Speed Management

Addressing our regional traffic safety crisis

Chicago Metropolitan
Agency for Planning

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Introduction

Improving travel safety is a key goal of ON TO 2050, the regional comprehensive plan for northeastern Illinois. That goal has become more urgent with increases in traffic fatalities, which spiked during the COVID-19 pandemic. The ON TO 2050 guiding principles of inclusive growth, resilience, and prioritized investment apply to traffic safety in many ways, including: addressing racial and economic equity in mobility and safety; supporting climate-friendly modes of travel such as transit, walking, and bicycling; and investing in solutions that are informed by multiple data sources to address safety risks *before* they result in death or injury.

This paper explores the topic of speeding in northeastern Illinois. It examines the causes of speed-related injuries and fatalities — particularly among vulnerable travelers like pedestrians and bicyclists — and highlights opportunities to reduce vehicle speed through research-based policies, designs, programs, and resources, using the Safe System Approach.

Speeding is one of many topics related to traffic safety, as described in the Traffic Safety White Paper the Chicago Metropolitan Agency for Planning (CMAP) produced in 2018. Speed was a factor in 46 percent of fatal crashes in our region between 2017 and 2021, according to IDOT crash data. This suggests that more than 1200 people died in speeding-related crashes.

This paper frames the current traffic safety crisis in both a national and regional context and highlights vehicle speed as its primary cause. Having identified this cause, the paper explores options for creating safer road designs for all users, implementing appropriate speed limits, and creating a culture of safe road users.

Acronyms

AASHTO	American Association of State Highway Transportation Officials
ASE	Automated speed enforcement
BDE	Bureau of Design and Environment
CDC	Centers for Disease Control and Prevention
EDR	Event data recorder
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
HSP	Highway Safety Plan
HVE	High-visibility enforcement
IDOT	Illinois Department of Transportation
ISA	Intelligent speed assist
LOS	Level of service
MPO	Metropolitan planning organization
MUTCD	Manual of Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NHTSA	National Highway Traffic Safety Administration
STAR	Safe Travel for All Roadmap
USDOT	United States Department of Transportation
VMT	Vehicle miles traveled
VRU	Vulnerable roadway user

CMAP's role

As the federally designated metropolitan planning organization (MPO) for northeastern Illinois, CMAP is responsible for setting and reporting on highway safety performance targets. This Federal Highway Administration (FHWA) rule, which took effect in 2018, requires state departments of transportation and MPOs to track five different safety metrics, including the region's total number of traffic fatalities, rate of traffic fatalities per 100 million vehicle miles traveled (VMT), and the number of bicycle and pedestrian fatalities and serious injuries.

In December 2019, CMAP's first report on the region's highway safety performance targets showed increases in fatalities for drivers and non-drivers alike. There was also a rise in serious injuries among bicyclists and pedestrians. In response, CMAP developed an expanded safety program in 2020 to better understand and address traffic safety issues in the region.

Safe Travel for All Roadmap: How the region will improve traffic safety

CMAP established a comprehensive traffic safety program, the Safe Travel for All Roadmap (STAR), in 2022. STAR is a multi-year effort to improve traffic safety and reduce the number of traffic fatalities in the region through policy change, planning, information, and resources. This work is being done in collaboration with federal, state, and regional partners.

STAR includes:

- A resource group of regional safety stakeholders from many different agencies, advocacy groups, and nonprofit organizations to guide the project
- A policy development initiative to establish consensus recommendations to improve travel safety, with a focus on speed management and bicycle and pedestrian safety
- An assessment of data needs for both the agency and local partners seeking to understand and address traffic safety
- Technical assistance to partners to help plan traffic safety improvements, such as complete street designs, intersection improvements, and speed management strategies
- Regionally coordinated safety action plans for counties in the region to analyze and address local safety issues

Key recommendations

CMAP's recommendations to address speeding in northeastern Illinois provide broad solutions for a variety of factors that influence speed and offer regional partners actions that can be implemented in the near, mid, and long term. Chapters 3 – 5 go into more details on specific actions related to each recommendation, and the Appendix notes which agency could lead each action.

Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks

1. Study and pilot new approaches to roadway capacity and design that reduce travel demand, encourage slower operating speeds, and support compliance with speed limits
2. Improve existing design guidance and standards to support compliance with speed limits
3. Increase funding for speed management projects by updating scoring metrics
4. Improve project-level design guidance and local approaches to reduce speeding

Reduce speed limits in urbanized areas where people walk, bike, and use transit

1. Improve guidance to allow and encourage reduced speed limits
2. Identify the most impactful changes to the motor vehicle code to support reduced speed limits
3. Reduce the risks posed by larger and heavier vehicles
4. Reduce speed limits by ordinance

Support safe driving behavior with education and equitable enforcement

1. Adopt the Safe System Approach
2. Promote enforcement techniques that have been shown to improve driver behavior, reduce speeds proactively, and advance equity
3. Improve the data needed to understand and address speeding
4. Create a framework for a traffic safety culture that leverages education

About the Safe System Approach

Many agencies in the U.S. are adopting the Safe System Approach to traffic safety, which is informed by Vision Zero successes in other countries. The Safe System Approach offers a set of principles and objectives that work together to create multiple layers of protection against both the risk of crashes occurring and the risk of those crashes resulting in death.

In January 2022, the United States Department of Transportation (USDOT) launched a National Roadway Safety Strategy guided by the Safe System Approach, signaling a new direction addressing traffic safety in the U.S. The principles of the Safe System Approach state that:

1. Death and serious injuries are unacceptable
2. Humans make mistakes
3. Humans are vulnerable
4. Responsibility is shared
5. Safety is proactive
6. Redundancy is critical

These tenets represent a significant shift from traditional approaches to safety, which accept traffic fatalities as inevitable, focus on high-crash locations, and prioritize vehicular safety over human-centered safety, as described in Figure 2. Instead, the Safe System principles form the elements of a *traffic safety culture*, or a set of shared values that are adopted by institutions, agencies, and individuals to proactively influence positive outcomes.

Figure 1. The Safe System Approach prioritizes human-centered safety and reaching zero deaths

Source: The Federal Highway Administration, USDOT.

Figure 2. The Safe System Approach differs from the traditional approach to safety

Safe System Approach	Traditional approach
Sets the goal of **zero fatalities,** with the understanding that all traffic deaths are preventable.	Sets targets for reducing traffic fatalities from the current level, accepting that a certain number of traffic deaths are inevitable.
Applies **systemic changes** to transportation, such as reducing speeds and improving design standards, to reduce the probability that a crash will be fatal and to prevent future crashes.	Identifies high-crash locations and implements countermeasures to address specific safety issues that have already caused crashes.
Describes safety efforts as holistic in terms of **value-centered outcomes** (safe roads, safe users, safe speeds, safe vehicles, and post-crash care) while emphasizing the interconnectivity of these elements.	Separates safety into distinct fields of influence (e.g., engineering and education) to be addressed by different agencies or partners, posing barriers to comprehensive and cross-cutting solutions.
Acknowledges human error and creates **redundancies** in safety so that one failure in the system does not result in a crash becoming fatal.	Assumes perfect behavior and individualizes errors as isolated, tragic, and beyond the influence of safety professionals.
Highlights **human-centered** activities (walking, bicycling, and safe driving) and safety measures to prevent crashes from being fatal.	Centers vehicle safety and mobility by relying on crash reports, which are less reliable for pedestrian and bicyclist crashes, and design principles that improve traffic flow and reduce congestion, despite the safety impacts for pedestrians, bicyclists, and other vulnerable travelers.

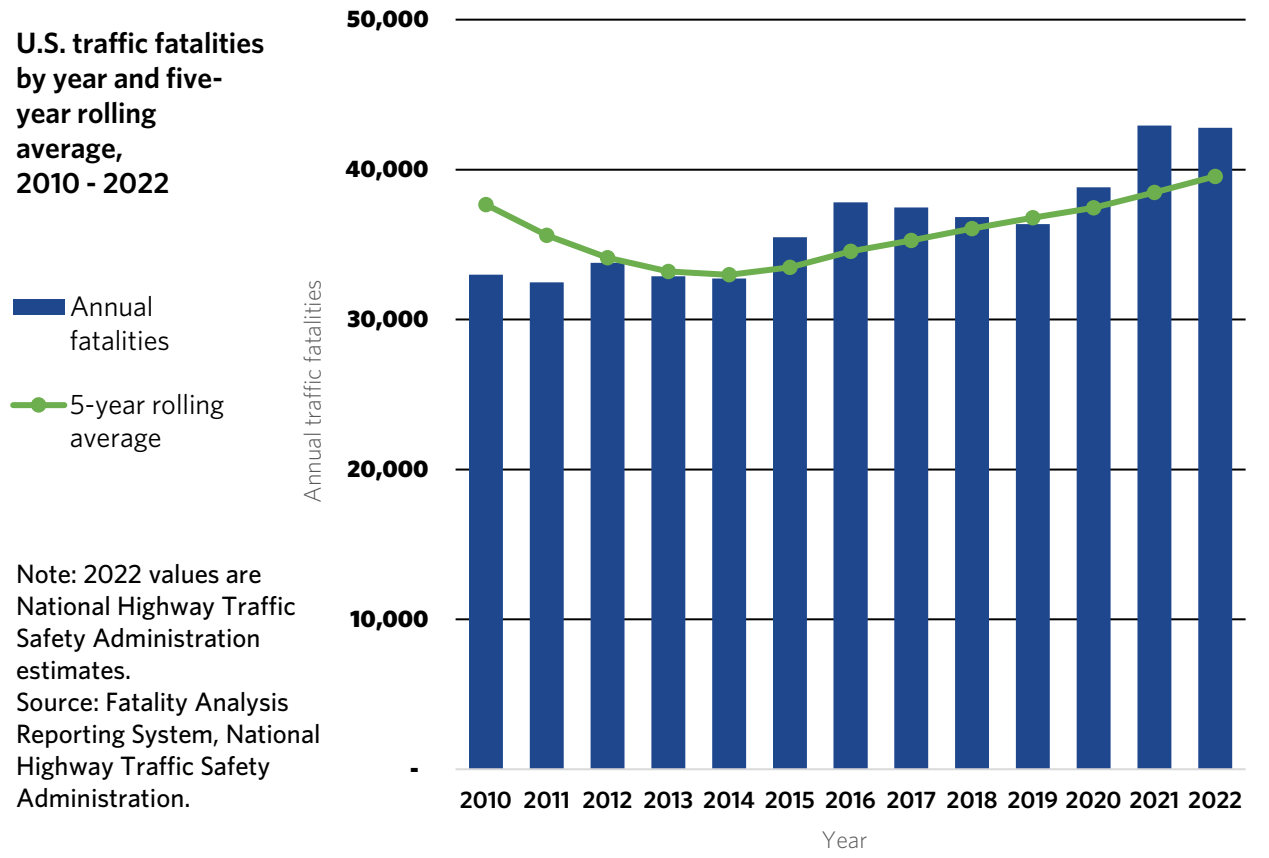
Source: CMAP.

Chapter 1: The current traffic safety crisis

In 2021, 42,939 people were killed on U.S. roadways, an increase of more than 10 percent over 2020 and the highest number on record since 2007.[1] Figure 3 illustrates the upward trend in traffic fatalities, which began in 2014 after decades of decline, spiking in 2021 with the COVID-19 pandemic *despite a drop in overall VMT*. Speeding is a major factor to this increase, identified as a contributing factor in approximately one-third of all traffic fatalities.[2] According to the National Center for Statistics and Analysis, there was an 18 percent increase in speeding-related fatalities from 2019 to 2020.[3]

To put the number of traffic fatalities into perspective, consider that traffic crashes in the U.S. kill more than the equivalent of a full Boeing 747 crashing *every week*. Yet, our culture has normalized roadway fatalities and become desensitized to this huge loss of life. Roadway deaths and injuries deserve our attention, and safety should be the top priority for our transportation system.

Figure 3. Traffic fatalities in the U.S. have been trending upward since 2014



Note: 2022 values are National Highway Traffic Safety Administration estimates.
Source: Fatality Analysis Reporting System, National Highway Traffic Safety Administration.

While the U.S. saw historically high rates of traffic fatalities in recent years, other countries had more success in reducing the total number and severity of traffic crashes. The fatality rate per 100,000 inhabitants in the U.S. was approximately 12.4, compared to between 3 and 6 deaths in other high-income countries like Sweden, Japan, and Canada (Figure 4).[4]

The reasons for this disparity are complex, but there is evidence suggesting countries with lower traffic fatality rates have prioritized safety over vehicle speeds, with stricter traffic laws and higher design standards for both roadways and vehicles.[5] These policies, programs, and standards are informed by systemic safety programs, such as Vision Zero, many of which were adopted in the late 1990s and early 2000s. Systemic safety programs focus on harm reduction through reduced operating speeds and infrastructure separating vulnerable roadway users (VRUs), like pedestrians and bicyclists, from vehicles in both space and time.

Figure 4. Traffic fatality rates are significantly higher in the U.S. than in other countries

Country	Fatality rate per 100,000 inhabitants
United States	12.4
Canada	5.8
Australia	5.6
Japan	4.1
United Kingdom	3.1
Sweden	2.8

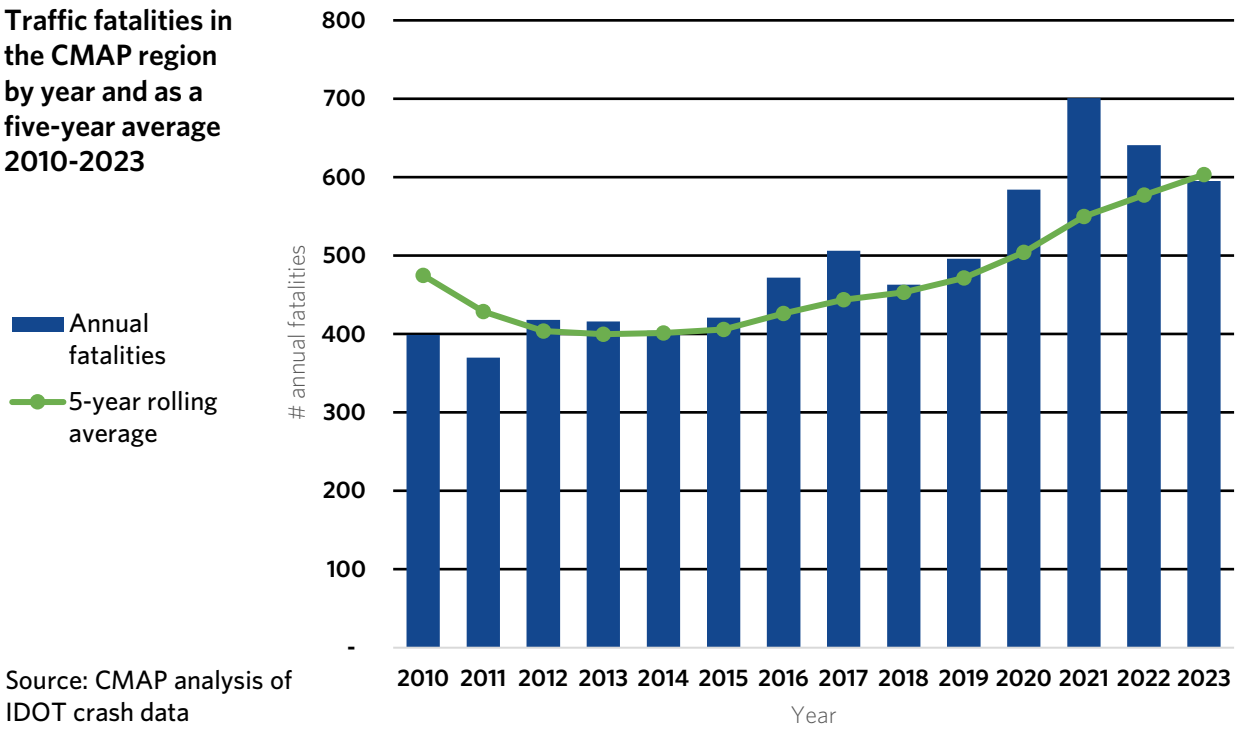
Note: Fatality rates are based on 2016 data.
Source: Global status report on road safety, World Health Organization, 2018.

Traffic fatalities in northeastern Illinois are increasing

After decades of relative decline, regional and statewide traffic fatalities began trending upward in 2014, consistent with national figures. 2021 and 2022 were the deadliest years for northeastern Illinois roads in decades. While statewide fatalities jumped by more than 15 percent over 2019 — reaching 1,200 in 2020 and 1,334 in 2021[6] — the trends in northeastern Illinois are particularly worrisome: traffic fatalities increased 41 percent, from 496 to 701, between 2019 and 2021. The five-year average for regional traffic fatalities rose from 401 in 2014 to 603 in 2023 (Figure 5).

Traffic fatalities in the seven-county Chicago metropolitan area (Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will counties) typically account for about 40 to 45 percent of Illinois totals; in 2021, the region represented more than 50 percent of Illinois' fatalities. While the dramatic increases in 2020 and 2021 correspond to travel patterns and behaviors that were severely altered by the COVID-19 pandemic, both long-term and near-term trends demand action.

Figure 5. Traffic fatalities in northeastern Illinois have been trending upward since 2014



Source: CMAP analysis of IDOT crash data

Risky behaviors contributed to an increase in traffic fatalities

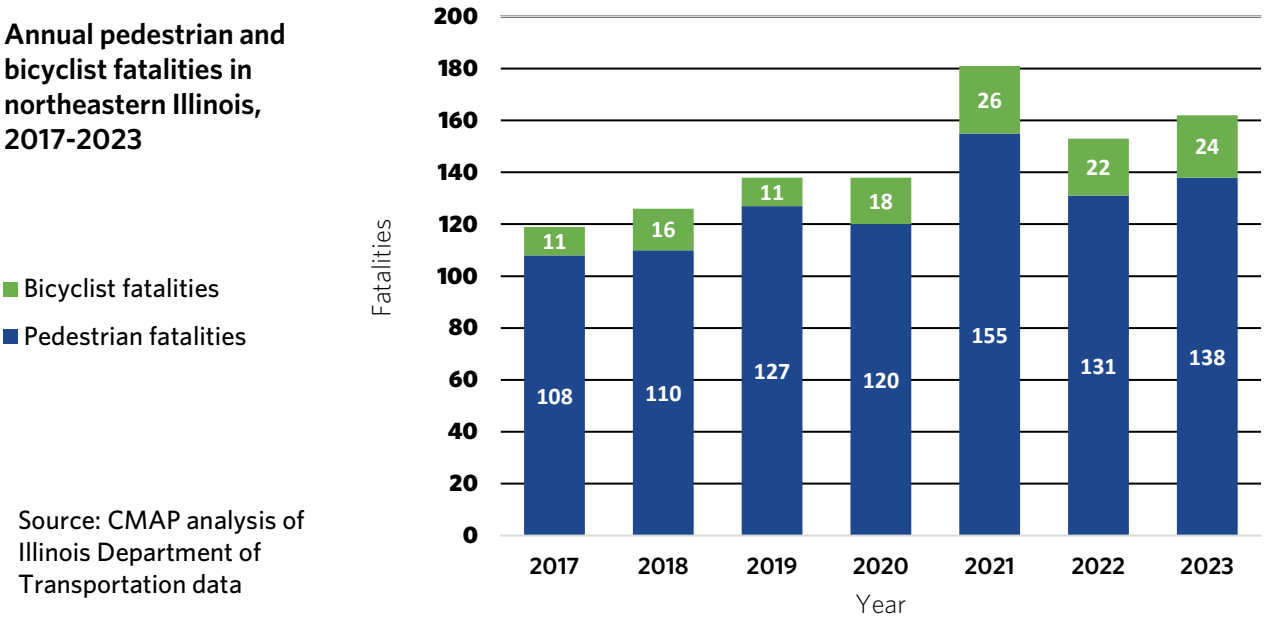
Historically, the number of traffic fatalities has correlated with the amount of travel or VMT. This means that increases in the amount of travel have corresponded to a proportionate increase in the number of fatalities. However, while COVID-19 stay-at-home orders significantly reduced the amount of travel in 2020, there was a 7.2 percent *increase* in the number of traffic fatalities, confounding expectations.[7] Speeding was a primary factor in this spike, enabled by empty roadways and increased risky behavior among drivers in general.[8] This signals an alarming shift in driver behavior. National research suggests an increase in risk-taking among drivers starting in 2020. These behaviors include speeding, impairment, and decreased use of seatbelts.[9] Enforcement, meanwhile, was believed to have been reduced due to concerns about COVID-19 transmission, as well as social unrest. Despite this, many police agencies report an increase in citations issued for aggressive speeding beginning with the pandemic.[10]

Fatalities among pedestrians and bicyclists are increasing

Pedestrians and bicyclists represent a growing number of traffic fatalities in the region. This increase began in 2014, reversing a decades-long trend of gradual decrease. The annual number of combined pedestrian and bicyclist fatalities increased more than 50 percent from 2017 to 2021 and remained above pre-pandemic levels in 2022 and 2023 (Figure 6).

Figure 6. Fatalities among pedestrians and bicyclists have been increasing, climbing 36 percent between 2017 and 2023

Annual pedestrian and bicyclist fatalities in northeastern Illinois, 2017-2023



Source: CMAP analysis of Illinois Department of Transportation data

These figures are troubling for several reasons. People traveling on foot or on bicycle are particularly vulnerable to traffic hazards because they are not protected by a vehicle. As a result, they require a much higher degree of protection from infrastructure and operational considerations, such as priority signal timing, protected separation from vehicle lanes, and high-visibility crosswalks.

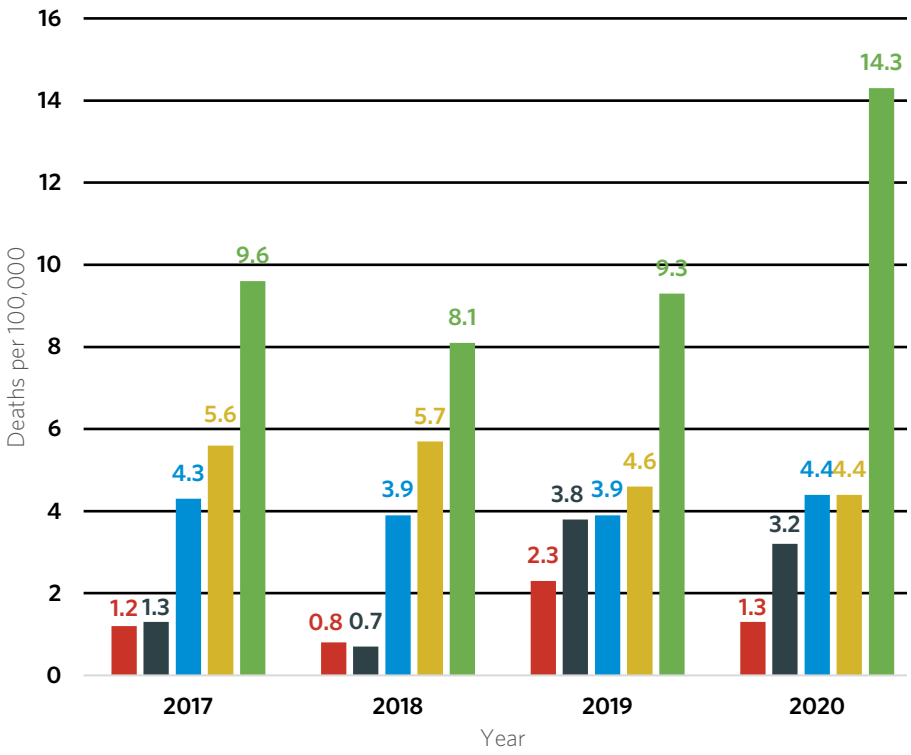
The risks posed by speeding are not shared evenly. VRUs — including pedestrians, bicyclists, and those accessing transit — are less likely to drive or own a car, which may be correlated to factors such as age, income, or ability. The harms of speeding may be disproportionately felt by groups that are already disadvantaged in other ways. Regardless of the reason, a person who walks or bikes has the same right to safe travel as someone who drives. Yet, these users contend with a transportation system that has been designed to prioritize the efficiency and speed of vehicular movement above all else.

Black residents are at higher risk of traffic fatalities

Disproportionately high rates of traffic fatalities. Black residents in the region are statistically overrepresented in fatal crashes, as shown in Figure 7. Although people identifying as Black represent 18 percent of the regional population, they account for 25 percent of all traffic fatalities. People who identify as other/multiple races are also overrepresented in traffic fatalities. No other racial category has this disproportionate representation. This is true nationally as well: between 2016 and 2020, Black people in the U.S. died in traffic crashes at a rate of 3 per 100,000 while white people died at half that rate.[11] In northeastern Illinois, Black residents die at a rate of 8.5 per 100,000; more than double the national rate, and far higher than that of white residents in the region.

Figure 7. Traffic fatalities are disproportionately high among Black residents in the region

Traffic fatality rate by race in northeastern Illinois, 2017-2020



Source: CMAP analysis of National Highway Traffic Safety Administration Fatality Analysis Reporting System (FARS) for 2017-2020 and the American Community Survey, five-year estimates, 2017-2020.

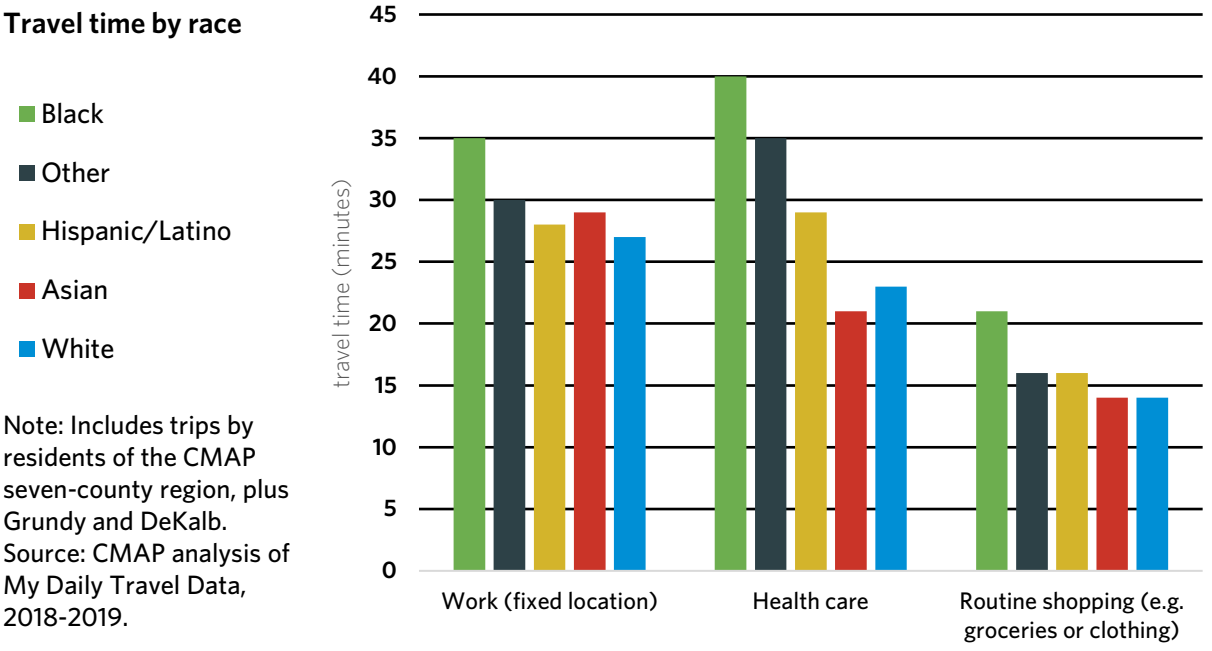
Inequity in roadway design. Historic inequities in transportation investments play a large role in today's traffic safety crisis. A study of national data on fatalities by race and VMT suggests that factors like roadway design in communities of color may play a role in higher traffic fatality rates.[12] There is a long history of building highways and high-speed arterials through communities of color in U.S. cities.[13] These decisions have increased the speed and amount of traffic and, as a result, increased traffic safety risks for those who live and work in these communities.

Compounding the issue of racial disparity in traffic fatalities is the fact that enforcement, which is often done as a response to high crash rates at specific locations, has been associated with profiling and violent events involving people of color.[14] Efforts to increase policing in neighborhoods with high-crash locations, where the nature of the infrastructure may be a contributing factor, has often resulted in targeted enforcement of people of color. Biased enforcement of traffic safety laws and traffic stops have created a culture of mistrust and continue to hinder safety programs that could protect lives in these communities.

Increased exposure to traffic safety risks. People of color in our region, particularly Black residents, have longer trip times on average when compared to white residents, according to CMAP's analysis of travel patterns (Figure 8). Additionally, people of color are more likely to use transit and connecting modes like walking and bicycling, which are more vulnerable to dangerous encounters with vehicles.[15] This increased exposure in terms of time spent traveling and mode of travel puts Black residents at higher risk.

Figure 8. Black residents have significantly longer trips to work, health care, and routine shopping

Travel time by race



Note: Includes trips by residents of the CMAP seven-county region, plus Grundy and DeKalb.
Source: CMAP analysis of My Daily Travel Data, 2018-2019.

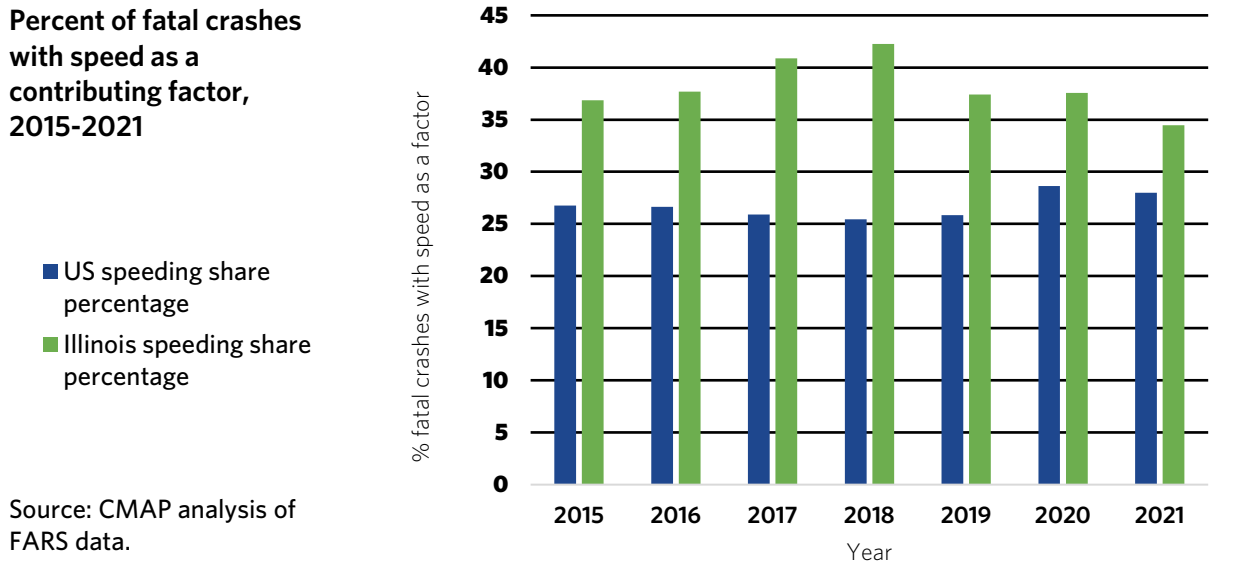
Chapter 2: Speed and its role in safety

Speed impacts roadway safety in many ways and has complex interactions with other factors. It impacts drivers' reaction time and field of vision. It is a factor in a vehicle's kinetic energy, and it plays a significant role in the severity of a crash. This chapter explores speeding trends, risks of speeding for non-vehicle road users, and how increasing vehicle weight and size amplify the dangers of speeding.

Speeding contributes to traffic fatalities nationally and regionally

According to the nationwide Fatality Analysis Reporting System (FARS), speeding is a contributing factor in 25 to 30 percent of traffic fatalities nationally and is believed to be underreported.[16] In Illinois, the percentage of fatal crashes with speed identified as a contributing factor between 2015 and 2021 has been between 34 and 42 percent (Figure 9). This translates to approximately 370 to 460 speeding-related deaths each year.

Figure 9. Speeding has contributed to a higher share of fatal crashes in Illinois compared to the U.S. as a whole



Source: CMAP analysis of FARS data.

Speeding results in personal injury, death, and economic loss

Vehicle speed is a significant factor in traffic safety and is directly correlated to the frequency and severity of crashes.[17] In addition to the tragedies of personal injury and loss of life caused by speeding, there are significant economic costs. The National Highway Traffic Safety Administration (NHTSA) estimates that the annual economic cost of speeding-related crashes is between $40 and $50 billion. These are costs associated with the treatment of injuries and fatalities, congestion and delay caused by crashes, legal and court costs associated with adjudicating crashes, insurance costs, reduced productivity for those involved in crashes, and property damage.[18] The comprehensive costs of speeding-related crashes include societal harm

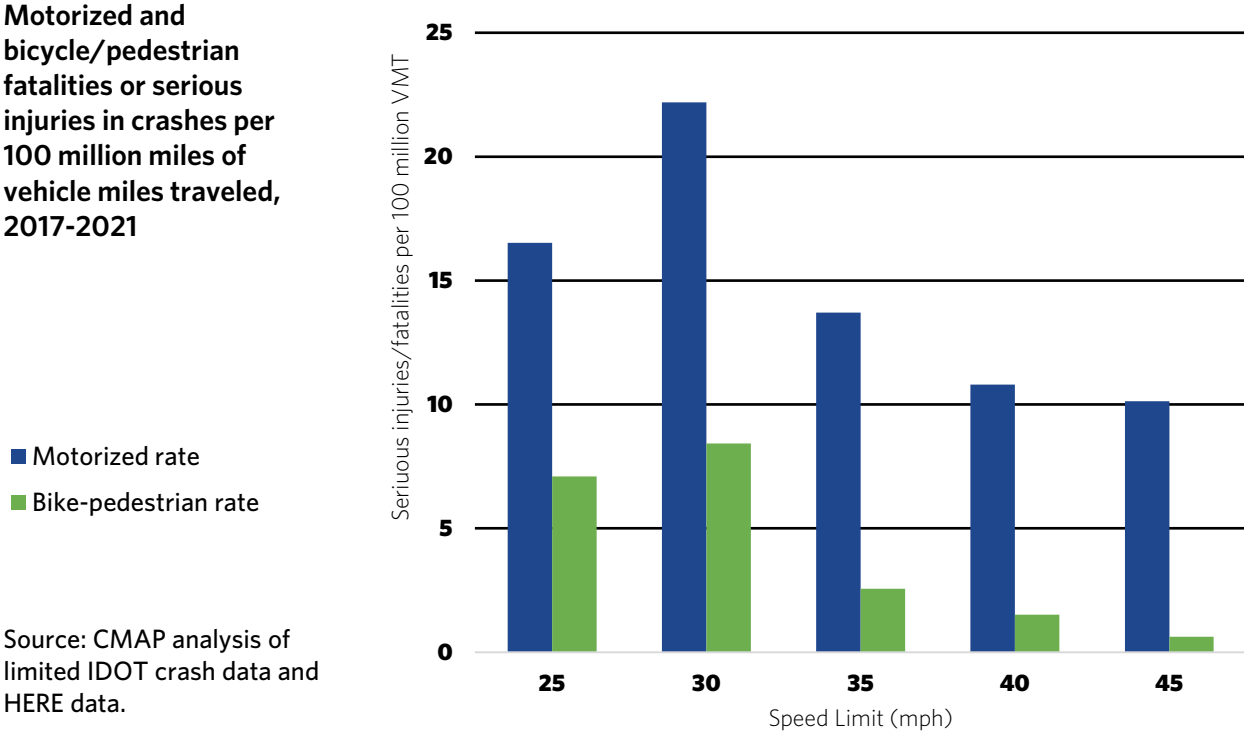
valuations, such as lost quality-of-life as a result of death or injury, and are estimated to be in the $200 billion range annually.[19]

Speeding is increasing on arterial roads

According to a 2015 national speed study by the NHTSA, mean and median operating speeds on major and minor arterial roads have increased significantly since 2009, while speeds on freeways have remained steady.[20] The same speed study shows that the 85th percentile speeds on these roads — the speed at which 85 percent of drivers are traveling — were higher in 2015 than in the 2009 study. [21] These types of roads tend to feature more frequent intersections, which introduce conflict points between directions and modes of travel.

Figure 10. Roads with a 30-mph speed limit see the highest rates of fatal and serious injury crashes in northeastern Illinois

Motorized and bicycle/pedestrian fatalities or serious injuries in crashes per 100 million miles of vehicle miles traveled, 2017-2021



Source: CMAP analysis of limited IDOT crash data and HERE data.

Fatalities and serious injuries occur at higher rates on lower-speed roads

There is an assumption that highways are the most dangerous roadways because they carry large volumes of vehicles traveling at high speeds. The data, however, show the opposite. City streets and neighborhoods report the highest rates of crashes, both fatal and otherwise. As Figure 10 above illustrates, more than half of all fatalities and serious injuries in northeastern Illinois happen on roads with speed limits between 30 and 45 mph. This aligns with 2018 data that show that 85 percent of speeding-related fatalities in the U.S. occurred on non-interstate roads, suggesting that speeding is an increasing problem on roadways that are more likely to be under local or county jurisdiction and serve multiple modes of travel.[22] These types of roads often connect to neighborhoods and business districts, creating opportunities for vehicles and

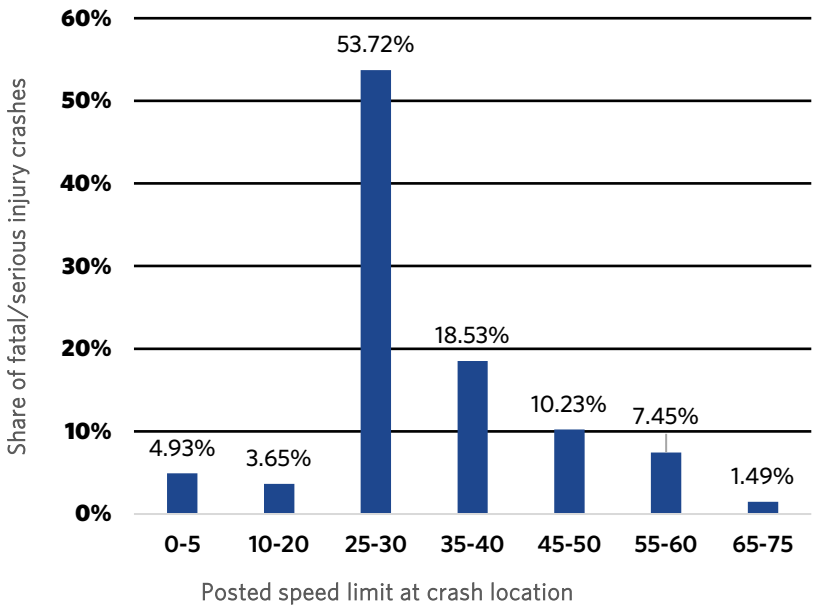
pedestrians or bicyclists to cross paths. These streets are also complex in nature, where balancing the needs of different users must be considered on a local level.

The fact that more drivers are speeding on urban roadways is important for two reasons. First, it signals a growing desensitization to speed and the risks associated with it, as more people choose a higher operating speed over time. Second, this may lead to unwarranted increases in posted speed limits where observational studies of drivers are used to set these limits. This is discussed further in Chapter 4.

The posted speed limit is a characteristic of roadways that is highly correlated with fatal and serious injury crashes, as shown in Figure 11. According to a data analysis by CMAP, 54 percent of 2019 fatal and serious injury crashes in northeastern Illinois occurred on roadways with a posted speed limit of 25-30 mph. This supports the idea that speeding is the biggest threat on urban district roads, not limited access highways.

Figure 11. More than 50 percent of all crashes resulting in fatalities or serious injuries in 2019 occurred on roads with posted speed limits of 25 mph and 30 mph

Share of crashes in northeastern Illinois resulting in fatalities or serious injuries by speed limit, 2019



Source: CMAP analysis of IDOT crash data.

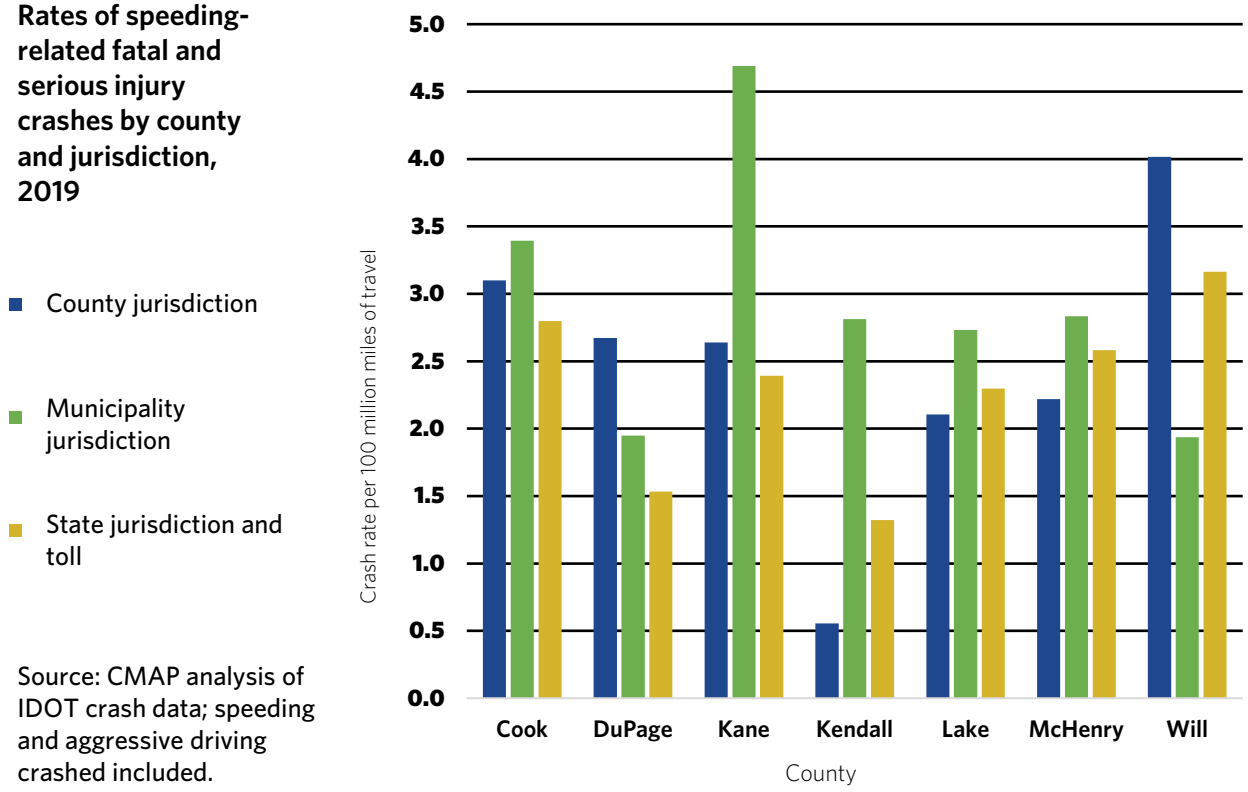
Speeding is a systemic problem across all road types in northeastern Illinois

Although speeding occurs on all types of roadways, data show that it may pose a bigger threat on roadways with certain characteristics. Figure 12 shows that rates of fatal and serious speeding-related crashes are distributed with some consistency across roadways under different jurisdictions regionwide, indicating a need for broad interventions in design standards and policies, as well as education and enforcement programs. Traditional hotspot approaches to addressing safety are not adequate to address this systemic issue.

It may also require changes to Illinois' Highway Safety Improvement Program (HSIP), so that projects aimed to reduce speeding systemically are appropriately scored for their ability to reduce kinetic energy in crashes broadly. HSIP and HSIP local programs enable important safety projects but may require new evaluation criteria that reflect the systemic benefits of speed management.

Figure 12. Speeding-related fatal and serious injury crashes are a systemic concern

Rates of speeding-related fatal and serious injury crashes by county and jurisdiction, 2019



Source: CMAP analysis of IDOT crash data; speeding and aggressive driving crashed included.

Speeding is especially dangerous to non-vehicle roadway users

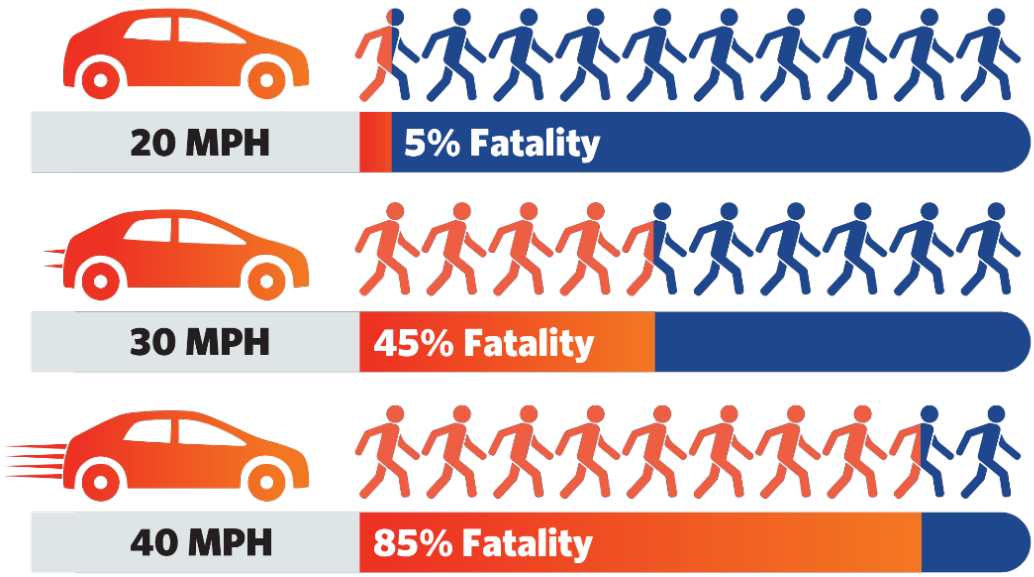
Speeding is a danger to everyone on the roadway, but it presents even greater safety risks for people outside of a protective vehicle "shell," which absorbs some of the kinetic energy of a crash. The impacts of a vehicle collision are more likely to result in fatal or serious injuries for people walking, riding bikes, and using wheelchairs or scooters. This threat increases with vehicle size, weight, and speed.

Non-motorized modes represent a growing number of traffic fatalities and serious injuries in our region. Ensuring the safety of people outside of vehicles through speed management supports many other regional goals including mobility options that are safe, healthy, affordable, and climate-friendly. Safe travel options for non-motorized modes are essential to functional cities and offer many societal benefits, including reduced greenhouse gas emissions from travel, improved public health,[23] and increased economic potential.[24]

Small changes in speed have significant safety impacts

The chance of a pedestrian being killed in a crash increases sharply with higher vehicle speeds. Many urban speed limits are set by state mandate at 30 mph. An adult pedestrian has approximately a 45 percent chance of dying if struck by a vehicle traveling at 30 mph and that risk increases sharply once the vehicle exceeds 30 mph (Figure 13).[25]

Figure 13. Higher speeds increase the likelihood of a pedestrian fatality

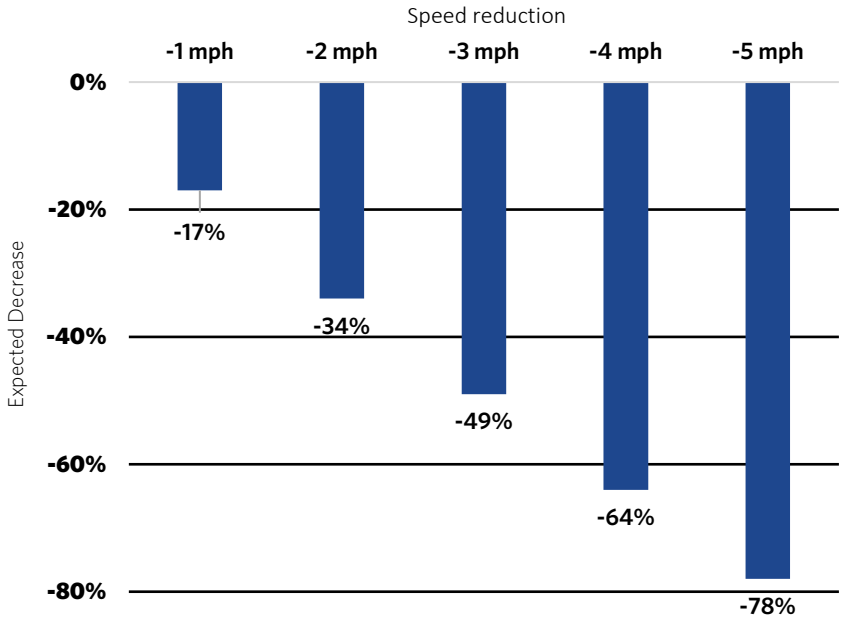


Source: National Transportation Safety Board (2017).

Small reductions in speed are correlated to lower rates of fatal and injury crashes, which makes a strong case for reducing speed limits, even by 5 mph or less. Figure 14 shows that when traveling at 30 mph, a reduction of just 3 mph in average traveling speed can reduce the likelihood of a fatal crash by almost 50 percent.

Figure 14. Small reductions in average operating speeds can significantly decrease the likelihood of fatal crashes

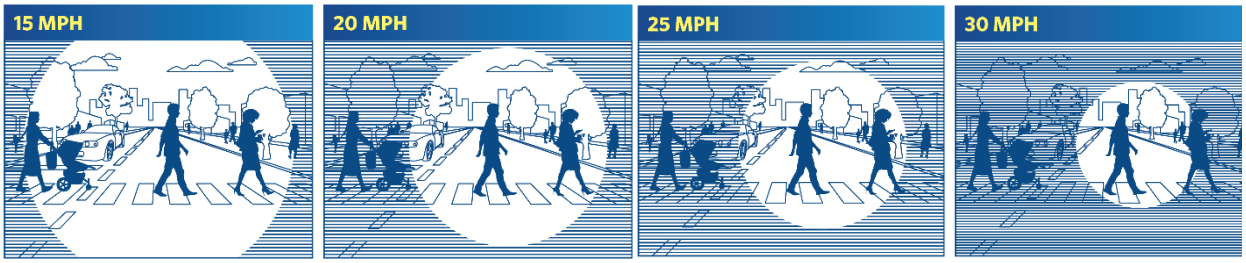
Expected decrease in pedestrian fatality rate with reduction in average vehicle speed from 30 mph



Note: Figure based on "Crash Modification Factors for Changes in Average Operating Speed" from the Highway Safety Manual, 1st Edition. Source: CMAP depiction of Pedestrian and Bicycle Information Center data.

Speeding decreases a driver's ability to react to hazards. One visual effect of speeding is a smaller field of vision due to the rate at which objects on the side of the road are passed (as Figure 15 shows). This presents a safety risk because speed reduces the likelihood that a driver will see and anticipate a pedestrian or hazard entering the roadway, which can prevent a driver from stopping with enough time to avoid a crash.

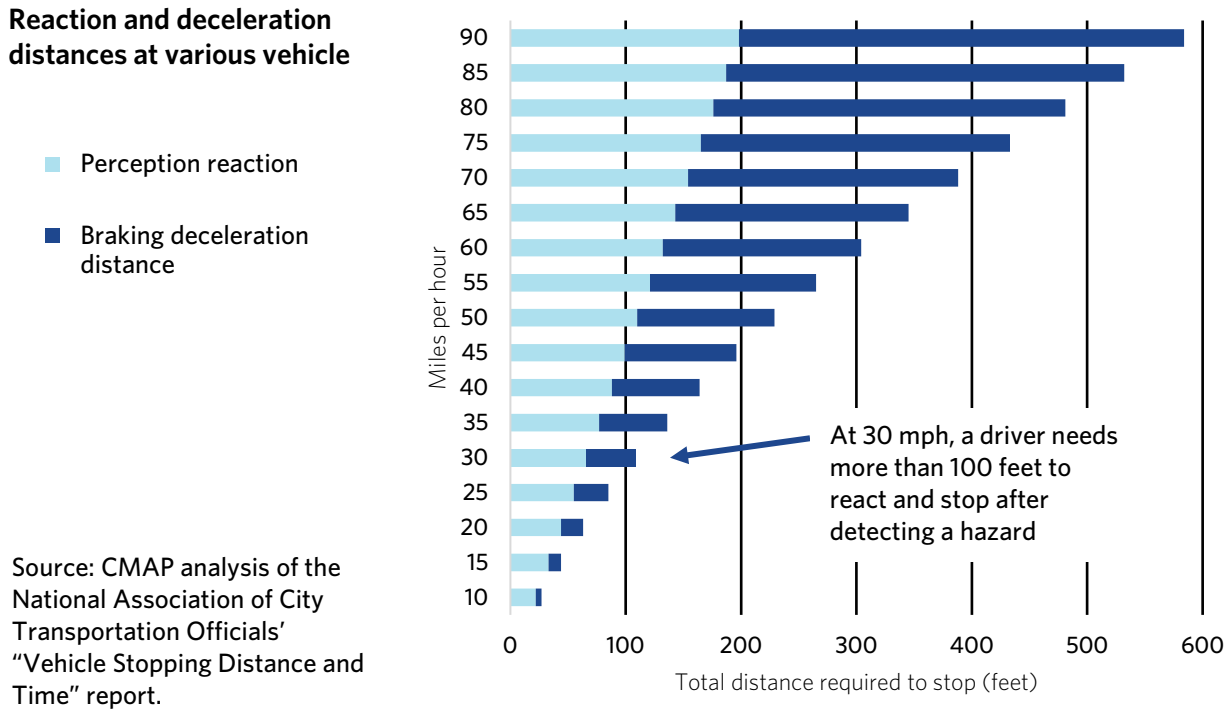
Figure 15. Drivers perceive less of their surroundings at higher speeds



Source: "Walkable City Rules," 2018.

In addition to reducing a driver's field of vision, higher speeds increase the distance required for a vehicle to stop, making a crash more likely. As vehicle speeds increase, both the time required to perceive and react to a hazard and the distance required to bring a car to a stop increase dramatically. In the graph below (Figure 16), perception time is translated into a physical distance based on the operating speed of a vehicle. At 30 mph, a driver requires 109 feet to perceive a hazard and bring their vehicle to a stop.

Figure 16. Higher speeds increase the distance required to react and stop after perceiving a hazard



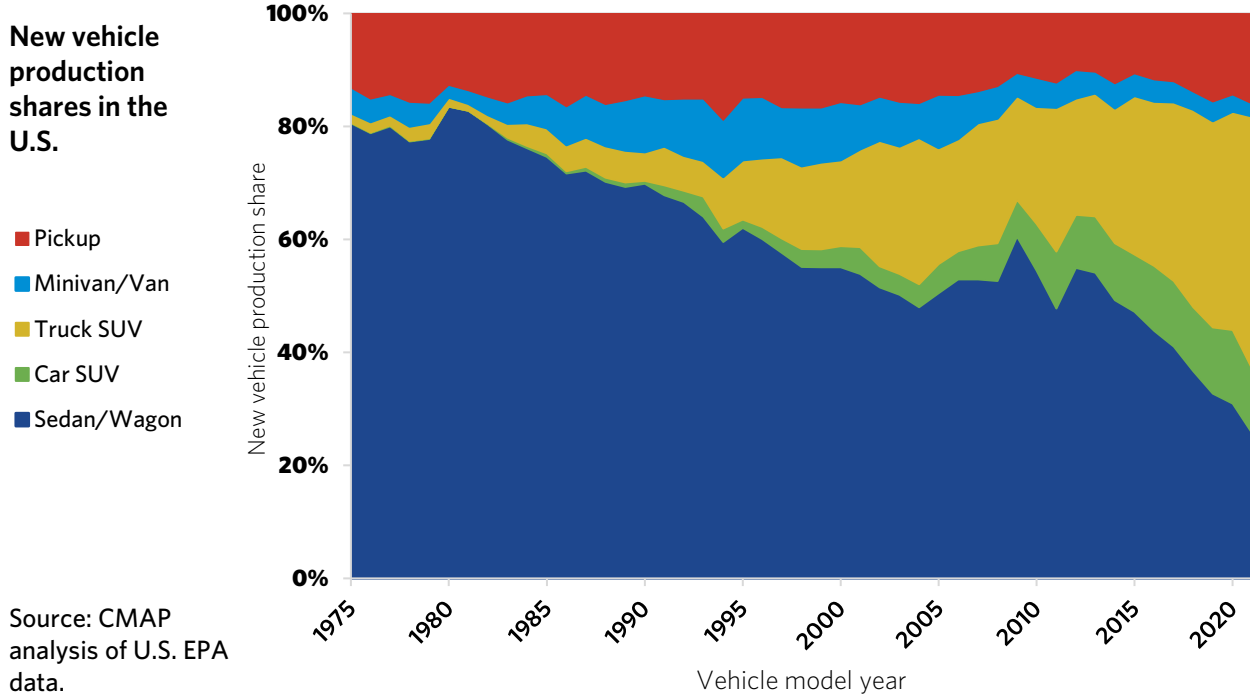
Source: CMAP analysis of the National Association of City Transportation Officials' "Vehicle Stopping Distance and Time" report.

Vehicle weights are trending upward

Vehicles today are on average significantly larger and heavier than in previous decades. According to the Environmental Protection Agency's (EPA) data, U.S. consumer demand for larger vehicles has steadily risen since 1975, a trend reflected in the production share of new vehicle types shown in Figure 17. In 1975, smaller sedan/wagon models accounted for more than 80 percent of all vehicles produced nationally; in 2021, they barely accounted for 30 percent of all vehicles. During the same period, the production shares of larger vehicle types such as SUVs have ballooned from less than 2 percent to more than 55 percent.[26] In short, the vehicle fleet on the road today is significantly larger, on average, than it ever has been.

Average new vehicle weight, especially for larger vehicle types, has increased over time as well. While an average new pickup truck weighed just over 4,000 pounds in 1975 — comparable to that of sedan/wagon vehicle types at the time — it averaged more than 5,200 pounds in 2021. In addition to the dangers related to vehicle weight, pedestrian survival rates are lower when struck by larger vehicles with high, blunt front bumpers because vital organs in the upper part of the body are directly impacted.[27]

Figure 17. Production shares of larger vehicle types like truck SUVs are steadily increasing



Source: CMAP analysis of U.S. EPA data.

Speed and vehicle weight contribute to kinetic energy

Safety advocates point to the increasing weight of vehicles as a contributing factor to the rise in traffic fatalities because heavier vehicles deliver higher kinetic energy on impact, and higher kinetic energy is more harmful to the human body.[28] The impact energy of vehicular crashes is measured by kinetic energy and is a function of both a vehicle's mass and velocity — (KE = ½(mass)(velocity)^2) — its weight and speed.[29]

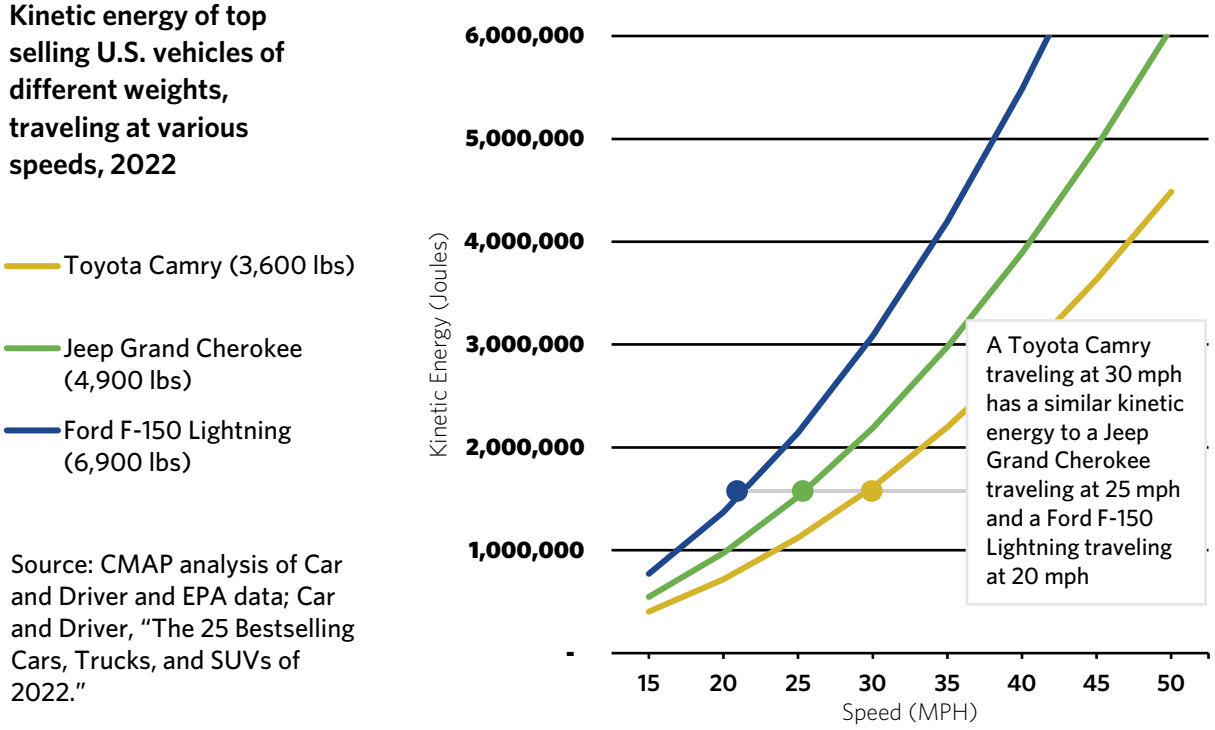
The significant increase in vehicle weight over time means that a crash at 30 mph — the urban statutory speed limit in Illinois and the speed at which most fatal crashes occur — has become more dangerous because heavier vehicles deliver higher damaging kinetic energy at a given speed. As average vehicle weight trends upward, it is likely that the severity of crashes will also continue to increase. Figure 18 illustrates this relationship between weight, speed, and kinetic energy for popular U.S. vehicles of varying weights.

Kinetic energy is the energy embodied in a moving object, such a motor vehicle in motion.

The Safe System Approach aims to reduce the kinetic energy in crashes to improve the chances that a crash is not fatal. Decreasing kinetic energy is done by reducing the speed and/or mass of the vehicle.

Figure 18. Heavier vehicles traveling at lower speeds deliver comparable kinetic energy at impact as lighter vehicles traveling at higher speeds

Kinetic energy of top selling U.S. vehicles of different weights, traveling at various speeds, 2022



Source: CMAP analysis of Car and Driver and EPA data; Car and Driver, "The 25 Bestselling Cars, Trucks, and SUVs of 2022."

Electric vehicles present risks related to weight, acceleration, and detection

As electric vehicles become more common, they present a compounded threat because they are, in almost all cases, heavier than their gas-powered counterparts. They also have faster reported acceleration rates and are quieter on approach, making detection and avoidance by VRUs more difficult.[30]

Batteries can add significant weight to electric vehicles, increasing their kinetic energy and risk to other roadway users. For example, the electric version of America's top-selling vehicle, the Ford F-150 Lightning, weighs more than 6,500 pounds, which is 35 percent heavier than its gas-powered counterpart.[31] Similarly, the Chevrolet Silverado electric version weighs almost twice as much as its gas-powered counterpart at 8,500 pounds.[32] Despite claims that added weight is safer for vehicle occupants, the additional kinetic energy generated makes these vehicles more dangerous to drivers in smaller or lighter vehicles, as well as to pedestrians or bicyclists.

Heavier vehicles require new speed management strategies

Speed management is critical to address the risks posed by heavier modern vehicles; we must reconsider whether current policies effectively protect our transportation system users. Some jurisdictions, such as Washington D.C., have recently assigned higher registration fees to heavy vehicles to compensate for their impact on safety and infrastructure.[33] Another strategy piloted in some cities is 'intelligent speed assist' (ISA) on truck or city fleets. ISA is a driver assistance

tool that automatically reduces a vehicle's speed when it has detected speeding over the posted speed limit. The pilot was deemed 99 percent effective in keeping vehicles in compliance with posted speed limits.[34]

National leaders are exploring other policy tools that would increase the safety of the large-vehicle fleet, the drivers operating those vehicles, and the people they share the road with. Commercial fleets offer opportunities to pilot strategies, such as increased education on the risks of speeding for commercial drivers at the time of licensure. Additional strategies include separate and lower speed limits for larger vehicles (e.g. trucks) in urban areas, and increased fines for speeding for operators of commercial vehicles and/or heavier vehicles.

Chapter 3: Designing roads for safer speeds

Key Recommendation: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks

Fast and efficient travel is an "embedded value" in traffic engineering and has historically been a priority for our federal and state transportation agencies.[35] Speed and efficiency have informed many aspects of our surface transportation network, including its design, capacity, and speed limit standards. Many of the practices, policies, and design standards developed in the 1950s and 1960s became the de facto standards for traffic engineering, with a focus on moving as many cars as possible, as fast as possible, and accommodating a growing demand for travel.

The transportation field must now reconcile decades of high-speed infrastructure investments. Safe roads, in terms of speed management, must consider the capacity and size of roadways, along with the geometric features in and along roads and intersections.

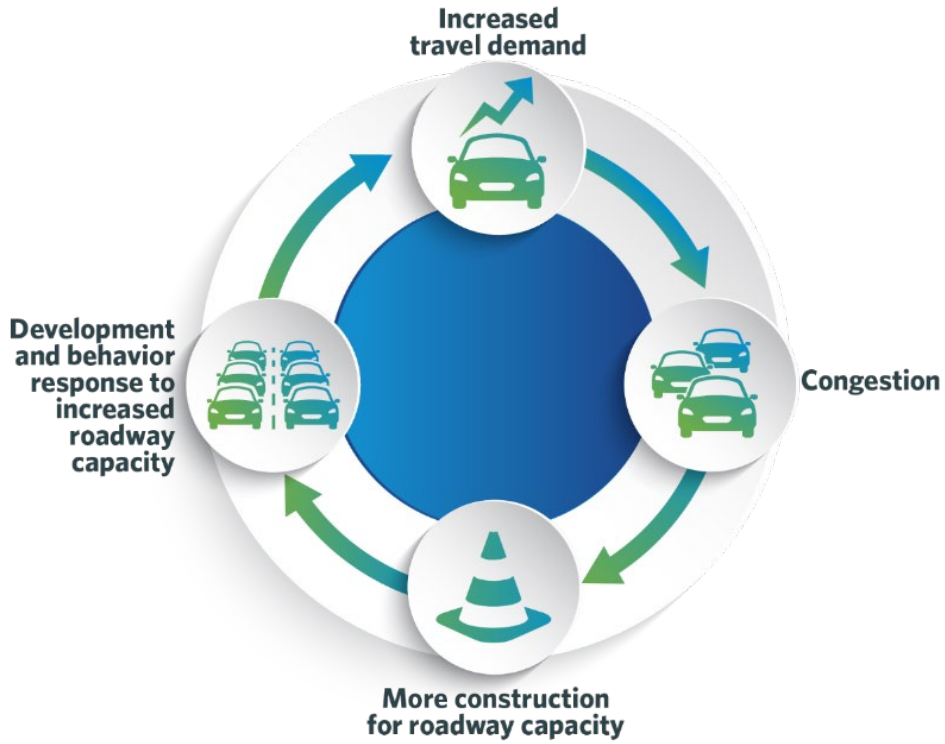
The exact relationship between road design and operating speeds is difficult to isolate because many factors that influence driving behavior, but controlled studies demonstrate that physical and visual engineering features can influence operating speeds. Safe roads, in terms of speed management, must consider the capacity and size of roadways, along with the geometric features in and along roads and intersections.

U.S. roads were originally designed for speed and volume

National security goals and rapid economic growth in the post-war boom drove demand for a high-speed surface transportation network to accommodate the growing number of privately-owned vehicles in the U.S. The National Interstate and Defense Highways Act of 1956 called for the creation of a "modern, efficient highway system […] to meet the needs of our growing population, our expanding economy, and our national security."[36] Federal programs to support homeownership also encouraged people to move outside of city centers and created the suburban housing model, which increased the number and length of trips to and from city centers. Over time, these forces combined to increase vehicle reliance and its inherent safety risks; this travel demand cycle is illustrated in Figure 19.

Traffic safety in the mid-20th century focused on reducing vehicular crashes while keeping cars moving quickly. When USDOT was first established as part of the Highway Safety Act of 1966, its mission was "to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system."[37] Similar prioritization of speed and efficiency is evident in early editions of the American Association of State Highway Transportation Officials' Policy on Geometric Design of Highways and Streets (also known as the "Green Book") and other foundational guidance used by transportation professionals.

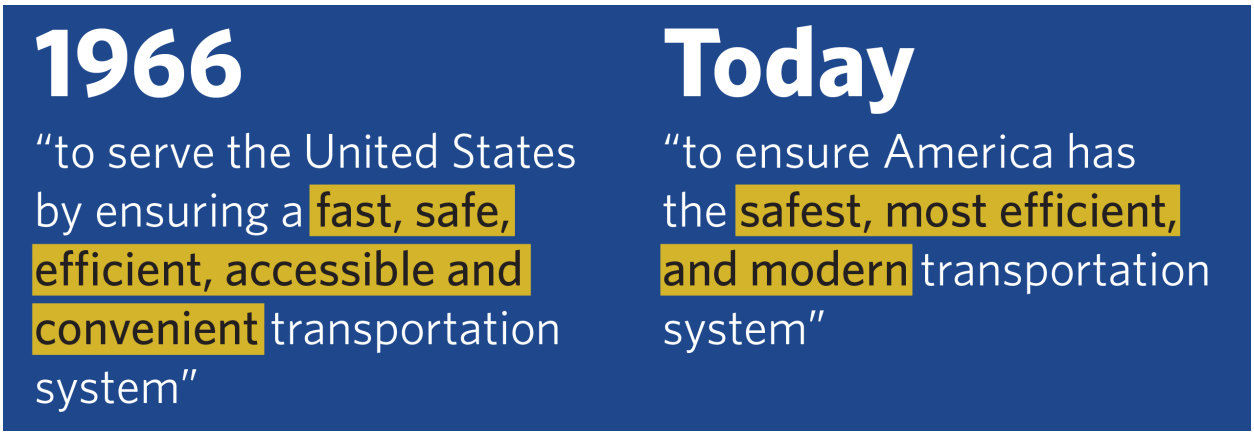
Figure 19. Adding capacity to accommodate travel demand has resulted in more driving, a larger surface transportation network, and more exposure to risks



Source: CMAP.

Only recently have these influential agencies reprioritized their missions to focus on safety over speed and acknowledged the threats that urban speeding poses to pedestrians and bicyclists. Today, USDOT's mission is "to ensure America has the safest, most efficient, and modern transportation system" (Figure 20).[38]

Figure 20: USDOT mission statements, 1966 and today



Current metrics and standards prioritize vehicles over other modes

The primary performance metric for the function of roadways is level of service (LOS), which measures the quality of travel from the driver's perspective. Quality is assessed based on travel time, speed, delay, number of stops, travel time reliability, and other factors. LOS is a standardized measure that informs decisions about the need to "improve service," often by expanding capacity to meet forecasted demand for travel. In the U.S., where travel demand has grown continuously with few exceptions, forecasted demand and efforts to improve quality have typically resulted in wider roads that move more traffic. There are several effects associated with this approach, primarily that the roadway network encourages more vehicular travel and supports higher speeds. This results in increased risks for roadway users, particularly those who are walking, bicycling, and accessing transit.

While Illinois and other states have developed LOS standards for other modes of travel, these measures are typically used on select routes rather than consistently across the entire roadway network. Poor bicycle LOS grades may inform improved bicycle infrastructure on a designated bicycle route, but they do not inform decisions about how *vehicular capacity* should be balanced with the need for improved bicycle LOS on the system as a whole.

Urban districts, which serve many modes of travel, particularly need alternatives to traditional LOS as measured from the driver's perspective. The quality of service of an intersection or roadway in an urban or suburban context must be measured from the perspective of all travelers using the roadway. Any increases in capacity should account for the impacts on other modes of travel. For example, when considering adding a right-turn vehicular lane to reduce delay at an intersection, transportation planners and engineers should also measure the safety impacts on pedestrians, such as longer crossing distances and higher-speed turning movements.

Design standards and guidance documents need updating

The Illinois Department of Transportation (IDOT) produces two design manuals that are intended to provide uniform and safe practices for engineering different types of roadways: 1) the Bureau of Design and Environment (BDE) Manual, IDOT's primary guidance for the design of projects on state roads, including interstates, expressways, and freeways, and principal, major, and minor arterials; and 2) the Local Roads and Streets Manual (Local Roads Manual) which provides guidance for roads under the jurisdiction of agencies other than the state. Both manuals are important resources for roadway design and provide guidance for many of the street design elements discussed here.

Changes to design manuals are critical to making safer roads. Planners and designers need to understand how, where, and in what combination alternative approaches (e.g., self-enforcing streets) should be used, and how design relates to the desired speed limit. Local agencies need an updated and comprehensive list of design features that promote safety. They also need guidance on aligning design features with posted speed limits and combining design features appropriately on different types of roadways. For example, speed tables and raised crosswalks have been used successfully on right-turn slip lanes on major arterials, but they are currently not included in the BDE Manual. Similarly, lateral shifts are not mentioned in the Local Roads

Manual but are included in the BDE Manual. These gaps and inconsistencies are barriers to implementation, compounded by the fact that design exceptions may be required to implement these features.

At the national level, there are similar efforts to change guidance in the Manual of Uniform Traffic Control Devices (MUTCD), which many safety professionals hold responsible for prioritizing vehicular speed and mobility over the safety and mobility of pedestrians and bicyclists.[39] The MUTCD contains all the national standards for traffic control devices and is the primary guidance document for many aspects of traffic controls and standards, such as pavement markings and the use of the 85th percentile as a speed-limit setting standard (see Chapter 4 for more about the 85th percentile). Groups such as the National Association of City Transportation Officials (NACTO), with support from partners, saw many of their recommended changes included in the recently released 11th edition of the MUTCD, including increased flexibility in how speed limits can be aligned with safety goals in urban areas.[40]

Safe road design is often inequitable

Transportation investments have not been implemented equitably. Planning practices in U.S. cities have long disadvantaged already under-resourced neighborhoods, making them more dangerous by design. Expansion of the urban roadway network — largely for the benefit of people moving to and from the suburbs — resulted in highways and high-speed arterials being constructed through low-income and/or predominantly Black neighborhoods. These high-volume, high-speed highways, arterials, and collectors encourage fast traffic movement and increase safety risks for those who live and work near them.[41]

Programs to improve unsafe and/or oversized roads have also been implemented inequitably. Federally funded roadway safety projects, such as the HSIP, typically require a local funding match of 20 percent, which can make these remedies financially inaccessible for low-income communities.

Additionally, traffic calming programs have often been implemented in ways that reward those with time, access, and resources to petition for them.[42] Safety features — like speed humps, improved crosswalks, and additional signage — are often added in response to resident engagement and involvement. This places a burden on residents to act and organize, which requires time, resources, and access to city staff, and can result in disparities between which neighborhoods receive safety features. This is likely a contributing factor in the higher rates of crashes in neighborhoods that are historically disadvantaged and majority people of color.

Communities including Charlotte, North Carolina and Austin, Texas have recently changed the way traffic calming infrastructure is deployed. Guidelines implemented in Austin prioritize traffic calming devices at high-crash locations in historically disadvantaged neighborhoods, which improves safety while reducing the reliance on police enforcement to discourage speeding.[43] Charlotte recently removed the burden of petitioning for a speed hump, which required a resident to gather support from 60 percent of homeowners within 1200 feet of a proposed speed hump. Now, one resident may submit a request and the city is responsible for contacting nearby residents. This reduces the time and effort required by residents and makes

it more feasible to install traffic calming infrastructure in neighborhoods that are less organized or with a higher number of rental units.[44]

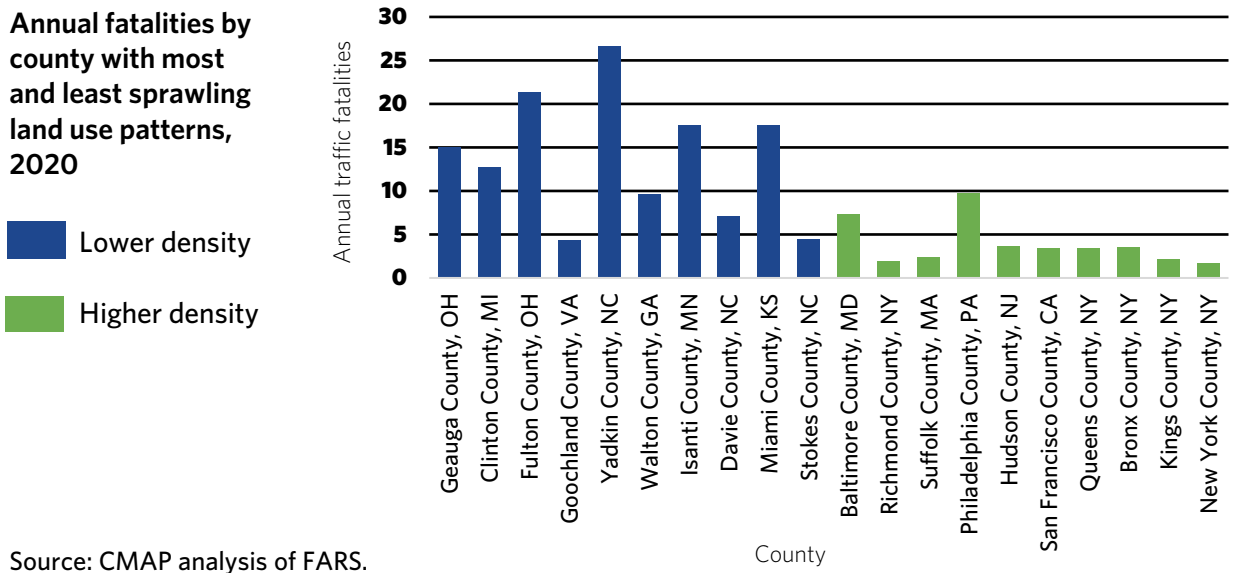
Finally, a common response to high rates of crashes is increased enforcement, which has had many negative outcomes, including higher rates of traffic stops, disproportionate financial burdens through citations, and higher risk of traffic stops that escalate to violence.

Land use, travel demand, and trip length influence speeding

While efficient traffic flow is an acceptable goal for limited access highway planning, it poses threats in developed areas such as urban, suburban, and residential settings. These more complex and densely developed contexts are markedly different environments. Urban and suburban areas have high degrees of access to adjacent land uses — businesses, neighborhoods, and schools — and higher numbers of people using other modes of travel, such as pedestrians, bicyclists, and transit users. Fast moving traffic on roads that access shopping, office space, homes, and community destinations are dangerous for all users but especially those not in a vehicle. Dangerous conditions discourage travel by foot, bicycle, or transit and encourage more driving.

Longer trips mean higher speeds. To understand the root causes of speeding, it is important to consider the broader demand for vehicular travel and how the amount we travel affects the way we travel. Traffic fatalities per population are higher in places with sprawling development patterns (Figure 21) with higher per capita VMT,[45] signaling an inherent risk, separate from personal travel habits, associated with increased driving and reliance on vehicular travel. Low-density land use patterns also discourage travel on foot, bicycle, or transit, because dispersed locations increase trip lengths and encourage more driving and wider roads, which make conditions more dangerous and less convenient for people walking, bicycling, and accessing transit. Efforts should be made on a broad scale to reduce the need for vehicular travel to improve safety outcomes through strategic decisions about land use and roadway capacity.

Figure 21. Low-density land use patterns are associated with increased traffic fatality rates



Source: CMAP analysis of FARS.

Wider roads have faster average speeds. Speeds tend to increase with the number and width of travel lanes, meaning that expanding roadway capacity to support a dispersed land use pattern has negative safety outcomes related to faster travel speeds.[46] Conversely, roadways with fewer and narrower travel lanes are associated with slower speeds.[47]

People who drive more tend to drive faster. The number of VMT is positively associated with speeding.[48] Longer trip lengths and more miles driven are positively correlated to a driver's likelihood to exceed the speed limit. This could be explained by the belief that frequent and long-haul drivers are more likely to speed because they can save more time, as a percentage of their total travel time.[49] Drivers who log the most miles may consider themselves more experienced drivers, and therefore better at speeding safely.[50] It may also be true that some portion of longer trips are on a highway; this can desensitize drivers to the fact that they may be speeding when exiting a highway to a roadway with a lower speed limit.

Roadway design can help drivers slow down

Right-sized roads. Sometimes called a road diet, right-sizing roads is a design approach that seeks to retrofit oversized roads. Roads can be deemed "oversized" based on traffic volume, the number and mix of different types of users, and/or the land use context. Right-sized roads have many benefits, including safer turning movements, reduced pedestrian crossing distances, and slightly slower and more uniform operating speeds. Right-sizing roads generally reduces the number of travel lanes in exchange for a single turning lane and/or lanes for bicycles, as shown in Figure 22.

Reducing roadway capacity by reducing travel lanes must be done with consideration of annual average daily traffic counts and other specific functions of a roadway. Road diets are generally appropriate on roadways that have annual average daily traffic volumes of about 20,000 vehicles or less, but operational changes can increase that number.[51] Research shows that narrower travel lanes are associated with only minor reductions in roadway capacity in urban and suburban environments.

Figure 22. Oak Park, Illinois reduced the number and width of travel lanes to effectively reduce speeding

Source: FHWA, "Traffic Calming EPrimer."

The tradeoffs in capacity reductions for safety benefits of right-sized roads are worthwhile.[52] Road diets are associated with a 19 to 47 percent decrease in crashes — depending on initial volume, context, and design — and significant improvements in pedestrian safety due to reduced operating speeds and increased driver reaction time.[53] Added left-turn lanes also reduce turning vehicles blocking travel lanes and subsequent rear-end accidents.

Road diets have been successfully implemented across northeastern Illinois. The Village of Niles completed a road diet on Howard Street at the intersection with the North Branch Trail, shown in Figure 23. Chicago also completed a road diet on East 55th Street, where vehicle crashes reportedly dropped by one-third and speeding was reduced. While road diets are increasingly being recognized for their broader safety benefits, their speed management benefits should also be highlighted.

Figure 23. A road diet with a planted median in Niles, Illinois, improved safety by reducing the width of the roadway and slowing vehicle speeds with visual friction

Note: The intersection of Howard Street and the North Branch Trail in the Village of Niles, March 2022.
Source: Christopher Burke Engineering.

Traffic calming. Traffic calming commonly refers to physical infrastructure features that encourage or require drivers to reduce speeds and avoid high-risk behaviors and movements, such as certain types of turns. Traffic calming approaches to speed management are highly contextual and must increase safety, particularly for VRUs, given the roadway's specific characteristics. Considerations for speed reduction include:

- Existing or proposed speed limits
- Traffic volume
- Types of vehicles using the roadway
- Roadway functional classification and jurisdiction
- Crash history
- Presence and design of facilities for other modes
- Activity levels of other modes
- Adjacent land uses
- Frequency, design, and location of access to adjacent land uses, such as driveways

There are three primary types of traffic calming elements that reduce speeds: horizontal curves, vertical shifts, and cross-sectional changes. A straight road can encourage speeding; adding curves or changes to the road encourages slower speeds. The most common horizontal curves used in traffic calming are roundabouts, traffic circles, lane shifts, and chicanes. Speed reductions vary depending on the curve's sharpness, overall length, and the driver's entry speed. Roundabouts, as shown in Figure 24, are among the most effective horizontal shifts and serve as intersection controls by replacing signals or stop signs. They are more effective at reducing speeds through an intersection than a traffic signal because the curve forces *all* drivers to reduce their speed. Roundabouts also reduce rear-end and severe crashes by eliminating stops and dispersing the kinetic energy of a crash across multiple directions due to the turning movement of the car.

Figure 24. Roundabouts and traffic circles are examples of horizontal curves that reduce operating speeds

Source: CMAP.

Figure 25. Raised crosswalks with speed tables and speed cushions are examples of vertical shifts that reduce operating speeds

Note: Changing the vertical alignment of a roadway has been proven to reduce operating speeds.
Sources: CMAP (left) and Mike Cynecki (right).

Vertical shifts are another primary traffic calming element, with elevated or depressed features in roadways designed to reduce vehicle speeds. Like horizontal shifts, the impact on speeding varies depending on the initial operating speed, as well as the length and degree of the shift. Vertical shifts include speed tables, speed cushions, speed humps, raised crosswalks, and raised intersections (Figure 25 above). The relative effectiveness of vertical shifts, horizontal shifts, and other road design elements are outlined in Figure 26.

Cross-sectional changes in a roadway can reduce its physical and visual width, changing a driver's perception and thereby decreasing operating speeds. These changes include: reducing the number and width of travel lanes and features that physically constrain the roadway such as medians, protected bike lanes, on-street parking, and curb extensions. These features can also help create visual friction, which is discussed below.

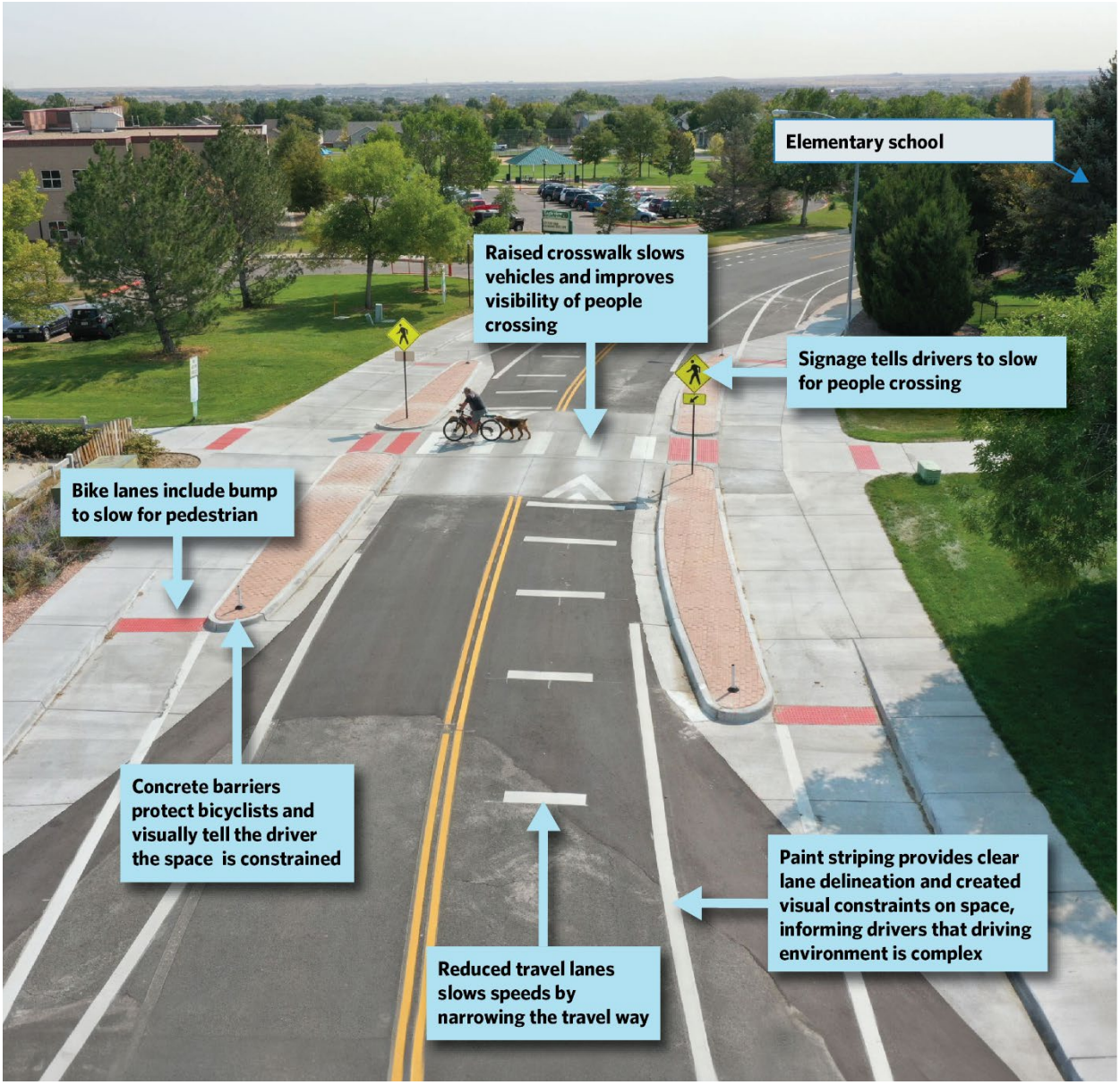
Figure 26. Road design elements are effective in reducing speeds

Treatment	Average speed after traffic calming (mph)	Average percent change in speed with traffic calming
Lumps (humps with wheel cutouts)	27	-25%
14' humps	25.6	-23%
12' humps	27.3	-22%
22' tables (raised crosswalks)	29.2	-20%
Half closures	26.3	-19%
One-lane slow points	28.6	-14%
Mini circles	30.3	-11%
Longer tables	31.3	-10%
Narrowing (chicanes, pinchpoints, and neckdowns)	32.2	-4%
Diagonal diverters	27.9	-4%
Raised intersections	34.3	-1%

Source: Reid Ewing, "U.S. Traffic Calming Manual."

Visual and physical friction, signage, and paint. Visual friction describes design features along the roadway that are intended to create visual narrowing of the roadway, signaling a need for the driver to reduce speed. Examples of visual friction include pavement markings and striping; fixed objects — such as medians, trees, or plantings — placed strategically along a roadway; and roadway features that serve another function, such as bicycle lanes, curb extensions, or mid-block and raised bus islands. Figure 27 shows several design elements that can be used together to improve safety for all road users.

Figure 27: Complementary self-enforcing street designs create a safer crosswalk near a school



Source: Institute of Transportation Engineers.

In addition to roadway features, the scale of the development surrounding a roadway affects driver speed. Low-lying buildings with large setbacks are associated with higher speeds because they are less visible to a driver, while more urban development patterns with taller buildings closer to the roadway feel more constrained and are associated with slightly lower speeds.[54]

These features add complexity to the driving environment, which can help reduce crash frequency and severity by inducing slower operating speeds. Growing research on the safety benefits of strategic roadside design shows that urban roadways with trees located within the typical clear zone — a designated area adjacent to a travel lane, such as a shoulder — have fewer roadside crashes than locations with no trees.[55] A similar study in Toronto showed a 5 to 20 percent reduction in crashes in locations with trees and planters along the roadside.[56]

Some speed reduction solutions can conflict with traditional engineering approaches. For example, a standard safety practice is maintaining a clear zone to reduce the risk of a roadway departure hitting a fixed object. Clear zones are based on evidence from highways and rural roads, where roadway departures resulted in vehicles striking trees or other fixed objects. But clear zones are not appropriate on lower-speed streets in urban areas where other roadway users may be walking, bicycling, or accessing transit. In these contexts, a wide clear zone reduces visual friction and may encourage higher speeds.

One-way couplet conversions to two-way streets. The use of one-way couplets in older downtown business districts was a popular traffic engineering tool used in the 1940s and 1950s to increase access, capacity, and flow on streets with low LOS. Many cities have recently converted these one-way couplets to two-way streets because they were associated with decreased property values, driver confusion, and higher speeds, making them less safe. Recent conversions in Baltimore, Maryland and Louisville, Kentucky have resulted in improved traffic safety through reduced speeds. An empirical analysis of two-way conversions in Louisville shows reductions in crashes of 36 to 60 percent after conversion, as well as significant decreases in crime and increases in property values, which may be related to increased activity and presence of people.[57]

Speed feedback signs. These signs use radar or inductive loop technology to display drivers' real-time speed. They have been shown to reduce speeding by increasing drivers' awareness of both the speed limit and their actual operating speed. A meta-analysis of speed feedback signs showed statistically significant reductions in operating speeds, about 4 mph on average.[58] As discussed earlier, even small reductions in speed can greatly decrease the risk of traffic fatality; for example, slowing average vehicle speeds from 30 mph to 26 mph can decrease the risk of pedestrian fatality by 64 percent.

Speed limit signage. In Illinois, posting a speed limit sign is not required when the statutory speed limit (30 mph) is in effect, which is often the case on urban local and residential streets. But drivers may be unaware of the speed limit in these areas due to lack of signage; some drivers caught speeding do not realize that they are exceeding it.[59] Particularly in urban and residential areas, adding speed limit signage can be a simple and effective way of increasing driver awareness. For example, Seattle, Washington installed 2,500 new speed limit signs in

conjunction with a reduction in the speed limit and saw compliance increase and crashes decrease by up to 40 percent.[60]

Synchronized signals. Traffic signal coordination can encourage speed limit compliance by creating "green waves," which can reduce average speeds by 10 to 20 percent.[61] This strategy involves coordinating signal timing and providing signage that informs drivers that speed limit compliance will reduce delay at sequenced signals (Figure 28). This relatively low-cost speed management option can also improve traffic flow, reduce congestion, and improve air quality.

Figure 28. Approaches like signal synchronization (left) and speed feedback sign (right) can raise awareness and help manage speeds

Source: CMAP.

Speed humps, raised crosswalks, and other traffic calming treatments may require that agencies maintain roads with more caution and operate vehicles more slowly. In some cases, different equipment may be required. Additional costs in time or equipment should be addressed as part of the design process. Access and circulation for emergency vehicles on streets with self-enforcing features, such as speed humps, presents similar concerns. There are several design treatments that can make passage by fire trucks and other emergency equipment faster without compromising the safety benefits of the traffic calming devices. For example, roundabouts can be designed with mountable aprons that allow fire trucks through without sharp turning movements, and speed humps can include cutouts that are sized for the wheelbase of an emergency vehicle (Figure 29). These treatments may be appropriate in locations near hospitals or fire stations.

Figure 29. Traffic calming features like mountable aprons (left) and speed hump cutouts, also referred to as speed lumps (right), can be designed to allow emergency access

Source: FHWA, Jeff Young (left) and Jeff Gulden (right).

Self-enforcing streets influence driving speeds through road design

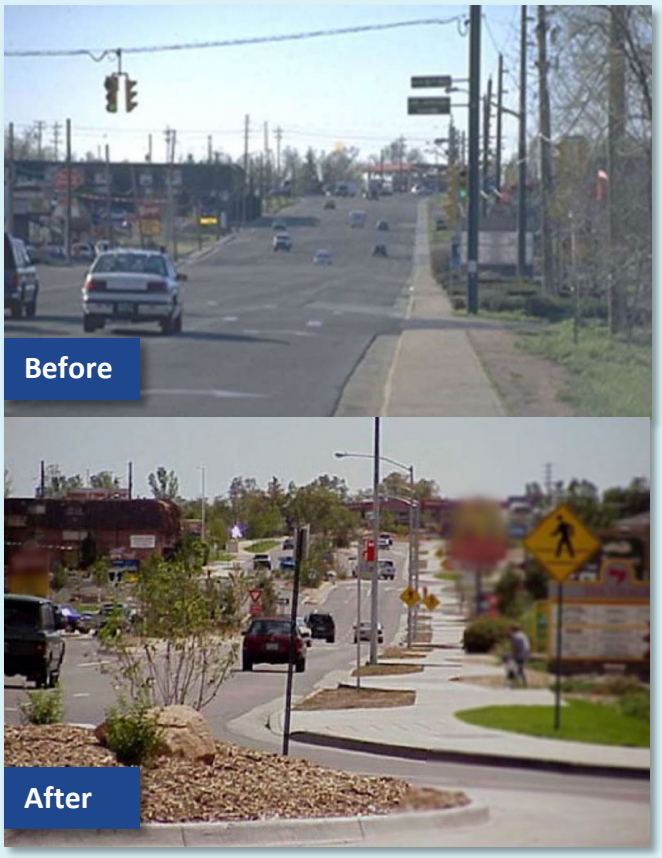
Self-enforcing streets are roadways designed for a desired travel speed; they are physically configured to support safe vehicle travel speeds and create a safe environment for all road users, including drivers, pedestrians, and bicyclists. Rather than using a design speed and related inferred speed to determine a basic roadway design, engineers first identify a desired operating speed at which experts believe it is safe to travel based on contextual factors. Those factors expand on traditional engineering considerations to include functional classification, traffic volumes, neighboring and nearby land uses, the presence of other modes of travel, and the speed at which a crash with other roadway users is unlikely to be fatal. Based on these considerations, roadway capacity and design are sized to support the target speed, thereby reducing operating speeds, crash severity, and the reliance on enforcement to manage speeding.[62] Research and experience in this area are growing rapidly as many recognize the need and opportunity for design to play a role in constraining speeds.

Self-enforcing strategies are best integrated into an initial design or redesign, which begins with determining the target speed, then utilizing traffic calming and complete streets tools to create a self-enforcing travel environment. Complete streets are "planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel and access for all anticipated roadway users, regardless of their age, abilities, or mode of travel."[63] These features include bicycle lanes, dedicated transit lanes, raised pedestrian crosswalks, curb extensions, high visibility transit stops, and/or medians between travel lanes — all of which have the co-benefit of reducing driving speeds and improving safety for all roadway users. For example, Evanston, Illinois installed protected bicycle lanes along Dodge Avenue, which resulted in a narrower vehicle travel lane and more defined parking zones. According to crash data from IDOT, the corridor saw an 18 percent decrease in the total number of crashes, a 60 percent decrease in injury crashes, and a 38 percent reduction in rear-end crashes.[64]

Self-enforcing streets case study: Golden, Colorado

When redesigning South Golden Road, a major local roadway through a commercial district in Golden, Colorado, engineers chose a design to encourage slower speeds. Prior to the redesign, 85 percent of vehicles drove at or below 43 mph in a 25-mph zone, and the roadway saw a significant number of crashes, including those with pedestrians and bicyclists.

A self-enforcing street design was constructed to include roundabouts instead of intersections, narrower travel lanes, medians, and restricted turning movements. On the redesigned roadway, 85 percent of vehicles drove at or below 33 mph, a full 10 mph less than before the self-enforcing street design.[65]



Source: FHWA, Dan Hartman.

Time and funding considerations of self-enforcing streets. Several factors may contribute to the higher costs of self-enforcing streets and traffic calming features compared to traditional street design. There are costs associated with training staff in new design strategies and how to incorporate them on appropriate roadways. Construction costs for self-enforcing streets may be higher because the designs can be more complex and context sensitive. Construction contractors may also require additional training on the proper installation or appropriate materials to use when building self-enforcing countermeasures. In a system that prioritizes safety, these time and funding costs are a worthy investment in preventing the loss of human life.

Recommended actions

Key recommendation: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks

1. **Study and pilot new approaches to roadway capacity and design that reduce travel demand, encourage slower operating speeds, and support compliance with speed limits**
    a. Create a self-enforcing streets initiative —– comprised of research, guidance, and a toolkit —– which begins a pilot program for self-enforcing streets in equity priority areas
    b. Advance research and policy efforts on the use of a multimodal level of service standard in urban districts for roadway construction and/or maintenance improvements. This standard should evaluate quality of service and safety for all types of travel, including pedestrians, bicyclists, and transit vehicles
2. **Improve existing design guidance and standards to support compliance with speed limits**
    a. Ensure that all proven traffic calming and self-enforcing street design elements are included in the *Bureau of Local Roads and Streets Manual* and the *Bureau of Design and Environment Manual* and do not require exception requests
    b. Create a policy and provide supportive design guidance on the coordinated use of right-sized roadway geometry, traffic calming infrastructure, visual friction, and informational signage. The policy and guidance should explain and promote street design that encourages compliance with lower speeds
3. **Increase funding for speed management projects by updating scoring metrics**
    a. Ensure that evaluation metrics within the HSIP adequately consider and score the benefits of systemic roadway safety improvements such as speed limit reductions
    b. Continue to improve scoring criteria in programming decisions to prioritize projects that reduce speed limits and include speed management strategies
4. **Improve project-level design guidance and local approaches to reduce speeding**
    a. Develop internal project scoring that captures the safety benefits of right-sizing roads on roadways with four or more travel lanes, such as reduced speeds and increased activity by vulnerable roadway users
    b. Integrate safety into technical assistance projects related to transportation and mobility to help partners identify traffic safety issues and prepare them to apply for implementation funding
    c. Increase the weight of programming metrics that reduce expected travel demand and per capita VMT for their safety and speed management benefits
    d. Encourage and support the creation of local traffic calming programs for neighborhoods, urban areas, and transit centers. Implement them uniformly within street construction programs at locations where speeding-related crashes are a concern.

Chapter 4: Reducing speed limits

Key recommendation: Reduce speed limits in urbanized areas where people walk, bike, and use transit.

Speeding is defined as driving at a speed that is unsafe for conditions or above the posted limit. Since "unsafe" is a qualitative term and requires the use of judgment, a strong emphasis is placed on posted speed limits when defining the term. Speed limits are the primary regulatory tool governments can use to guide driver behavior. They achieve important systemic impacts by establishing driver expectations about safe operating speeds and apply widely across the roadway system.

This paper proposes that posted speed limits themselves may not always be safe for all roadway users, such as people walking and bicycling, because the methods historically used to set speed limits prioritize fast vehicular travel. Clear guidance on safe speeds for all road users and different contexts/conditions should be used to determine appropriate posted speed limits.

There is a growing interest in setting speed limits that improve safety outcomes for *all* road users. Engineering approaches, such as the percentile-speed method (see below), typically inform speed limits when the statutory speed limit is believed to be too fast or too slow for conditions. This method is generally believed to promote higher-than-safe speeds, particularly in developed areas, where pedestrians and bicyclists may be present.[66] Recent results of new speed limit setting methods that consider contextual and operational characteristics of roadways may be better aligned with safety goals.

The 85th percentile speed describes the speed at or below which 85 percent of drivers operate their vehicles. Many speed limits are set at or close to the 85th percentile for several reasons: alignment with the speed at which most drivers drive, reducing differentials between operating speeds, and supporting higher traffic flow at the maximum safe speed. Enforcement is also considered when determining speed limits employing the 85th percentile method, which will put 15 percent of drivers out of compliance. This is considered more realistic to enforce than, for example, the 50th percentile.

This method has been the basis for setting speed limits since the seminal 1964 research paper *Accidents on Main Rural Highways Related to Speed, Driver, and Vehicle.*[67] The paper's main findings were that variation in vehicle speeds increased crashes, and injury crashes occurred at the highest rates at low speeds (in the rural highway context). These findings made speed harmonization — or encouraging similar average speeds among vehicles — the top priority for safety purposes.

For decades, this principle has been misapplied to urban and suburban streets, which have frequent intersections and are used by multiple modes. 85th percentile speeds set higher-than-safe speed limits in these contexts and speed harmonization does not improve safety for all users.

Speed limits and safety have a distinct relationship

Numerous studies show that posted speed limits have a significant influence on the speed at which people drive. In some studies, posted speed limits have been more highly correlated to operating speeds than other design factors.[68] Research also demonstrates the relationship between speed limits and safety outcomes. When Congress abolished the national maximum speed limit of 65 mph on interstate highways as part of the National Highway System Designation Act of 1995, every state in the country raised at least one of their statutory speed limits. Over the 10 years that followed, there was a 3.2 percent increase in national roadway fatalities attributable to higher posted speed limits, or an additional 12,545 fatalities.[69] The Insurance Institute for Highway Safety attributed 37,000 deaths to speed limit increases between 1993 and 2017.[70]

Most motor vehicle codes state that drivers are responsible for driving at a speed that is "reasonable and proper" for roadway conditions — a speed that does not endanger the safety of any person or property.[71] Posted speed limits are generally interpreted as the speed at which one *may* drive or *should* drive, without the risk of enforcement. In fact, speed limits are intended to be the highest speeds determined to be safe and reasonable in ideal road, traffic, and weather conditions. While speed limits are not the only factor in determining average speeds, they set drivers' expectations about safe operating speeds and the speeds that other drivers will likely choose. Posted speed limits are also more easily and readily enforceable than judging a "reasonable and proper" speed.

Speed limits in Illinois

Statutory speed limits. Statutory speed limits serve not only as de facto regulatory limits when a posted speed limit is not in place, but also as important baselines for government agencies and the general driving public, as they consider what is "reasonable and safe" in their communities.

Illinois speed limits are established by statute in the Illinois Motor Vehicle Code. These statutory speed limits, listed in Figure 30, are the default speed limits. They are in effect when no speed limit is posted, unless an agency with jurisdiction has taken action to amend the statutory limit. These speed limits are intended to be blanket maximums that are enforceable when speed limit signage is missing, not visible, or damaged. They also serve to advise what the top "reasonable and proper" speed is on different types of roadways.

Figure 30. Statutory speed limits for different types of Illinois roads

Roadway type	Statutory speed limit
Interstates and tollways	70 mph
Highways and four-lane roads	65 mph
Other highways and rural areas	55 mph
Urban districts (cities and towns)	30 mph
Alleys in urban districts	15 mph
School zones	20 mph

Source: Illinois Vehicle Code.

Illinois has an urban district speed limit of 30 mph. Urban district roads feature high degrees of access to destinations, such as stores, restaurants, offices, and homes. They also tend to serve those who are more likely to access such destinations on foot, bicycle, or via transit. The high rate of crashes on these roads, for both motorized vehicles alone and those involving bicyclists and pedestrians, indicates that vehicles may be driving too fast to avoid a crash on these roads.

As discussed previously, fatal crashes were most common on roads where the posted speed limit was 30 mph. A difference of 10 mph can have profound safety implications: a person struck by a vehicle traveling at 30 mph has a 45 percent chance of being killed, but that risk decreases to about 5 percent when that same vehicle is traveling at 20 mph.[72] Slower speeds on urban district roadways would significantly improve safety and can be supported through reduced speed limits and better design.

Twenty-five states identify statutory limits for urban districts lower than that of Illinois.[73] Some of these states identify additional statutory speed limits for residential districts, which Illinois does not; 15 of the 23 states set residential speed limits of 25 mph or lower. While it is difficult to determine if the statutory speed limit alone changes safety outcomes, the FHWA's call to set appropriate speed limits as a proven safety countermeasure requires examining this important regulatory tool.[74]

Speed limit policies should also consider that many people drive above the speed limit because it is generally believed that driving a little over the speed limit will not be enforced. In a recent survey, 45 percent of U.S. drivers self-reported traveling 15 mph above the speed limit within the last year.[75] This poses grave dangers to anyone outside of a vehicle on our urban and residential streets and should be considered when setting speed limit policies.

Current options for reducing speed limits in Illinois

Citywide reductions. In 2008, the Illinois State Legislature enabled local agencies — including counties, municipalities, and others — to reduce statutory speed limits due to speeding and safety concerns. Local authorities in Illinois "may establish absolute maximum speed limits on all streets which are within its corporate limits" (and under local control).[76] This means that local governments in the region may adopt local ordinances for reduced speed limits that are in effect throughout their jurisdiction on all roads except those under control of a different agency, such as the county or IDOT. Lowering speed limits is an attractive option because it can be applied to large areas, delivering broader systemwide results. Citywide speed limit reductions have been established by several communities in northeastern Illinois, including Evanston, Villa Park, and Western Springs. Figure 31 lists the allowed changes in different contexts.

Figure 31. Allowed changes to statutory speed limits by local agencies in Illinois

Context	Allowed change
Urban districts	May be reduced to no less than 20 mph or increased to no more than 55 mph
Areas outside urban districts	May be reduced to no less than 35 mph
Residential districts (outside of urban districts)	May be reduced to no less than 25 mph

Source: Illinois General Assembly.

Speed zones. When agencies want to establish a higher or lower speed limit on a certain portion of a roadway, they may create a "speed zone," which is a section of roadway with a posted speed limit that is different from the statutory limit. A speed zone's speed limit must be determined by an engineering study, according to state law. Most agencies in Illinois use the engineering study process dictated by IDOT's Policy on Posted Speed Limits, which generally follows the 85th percentile rule.[77] A speed zone is commonly used when a higher-speed roadway enters a commercial area, when there is increased activity by pedestrians and bicyclists, and when transit and/or parking activity is better served by a lower speed limit and slower moving traffic.

A neighborhood approach: slow zones

According to the Centers for Disease Control and Prevention (CDC), traffic crashes are the leading cause of death for children 12 and under. Neighborhood slow zones are a reduced speed limit program that has been adopted by several cities in the U.S. after demonstrating compelling safety benefits in the United Kingdom and Europe.

Note: Neighborhood slow zone in New York City.
Source: NACTO Urban Stret Design Guide.

The CDC identified "reducing speeds in neighborhoods" as part of its transportation policy platform and recommends neighborhood slow zones as a tool to achieve this. Neighborhoods, schools, and community groups may apply for a special designation that allows them to reduce speed limits to 20 or 25 mph in a defined area. They can also apply for accompanying low-cost roadway treatments, such as pavement markings and special signage. Boston, New York City, and Philadelphia are currently implementing neighborhood slow zones in residential, recreational, and school areas and have seen reductions in speeding.

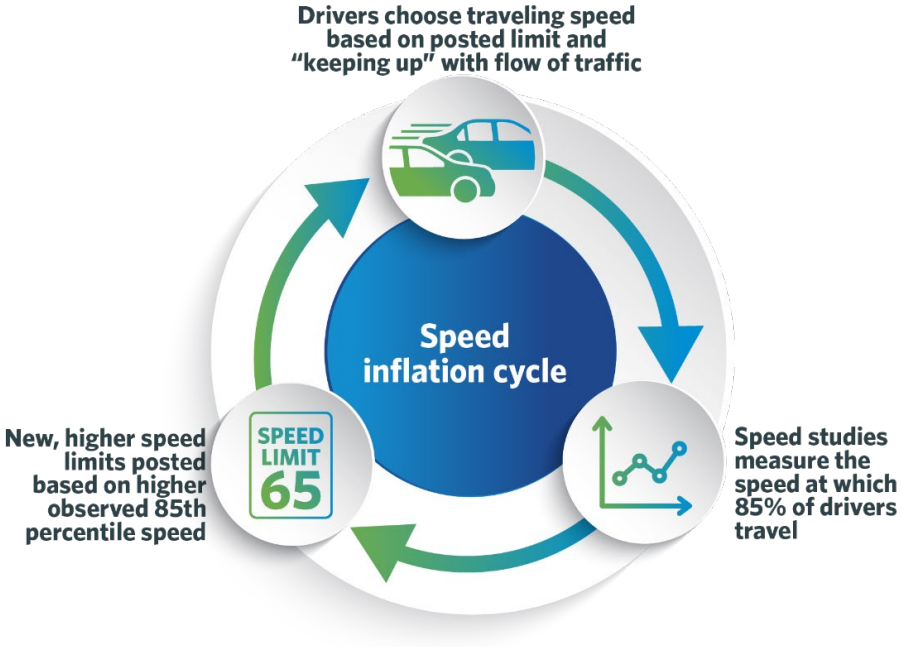
A CMAP survey of 246 municipal officials in northeastern Illinois identified significant interest in reducing speed limits on roads under local jurisdiction:

- At least 15 municipalities (6 percent of respondents) have reduced speed limits on all roads under their jurisdiction.
- 87 communities (35 percent of respondents) have reduced speed limits on specific roads of concern.
- 24 communities (10 percent of respondents) have not yet taken action to reduce speed limits but are interested in doing so soon.
- 120 remaining respondents (almost half of respondents) indicated that they have taken no action.

Speed limit setting methods need to be updated

Moving away from the 85th percentile method. Using percentile speeds to set limits is believed to increase speeds over time by supporting high-speed driving behavior.[78] Although the 85th percentile approach has been widely used in the U.S., its theory and method are being re-evaluated across the traffic safety community, particularly on roads where people live, work, and shop. The research that originally justified the 85th percentile approach was completed in 1964 and based on analysis of driver behavior on two-lane rural highways.[79] Many experts consider this research out-of-date and lacking relevance to today's traffic environment in urbanized areas, which are generally more congested, complex, and diverse in the number of modes of travel. Critics of the 85th percentile approach also describe it as reactionary because it responds to drivers' desired operating speeds rather than setting a speed that is desirable for context and safety, as illustrated in Figure 32.

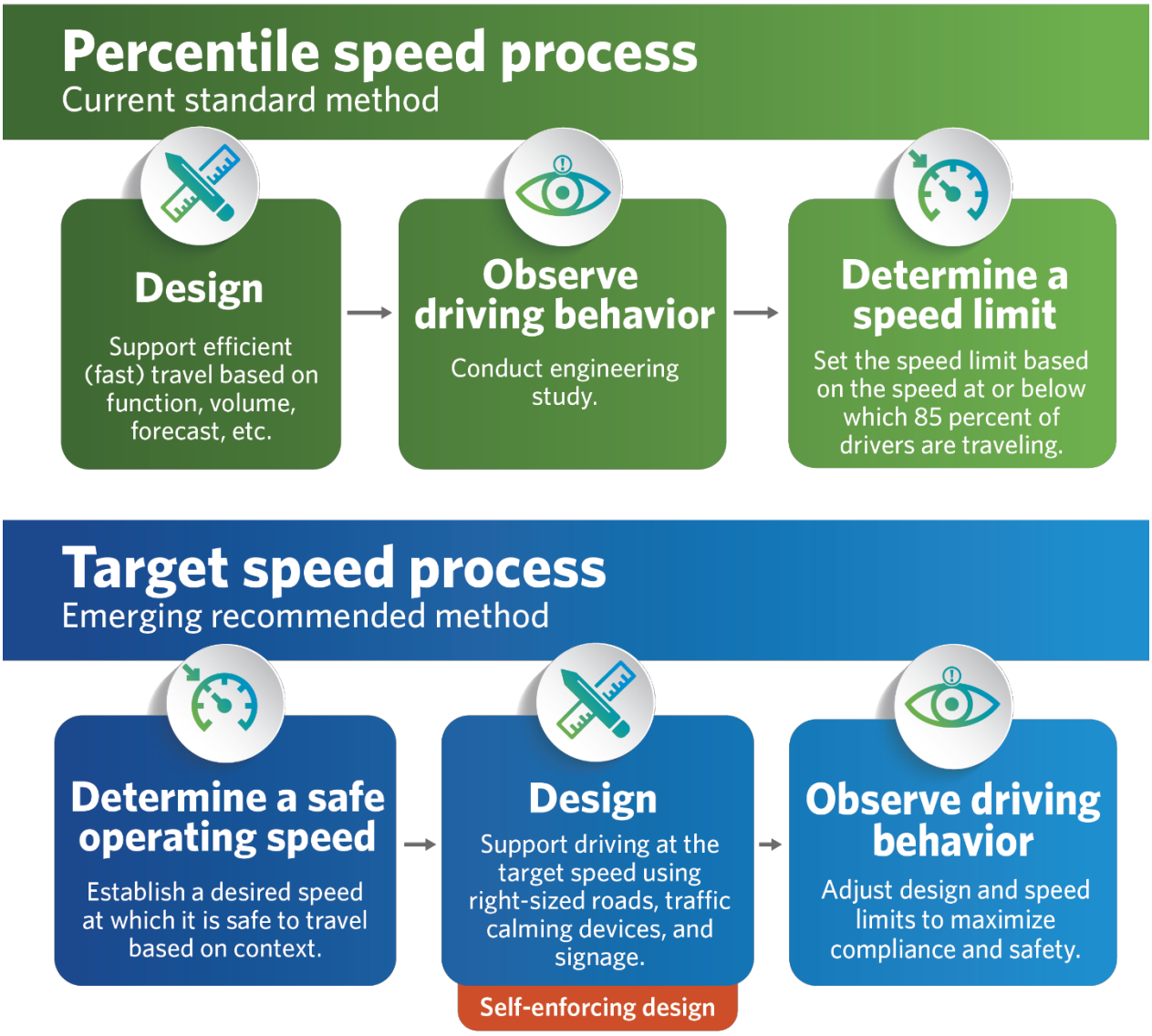
Figure 32: The role of the 85th percentile approach in the speed inflation cycle



Source: CMAP.

Consensus is growing among national engineering and safety organizations to abandon the 85th percentile rule in favor of more context-sensitive, safety-oriented processes (Figure 33). For instance, NACTO recommended that "state rules or laws that set speed limits at the 85th percentile speed should be repealed."[80] Similarly, the National Transportation Safety Board recommended that the FHWA "remove the guidance that speed limits in speed zones should be within 5 mph of the 85th percentile speed."[81]

Figure 33: Percentile speed process versus target speed process



Source: CMAP.

Statewide statutory speed limit changes. One approach to reducing speeds limits in urban contexts is a legislative change to the Illinois Motor Vehicle Code that would change the blanket speed limit in urban districts from 30 mph to 25 or 20 mph. The new speed limit would apply to all roads within urban districts that have not already been impacted by a speed zone or citywide reduction. Another legislative approach is creating a residential district speed limit within the Illinois Motor Vehicle Code that is different from the code for urban districts. Although statutory speed limits do not have to be posted to be in effect and enforceable, many roads currently have signs that would need updating, which would have associated costs.

Alternative methods for setting speed limits help prioritize safety

Several tools and guidance documents are available for determining appropriate speed limits where statutory limits are to be amended (see list below). These resources consider contextual aspects of a roadway, including physical features such as driveways and medians. Adjacent land uses are also important since they are related to development density and the presence of pedestrians, bicyclists, and transit users.

USLIMITS2

In 2020, the FHWA updated USLIMITS2, a web-based decision-making tool used to establish recommended posted speed limits for different types of roadways. USLIMITS2 is considered an "expert system" approach to speed limit setting, which is based on previous research and an algorithm that requires inputs of various factors, including 85th and 50th percentile speeds, traffic volume, crash history, the presence of pedestrians and bicyclists, and other roadway features.[82]

Speed Limit Setting Tool

In 2021, the Transportation Research Board created an "expert system" tool, the Speed Limit Setting Tool, which is a spreadsheet-based application that incorporates research on factors that have the largest influence on drivers' operating speeds. These include roadway contexts, crash history, driveway density, roadway features such as medians, and the presence of pedestrians and bicyclists.[83] The tool uses a 50th percentile speed, rather than the 85th percentile speed, as the basis for a speed limit in developed (urban) areas with certain roadway features and where bicyclists and pedestrians are present.

City Limits: Setting Safe Speed Limits on Urban Streets guide

NACTO published *City Limits: Setting Safe Speed Limits on Urban Streets* in 2020, which recommends speed limits for different categories of streets in urban settings using the injury reduction method. It considers characteristics such as traffic volumes and controls; the number of travel lanes; the presence of bicyclists, pedestrians, and transit stops; and conflict density where crossings, turns, and other movements associated with crashes may occur.

Recommended speed limits range from 10 mph on shared streets and alleys to 20 to 25 mph on minor and major streets in urban areas. A speed limit of 30 or 35 mph is only recommended in urban areas where bicyclists and pedestrians have the highest form of protections, such as protected bicycle lanes, and in lower-density land uses, such as manufacturing or low-density residential areas.[84]

Equity impacts of reduced speed limits require thoughtful mitigation

CMAP is committed to an equity-centered approach to improving traffic safety through speed management. When speed limits are reduced, it is common practice to use additional police enforcement to educate drivers and deter them from exceeding the new speed limit. An equity-centered approach to reducing speed limits should include efforts to mitigate the impacts of police enforcement for drivers of color and minimize the financial burden of citation fines on low-income drivers. Best practices for implementing reduced speed limits include a comprehensive informational campaign before the new speed limits take effect, including signage, social media engagement, direct mail to licensed drivers, and announcements that enforcement is present at specific locations. In addition to providing alternatives to monetary fines, such as educational courses, some agencies are allocating the fines collected from these citations so they are logically and practically linked to improving traffic safety. More details on equity can be found in Chapter 5.

Success stories about safer speed limits

Many cities and countries have reduced speed limits, particularly in urban settings where pedestrians and bicyclists are more likely to share the road with vehicles. This is a systemic and relatively low-cost approach to quickly improving traffic safety.

- In Seattle, a citywide speed limit reduction from 30 mph to 25 mph on 90 percent of its streets, combined with additional speed limit signs and no additional enforcement, resulted in a 20 to 40 percent reduction in crashes.[85]
- In Boston, a citywide speed limit reduction from 30 to 25 mph resulted in a 3 percent lower incidence of a vehicle exceeding 25 mph, a 9 percent lower incidence of exceeding 30 mph, and a 29 percent lower incidence of exceeding 35 mph.[86]
- In Toronto, a speed limit reduction from 40 km/hour (about 25 mph) to 30 km/hour (about 19 mph) resulted in a 28 percent decrease in crashes with motor vehicles and pedestrians and a 67 percent decrease in fatal or serious injuries.[87]
- In Edinburgh, a reduction in the speed limit from 30 mph to 20 mph was associated with a 30 percent reduction in the number of crashes.[88]
- In Sweden, the risk of a bicyclist sustaining a fatal or serious injury in a crash decreased by 50 percent on roadways in where the speed limit had been lowered from 50-60 km/h (about 31-37 mph) to 30-40 km/h (about 18-25 mph).[89]

The literature identifying the safety benefits of speed limit reductions has grown in recent years. In a review of studies that examined reduced speed limits, 84 percent demonstrated improved safety performance in terms of reductions in total crashes and the number of fatalities and serious injuries.[90] Conversely, increased speed limits were associated with deteriorated safety performance in 72 percent of the studies.[91]

The positive effects of reduced speed limits are far greater when those changes are aligned with design improvements, educational and awareness programs, and appropriate equity-

centered enforcement techniques. However, the evidence shows that speed limit changes alone (with appropriate signage) can reduce operating speeds and improve safety.

Recommended actions

Key recommendation: Reduce speed limits in urbanized areas where people walk, bike, and use transit

1. **Improve guidance to allow and encourage reduced speed limits**
   a. Revise the speed limit restriction language in the Illinois Vehicle Code (625 ILCS 5/11-604) for clarity and usefulness to local governments who wish to reduce citywide speed limits by ordinance
   b. Revise the state's speed limit policy to indicate 50th-percentile speed limits in urban districts and consider other changes that will result in lower speed limits wherever vulnerable road users may be present
2. **Identify the most impactful changes to the motor vehicle code to support reduced speed limits**
   a. Conduct additional analysis to determine the most beneficial approaches to reducing the speed limits in urban and residential areas via the motor vehicle code
3. **Reduce the risks posed by larger and heavier vehicles**
   a. Study and identify policies that target speed limit compliance among drivers of large and heavier vehicles, such as intelligent speed assistance for fleets
4. **Reduce speed limits by ordinance**
   a. Adopt a local ordinance to reduce speed limits to 20 or 25 mph on local roads, citywide

Chapter 5: Fostering traffic safety culture and equitable enforcement

Key recommendation: Support safe driving behavior with education and equitable enforcement

Traffic safety culture is defined as "the values and beliefs shared among groups of road users and stakeholders that influence their decisions to behave or act in ways that affect traffic safety."[92] A traffic safety culture that raises awareness of the risks of speeding is essential for supporting safe road users. Collaboration with regional partners and centralized and accessible data analysis are necessary to support consistent messaging. In addition to promoting positive social norms and discouraging unsafe speeds, fair enforcement programs can align strategies with desired traffic safety outcomes.

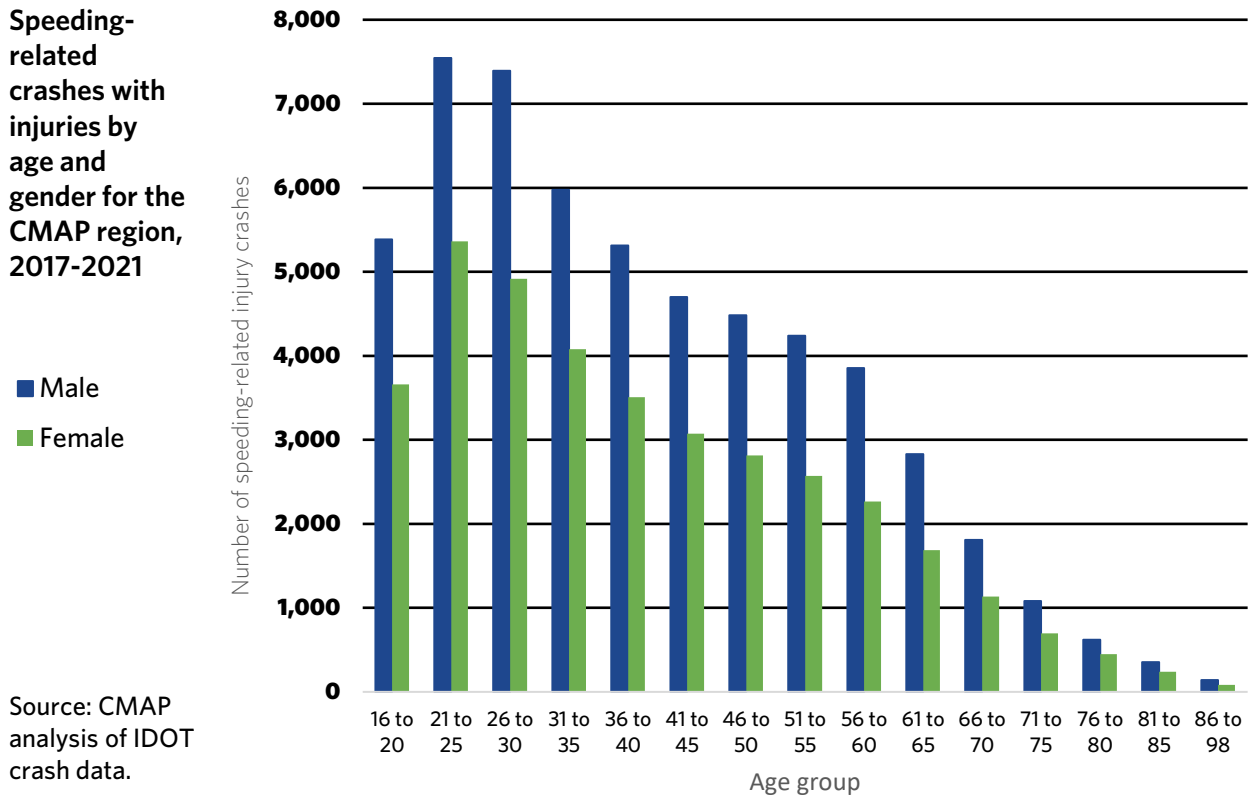
Who speeds and why

Speeding is the result of roadway characteristics and driving behaviors. The physical and policy environment of our transportation network — such as roadway design and speed limits — influences speeding, as discussed in Chapters 3 and 4. However, drivers also *choose* a speed at which to drive, either consciously or unconsciously. National surveys can offer insights into factors that influence the choice to speed, but these factors are complex and frequently vary for different locations, different times of day, and for individuals across these variables.[93] While it can be useful to understand categories of drivers who tend to speed, the prevalence of speeding suggests a broader approach to behavior may have value.

Males aged 21-34 are twice as likely to be involved in fatal speeding-related crashes as their female counterparts, accounting for about one-third of fatal crashes in Illinois where speeding is a contributing factor.[94] Illinois drivers (all genders) between the ages of 21 and 34 were most represented in the total number of speeding-related fatal crashes, as shown in Figure 34 below. The Illinois Graduated Driver License program, enacted in 2008, is credited with reducing the number of teenage traffic fatalities and improving the outcomes for the youngest drivers, but young adults and less-experienced drivers remain the focus of many safety interventions.[95]

Generally, speeders are considered a high-risk group who often participate in other unsafe behaviors, such as not using a seatbelt and/or driving while impaired.[96] This, plus evidence pointing to an increasing number of people taking risks, makes an even stronger case for the need to address speeding behavior comprehensively.[97]

Figure 34. Drivers aged 21-35 are most often involved in speeding-related injury crashes



There have been many efforts to identify shared characteristics and categories of speeders in order determine and focus interventions. Categorizations often define groups such as:

- Unintentional speeders who are not aware of the speed limit and/or not paying attention
- Moderate intentional speeders who speed on occasion but to a degree that they believe is safe
- Frequent high speeders who knowingly take risks and intend to speed but believe they do it safely
- Socially deviant speeders who are more likely to engage in all forms of dangerous driving and law-breaking[98]

Effective interventions for each of these groups varies, but it can be helpful to understand that for some speeders, small changes — such as additional speed limit signage or a speed feedback sign — can improve compliance by making the driver more aware of the existing speed limit. To understand the culture of speeding more broadly, there are a few emerging themes that may inform a campaign:

Increased social acceptance of speeding. There is evidence to suggest that speeding has become more socially acceptable. Data show that average operating speeds have slowly crept upward over decades.[99] The reasons for this are complex and may include situational factors,

such as roadway designs that support faster moving traffic, experiential factors such as increasing trip lengths and travel times, and the real or perceived pressure to save time. Social factors, such as peer influence, appear to play a large role in driver's decision making around speeding. Young drivers are highly influenced by their friends and parents' behaviors, suggesting the need for interventions among these groups.[100] There is also evidence that cultural norms tend to promote speeding. For example, exposure to content that promotes speeding — such a films, games, and television — may increase the likelihood that someone speeds.[101]

Optimism bias. Many people believe that they can speed safely with no adverse impacts, despite evidence that speeding is a leading contributing factor in crashes.[102] Drivers may not be aware of how speed can increase the risk and severity of a crash, or the risks posed to pedestrians, bicyclists, children, seniors, and other VRUs. Many do not realize that larger and heavier vehicles are more likely to seriously injure or kill when involved in a crash, and that slowing down is essential to avoiding crashes and reducing the harm of crashes when they do occur. The concept of "optimism bias" — when a driver believes that they can safely speed because they are exceptional or highly experienced drivers — is closely related to this lack of knowledge.[103] This may also be a function of increasing travel per capita, which can lead people to believe that they are capable and can speed without consequence, whether that be a citation or a crash.

Education and awareness support a safer traffic safety culture

A traffic safety culture is a system of social reinforcement that creates acceptable and unacceptable behaviors related to driving, walking, bicycling, and other forms of mobility.[104] Culture creates social norms, which may be positive or negative. A few social norms for traffic safety from recent decades are "click it or ticket" and "don't drink and drive," which describe behaviors that are either acceptable or not acceptable respectively. Norms can and should create aligned messaging across all types of social environments, including homes, schools, neighborhoods, and governing agencies (see Figure 35).

Two primary audiences influence roadway users. Both influencer groups may benefit from additional information and education related to speeding and its risks.

- Professionals who work in areas related to transportation safety include engineers, planners, designers, policymakers, enforcement agencies, and elected officials. This group needs high-quality data and information to make decisions related to the safety of our transportation network.
- The traveling public, and drivers in particular, must be more informed about the risks of speeding and aware of safe speeds and incentives for complying with them. While deterrents like penalties for speeding citations are effective, it is important to leverage education and awareness to improve compliance broadly without solely relying on enforcement.

Figure 35. A traffic safety culture promotes aligned social norms across multiple social environments

Source: CMAP.

Establishing and strengthening a traffic safety culture requires an intentional process. This begins by creating partnerships among a diverse group of traffic safety influencers, who meet regularly to define and execute an agenda. Regional partners in a traffic safety culture include:

- Traffic engineers
- Transportation planners
- Transit planners and managers
- Infrastructure asset managers
- Rideshare, scooter, and bikeshare companies
- Advocates who work on safety and mobility for transit users, bicyclists, pedestrians, safety, disadvantaged populations, and travelers with disabilities
- Police officers, police trainers, and chiefs of police
- Coordinators for safe routes to schools
- Elected officials and school board representatives
- Representatives from the adjudication process and legal system, such attorneys general and court system representatives
- Secretary of state representatives involved in education and training
- Representatives from educational programs for drivers, bicyclists, and other road users at public, private, and professional schools
- Mission-driven, nonprofit, or citizen organizations

The Please Drive Carefully Campaign — a partnership between Batavia, Illinois' city, park district, public schools, and libraries — provides free yard signs to residents in an effort to increase awareness and foster community support around traffic safety.

Convening regional partners is an opportunity to address the issue of speeding proactively and systemically. Activities may include:

- Sharing data and information with a range of experts to understand systemic factors that impact speeding and safety
- Building consensus on key terminology and definitions of speeding and safety
- Defining positive social norms around safe speeds
- Identifying and addressing gaps in data and knowledge
- Identifying key groups to target for educational initiatives, such as school children and young drivers and their parents
- Developing educational requirements for drivers who receive speeding tickets or are demographically more likely to speed
- Increasing content on the dangers of speeding in driver's education curricula and questions on the licensure exam
- Increasing knowledge and awareness in diverse fields related to safety and proposing cross-cutting solutions
- Innovating on program and funding opportunities with non-traditional partners through an expanded network of fields
- Aligning approaches to addressing safety, such as messaging in media campaigns
- Crowd-sourcing identification of needed changes to roadway design standards, enforcement practices, technological solutions, and speed limit changes
- Ensuring equity considerations are built into all programs
- Developing metrics and data collection programs for measuring effectiveness of programs

Utah's Department of Public Safety embarked on a strategy to increase the use of seatbelts in rural areas and leveraged different levels of the social environment. Strategies included: encouraging stricter family rules around wearing seatbelts, changing workplace policies about seatbelts, increasing enforcement of seatbelt violations, and eventually passing a new seat belt law at the state level.

Funding for speed management programs

Local agencies require funding for speed management programs to build awareness, implement educational campaigns, and provide data-driven and equitable engagement programs involving educators, advocates, and police. While current funding categories in the Illinois Highway Safety Program may support speed management programs (e.g., category 402: general highway safety), there is no designated funding category to address the comprehensive speed management activities mentioned in this report.[105] This presents an opportunity to create an additional funding category to address speed management through education and engagement.

Speed limit enforcement

The goal of an effective and equity-centered speed enforcement program is to slow average operating speeds to reduce crash severity or avoid them altogether. Enforcement has been the primary U.S. speed management method and has shaped our traffic environment in many ways. It has been a key component of traffic safety programs and is a common countermeasure recommended in safety plans in high-crash locations.

While enforcement has been shown to increase compliance with speed limits and reduce crashes in both number and severity, its effectiveness is limited by multiple complex factors.[106] Enforcement is limited by its own effective deployment, which is increasingly impacted by staffing challenges. It is also limited by its demonstrated misuse. Policing in general has come under scrutiny for targeting people of color in pretextual traffic stops, as discussed in more detail below.

Understanding deterrence. Enforcement relies on deterrence, which discourages drivers from speeding with the threat of punishment. Studies show that drivers are more likely to change their behavior as the expectation of being caught speeding increases.[107] Regular, visible, frequent, and consistent enforcement is quite effective in reducing the incidence and severity of speeding. The most effective speed enforcement programs, which reduce average operating speeds over longer periods of time, leverage multiple techniques to deter unsafe driving by increasing the expectation of consistent enforcement.

Deterrence, as it relates to enforcement, is considered across three separate factors. These include the certainty, swiftness, and severity of punishment. Literature reviews of the effectiveness of each those aspects consistently show that certainty of punishment is more effective in deterring speeding than the severity of punishment.[108] This suggests that increasing the expectation of enforcement of speeding is more effective in reducing speeding than increasing the fine for a citation.

The effectiveness of enforcement also varies depending on whether drivers experience "general deterrence" versus "specific deterrence." General deterrence is the observation (or knowledge) of enforcement occurring to others. Specific deterrence is the personal experience of enforcement. The effectiveness of specific deterrence is far greater than general deterrence.[109] People who receive citations for speeding are far more likely to comply with speed limits. This concept has been supported in cities where automated enforcement programs issue high numbers of citations at the start of a program, but far fewer — only 36 percent — to the

Recidivist speeders, or repeat offenders, may intentionally take risks without considering what is safe. They tend to be less deterred from speeding through ticketing, according to data published by automated enforcement programs.

A study of camera-related violations by New York City's Department of Transportation and the University of Chicago found that, between 2012 and 2019, vehicles with 5 or more violations were nearly twice as likely to crash and cause injuries as a vehicle with no violations; vehicles with 10 or more violations were 3 times as likely.

Escalating penalties, beginning with remedial education, and escalating to vehicle impoundment and license revocation, should be considered for drivers who repeatedly and knowingly threaten the safety of others.

same vehicle twice. This suggests that specific deterrence is changing the speeding behavior of drivers across the larger network of cameras.[110]

Impacts and limitations of manual enforcement

Any type of enforcement performed by a uniformed police officer is referred to as "manual enforcement." In the U.S., manual enforcement is typically done with the use of handheld radar or LIDAR equipment to measure speeds in real time or using photography or pacing (when an officer drives at the same speed of a vehicle believed to be speeding).

Manual enforcement may occur from stationary or mobile vehicles and may be visible or stealth in nature. A police department decides how much time and which methods to spend on enforcement. Visible enforcement is associated with improving driver compliance with speed limits and traffic safety, but the effects are often temporary. As time and distance from the enforcement location increase, so does the reduced speed. Drivers tend to return to previous speeds after moving beyond the time and distance halo.[111] Because of limitations in staffing and costs, it is not possible to achieve the scale and consistency of speed enforcement needed to systemically reduce speeding broadly and over the long term.[112]

Stealth enforcement has been said to be a greater general deterrent of speeding based on the idea that it could happen when a driver is not expecting enforcement. Yet research demonstrates that awareness and certainty of enforcement are most effective at improving compliance. Stealth speed enforcement (speed traps), result in fewer but higher-fine citations, whereas highly visible enforcement has the potential to improve compliance with speed limits across a broader audience though deterrence — which can reduce the need for manual ticketing.

Manual enforcement also creates physical risks for the officer conducting the traffic stop, the driver of the stopped vehicle, and passing drivers who may be distracted by the traffic stop. In 2021, traffic-related law enforcement deaths grew by 38 percent over the previous year, with 58 officers killed in traffic-related incidents in the U.S.[113]

Mistrust and undermined safety goals. Misuse of manual traffic enforcement is detrimental to the safety outcomes it is intended to support. Take, for example, ticket quotas, which require officers to issue a set number of citations during a specific time. Quotas were created as a measure of officer productivity but have been shown to have no effect on public safety, instead causing mistrust in policing. Police departments also erode trust and undermine safety goals when they issue citations for the purpose of generating revenue rather than improving safety.

Pretextual traffic stops — based on suspicion rather than direct observance of a safety issue — are another form of manual enforcement misuse and disproportionately impact people of color.[114] These stops show little benefit to public safety and serve to compromise public trust in *all* traffic stops, including those issued for legitimate safety violations.[115] In response, some U.S. police departments are changing their policies around the practice of pretextual traffic stops[116] — including Philadelphia[117] and Minneapolis[118] — to better align practices with demonstrated safety outcomes.

Equity considerations of manual enforcement. The effectiveness of speed enforcement must be balanced with the burdens it places on disadvantaged communities. A growing body of research highlights how speeding-related enforcement measures generate disproportionately negative outcomes for people of color and low-income populations.[119] Compounding this is the fact that excessive traffic fines have disproportionate and long-lasting impacts on low-income populations.[120]

Many advocates are calling for a new approach to policing to ensure practices are aligned with evidence-based safety benefits and reduce bias and violence, which disproportionately affect people of color.[121] Some agencies are exploring alternatives to armed manual traffic enforcement, including civilian enforcement.[122] Traffic stops that result in violence or death call into question the use of escalating and aggressive policing tactics.[123] These events also raise questions of systemic racial bias when considering who gets pulled over and for what infraction. The use of manual enforcement to conduct traffic stops for speeding or other violations has been shown to unfairly target Black drivers.[124] In 2019, Black drivers in Illinois were stopped at almost three times the rate of white drivers.[125] This creates a culture of mistrust and contributes to an increased risk of trauma and violence due to aggressive interactions with police.[126]

Contemporary events and their impact on manual speed enforcement. The events of 2020 — namely the COVID-19 pandemic and the high-profile murder of George Floyd — changed the landscape of police enforcement. Many police departments reduced or eliminated traffic stops to prevent the spread of the virus, while nationwide protests against police violence increased tensions between police and the public. Together, these environmental factors may have affected the willingness of some police officers to conduct traffic stops.[127] Then, in 2021, many police departments saw unprecedented resignations and retirements, leaving them short staffed and unable to conduct enforcement at the same levels post-pandemic.[128] Recruitment of police officers remains a challenge, leading many policy leaders to suggest that a new approach to policing is needed.[129]

Impacts and limitations of high-visibility enforcement

High-visibility enforcement (HVE) is a form of manual enforcement deployed as a program of activities for a limited duration of time to deter a form of unsafe behavior, such as drunk driving, not using a seatbelt, or speeding. HVE generally includes educational campaigns prior to and during the enforcement program to alert people to unsafe behavior and alert drivers that police will be at a certain location for a given time to prevent unsafe driver behavior. HVE is intended to increase the expectation that enforcement will occur with pre-enforcement education and increasing the visibility of police while conducting enforcement. It is a strategy that fully leverages the visibility of enforcement and is often used when staff resources for enforcement are too limited for sustained manual enforcement of speeding.[130]

HVE targets locations at specific times where unsafe driving practices may be more likely (e.g., holidays). Prior to enforcement, a media and educational traffic safety campaign is typically launched to educate and inform the public about speeding risks and that increased enforcement measures will be used in a certain location. HVE programs often include specially

marked vehicles, additional signage, or electronic messaging. It is common practice for HVE programs to focus on educating drivers about unsafe driving rather than issuing tickets, but tickets may be issued when a violation is egregious.

HVE campaigns have demonstrated some success. A six-week HVE campaign by the Metro Nashville Police Department resulted in a 23 percent reduction in crashes comparing six-week periods before and after the start of the HVE campaign.

HVE has limitations that include many of those discussed with respect to manual enforcement. HVE is identified as an important and effective countermeasure in IDOT's Highway Safety Program and recommended as key a strategy to address speeding and other safety risks such as impairment.[131] More data is needed to both determine the impact and effectiveness of HVE and confirm its safety benefits and equity impacts. To accomplish this, data collection should be a required component of any grant funded programs, such as IDOT's Highway Safety Program.

Impacts and limitations of automated speed enforcement (ASE)

ASE uses camera-based technology and has been shown to be broadly effective in reducing average operating speeds and overall crash totals. ASE also offers the benefit of supplementing manual enforcement, addressing some of its limitations across time and space, and allowing police departments to reassign officer resources to other uses. It was first used in the U.S. in the late 1980s after demonstrated successes in other countries. Speed enforcement by camera is currently only permitted in 16 states where it is used in more than 150 jurisdictions, often in association with school safety zones. ASE was also recently added to the FHWA's "Proven Safety Countermeasures."

Speed enforcement by camera can be highly effective in reducing speeds, as well as the incidence and severity of crashes, as shown in Figure 36.[132] A global review of speed enforcement techniques demonstrates that ASE by camera is generally associated with a 20 to 25 percent reduction in fatal and serious injury crashes.[133]

Selected outcomes from specific ASE programs in the U.S. include:

- In Montgomery County, Maryland, speed cameras were associated with a 10 percent reduction in mean speeds and a 62 percent reduction in the likelihood of a vehicle traveling more than 10 mph above the speed limit.[134]
- In Chicago, speed cameras were associated with an 8.7 percent reduction in average speeds systemwide, comparing the first two weeks of enforcement with speeds recorded at least six months later. While the city saw a 19

Shifting from police enforcement to self-enforcing streets

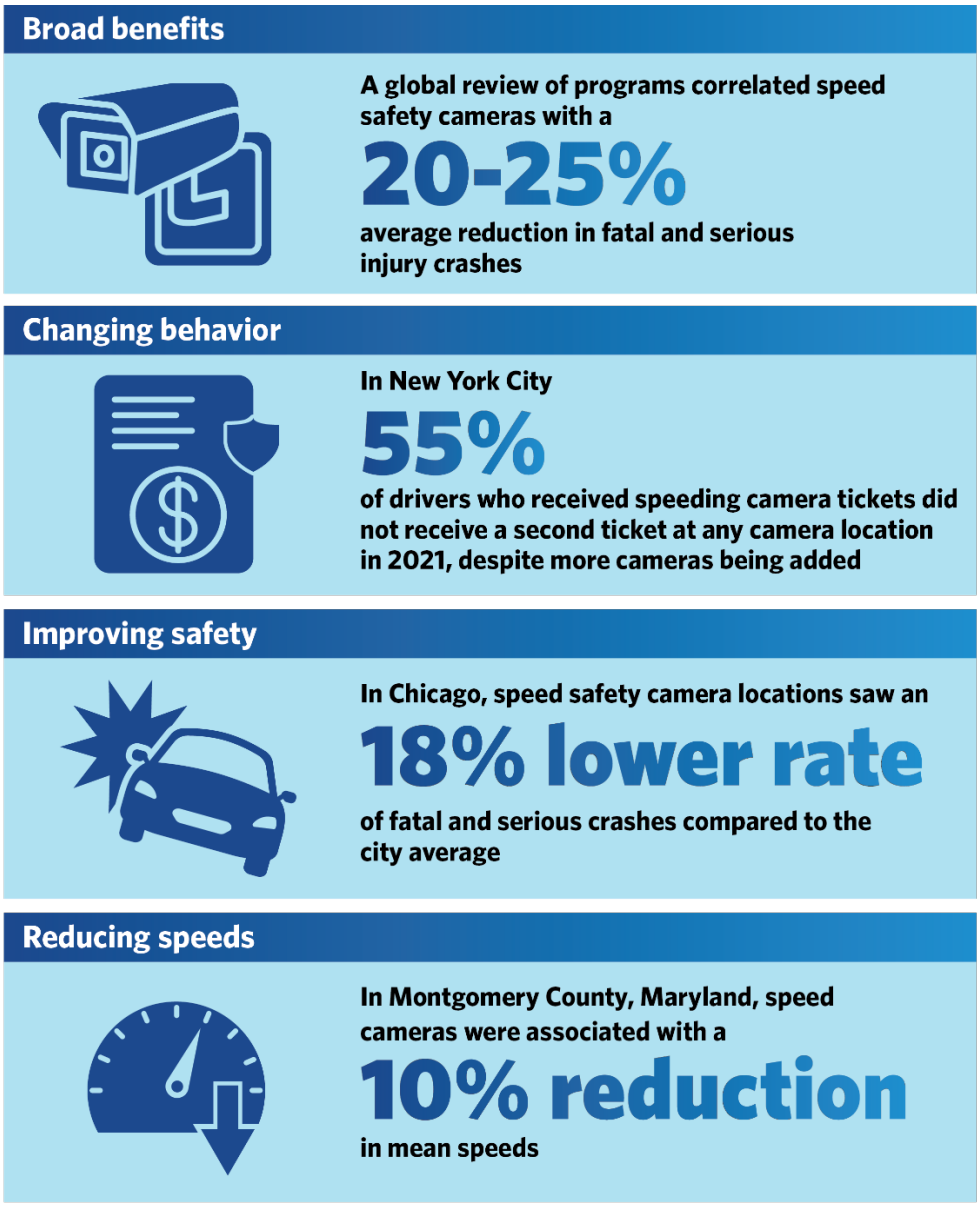
Enforcement may be necessary to curb speeding and protect road users in the near term. But over-reliance on manual police enforcement ignores infrastructure's critical role in supporting safe operating speeds through self-enforcing, traffic-calmed streets.

As streets are resized and redesigned over time to become more self-enforcing, reliance on police enforcement for speed management can and should be reduced. Self-enforcing streets and tools like automated speed enforcement have the potential, once permitted, to improve safety and redeploy police officers to other activities.

percent increase in fatal or serious injury crashes citywide in 2020, locations with speed cameras saw a much lower 1 percent increase.[135]

- In New York City, which has the largest ASE program in the country, the total number of crashes dropped 3 percent in school speed zones, crashes resulting in injuries dropped 8 percent, and bicycle and pedestrian crashes involving children dropped almost 20 percent.

Figure 36. Speed safety cameras improve safety and reduce speeds

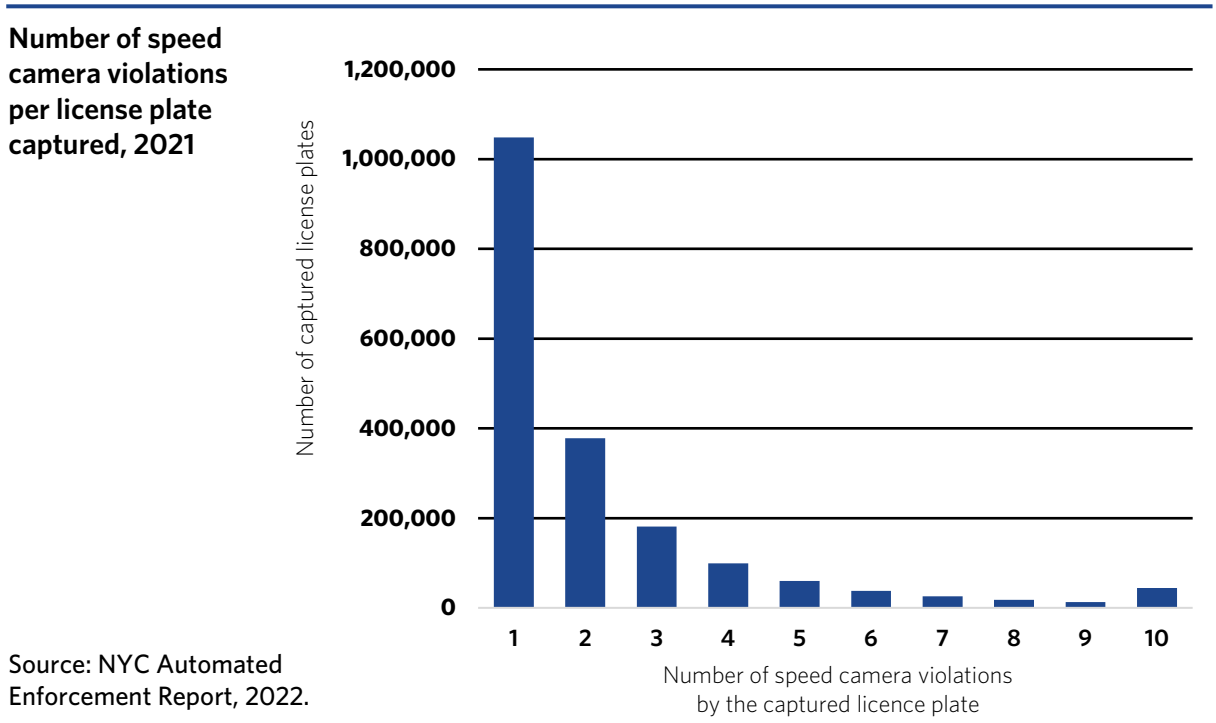


Source: Thomas, Libby, Safety Effects of Automated Speed Enforcement Programs: Critical Review of International Literature, Transportation Research Record, Dec 1, 2008, p. 117-126; New York City Speed Camera Report 2022; City of Chicago Automated Enforcement Report, 2022; Hu and McCartt, Effects of automated speed enforcement in Montgomery County, Maryland, on vehicle speeds, public opinion, and crashes.

Illinois has used ASE for limited purposes since 2014. Currently, camera speed enforcement is allowed in municipalities with a population of over 1 million, within safety zones (areas that are within 1/8-mile of a school or park) and only during peak hours of use.[136] Functionally, this means that municipal ASE use is limited only to designated school and park zones within the City of Chicago. Illinois camera speed enforcement is also allowed in work zones statewide, where speed reductions are necessary to protect the safety of construction workers.

Drivers who pay fines for speeding are more likely to comply with posted speed limits than drivers who have not previously experienced enforcement.[137] In one study, 60 percent of drivers who had been penalized for speeding said that being caught influenced their future behavior.[138] This suggests that receiving citations can produce lasting effects for those who receive them. Data from New York City's ASE program shows that most drivers who received one citation from speed cameras did not receive a second, even as the number of cameras increased over time (Figure 37).[139] Even with their limited application, speed cameras have demonstrated effectiveness in reducing speeding and crashes where they have been installed.

Figure 37. Most drivers who received one speed camera citation did not receive a second, indicating ASE can be effective in changing behavior



Source: NYC Automated Enforcement Report, 2022.

Legal recognition. While ASE as a countermeasure has been shown to improve safety, federal, state, and local restrictions have limited its use.[140] Unlike manual enforcement, ASE has not been eligible for federal or state transportation funding through safety programs like the federal HSIP or IDOT's HSP. However, the federal Infrastructure Investment and Jobs Act reversed that, and for the first time allows state-apportioned funds to "purchase, operate, or maintain an automated traffic enforcement system in a work zone or school zone,"[141] signaling

both a greater acceptance of and need for automated traffic enforcement.[142] The FHWA also published a Speed Safety Camera Program Planning and Operations Guide, which will support ASE as an effective tool for communities to improve safety.[143]

Despite the limits placed on ASE use by states, court challenges have been mounted against existing programs. Eighteen states have banned the use of ASE for reasons related to privacy concerns and due process because the burden of proof on ticketed drivers is too onerous with the delay in receiving citations once a violation has occurred.[144]

Equity and transparency considerations relating to ASE

Camera-based enforcement theoretically mitigates important issues associated with manual enforcement such as racial profiling by officers and the risk of escalating violence in traffic stops. Yet there are still equity impacts to consider. An analysis of citations issued through the ASE program in Chicago showed that both speed cameras and red-light cameras disproportionately issue tickets to addresses in census tracts that are predominantly people of color.[145] The reasons for this are complex and may include both the nature of the built environment in lower-income neighborhoods of color, as well as the per capita travel demand burden experienced by people of color in our region.

Many of our widest, fastest, and most dangerous roads — including limited-access highways — are in disadvantaged communities. This is the result of decades of institutional programs, policies, and decisions that began with the acquisition of land to build the National Highway System, and continue today with roadway expansions to accommodate suburban travel demand at the edges of our metropolitan areas.[146] Other physical features — such as more vacant lots or reduced visual friction from street trees, planted medians, or sidewalk activity — may play a role in the increased speeds observed in lower-income neighborhoods of color.

Another contributor to higher rates of ticketing may be increased exposure to the cameras themselves due to more travel. According to the My Daily Travel survey by CMAP in 2018, Black residents in our region traveled longer distances to work, healthcare, and shopping (shown in Figure 8 on page 14), and lower-income residents travel more per capita than higher income residents.[147] Increased travel can result in more exposure to ASE and increased likelihood of receiving violations.

Increased ticketing creates a disproportionate financial burden of traffic fines on people of color and populations with lower income, which can lead to ongoing debt and even loss of employment necessary to recover from the debt.[148] This is not the intended outcome of fines associated with speeding tickets. The goal of issuing speeding citations is — and should remain — to deter violators from speeding in the future. The cost of the violation should reflect an amount that deters speeding but is not overly punitive to people at different income levels.

There are numerous ways to reduce the financial burden of speeding citations to improve equity:

- Reduce the cost of tickets for people below a certain income, or scale fines to incomes
- Offer educational alternatives to fines such as courses on the dangers of speeding
- Create speed camera fine schedules that begin with both a warning and education on the dangers of speeding and scale up fines only with repeat violations
- Cap the amount one can owe for citations within a period to mitigate accumulating fines. This can also mitigate the fact that drivers who receive ASE citations do not immediately change behavior.

Cities using ASE are exploring ways to reduce disproportionate impacts of traffic fines. Chicago's Clear Path Relief Pilot Program allows amnesty to drivers below a certain income on ticket debt that is more than 3 years old and a 50 percent discount on new traffic related fines.[149] Seattle offers a community service alternative to fines for drivers who receive government assistance.[150]

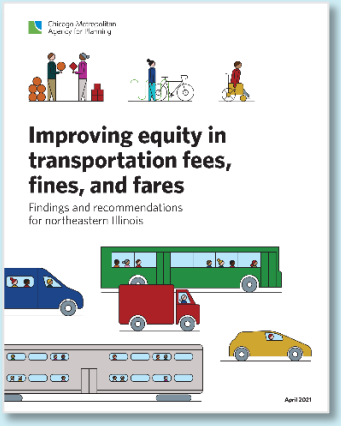
Public mistrust surrounding automated enforcement. ASE has been portrayed (and in some cases used) as a revenue generating tool, which presents challenges related to public trust. Incidents of corruption surrounding red light cameras in Chicago increased public mistrust around automated enforcement generally.[151] For ASE to be accepted and successful, its implementation must align with proven traffic safety outcomes alone.

The public may question why agencies are using ASE and who is benefitting financially from citations.[152] Questions about the ethics and cost-sharing of revenue generated by speed safety cameras highlight the need to ensure contracts are in the public interest and aligned with desired safety outcomes. A recent opinion survey showed that when ASE is framed as a racial justice and/or safety tool, there is far greater public support than if it is framed as a revenue generation tool for local agencies.[153] A transparent plan for how ASE revenue is collected and spent is also critical. An emerging best practice is to use the revenue generated by speed safety cameras to make safety improvements that manage speeding, such as infrastructure improvements and programs to educate and raise awareness of risks among drivers.

Transparency in ASE implementation and administration. In keeping with a program mission to reduce operating speeds proactively, enforcement programs should leverage visibility,

ON TO 2050, northeastern Illinois' comprehensive plan, recommends both fully funding the region's transportation system and leveraging it to promote inclusive growth. To support these goals, CMAP conducted its first comprehensive analysis of the impacts of transportation fees, fines, and fares on residents with low income.

Learn more about CMAP's work improving equity in transportation fees, fines, and fares.



transparency, and awareness. Enforcement programs, including ASE, should give warnings that enforcement will occur, indicate the posted speed limit appropriately, and use communications to raise awareness about the dangers of speeding.

As discussed earlier, the most effective, equitable, and fair enforcement is *expected* enforcement. Monitoring ASE and evaluating its effectiveness must be transparent, with regular reporting on the number of citations issued, locations of the cameras, and safety impacts. Chicago and New York City, among others, produce annual reports on their ASE and red-light camera programs and provide the data in public portals.

Data can help communities understand speeding and evaluate interventions

Vehicle speeds have not typically been measured in a regular, broad, or consistent way, which limits our understanding of population-level trends and broad patterns of behavior. It is not possible to measure or address traffic safety issues without accurate, timely, and consistent data collection. Changes in crash reporting policies and emerging technologies present opportunities to better understand speeding and evaluate programs, policies, and projects.

Uses and limitations of speeding citation data. Evidence of speeding has primarily been based on speeding citations by local law enforcement, which, in most cases, are dependent on local practices and resources. Speed violations can, however, provide insights on driver demographics, operating speeds, and locations where speeding occurs. A limitation is that the timing and location of officer-based manual enforcement changes frequently, making it difficult or impossible to understand broad locational patterns of speeding or trends over time. Citations issued through ASE programs can provide some helpful insights into speeding trends because they are typically geographically fixed and enabled on consistent schedules.

Uses and limitations of crash report data. Crash reporting by law enforcement is an essential input into understanding traffic safety from both a location and behavior perspective, yet crash reports only capture speeding behaviors *that result in a crash*. These reports do provide demographic information, insights into the primary cause and contributing factors of a crash, and the outcomes of a crash. Also, crash report forms vary from state to state, making it difficult to accurately compare rates of speeding-related injuries and fatalities.

Speeding is believed to be severely underreported on crash reports, in part because officers do not typically observe the speeds of vehicles involved in a crash in real time, and because crash reports have historically prioritized other factors that determine fault, which is used by insurance companies to properly assign damages. Speed-related crash data is gathered from state-mandated reports for all crashes that result in injury and/or property damage of $1,500 or more. A crash is considered speed-related if any driver involved was charged with a speed-related offense as opposed to other causes such as distraction, impairment, or disregarding traffic signals.[154] This classification depends on a law enforcement officer's ability to determine and report factors accurately, which is challenging if an officer does not witness the crash. For these reasons, speeding-related crash data may be better suited to recognizing trends over time than accurately depicting the breadth of the problem.

IDOT's 2019 revised crash report form allows police officers to report on the incidence of speeding by each vehicle involved in a crash, rather than just the at-fault vehicle, as well as the posted speed limit for each vehicle if the vehicles crashed at or near an intersection. These changes allow for more complete reporting of vehicle speed, which improves the understanding of how often speed is a contributing factor in a crash.

Emerging technology and its insights on speeding. Emerging technologies can help assess speeding and crashes by measuring population-level speeding trends, including individual and average operating speeds at various locations and times:

- Connected device data offers insights into broad patterns of speeding. Private companies collect this probe data from on-board navigation systems and connected mobile devices to crowdsource trip data such as origin, destination, route selection, and spot speeds. The data is anonymous and, when aggregated, provides spot-specific speeds at given locations across a broad population and geographic scale. Spot speeds may be used to calculate average speeds at different locations and times to understand how conditions affect travel speeds.
- Police departments are using drone technology to help with crash reconstruction.
- Event data recorders (EDRs), which are now standard in vehicles, can help police understand the conditions and actions taken immediately before and after a crash. EDRs are not yet a widely used data source but federal regulations have standardized them, which has improved their admissibility for public use;[155] data from EDRs has been used in Illinois courts.[156]

Law enforcement reports and emerging technologies present challenges to utilizing data:

- While powerful sources of information, probe datasets are large, complex, and expensive, making them inaccessible to many regional partners. Data analysis must be done by experts with access to computing facilities and experience with cleaning and analyzing complex data sets with geolocational attributes.
- Crash reports are sourced through the IDOT safety data portal. Access to the portal is restricted to designated public safety professionals with knowledge and experience to manage and analyze the data. Those who do not have access to the portal may request crash data, but local governments often lack the time or resources to analyze such data sets. This can be a barrier for communities seeking to understand and improve traffic safety. CMAP's Regional Safety Data Project aims to improve and share data with partners for use in local plans, policy development, and for collaborative safety efforts with agency partners.

Recommended actions

Key recommendation: Support safe driving behavior with education and equitable enforcement

1. **Adopt the Safe System Approach**
    a. Convene partners to determine paths to integrate the Safe System Approach into agency practices at the state, regional, and local level
2. **Promote enforcement techniques that have been shown to improve driver behavior, reduce speeds proactively, and advance equity**
    a. Promote high-visibility and other education-centered enforcement programs, within the IDOT Highway Safety Plan
    b. Conduct a benefits and burdens analysis of safety-oriented automated speed enforcement programs
    c. Seek legislative approval for a pilot program for automated speed enforcement at high-crash locations that includes an equity-centered approach toward fines
3. **Improve the data needed to understand and address speeding**
    a. Provide local partners information on high-crash and high-risk locations and priority safety issues, with recommended countermeasures
    b. Develop a regional data-driven understanding of speeding to identify needed changes in design and policy
    c. Update the Illinois Roadway Information System to include updated speed limit data
    d. Improve frequency and quality of police officer training in reporting crashes, with a focus on capturing speeding-related details
4. **Create a framework for a traffic safety culture that leverages education**
    a. Develop research driven recommendations and convene regional partners to determine actions, policies, and programs to support a regional culture of slower and safer driving
    b. Ensure driver education curricula appropriately explain the risks of speeding. Expand school-based education programs on traffic safety.

Conclusion and next steps

Managing speeds is foundational to the Safe System Approach and requires a comprehensive strategy. Communities that have adopted a systemic approach to speeding and safety are seeing results — they have lower fatality rates and support comfortable and safe environments for all road users. Achieving this requires prioritizing safety over speed on streets where people live, work, learn, shop, and play. CMAP and its partners can achieve this goal by developing new standards for design, speed limit policy, educational efforts, and enforcement programs that reflect safety as the most important priority, to aggressively reduce and eventually eliminate speeding-related traffic deaths.

A systemic approach must include collaborative advocacy at the state and federal levels to ensure that design standards, guidance, project programming criteria, and funding priorities are aligned to create a transportation network that supports safe speeds informed by multiple safety disciplines. The continued advancement of pilot programs is key to better understand all the influences on driver speeds and inform permanent design solutions. To further advance this work, agencies should collect and share data, collaborate on solutions, and report on results.

Ongoing safety planning efforts in the region will benefit from the analysis and recommendations presented in this report, but the work towards implementation is just the beginning. The recommendations in this report create a multiyear work plan for CMAP and its partners to address speeding using a Safe System Approach. Partnership with state and local governments, as well as advocates, educational institutions, and elected officials, will make travel safer in our region, with the goal of reaching zero traffic fatalities by 2050.

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Appendix

The following table outlines the high-level recommendations and specific tactics proposed in the report, along with potential implementation partners. The proposed lead and supporting partners listed represent CMAP's recommended approach and do not imply a commitment from these partners.

Table 1: Speed management recommendations and corresponding implementation partners

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 3: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks	ICT Safety Technical Advisory Group	1. Study and pilot new approaches to roadway capacity and design that reduce travel demand, encourage slower operating speeds, and support compliance with speed limits	a. Create a self-enforcing streets initiative — comprised of research, guidance, and a toolkit — which begins a pilot program for self-enforcing streets in equity priority areas	CMAP, IDOT, counties, municipalities, academic partners
			b. Advance research and policy efforts on the use of a multimodal level of service standard in urban districts for roadway construction and/or maintenance improvements. This standard should evaluate quality of service and safety for all types of travel, including pedestrians, bicyclists, and transit vehicles	CMAP, IDOT, counties, academic partners

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 3: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks	IDOT	2. Improve existing design guidance and standards to support compliance with speed limits	a. Ensure that all proven traffic calming and self-enforcing street design elements are included in the *Bureau of Local Roads and Streets Manual* and the *Bureau of Design and Environment Manual* and do not require exception requests	CMAP
			b. Create a policy and provide supportive design guidance on the coordinated use of right-sized roadway geometry, traffic calming infrastructure, visual friction, and informational signage. The policy and guidance should explain and promote street design that encourages compliance with lower speeds.	CMAP, counties, municipalities
		3. Increase funding for speed management projects by updating scoring metrics	a. Ensure that evaluation metrics within the Highway Safety Improvement Program adequately consider and score the benefits of systemic roadway safety improvements such as speed limit reductions	CMAP

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 3: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks	CMAP	3. Increase funding for speed management projects by updating scoring metrics	b. Continue to improve scoring criteria in programming decisions to prioritize projects that reduce speed limits and include speed management strategies	CMAP, IDOT
		4. Improve project-level design guidance and local approaches to reduce speeding	a. Develop internal project scoring that captures the safety benefits of right-sizing roads on roadways with four or more travel lanes, such as reduced speeds and increased activity by vulnerable roadway users	CMAP, IDOT, counties, municipalities
			b. Integrate safety into technical assistance projects related to transportation and mobility to help partners identify traffic safety issues and prepare them to apply for implementation funding	Municipalities
			c. Increase the weight of programming metrics that reduce expected travel demand and per capita VMT for their safety and speed management benefits	IDOT, counties

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 3: Improve roadway design and capacity guidance to reduce speeding and exposure to safety risks	Local partners	4. Improve project-level design guidance and local approaches to reduce speeding	d. Encourage and support the creation of local traffic calming programs for neighborhoods, urban areas, and transit centers. Implement them uniformly within street construction programs at locations where speeding-related crashes are a concern.	CMAP
Chapter 4: Reduce speed limits in urbanized areas where people walk, bike, and use transit	IDOT	1. Improve guidance to allow and encourage reduced speed limits	a. Revise the speed limit restriction language in the Illinois Vehicle Code (625 ILCS 5/11-604) for clarity and usefulness to local governments who wish to reduce citywide speed limits by ordinance	State partners, CMAP, IDOT, counties, municipalities, advocacy organizations
			b. Revise the state's speed limit policy to indicate 50th-percentile speed limits in urban districts and consider other changes that will result in lower speed limits wherever vulnerable road users may be present.	CMAP, counties, academic partners

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 4: Reduce speed limits in urbanized areas where people walk, bike, and use transit	CMAP	2. Identify the most impactful changes to the motor vehicle code to support reduced speed limits	a. Conduct additional analysis to determine the most beneficial approaches to reducing the speed limits in urban and residential areas via the motor vehicle code	IDOT, counties, municipalities, advocacy organizations, academic partners
		3. Reduce the risks posed by larger and heavier vehicles	a. Study and identify policies that target speed limit compliance among drivers of large and heavier vehicles, such as intelligent speed assistance for fleets	IDOT, advocacy organizations, academic partners, media
	Local partners	4. Reduce speed limits by ordinance	a. Adopt a local ordinance to reduce speed limits to 20 or 25 mph on local roads, city-wide	CMAP

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 5: Support safe driving behavior with education and equitable enforcement	IDOT, CMAP and all agencies related to transportation and traffic safety	1. Adopt the Safe System Approach	a. Convene partners to determine paths to integrate the Safe System Approach into agency practices at the state, regional, and local level	CMAP, IDOT, counties, municipalities, advocacy organizations, academic partners, educational partners, media, law enforcement
	IDOT Bureau of Safety Programs and Engineering, Illinois State Police	2. Promote enforcement techniques that have been shown to improve driver behavior, reduce speeds proactively, and advance equity	a. Promote high-visibility and other education-centered enforcement programs, within the IDOT Highway Safety Plan	CMAP, counties, municipalities, advocacy organizations, law enforcement
	CMAP with state partners		b. Conduct a benefits and burdens analysis of safety-oriented automated speed enforcement programs	IDOT, counties, municipalities, advocacy organizations, law enforcement
			c. Seek legislative approval for a pilot program for automated speed enforcement at high-crash locations that includes an equity-centered approach toward fines	State partners, CMAP, IDOT, counties, municipalities, advocacy organizations, law enforcement

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 5: Support safe driving behavior with education and equitable enforcement	CMAP	3. Improve the data needed to understand and address speeding	a. Provide local partners information on high-crash and high-risk locations and priority safety issues, with recommended countermeasures	Counties, municipalities
			b. Develop a regional data-driven understanding of speeding to identify needed changes in design and policy	IDOT, counties
	IDOT		c. Update the Illinois Roadway Information System to include updated speed limit data	CMAP
	Illinois Traffic Records Coordinating Committee and Illinois State Police Training Program		d. Improve frequency and quality of police officer training in reporting crashes, with a focus on capturing speeding-related details	State partners, CMAP, IDOT, academic partners, law enforcement

Key recommendation	Proposed lead partner	High-level recommendations	Specific tactics	Proposed supporting partners
Chapter 5: Support safe driving behavior with education and equitable enforcement	CMAP	4. Create a framework for a traffic safety culture that leverages education	a. Develop research driven recommendations and convene regional partners to determine actions, policies, and programs to support a regional culture of slower and safer driving	IDOT, counties, municipalities, advocacy organizations, academic partners, educational partners, media
	Illinois Secretary of State		b. Ensure driver education curricula appropriately explain the risks of speeding. Expand school-based education programs on traffic safety	State partners, CMAP, advocacy organizations, academic partners

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The Chicago Metropolitan Agency for Planning (CMAP) is the region's comprehensive planning organization. The agency and its partners developed and are now implementing ON TO 2050, a long-range plan to help the seven counties and 284 communities of northeastern Illinois implement strategies that address transportation, housing, economic development, open space, the environment, and other quality-of-life issues.

See **cmap.illinois.gov** for more information.

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