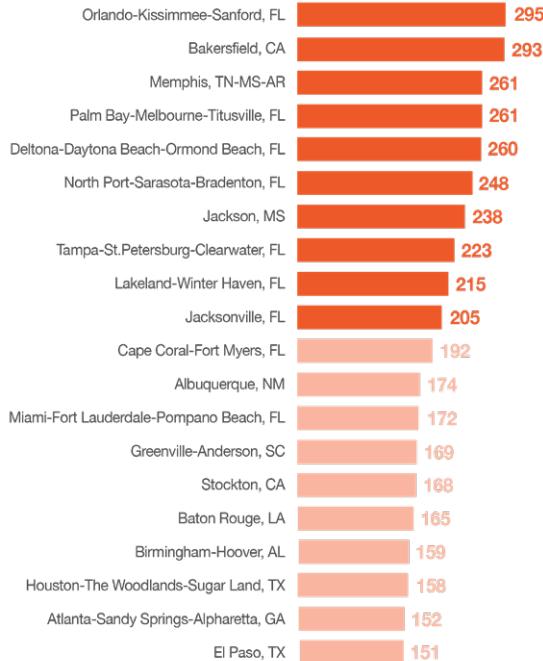


The graphic on this page shows the ten states that saw the biggest increases in PDI since *Dangerous by Design* 2019. PDI scores for these states rose by anywhere from 13.4 to 32.2 points, meaning these places have become even more dangerous for people walking since the last report. These are noteworthy large increases, reflecting an increase in the number of deaths in 2018 and 2019 in many cases. As of *Dangerous by Design* 2019, which analyzed deaths from 2008-2017, the states with the largest change in PDI scores since the prior 2016 report ranged from 7.9 to 24.5 points.

Top photo by the National Complete Streets Coalition, middle photo by Stephen Lee Davis / Smart Growth America, and the bottom photo by BikeWalk KC on Flickr.



The graphic on this page shows the PDI scores for the top twenty most dangerous metropolitan areas for people walking. Once again, seventeen of those twenty most dangerous metro areas are located within southern states. Research has consistently linked the sprawling growth patterns common in many of those states to higher rates of both traffic-related deaths for people walking and traffic-related deaths overall.^{27,28} Nine of the twenty most dangerous MSAs are in Florida.



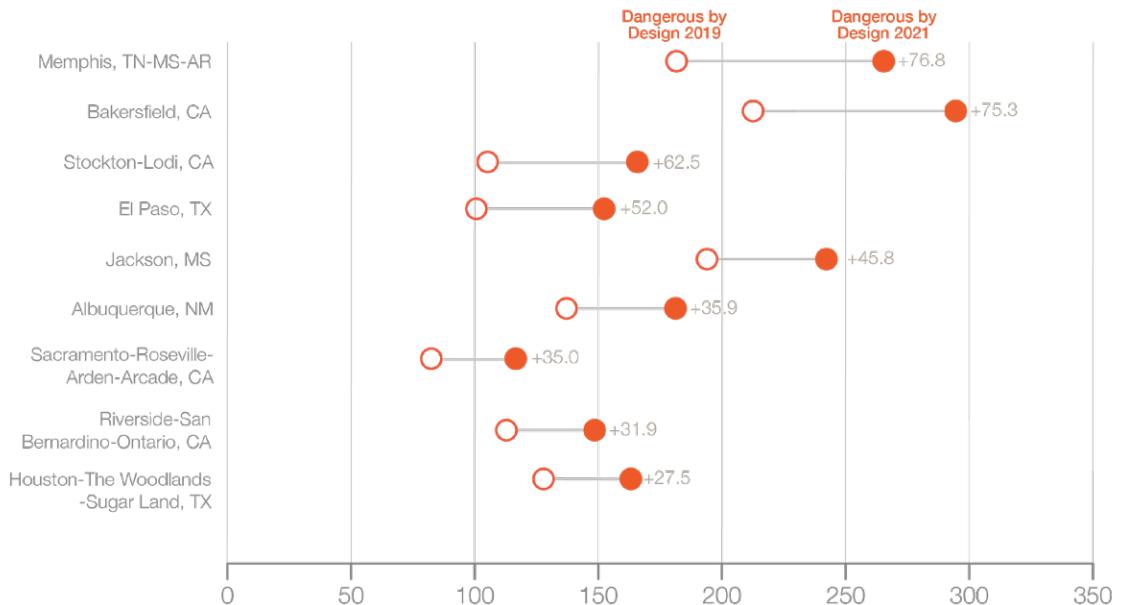
THE TOP 20

Most dangerous metropolitan areas for pedestrians (2010-2019)

● Top 1-10 ● Top 11-20



MSAs with largest increases in 10-year PDI scores



Eighty-four of the 100 largest metropolitan areas grew more dangerous for people walking since the previous edition of Dangerous by Design. The graphic above shows the metropolitan areas that experienced the worst increases. These regions saw PDI scores climb by as much as 77 points, meaning the decade from 2010 to 2019 was much more dangerous on average for people walking in these places compared to the decade between 2008 and 2017.

In Jackson, MS, the metro area with the fifth-biggest increase in PDI since the 2019 report, every improvement in conditions (as seen in the top and middle photos at right) is countered by hundreds of other streets and sidewalks that are woefully insufficient to allow for safe travel by all people who need to use the road, as with the bottom image. Moments of progress are worth celebrating, but scattered, small fixes will fail to keep up with the scale and scope of the problem. Photos submitted by Dr. Scott Crawford.



Some Florida cities are becoming safer, but statewide progress has stalled

For many years, Florida has topped the list of most dangerous states in the U.S. for people walking, with scores of metropolitan areas in Florida consistently falling within the top twenty most dangerous cities. Despite that, recent editions of this report have applauded Florida state leaders' recognition of the problem and efforts to improve safety for people walking. In 2014, the state adopted a Complete Streets policy and the Florida Department of Transportation (FDOT) initially took ambitious steps to implement the policy, launching major updates to its design standards and planning statewide training for roadway engineers.

Policies intended to save lives should be measured by their success, and **Florida's effort has failed to live up to its billing**.

Undoing the damage caused by decades spent building dangerous roads and car-scale development takes continuous and ongoing commitment. While it makes sense not to see dramatic improvements immediately, progress should be evident at some point. But Florida has continued to grow more dangerous for people walking. In fact, the state saw one of the largest increases in PDI score since *Dangerous by Design 2019*. FDOT may have taken some important initial steps and clearly continues to have champions working to make streets

This example from Hollywood Blvd. in Broward County, FL shows some of the simple interventions that are proven to enhance safety: bulbouts, mid-block crossings, additional lighting, narrower lanes, and others. Photo courtesy of the Broward MPO.



safer, but the state has lost the momentum and political will needed to truly implement that change, and people walking continue to pay the price with their lives.

On the other hand, four of the most dangerous metropolitan areas in Florida (and in the country) have improved slightly in PDI scores since *Dangerous by Design 2019* (Appendix A has all changes in PDI scores). This is a good trend, but hold your applause—all four still rank in the top 11. Orlando, Lakeland-Winterhaven, Jacksonville, and Cape Coral-Fort Myers saw the largest drops in PDI scores since the last edition. Those drops suggest those cities have made some strides in recent years in making streets less dangerous for people walking.

For example, Orlando has taken steps to address the city's safety problem by developing a Vision Zero resolution and action plan to eliminate serious injuries and fatalities and installing traffic calming projects, though the improvements weren't enough to move it down from the top spot for most dangerous metro area. Other Florida regions topping the list of most dangerous MSAs have also seen some success reducing speeding and crashes through design changes on specific high-crash corridors. But no city will be able to do it on their own because FDOT owns and operates many of the roads in those metro areas. Orlando and other Florida cities need the state to be a stronger partner.

The most vulnerable populations

All people do not experience the benefits and burdens of transportation policy and funding decisions equally. Low-income households are significantly less likely to have access to a vehicle and also less likely to live in communities where they can reach daily needs safely and affordably outside a car. Structural racism has guided many of the decisions made about housing and transportation for decades. The construction of the National Highway System disproportionately carved through communities of color.²⁹ “Urban renewal” projects have displaced more than a million Americans and continue to harm Black and Brown communities today.

Many of these same disparities persist when it comes to who is most vulnerable to being struck and killed while walking. Though people of all ages, races, ethnicities, and income levels suffer the consequences of dangerous street design, some neighborhoods and groups of people bear a larger share of the burden.

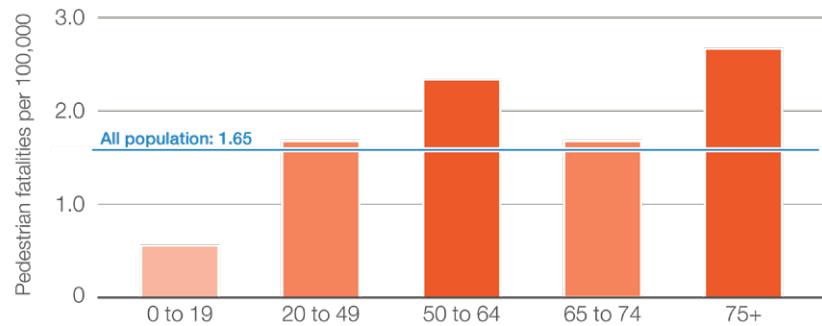
Older adults, Black or African American and American Indian or Alaska Native people, and people walking in low-income communities continue to be disproportionately represented in fatal crashes involving people walking.

To round out this analysis of the most vulnerable populations, we also wanted to analyze disparities for people living with different disabilities, but as noted on page 14, the data is incredibly incomplete on this count and makes conclusions difficult. Better data is urgently needed.

Older adults

As the graphic on this page shows, people between ages 50 and 65, and people over 75, are overrepresented in deaths involving people walking.³⁰ Our nation’s population is becoming older on average. According to the U.S. Census Bureau projections, one in five Americans will be over age 65 by 2030.³¹ We must devote greater attention to the needs of older adults when we design our streets. A 2018 survey from the National Aging and Disability Transportation Center found that older adults who give up driving face substantial barriers to getting around and often face physical isolation, frustration, and feel dependent and trapped. Forty percent of the non-driving older adult survey respondents cited access and availability of affordable transportation as a barrier.³²

Pedestrian fatalities per 100,000 people by age (2010-2019)



People of color

People of color, especially Black or African American and American Indian or Alaska Native people, continue to die while walking at higher rates compared to White, Non-Hispanic, Asian, and Pacific Islander people. The graphic on the top illustrates these inequities, controlling for differences in population and walking rates.^{33,34}

Structural racism in policy and funding decisions has perpetuated these disparities. Implicit bias may also play a role. Research by the University of Nevada found that drivers are significantly more likely to yield to a white pedestrian in a crosswalk than to a Black pedestrian.³⁵

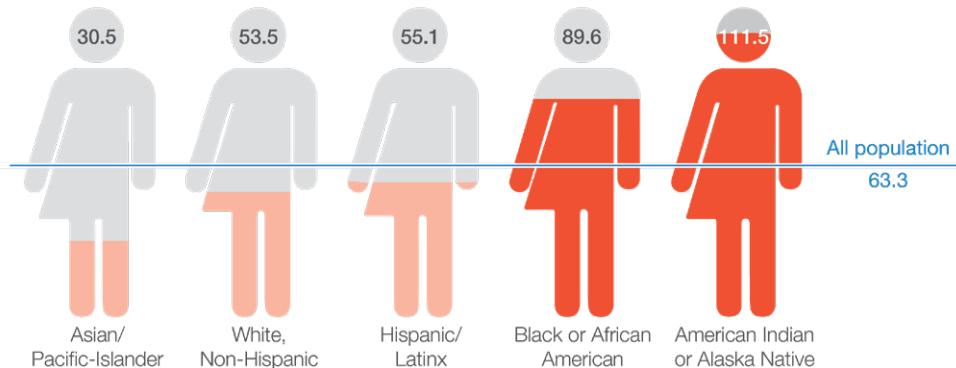
Low-income communities

While there are no national data on household income of people struck and killed while walking, we know where individuals were walking at the time of death—and as the bottom graphic shows, people die while walking at much higher rates in lower-income communities compared to higher-income areas.³⁶ Low-income communities are significantly less likely to have sidewalks, marked crosswalks, and street design to support safer, slower speeds.³⁷ It is likely that many of the people walking in these lower-income census tracts are also lower-income themselves.

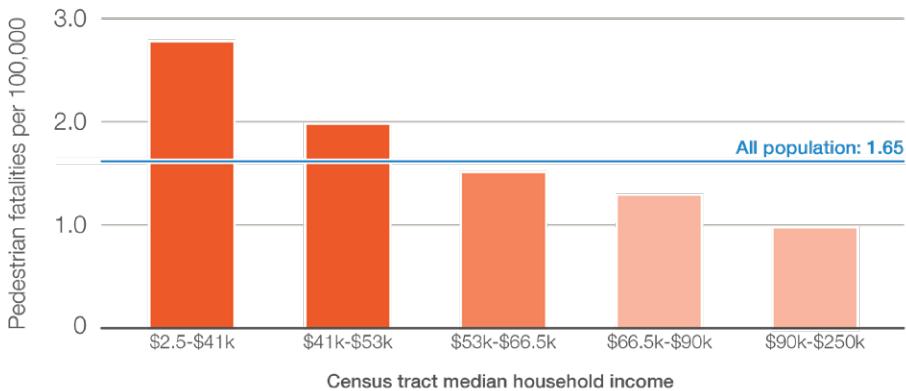
People in rural areas

Unlike past editions, this edition of Dangerous by Design examines the relative danger to people walking in urban communities and rural communities in the U.S. While more people are struck and killed while walking in urban areas than rural areas, people in

Relative pedestrian danger by race and ethnicity (2010-2019)



Pedestrian fatalities per 100,000 people by census tract MHI (2010-2019)



rural areas are struck and killed at about the same rates when controlling for population: **1.7 pedestrian deaths for every 100,000 people in rural areas versus 1.6 pedestrian deaths for every 100,000 people in urban areas.**

While we can't readily draw a comparison that accounts for differences in walking rates between urban and rural areas using available national data, past research indicates people do not universally walk more in urban areas than rural areas. The time spent walking and share of trips taken by walking in urban versus rural areas varies substantially between regions of the U.S. and purposes of the walking trip (walking for leisure or traveling to work, stores, and services).³⁸

What we do know is that people walking in areas designated as "rural" face unique dangers. Small town main streets are often also state highways that carry significant regional and truck traffic (and the state departments of transportation that manage those highways are often resistant to changes that slow down traffic.) Rural roads are less likely to be designed with people walking in mind, often lacking sidewalks and safe options to cross the street, but that doesn't mean people in rural areas don't walk. More than one million households in primarily rural counties in the U.S. do not have access to a vehicle.³⁹

We need better data and better geographic designations to help us understand the needs and dangers faced by people walking in communities outside major metro areas. The "urban" and "rural" dichotomy in many national datasets is a false one. Exurban communities that are developed but relatively low-density face distinct safety challenges that differ from the safety challenges of their truly rural counterparts, which differ from the challenges in small town centers.



Flickr photo by BikeWalk KC

Conclusion

We are tired and saddened to produce yet another edition of this report that reads so much like every other edition. We continue to mourn the increase in pedestrian deaths, especially while many of the steps needed to reverse this trend are well-known. We must do more to reduce the number of people that die while walking every day on our roadways and more to protect older adults, Black or African American and American Indian or Alaska Native people walking, and people walking in lower income areas. Policymakers have disregarded this problem for too long and failed to change how we fund, design, operate, maintain, and measure the success of our roads. They have failed to make vehicles safer for people walking. Despite what they claim about safety, they continue to prioritize moving cars at high speeds. People walking—especially those most vulnerable to being struck and killed—continue to pay the price.

Once again, we call on policymakers at all levels of government to address this problem. We call on federal policymakers in Congress and the U.S. Department of Transportation to finally take action and establish safety as a higher priority. We call for binding, enforceable requirements for states to reduce—and eventually eliminate—deaths and serious injuries on our roadways. We call for funding dedicated to safer street projects that specifically serve the needs of people walking, of older adults, of people of color, and of low-income communities. We call for federally endorsed street design standards that put the safety of vulnerable users first and foremost. We call on states and localities to take responsibility for the safety of people walking on their streets and change how they design roads.

This is a matter of life and death. We fervently hope the next edition of *Dangerous by Design* will tell a different story.

Endnotes

- 1 All pedestrian fatality data for the report are from: National Highway Traffic Safety Administration. (2019). Fatality Analysis Reporting System. Available from <https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars>.
- 2 ibid
- 3 As of *Dangerous by Design* 2019, FARS reported 5,977 pedestrian fatalities nationwide in 2017. That number has since been revised to 6,075 reflected in this report, correcting what initially appeared to be a modest decrease in deaths between 2016 and 2017.
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- 5 National Safety Council (2021, March). Motor Vehicle Deaths in 2020 Estimated to be Highest in 13 Years, Despite Dramatic Drops in Miles Driven. Available from: <https://www.nsc.org/newsroom/motor-vehicle-deaths-2020-estimated-to-be-highest>.
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- 13 Smart Growth America. (2019). *Dangerous by Design* 2019 <https://smartgrowthamerica.org/dangerous-by-design-2019/>.

- 14 For a detailed analysis of state safety targets, see the following blog post from the National Complete Streets Coalition published in October 2020: <https://t4america.org/2020/10/27/state-safety-targets-show-need-for-congress-to-further-prioritize-safety/>.
- 15 National Traffic Safety Board. (2017). Reducing speed-related crashes involving passenger vehicles. Available from: <https://la-bike.org/wp-content/uploads/2018/08/NTSB-report-SS1701.pdf>.
- 16 Dumbaugh, E., Saha, D. et al. (2020). Toward Safe Systems: Traffic Safety, Cognition, and the Built Environment. *Journal of Planning Education and Research*. Available from: <https://doi.org/10.1177/0739456X20931915>.
- 17 Lym, Y., and Chen, Z. (2021). Influence of built environment on the severity of vehicle crashes caused by distracted driving: A multi-state comparison. *Accident Analysis and Prevention* 150. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0001457520317401?via%3Dhub>.
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- 19 Smart Growth America (2020, November). "How the Biden administration can make immediate strides on climate and racial equity." <https://smartgrowthamerica.org/how-the-biden-administration-can-make-immediate-strides-on-climate-and-racial-equity/>.
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- 24 State of Massachusetts pedestrian fatality data is available from: <https://apps.impact.dot.state.ma.us/cdp/dashboard-view/26>.
- 25 State of Washington pedestrian fatality data is available from: <https://remoteapps.wsdot.wa.gov/highwaysafety/collision/data/portal/public/>.
- 26 Smart Growth America. (2020). Arts and Transportation Rapid Response: Artist-led projects to address COVID-19 transportation challenges. Available from: <https://smartgrowthamerica.org/resources/arts-and-transportation-rapid-response-2/>.
- 27 Ewing R, Schieber RA, and Zegeer CV. (2003). Urban Sprawl as a Risk Factor in Motor Vehicle Occupant and Pedestrian Fatalities. *American Journal of Public Health* 93(9): 1541-1545. Available from <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.93.9.1541>.
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- 29 Rothstein R. (2017). *The Color of Law: A forgotten history of how our government segregated America*. New York: Liveright Publishing Corporation.
- 30 Figure excludes 428 reported pedestrian fatalities (0.8 percent of all pedestrian fatalities) with missing age data.
- 31 U.S. Census Bureau. (2017). National Population Projections Tables. Available from <https://www.census.gov/data-tables/2017/demo/popproj/2017-summary-tables.html>.
- 32 National Aging and Disability Transportation Center. (2018). Transportation Needs and Assessment Survey of Older Adults, People with Disabilities, and Caregivers. Available from: https://www.nadtc.org/wp-content/uploads/KRC-nadtc-Survey-Report-120718-FINAL_for-web508.pdf.
- 33 Share of all trips made by walking by race and ethnicity taken from the 2019 five-year estimates of American Community Survey (ACS) Public Use Microdata Sample (PUMS), a change in methodology since *Dangerous by Design* 2019. Consult the Appendix of this report for a discussion of the change.
- 34 Figure excludes the 5,552 reported pedestrian fatalities (10 percent of reported pedestrian fatalities) over this time period with missing race and ethnicity data.
- 35 Coughenour C, Clark S, Singh A, et al. (2017). Examining racial bias as a potential factor in pedestrian crashes. *Accident Analysis & Prevention* 98: 96-100. Available from <https://www.sciencedirect.com/science/article/abs/pii/S000145751630361X>.
- 36 Consult the Methodology for a more detailed description of this analysis.
- 37 Gibbs K, Slater SJ, Nicholson N, et al. (2012). "Income Disparities in Street Features that Encourage Walking." *Bridging the Gap Program*, University of Illinois at Chicago. Available from http://www.bridgingthegapresearch.org/_asset/02fpi3/btg_street_walkability_FINAL_03-09-12.pdf.
- 38 Carlson SA, Whitfield GP, Peterson EL, Ussery EN, Watson KB, Berrigan D, Fulton JE. Geographic and Urban-Rural Differences in Walking for Leisure and Transportation. *Am J Prev Med*. 2018 Dec;55(6):887-895. Available from: <https://pubmed.ncbi.nlm.nih.gov/30344032/>.
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Appendix A: Methodology

Dangerous by Design uses several metrics to assess relative danger to pedestrians across different geographies and demographic characteristics. All pedestrian fatalities are reported within the 10-year timeframe of 2010 to 2019 to account for any large variations in fatalities in a single year. The previous iteration of the report, published in 2019, accounted for data between 2008 and 2017.

One measure of pedestrian fatality rates that this report cites across different demographic characteristics is pedestrian fatalities per 100,000 people. This metric accounts for the number of pedestrian deaths that are occurring within a certain population, while normalizing by the population itself. That metric is used in this report to evaluate pedestrian deaths by age, neighborhood income level, and in comparing urban and rural areas. All population, race, age, and ethnicity data are from the 2015-2019 American Community Survey 5-year estimates, to ensure the most up-to-date information at the time of this report.

$$\frac{\text{Pedestrian deaths}}{\text{Population of group 2019}} \times 100,000 = \text{Fatality rate}$$

The Pedestrian Danger Index (PDI) takes pedestrian deaths per 100,000 people and normalizes it by walking rates. All PDI scores in this edition of *Dangerous by Design* were calculated using walking rates measured with Census “Means of Transportation to Work” data. While walk-to-work percentage is merely a proxy for the share of walking trips in an area, the metric is available uniformly across all states and the top 100 metropolitan statistical areas.

$$\left(\frac{\text{Pedestrian deaths 2010-2019}}{\text{Population 2019}} \right) \times 100,000 = \text{Pedestrian Danger Index}$$

% of 2019 work trips made by walking

The previous edition of this report, *Dangerous by Design 2019*, used a different version of the PDI score for all demographic categories across age, race, and ethnicity. This is because walking rates in the 2019 report were taken from the percentage of total trips, calculated from the 2017 National Household Travel Survey (NHTS), instead of journey-to-work trips from the Census. That approach allowed relative danger by age, race, and ethnicity to reflect whether these populations tend to walk more or less than the population as a whole. However, it prevented a direct comparison to the PDI scores of states and MSAs. The NHTS is also updated infrequently, meaning those data will grow more out of date with each future edition of *Dangerous by Design*. Therefore, in this 2021 edition of the report, all PDI calculations use Census data and the same methodology, and can be compared directly. Due to limitations of journey-to-work walking data, this edition does not include PDI scores by age group, instead relying on pedestrian fatalities per 100,000 people to put the relative dangers faced by different age groups in context.

NHTSA FARS data do not include information about the household income of individuals who are struck and killed while walking; however, they do reveal where people are walking when they are killed. To analyze where pedestrian fatalities occur relative to median household income of the surrounding area, fatalities were joined using GIS to census tracts. The median household income of census tracts was grouped into quintiles to determine high- and low-income communities. Pedestrian deaths were then aggregated into these 5 tract types, and normalized by the population of the tracts. While FARS data do not include individual-level household income data, this analysis serves as a method to determine whether pedestrians die disproportionately in low-income areas.

To calculate the number of fatalities by MSA, a spatial join was performed with the longitude and latitude as reported by FARS.

State Pedestrian Danger Index, 2010-2019

Rank	State	Pedestrian fatalities (2010-2019)	Average annual pedestrian fatalities per 100,000 (2010-2019)	Pedestrian Danger Index
1	Florida	5,893	2.8	201.4
2	Alabama	936	1.9	174.6
3	New Mexico	626	3.0	149.5
4	Mississippi	596	2.0	142.9
5	Delaware	269	2.8	140.5
6	Louisiana	1,118	2.4	133.3
7	Arizona	1,710	2.4	127.9
8	South Carolina	1,280	2.6	127.5
9	Georgia	1,980	1.9	126.7
10	Texas	5,308	1.9	125.3
11	Nevada	651	2.2	121.7
12	Tennessee	1,008	1.5	115.4
13	North Carolina	1,890	1.8	102.2
14	Oklahoma	662	1.7	98.8
15	Arkansas	473	1.6	92.9
16	California	7,891	2.0	77.3
17	Missouri	852	1.4	73.7
18	Maryland	1,083	1.8	72.0
19	Michigan	1,460	1.5	66.8
20	Kentucky	649	1.5	66.4
National average		53,435	1.6	63.3
21	New Jersey	1,598	1.8	58.1
22	Indiana	808	1.2	55.0
23	Connecticut	467	1.3	48.5
24	Utah	344	1.1	46.3
25	Virginia	957	1.1	45.2
26	West Virginia	233	1.3	44.1

Rank	State	Pedestrian fatalities (2010-2019)	Average annual pedestrian fatalities per 100,000 (2010-2019)	Pedestrian Danger Index
27	Ohio	1,125	1.0	44.1
28	Hawaii	277	2.0	43.3
29	Oregon	636	1.5	42.8
30	Colorado	662	1.2	42.1
31	Illinois	1,416	1.1	37.0
32	Kansas	246	0.9	37.0
33	Pennsylvania	1,575	1.2	33.2
34	Rhode Island	114	1.1	30.0
35	Nebraska	146	0.8	29.2
36	Washington	798	1.1	29.2
37	Wisconsin	512	0.9	28.4
38	Idaho	128	0.8	27.8
39	South Dakota	75	0.9	26.1
40	North Dakota	63	0.8	25.9
41	New Hampshire	101	0.8	25.9
42	Montana	136	1.3	25.8
43	Minnesota	383	0.7	25.6
44	Wyoming	56	1.0	25.3
45	New York	2,887	1.5	25.1
46	Maine	130	1.0	24.3
47	District of Columbia	98	1.4	23.9
48	Massachusetts	760	1.1	23.1
49	Iowa	215	0.7	21.3
50	Alaska	101	1.4	17.8
51	Vermont	53	0.9	15.2

Change in statewide ten-year Pedestrian Danger Index scores, from *Dangerous by Design* 2019 to 2021

Rank	State	Dangerous by Design 2019 PDI	Dangerous by Design 2021 PDI	Change in PDI, DBD 2019 to DBD 2021 (largest to smallest change)
3	New Mexico	117.3	149.5	32.2
2	Alabama	145.0	174.6	29.6
11	Nevada	101.0	121.7	20.7
4	Mississippi	122.7	142.9	20.2
8	South Carolina	107.7	127.5	19.8
1	Florida	182.0	201.4	19.4
7	Arizona	111.5	127.9	16.4
12	Tennessee	100.8	115.4	14.6
10	Texas	111.9	125.3	13.5
5	Delaware	127.1	140.5	13.4
14	Oklahoma	85.6	98.8	13.3
9	Georgia	117.3	126.7	9.3
16	California	68.2	77.3	9.2
20	Kentucky	57.5	66.4	8.9
6	Louisiana	125.0	133.3	8.3
15	Arkansas	84.7	92.9	8.2
24	Connecticut	40.7	48.5	7.8
29	Hawaii	36.4	43.3	7.0
36	Nebraska	23.0	29.2	6.3
18	Maryland	65.9	72.0	6.1
30	Oregon	36.8	42.8	5.9
17	Missouri	67.9	73.7	5.8
31	Colorado	36.7	42.1	5.5
27	West Virginia	38.7	44.1	5.5

Rank	State	Dangerous by Design 2019 PDI	Dangerous by Design 2021 PDI	Change in PDI, DBD 2019 to DBD 2021 (largest to smallest change)
45	Wyoming	20.5	25.3	4.8
28	Ohio	39.6	44.1	4.5
25	Utah	41.9	46.3	4.3
22	New Jersey	54.1	58.1	4.0
13	North Carolina	98.3	102.2	3.9
32	Illinois	33.2	37.0	3.8
40	South Dakota	22.4	26.1	3.7
34	Pennsylvania	30.0	33.2	3.2
38	Wisconsin	25.8	28.4	2.6
23	Indiana	52.4	55.0	2.6
42	New Hampshire	23.6	25.9	2.3
19	Michigan	64.6	66.8	2.3
39	Idaho	25.5	27.8	2.3
44	Minnesota	23.6	25.6	2.0
26	Virginia	43.3	45.2	1.9
51	Alaska	16.0	17.8	1.8
50	Iowa	19.4	21.3	1.8
52	Vermont	13.8	15.2	1.4
41	North Dakota	24.7	25.9	1.2
37	Washington	28.1	29.2	1.1
43	Montana	24.9	25.8	0.9
33	Kansas	36.1	37.0	0.9
49	Massachusetts	22.5	23.1	0.6
46	New York	24.6	25.1	0.5
47	Maine	23.9	24.3	0.4
35	Rhode Island	30.0	30.0	0.0
48	District of Columbia	26.8	23.9	-2.9

Metropolitan statistical area Pedestrian Danger Index, 2010-2019 (top 100 metro areas in population)

Rank	Metropolitan statistical area	Pedestrian fatalities (2010-2019)	Average annual pedestrian fatalities per 100,000 (2010-2019)	Pedestrian Danger Index
1	Orlando-Kissimmee-Sanford, FL	740	3.0	295.0
2	Bakersfield, CA	260	2.9	293.0
3	Memphis, TN-MS-AR	350	2.6	261.0
4	Palm Bay-Melbourne-Titusville, FL	168	2.9	260.9
5	Deltona-Daytona Beach-Ormond Beach, FL	235	3.6	260.0
6	North Port-Sarasota-Bradenton, FL	199	2.5	248.0
7	Jackson, MS	128	2.1	237.8
8	Tampa-St. Petersburg-Clearwater, FL	968	3.1	222.9
9	Lakeland-Winter Haven, FL	162	2.4	214.6
10	Jacksonville, FL	462	3.1	204.7
11	Cape Coral-Fort Myers, FL	170	2.3	192.5
12	Albuquerque, NM	270	3.0	174.1
13	Miami-Fort Lauderdale-Pompano Beach, FL	1,675	2.8	171.9
14	Greenville-Anderson, SC	212	2.4	169.3
15	Stockton-Lodi, CA	187	2.5	168.0
16	Baton Rouge, LA	211	2.5	164.7
17	Birmingham-Hoover, AL	190	1.8	159.1
18	Houston-The Woodlands-Sugar Land, TX	1,298	1.9	157.5
19	Atlanta-Sandy Springs-Alpharetta, GA	1,160	2.0	152.3
20	El Paso, TX	215	2.6	150.6
21	Fresno, CA	235	2.4	149.4
22	Las Vegas-Henderson-Paradise, NV	485	2.2	148.0
23	Riverside-San Bernardino-Ontario, CA	1,078	2.4	147.5
24	Phoenix-Mesa-Chandler, AZ	1,042	2.2	146.0

25	Little Rock-North Little Rock-Conway, AR	139	1.9	145.4
26	Tulsa, OK	171	1.7	144.2
27	McAllen-Edinburg-Mission, TX	133	1.6	141.8
28	San Antonio-New Braunfels, TX	582	2.4	138.8
29	Augusta-Richmond County, GA-SC	122	2.0	135.3
30	Greensboro-High Point, NC	133	1.8	134.6
31	Dallas-Fort Worth-Arlington, TX	1,160	1.6	131.7
32	Louisville/Jefferson County, KY-IN	247	2.0	130.7
33	Detroit-Warren-Dearborn, MI	774	1.8	127.9
34	Charlotte-Concord-Gastonia, NC-SC	421	1.7	126.9
35	Raleigh-Cary, NC	182	1.4	124.6
36	Sacramento-Roseville-Folsom, CA	476	2.1	121.2
37	Nashville-Davidson--Murfreesboro--Franklin, TN	276	1.5	113.1
38	Winston-Salem, NC	98	1.5	113.1
39	Oklahoma City, OK	245	1.8	110.6
40	Tucson, AZ	240	2.3	106.4
41	Charleston-North Charleston, SC	188	2.4	105.7
42	Kansas City, MO-KS	258	1.2	100.8
43	Knoxville, TN	111	1.3	100.0
44	Indianapolis-Carmel-Anderson, IN	297	1.5	97.3
45	St. Louis, MO-IL	429	1.5	95.6
46	Austin-Round Rock-Georgetown, TX	360	1.7	94.4
47	Richmond, VA	193	1.5	89.4
48	New Orleans-Metairie, LA	268	2.1	87.9
49	Los Angeles-Long Beach-Anaheim, CA	2,717	2.1	85.4
50	San Jose-Sunnyvale-Santa Clara, CA	323	1.6	81.0
51	Chattanooga, TN-GA	69	1.2	77.5
52	Salt Lake City, UT	171	1.4	74.7
53	Ogden-Clearfield, UT	71	1.1	71.3
54	Baltimore-Columbia-Towson, MD	517	1.9	71.2
55	San Diego-Chula Vista-Carlsbad, CA	676	2.0	70.3
National average			53,435	1.6
				63.3

Rank	Metropolitan statistical area	Pedestrian fatalities (2010-2019)	Average annual pedestrian fatalities per 100,000 (2010-2019)	Pedestrian Danger Index
56	Wichita, KS	68	1.1	62.9
57	Denver-Aurora-Lakewood, CO	395	1.4	62.3
58	Oxnard-Thousand Oaks-Ventura, CA	96	1.1	59.5
59	Columbia, SC	215	2.6	59.3
60	Durham-Chapel Hill, NC	88	1.4	58.3
61	Hartford-East Hartford-Middletown, CT	158	1.3	57.0
62	Columbus, OH	244	1.2	55.7
63	Scranton--Wilkes-Barre, PA	83	1.5	55.2
64	Grand Rapids-Kentwood, MI	121	1.1	54.3
65	Toledo, OH	83	1.3	53.8
66	Akron, OH	57	0.8	50.6
67	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1,104	1.8	50.6
68	Bridgeport-Stamford-Norwalk, CT	119	1.3	50.4
69	Milwaukee-Waukesha, WI	196	1.2	49.6
70	Dayton-Kettering, OH	95	1.2	49.2
71	Cincinnati, OH-KY-IN	210	1.0	47.5
72	Omaha-Council Bluffs, NE-IA	75	0.8	47.1
73	Harrisburg-Carlisle, PA	77	1.4	46.6
74	Boise City, ID	56	0.8	46.5
75	Allentown-Bethlehem-Easton, PA-NJ	99	1.2	45.4
76	Des Moines-West Des Moines, IA	55	0.8	45.0
77	Buffalo-Cheektowaga, NY	125	1.1	44.4
78	New Haven-Milford, CT	133	1.6	44.3
79	Portland-Vancouver-Hillsboro, OR-WA	350	1.4	43.3
80	Virginia Beach-Norfolk-Newport News, VA-NC	239	1.4	41.2
81	Washington-Arlington-Alexandria, DC-VA-MD-WV	801	1.3	40.3
82	Cleveland-Elyria, OH	169	0.8	39.1

83	Chicago-Naperville-Elgin, IL-IN-WI	1,112	1.2	39.0
84	Albany-Schenectady-Troy, NY	111	1.3	38.2
85	Rochester, NY	120	1.1	36.1
86	Urban Honolulu, HI	189	1.9	34.9
87	Providence-Warwick, RI-MA	186	1.2	33.8
88	Worcester, MA-CT	104	1.1	33.3
89	Syracuse, NY	81	1.2	32.6
90	San Francisco-Oakland-Berkeley, CA	687	1.5	32.4
91	Minneapolis-St. Paul-Bloomington, MN-WI	254	0.7	32.3
92	Colorado Springs, CO	75	1.0	29.7
93	New York-Newark-Jersey City, NY-NJ-PA	3,112	1.6	28.3
94	Pittsburgh, PA	217	0.9	28.2
95	Seattle-Tacoma-Bellevue, WA	408	1.1	26.9
96	Springfield, MA	86	1.2	26.7
97	Boston-Cambridge-Newton, MA-NH	469	1.0	19.0
98	Poughkeepsie-Newburgh-Middletown, NY	56	0.8	18.9
99	Madison, WI	52	0.8	17.4
100	Provo-Orem, UT	40	0.7	14.8

Change in statewide ten-year Pedestrian Danger Index rankings, *Dangerous by Design 2019* to 2021

PDI Rank	Dangerous by Design 2019 rank	Dangerous by Design 2021 rank
1	Florida	Florida
2	Alabama	Alabama
3	Delaware	New Mexico
4	Louisiana	Mississippi
5	Mississippi	Delaware
6	Georgia	Louisiana
7	New Mexico	Arizona
8	Texas	South Carolina
9	Arizona	Georgia
10	South Carolina	Texas

Change in metropolitan statistical area ten-year Pedestrian Danger Index scores, from *Dangerous by Design 2019* to 2021

PDI Rank	Metropolitan statistical area	Dangerous by Design 2019 PDI	Dangerous by Design 2021 PDI	Change in PDI, DBD 2019 to DBD 2021 (largest to smallest change)
3	Memphis, TN-MS-AR	184.2	261.0	76.8
2	Bakersfield, CA	217.7	293.0	75.3
15	Stockton-Lodi, CA	105.5	168.0	62.5
20	El Paso, TX	98.6	150.6	52.0
7	Jackson, MS	192.0	237.8	45.8
12	Albuquerque, NM	138.2	174.1	35.9
36	Sacramento--Roseville--Arden-Arcade, CA	86.2	121.2	35.0
23	Riverside-San Bernardino-Ontario, CA	115.6	147.5	31.9
18	Houston-The Woodlands-Sugar Land, TX	130.0	157.5	27.5
26	Tulsa, OK	116.9	144.2	27.3
32	Louisville/Jefferson County, KY-IN	104.1	130.7	26.6
19	Atlanta-Sandy Springs-Roswell, GA	127.9	152.3	24.5
51	Chattanooga, TN-GA	55.0	77.5	22.5
21	Fresno, CA	127.7	149.4	21.7
40	Tucson, AZ	86.1	106.4	20.3
22	Las Vegas-Henderson-Paradise, NV	128.8	148.0	19.2
34	Charlotte-Concord-Gastonia, NC-SC	107.9	126.9	19.1
13	Miami-Fort Lauderdale-West Palm Beach, FL	153.5	171.9	18.4
41	Charleston-North Charleston, SC	87.3	105.7	18.3

8	Tampa-St. Petersburg-Clearwater, FL	204.7	222.9	18.2
14	Greenville-Anderson-Mauldin, SC	152.7	169.3	16.6
24	Phoenix-Mesa-Scottsdale, AZ	130.0	146.0	16.0
38	Winston-Salem, NC	97.1	113.1	15.9
4	Palm Bay-Melbourne-Titusville, FL	245.0	260.9	15.9
42	Kansas City, MO-KS	86.9	100.8	13.9
37	Nashville-Davidson-Murfreesboro-Franklin, TN	99.2	113.1	13.9
6	North Port-Sarasota-Bradenton, FL	234.6	248.0	13.5
63	Scranton-Wilkes-Barre-Hazleton, PA	42.1	55.2	13.1
47	Richmond, VA	77.2	89.4	12.2
72	Omaha-Council Bluffs, NE-IA	36.1	47.1	11.0
68	Bridgeport-Stamford-Norwalk, CT	39.6	50.4	10.8
25	Little Rock-North Little Rock-Conway, AR	135.0	145.4	10.4
35	Raleigh, NC	114.2	124.6	10.4
74	Boise City, ID	36.1	46.5	10.4
53	Ogden-Clearfield, UT	61.2	71.3	10.2
30	Greensboro-High Point, NC	124.6	134.6	10.0
59	Columbia, SC	49.8	59.3	9.6
49	Los Angeles-Long Beach-Anaheim, CA	76.4	85.4	9.0
89	Syracuse, NY	23.8	32.6	8.9
58	Oxnard-Thousand Oaks-Ventura, CA	51.0	59.5	8.5
45	St. Louis, MO-IL	87.5	95.6	8.1
69	Milwaukee-Waukesha-West Allis, WI	41.9	49.6	7.8
28	San Antonio-New Braunfels, TX	131.2	138.8	7.6
54	Baltimore-Columbia-Towson, MD	63.6	71.2	7.6
31	Dallas-Fort Worth-Arlington, TX	124.2	131.7	7.5

PDI Rank	Metropolitan statistical area	Dangerous by Design 2019 PDI	Dangerous by Design 2021 PDI	Change in PDI, DBD 2019 to DBD 2021 (largest to smallest change)			
79	Portland-Vancouver-Hillsboro, OR-WA	35.9	43.3	7.5			
85	Rochester, NY	29.1	36.1	7.0			
61	Hartford-West Hartford-East Hartford, CT	50.0	57.0	7.0			
16	Baton Rouge, LA	157.9	164.7	6.8			
70	Dayton, OH	42.4	49.2	6.8			
92	Colorado Springs, CO	23.5	29.7	6.2			
78	New Haven-Milford, CT	38.1	44.3	6.2			
66	Akron, OH	44.4	50.6	6.2			
44	Indianapolis-Carmel-Anderson, IN	91.3	97.3	6.0			
55	San Diego-Carlsbad, CA	64.5	70.3	5.9			
73	Harrisburg-Carlisle, PA	41.7	46.6	4.9			
71	Cincinnati, OH-KY-IN	42.9	47.5	4.6			
83	Chicago-Naperville-Elgin, IL-IN-WI	34.5	39.0	4.5			
86	Urban Honolulu, HI	30.6	34.9	4.3			
52	Salt Lake City, UT	70.5	74.7	4.2			
65	Toledo, OH	49.6	53.8	4.2			
57	Denver-Aurora-Lakewood, CO	58.2	62.3	4.1			
67	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	46.8	50.6	3.8			
84	Albany-Schenectady-Troy, NY	34.6	38.2	3.6			
82	Cleveland-Elyria, OH	35.9	39.1	3.1			
64	Grand Rapids-Wyoming, MI	51.4	54.3	2.9			
46	Austin-Round Rock, TX	91.8	94.4	2.7			
17	Birmingham-Hoover, AL	157.0	159.1	2.1			
96	Springfield, MA	24.7	26.7	2.1			
62	Columbus, OH	53.8	55.7	1.9			
75	Allentown-Bethlehem-Easton, PA-NJ	43.9	45.4	1.5			
91	Minneapolis-St. Paul-Bloomington, MN-WI	30.9	32.3	1.4			
93	New York-Newark-Jersey City, NY-NJ-PA	27.1	28.3	1.1			
27	McAllen-Edinburg-Mission, TX	140.8	141.8	1.0			
29	Augusta-Richmond County, GA-SC	134.4	135.3	1.0			
94	Pittsburgh, PA	27.3	28.2	0.9			
81	Washington-Arlington-Alexandria, DC-VA-MD-WV	39.7	40.3	0.6			
76	Des Moines-West Des Moines, IA	44.4	45.0	0.6			
50	San Jose-Sunnyvale-Santa Clara, CA	80.6	81.0	0.4			
95	Seattle-Tacoma-Bellevue, WA	26.5	26.9	0.4			
87	Providence-Warwick, RI-MA	33.6	33.8	0.2			
77	Buffalo-Cheektowaga-Niagara Falls, NY	44.2	44.4	0.2			
88	Worcester, MA-CT	33.3	33.3	0.0			
39	Oklahoma City, OK	110.7	110.6	-0.1			
80	Virginia Beach-Norfolk-Newport News, VA-NC	41.3	41.2	-0.1			
99	Madison, WI	18.0	17.4	-0.6			
97	Boston-Cambridge-Newton, MA-NH	19.6	19.0	-0.6			
90	San Francisco-Oakland-Hayward, CA	33.5	32.4	-1.1			
48	New Orleans-Metairie, LA	89.6	87.9	-1.7			
43	Knoxville, TN	102.5	100.0	-2.5			
100	Provo-Orem, UT	17.3	14.8	-2.6			
5	Deltona-Daytona Beach-Ormond Beach, FL	265.4	260.0	-5.4			
33	Detroit-Warren-Dearborn, MI	135.4	127.9	-7.5			
56	Wichita, KS	70.7	62.9	-7.7			
9	Lakeland-Winter Haven, FL	230.9	214.6	-16.4			

PDI Rank	Metropolitan statistical area	Dangerous by Design 2019 PDI	Dangerous by Design 2021 PDI	Change in PDI, DBD 2019 to DBD 2021 (largest to smallest change)
1	Orlando-Kissimmee-Sanford, FL	313.3	295.0	-18.3
10	Jacksonville, FL	226.2	204.7	-21.5
11	Cape Coral-Fort Myers, FL	217.0	192.5	-24.5
NA	Spokane-Spokane Valley, WA	36.2	NA	NA
NA	Youngstown-Warren-Boardman, OH-PA	67.2	NA	NA
NA	Durham-Chapel Hill, NC	NA	58.3	NA
NA	Poughkeepsie-Newburgh-Middletown, NY	NA	18.9	NA

*The list of top 100 MSAs by population changes slightly from year to year as metro areas grow. These regions were either in the top 100 largest MSAs in 2017 but not 2019, or vice versa.



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