STRONG TOWNS

Beyond Blame:
How Cities Can Learn From Crashes To Create Safer Streets Today

Executive Summary

Art memorial to honor crash victim Terry Binder in Meridian, Idaho.

Every fatal crash has something to teach us. That is the animating insight of this report.

- In North America, nearly all car crashes are attributed to human error. Yet, there are always many contributing factors that remain unidentified.
- Currently, there is no widely adopted approach to studying and learning from traumatic crashes.
- Local leaders must adopt such an approach in response to the rising number of auto-related deaths.

Every day in North America, people are killed in automobile crashes. In the U.S. alone, the number is over 40,000 annually. Emergency response personnel are generally tasked with documenting what happened. They interview witnesses, draw schematics and check boxes.

The primary purpose of these efforts is to assist in assigning blame. Courts adjudicate and insurance companies pay claims based on the findings in police reports. Sometimes, statistics from all those checked boxes prompt an institutional response, such as national campaigns to educate drivers on the dangers of texting while driving. Beyond that, it is rare that anything more is done, even for a fatal crash.

The medical profession uses clinical mortality reviews to study and learn from adverse outcomes. The National Transportation Safety Board has a similar commitment to study each plane crash. Yet, despite the level of urgency, there is no institutional response to gain insight from automobile crashes.

This is not because there is nothing to learn. And it's not because we lack the capacity to conduct this kind of review. The most immediate obstacle to action is the lack of an established practice for analyzing and learning from fatal car crashes.

In 2023, Strong Towns began conducting monthly studio sessions to analyze crashes. These Crash Analysis Studios were broadcast live through Zoom so that anyone could watch them. In each session, technical and nontechnical experts reviewed data. They examined photos and video of the scene. They worked to identify the multiple factors, large and small, that contributed to each crash. A report detailing the findings was prepared and made publicly available for each Studio session.

The immediate goal of this exercise was to demonstrate a process that cities can emulate to learn from their own crashes. These overlooked and underappreciated insights can be used by local leaders to improve traffic safety. A side effect of the process was the discovery of some recurring factors. These facets were noted numerous times, despite the crashes' otherwise unique characteristics.

In the first 18 studio sessions, participants repeatedly documented the following contributing factors:

1. **High-speed road design in urban areas,** where the design of the street facilitated traffic speeds above what is known to be safe (noted in 16 sessions).
2. **Design that inadequately accounts for people walking and biking,** particularly in areas where street designers were clearly aware of the presence of people biking and walking but chose to prioritize high vehicle speeds over safety (noted in 14 sessions).
3. **Dangerous intersection design,** where streets were designed to speed — and sometimes even accelerate — vehicles into areas with high conflict potential (noted in 13 sessions).
4. **Visibility and lighting issues,** where the lighting used to illuminate driving areas obscured people biking and walking in glare and shadow (noted in 12 sessions).
5. **Deviation from the designer's intent,** where unsafe conditions unintentionally crept into the design during or after construction (noted in 4 sessions).

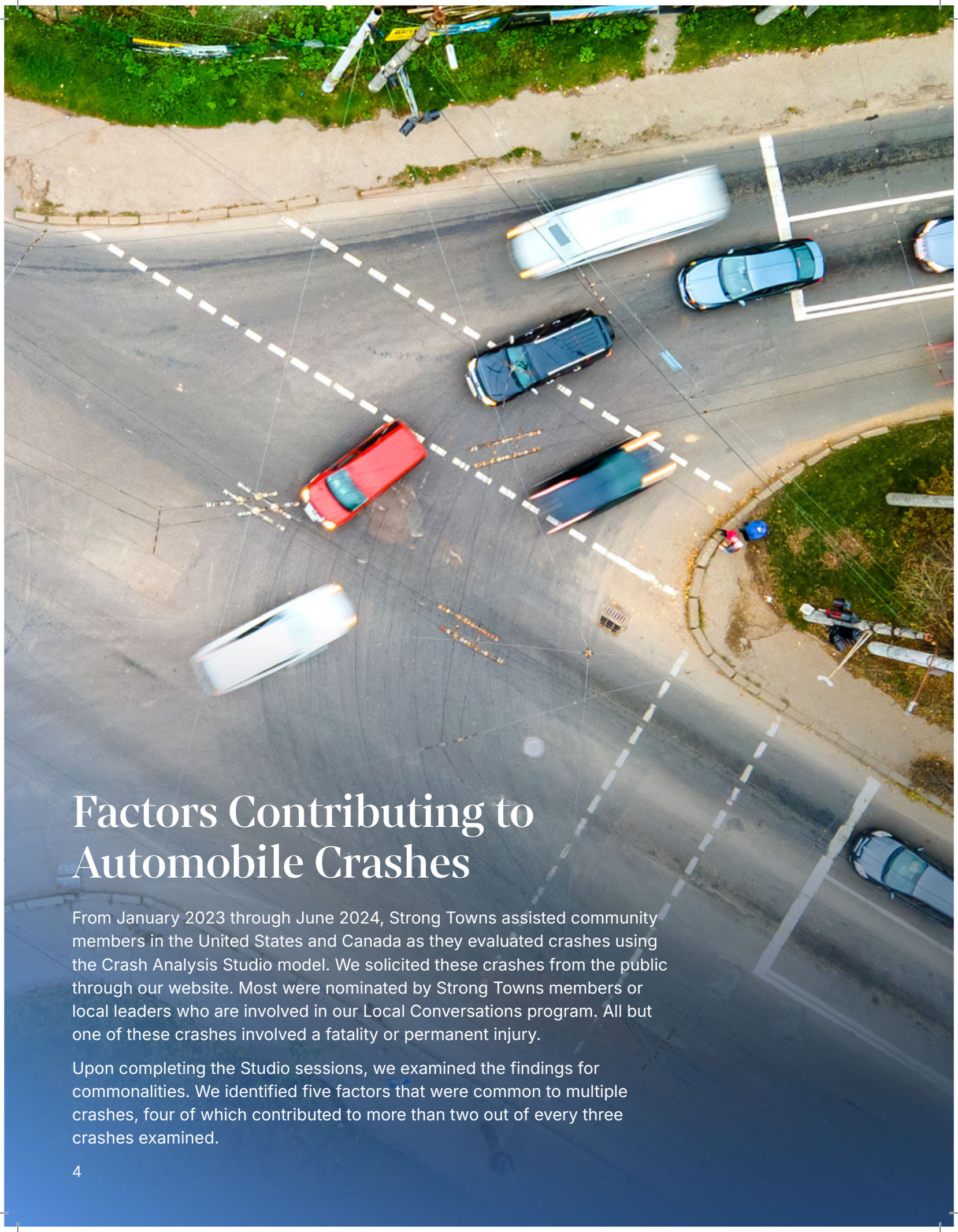
These findings prompt Strong Towns, along with our partner participants in this effort, to make the following recommendations to city officials and local leaders across North America:

1. **Make safety a core organizational responsibility** by empowering a person or team to intervene in established city processes on behalf of traffic safety.
2. **Establish a Crash Response Team** to gather data following a fatal or traumatic crash.
3. **Establish a Crash Analysis Studio** to identify and learn from the many factors that cause a crash.
4. **Use temporary traffic control devices to respond quickly** to dangerous situations.
5. **Update local street standards to prioritize safety** instead of traffic speed and throughput.
6. **Conduct bike and walk audits for all projects** to provide the same level of insight and awareness to the safety of people biking and walking as is routinely applied to people driving.

Since the end of World War II, American traffic safety officials have dramatically reduced the rate of injury and death from auto crashes. Yet, there is a persistent amount of trauma we have been unable to eliminate or even meaningfully reduce. It's not from lack of effort or resources.

To close that final gap, local officials need to take the lead. They need to begin learning from the fatal crashes occurring on their own streets. That knowledge can be put to work immediately to build local streets that are truly safe.

We have the ability to learn something from each crash. The only thing we need now is the desire to obtain that knowledge.



Factors Contributing to Automobile Crashes

From January 2023 through June 2024, Strong Towns assisted community members in the United States and Canada as they evaluated crashes using the Crash Analysis Studio model. We solicited these crashes from the public through our website. Most were nominated by Strong Towns members or local leaders who are involved in our Local Conversations program. All but one of these crashes involved a fatality or permanent injury.

Upon completing the Studio sessions, we examined the findings for commonalities. We identified five factors that were common to multiple crashes, four of which contributed to more than two out of every three crashes examined.

Factor #1

High-Speed Road Design in Urban Areas

The most frequently cited contributing factor in our analysis was the presence of high-speed roadways in urban areas (noted in 16 of the 18 crashes analyzed). We define a "high-speed roadway" as any transportation corridor where the design facilitates automobile speeds exceeding 30 mph.

Of these 16 crashes on high-speed roadways, 14 occurred where the posted speed limit was 30 mph or greater. All 16 occurred where the 85th percentile speed was greater than the posted speed limit.

Any transportation corridor where the design facilitates automobile speeds exceeding 30 mph is a **high-speed roadway.**

Any location featuring elements of a complex human environment, such as crosswalks, bike lanes, public transit or multiple land uses — homes, businesses, parks, etc. — is considered an **urban area.**

[1]DEFINITION

85th Percentile Speed: The speed that 85% of drivers are traveling at or below. Traffic engineers broadly consider the measured 85th percentile speed to be the speed of traffic.

CRASH STUDIO SESSION	POSTED SPEED LIMIT	MEASURED 85TH PERCENTILE SPEED [1]	VARIATION FROM THE POSTED SPEED LIMIT
Hyattsville, Md.	30 mph	39 mph	+30%
Richmond, Va.	25 mph	32 mph	+28%
Meridian, Idaho	40 mph	44 mph	+10%
Bradenton, Fla.	40 mph	46 mph	+15%
Amarillo, Texas	40 mph	46 mph	+15%
Charlotte, N.C.	45 mph	50 mph	+11%
Ottawa, Ontario	40 kph	48 kph	+20%
Huntsville, Ala.	45 mph	52 mph	+16%
Denver, Colo.	45 mph	48 mph	+7%
Rochester, N.Y.	30 mph	36 mph	+20%
Carlsbad, Calif.	25 mph	37 mph	+48%
San Antonio, Texas	45 mph	48 mph	+7%
Grand Junction, Colo.	40 mph	49 mph	+23%
Nice, Calif.	40 mph	48 mph	+20%
State College, Pa.	35 mph	40 mph	+14%
Durango, Colo.	25 mph	40 mph	+60%

Posted speed limits vs. driver speeds at sites studied in 16 Crash Analysis Studios, January 2023-June 2024.

This indicates that speeding at these locations is not a deviation from the norm but a persistent outcome of the street design. When elements commonly used in highway design — such as wide lanes, unused shoulders, turn lanes and clear zones — are incorporated into the design of an urban street, drivers perceive an extra margin of safety. Drivers consistently respond to that added margin of safety by increasing speeds.

Ager Road approaching an intersection with Hamilton Street in Hyattsville, Maryland. Ager Road features wide automobile travel lanes, a slip lane to facilitate faster speeds for drivers entering the street, wide margins on either side of the road, and other design elements that induce travel speeds too fast for the urban environment.

2

Distance traveled before reacting to potentially dangerous roadway conditions as related to initial travel speed. Source: NHTSA, "Speed-Measuring Device Operator Training Participant Manual."

Persistent speeding is particularly problematic in urban areas. Unlike travel along a highway, drivers in urban areas experience a great deal of random complexity. Drivers of other vehicles speed up and slow down for reasons that aren't always obvious. Vehicles turn into, out of and across traffic. People walk and bike with, against and across traffic. Each of these normal occurrences is a potentially unanticipated source of conflict.

High speeds don't just make collisions more violent; they also decrease the driver's margin for error. According to the National Highway Traffic Safety Administration, it takes 1.5 seconds for a driver to perceive and react to a potentially dangerous situation[2]. This means that a driver can travel a significant distance before even taking their foot off the gas, turning the wheel, or touching the brakes. That distance grows as speeds increase: At 50 mph, a driver will travel 110 feet before they even start to react.

DRIVING SPEED	DISTANCE TRAVELED BEFORE REACTION
20 mph	44 feet
30 mph	66 feet
40 mph	88 feet
50 mph	110 feet

Once the driver reacts, if they apply the brakes, the vehicle will travel an additional distance before coming to a complete stop. That distance is greater depending on the vehicle's size and speed.

Relationship between driving speed and distance necessary to come to a complete stop when brakes are applied. Source: NHTSA, "Speed-Measuring Device Operator Training Participant Manual."

DRIVING SPEED	DISTANCE REQUIRED TO STOP
20 mph	18 feet
30 mph	40 feet
50 mph	74 feet

> Combining the low margin of error inherent in high-speed designs with the random complexity of urban areas means that a base level of violent collisions is all but guaranteed.

The ubiquitous speeding identified in these Studio sessions indicates a design mismatch, not broadly deviant behavior on behalf of the driving public. **These are not education or enforcement challenges; they are design problems.**

High-speed road design in urban areas was a factor in 16 of the 18 crashes examined.

Factor #2

Design That Inadequately Accounts for People Walking and Biking

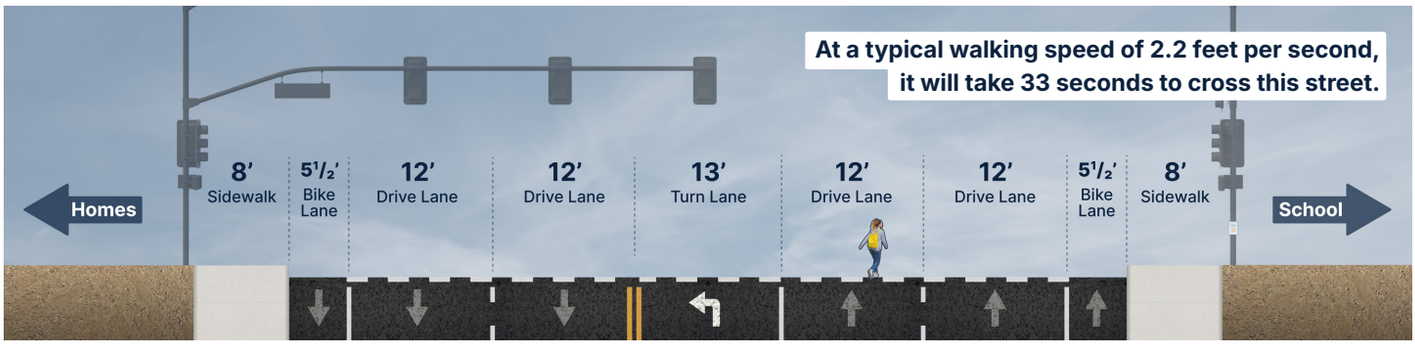
While analyzing 14 of the 18 crash sites in this report, Crash Response Team members observed people traveling on foot or by bicycle. In each of those cases, there were homes, retail establishments, offices, schools or parks located within walking distance. However, the design of the streets in question did not adequately account for the safety of these road users.

When people bike or walk near fast-moving traffic, it takes only a very small miscalculation by one party to create a fatality or traumatic injury. Street designers can minimize this risk by designing streets for slower traffic, by minimizing the amount of time that people biking and walking are exposed to traffic, and by providing physical separation between vehicles and people biking and walking, especially when speeds are commonly lethal (over 20 mph).

Across the crashes examined, however, municipalities consistently implemented designs that prioritized high traffic speed over safety. This was often done at greater overall cost, with wider lanes, added shoulders and more right-of-way all creating extra project expense, so a lack of resources is not the problem. Even where designers anticipated people biking and walking, accommodating them was a design afterthought, something to be done after designing the roadway to facilitate high speeds.

For example, in Meridian, Idaho, a housing development is located on the west side of North Ten Mile Road and a neighborhood school is located on the east side. Designers recognize that people, including young children, routinely cross this street on foot and by bike. Even so, the street is designed for high speeds (with an 85th percentile speed of 44 mph) and the only accommodation for someone outside an automobile is a crosswalk and a walk button. A typical person crossing on foot is directly exposed to dangerously fast traffic for approximately 33 seconds during each crossing.

Somewhat inevitably, given the degree of danger, someone was killed at this crossing. In this case, it was 16-year-old Terry Binder, who was killed on his way to school.



North Ten Mile Road approaching an intersection with West Pine Avenue in Meridian, Idaho.

Municipal officials found that this crash was caused by a mistake made by the driver. This highlights the fact that designers improperly rely on all participants in the space, from drivers to people walking and biking, to not make mistakes. A different assumption more in line with observed human behavior would yield a different design, one that gives greater consideration to the safety of people walking and biking.

Design that inadequately accounts for people walking and biking was a factor in 14 of the 18 crashes examined.

Factor #3

Dangerous Intersection Design

Intersections are the most common location for crashes because they are inherently high-risk areas. Whenever different streams of traffic cross paths, the risk of conflict is higher and all street users need to pay careful attention. When street design fails to communicate this increased risk, it gives drivers a false sense of security. This can have fatal consequences.

For example, in Richmond, Virginia, a student named Mahrokh Khan was fatally struck by a vehicle while crossing from her apartment to the Virginia Commonwealth University campus. Despite the heavy presence of students and the modest volume of traffic, the intersection is designed primarily for the high-speed movement of automobiles. There is one-way traffic, multiple wide lanes and long through-signal timing, all of which facilitate excessive speed as drivers approach the intersection (which has an 85th percentile speed of 32 mph). The wide curb radii ensure that anyone crossing on foot is exposed to cross-traffic for much longer than necessary.

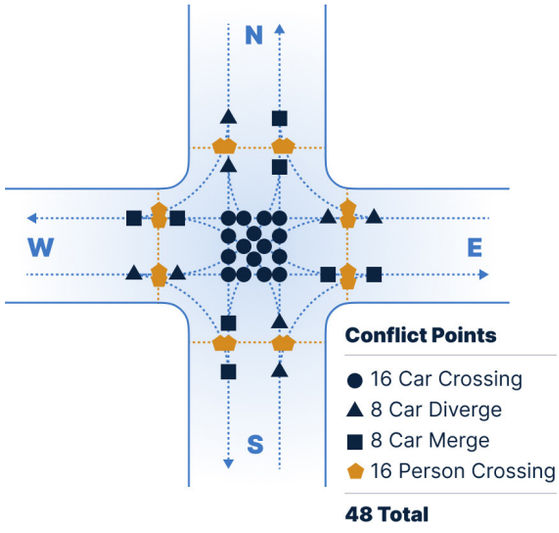


Diagram adapted from "The Application of Axiomatic Design Theory and Conflict Techniques for the Design of Intersections: Part 2."

In complex urban areas, it is critical to slow vehicles down before they enter an intersection. The margin of error shrinks considerably at high speeds. With travel speeds over 20 mph, it is nearly impossible to design an intersection that can overcome common human mistakes.

Dangerous intersection design was a factor in 13 of the 18 crashes examined.

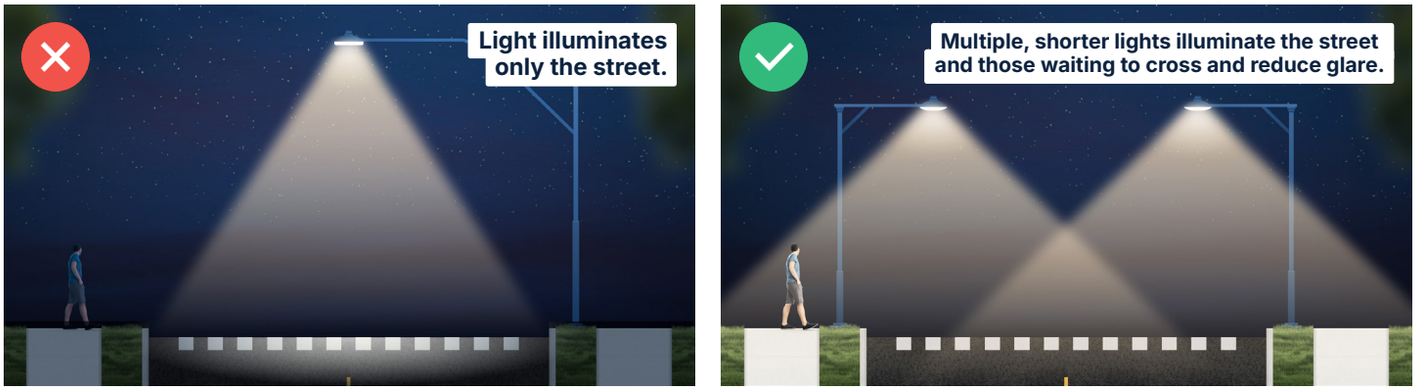
Factor #4

Visibility and Lighting Issues

While street designers often take care to ensure that drivers can see other vehicles in low light conditions, waiting and crossing areas for people walking and biking are frequently neglected. Even worse, the lighting designed for drivers often creates glare and/or shadow that conceals people on foot or bike.

For example, in Hyattsville, Maryland, a woman named Hellen Jorgensen was fatally struck by a vehicle while she was attempting to cross the street at a marked crossing. The driver indicated that not only did they not see a person, but they didn't even know they had struck a human. This was plausible because, while the vehicle intersection was well lit, the lighting placed anyone waiting to cross the street in shadow. The woman who was killed would have been able to clearly see the oncoming vehicle and likely felt seen in return, even though she was not.

Visibility and lighting issues were a factor in 12 of the 18 crashes examined.



How inadequate lighting design obscures people traveling on foot or by bicycle.

Factor #5

Deviation From the Designer's Intent

No matter how careful or thoughtful a street or intersection designer is, the contractor who builds it or the street maintenance department that cares for it may make adjustments they didn't anticipate. The deviations can occur intentionally or through neglect or unintentional oversight. At times, these changes can introduce conflicts or decrease safety in unanticipated ways.

For example, in Huntsville, Alabama, Joshua Gurley was fatally struck by a vehicle while attempting to cross University Drive on his bicycle. The sidewalk had been recently modified to accommodate a new bus shelter and changes to the transit route. A curb ramp and high-visibility striping were also installed on one side of the intersection. These upgrades addressed the transit situation, but unintentionally made it harder for someone biking to reach the crossing activation push button and added significant confusion for someone biking through the intersection.

When changes like this impact driving patterns, it's common for a public works department or project engineer to perform a follow-up observation to make sure nothing that impacts traffic has been unintentionally overlooked. Such a follow-up is rarely done for someone walking or biking.

Deviation from the designer's intent was a factor in 4 of the 18 crashes examined.

Key Recommendations

City officials must make systematic changes to ensure that knowledge is gained from each fatal crash and used to meaningfully improve traffic safety over time. While every crash has its own contributing factors and subsequent recommendations, local governments must take the following six steps to build a culture of traffic safety.

Recommendation #1

Make Safety a Core Organizational Responsibility

Most city governments have committed themselves to improving traffic safety. Yet, making a commitment to safety is different from embedding a culture of safety within an organization. For example, in Charlotte, North Carolina, the city government committed over $21 million since 2019 to support traffic safety efforts. However, an internal audit found that the city's fatality and traumatic injury rates from car crashes are actually rising.

The primary finding cited in the city's report is that traffic safety officials lack any meaningful authority to demand changes or create systematic accountability for traffic safety. In the city's organizational chart, safety officials are subordinate to the city's entire leadership structure. Charlotte is far from alone in this regard; few cities empower officials with the authority they need to make traffic safety a real priority.

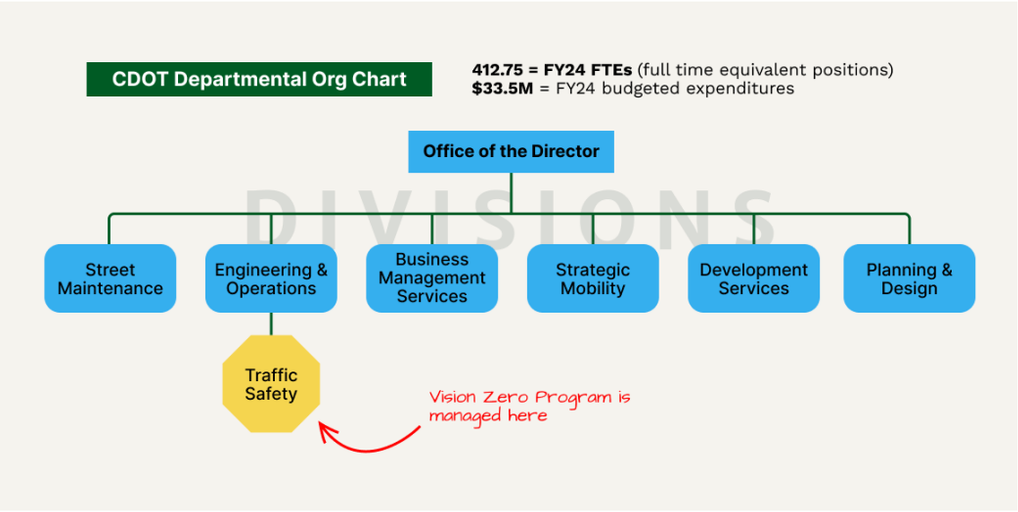


Image from Charlotte's Vision Zero audit report, July 2024.

To make traffic safety a core organizational responsibility, the individual or group responsible must have real authority. They must be able to raise issues with the city's design process. They must have veto power over dangerous street designs. They must have direct access to whoever makes day-to-day decisions. They should be responsible for reporting directly to elected officials and should be required to sign off on all transportation plans going out to bid.

Without authority vested near the top of the municipality's organizational chart, traffic safety will continue to be an aspirational afterthought subordinate to other priorities.

Recommendation #2

Establish a Crash Response Team

Municipalities generally respond to traffic crashes with public safety staff such as police officers, firefighters and emergency medical personnel. These people are trained to handle the immediate situation, providing aid and comfort to victims and managing any urgent problems at the crash site. They will often take statements from witnesses and conduct rudimentary fact-finding to assist in the adjudication of blame by insurance companies and courts.

However, these professionals are not trained to assess, document and evaluate the many factors that potentially contributed to the crash. For this critical task, cities need

to establish a Crash Response Team, a group of people with expertise in traffic safety and urban design. This is particularly urgent for crashes that result in a fatality or traumatic injury.

A Crash Response Team doesn't need to rush to the site of an incident — that can be left to the emergency response personnel. However, the team must visit the site within a reasonable timeframe so as to accurately assess the conditions at the time of the crash. Every attempt must be made to experience the location as the participants involved in the crash experienced it.

The goal of the Crash Response Team isn't to assign blame but to collect measurements and make observations of the site for later evaluation.

Who should be on a Crash Response Team?

Technical Experts with a vocational background in urban design, transportation planning, traffic safety or a related field.

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Local Experts who are familiar with the crash location and who travel through the area at least a few times a month by car, foot or bicycle.

Recommendation #3

Establish a Crash Analysis Studio

PROCESS

1. Review the information collected by the Crash Response Team.
2. Share observations about the crash and crash environment.
3. Identify actions that can be taken to address the factors that contributed to the crash.

The work of the Crash Response Team is best evaluated within the framework of a Crash Analysis Studio. Drawing on the best practices of the medical profession and their use of morbidity and mortality conferences to improve outcomes, Crash Analysis Studio sessions provide a formal venue for identifying areas of improvement.

In a Studio, participants gather to review the information collected by the Crash Response Team. A designated moderator invites participants to share their observations. Once all participants have been heard and all the potential factors they identified have been documented, the moderator facilitates a discussion about potential ways to address these factors. The discussion should identify actions that can be taken immediately to address the identified factors, along with near- and long-term responses that will improve outcomes over time.

In the 18 Studio sessions conducted by Strong Towns, participants included technical professionals such as engineers, planners and traffic safety officials. They also included nontechnical neighborhood experts — people who live near and/or routinely travel through the location of the crash.

> Including nontechnical experts was sometimes challenging, but they very often revealed critical insights that were not apparent to others with more technical expertise.

We highly recommend making the effort to include these nontechnical experts.

Instead of assigning blame, the purpose of Studio sessions is to identify the many factors that contributed, in any way and to whatever extent, to the crash and then to use those insights to improve future outcomes. The use of a Crash Analysis Studio promotes professionalism, ethical integrity and transparency in assessing and improving traffic safety.

Recommendation #4

Use Temporary Traffic Control Devices To Respond Quickly

Even when a street is dangerous enough to require immediate design changes, city officials often spend years doing studies and holding meetings to determine the best course of action. These delays are a threat to public health and safety. If local governments are committed to safety, they cannot tolerate these delays in action. Fortunately, they don't have to.

When a rapid response to an ongoing traffic safety situation is necessary — or when city officials want to examine the impact of different street modification approaches — city staff can use existing standards for traffic control measures to deploy cones, bollards, paint and other temporary devices to simulate potential street modifications. Consistent with these standards, these measures must be monitored and adjusted as needed.

> When an unsafe street condition has been identified, cities need not tolerate delays in taking action.

Every municipality has a codebook or set of standards for implementing temporary traffic control measures during construction projects. These detail how to deploy temporary traffic control devices (cones, barrels, signs, etc.) to slow and divert traffic safely through a construction zone. These guides include instructions on how to monitor the street and make adjustments if necessary. This is standard practice within the transportation industry.

There is no reason for local leaders to be frustrated by inaction or feel unable to respond to known problematic situations. Rapid deployment of traffic control devices is safe, proven and generally inexpensive. These temporary measures will save lives and make future safety projects more sound and reliable.

Recommendation #5

Update Local Street Standards To Prioritize Safety

Automobile travel speeds must not exceed 20 mph where:

- People travel on foot or by bicycle.
- Cars stop or turn frequently.
- People may enter the street regularly or randomly.

In municipalities where high-speed road designs are routinely used in complex urban areas, city officials must modify local street standards to reduce speeds and improve safety.

As a general rule, in places where there are lethal automobile speeds — speeds greater than 20mph — there can't be complexity. These high speeds are appropriate for roads and highways, where there should not be people walking or biking, businesses, or other potential conflicts.

In turn, where there is a complex human habitat, there can't be high-speed traffic. A complex human habitat includes random occurrences such as stopping or turning traffic, people biking or walking, kids chasing a ball into the street, etc.

When lethal speeds come into contact with complex human spaces, it is only a matter of time before a random occurrence results in tragedy.

To use Strong Towns vernacular, cities must build either roads or streets. A road is a high-speed connection between places, while a street is a platform for building a place.

Ineffective traffic safety efforts focus on responding to random occurrences or eliminating human messiness.

Effective traffic safety efforts focus on addressing the underlying causes of crashes, which are often design-related.

We measure the success of a road by all the typical engineering variables like traffic speed, volume and travel time.

We measure the success of a street by measuring the level of investment and the quality of the built environment it supports. When designed correctly, both roads and streets are inherently safe.

	ROAD	STREET
PURPOSE	Moving traffic	Building a place
DESIGN APPROACH	Simplify, avoid complexity	Embrace complexity
DESIGN SPEED	Fast, more than 50 mph	Slow, 20 mph or less
ACCESSIBILITY	Few access points	Frequent access provided
ADJACENT DEVELOPMENT	Avoid building anything	Shops, homes, services and more
HUMANS WALKING / BIKING	No, except on separated facilities	Yes, and given priority throughout

Key differentiations between streets and roads.

Recommendation #6

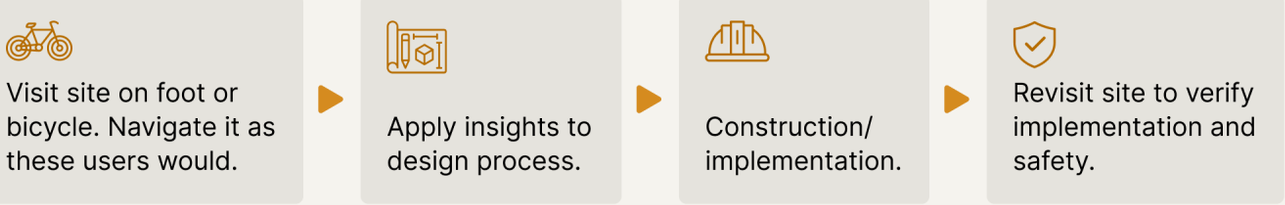
Conduct Bike and Walk Audits for All Projects

During a street project's design phase, the design team needs to conduct audits of the project area to experience it as a person walking and biking would. These audits should be repeated after the project is complete.

These assessments will validate or challenge the design team's assumptions (pre-design) and verify the implementation of the design team's intent and the design's overall safety (post-construction).

In addition to members of the design team and traffic safety officials, a good audit will include a cross section of the municipality's experts in areas such as engineering, planning, maintenance and law enforcement. It will also include any individual in the area known to have a disability or particular struggle that will be impacted by the design.

How To Conduct a Bike & Walk Audit



Take an iterative approach to this process. If shortcomings are identified in the second audit, address them through design immediately.

About the Crash Analysis Studio Approach

There's a prevalent misconception that car crashes are caused primarily by mistakes that drivers make, such as looking at a phone, changing the radio, speeding or drinking alcohol. When a crash occurs, the North American response is to send law enforcement and insurance agencies to assign blame. We ask a very narrow set of questions: Who made the mistake that caused this crash? Who should be held accountable?

In the medical profession, adverse outcomes go through a morbidity and mortality conference, a process of internal review where all contributing factors are considered. In these cases, a different set of questions is asked: To what extent did the clinic or hospital — through its processes, recommendations, environment or other actions — contribute to the negative outcome? What could have been done differently?

Instead of assigning blame, the medical profession seeks to learn, improve and reduce adverse outcomes over time. When implemented properly, this process results in tangible improvements that save lives.

It's a moral imperative that city officials do the same thing for deadly crashes. That's why Strong Towns created the Crash Analysis Studio.

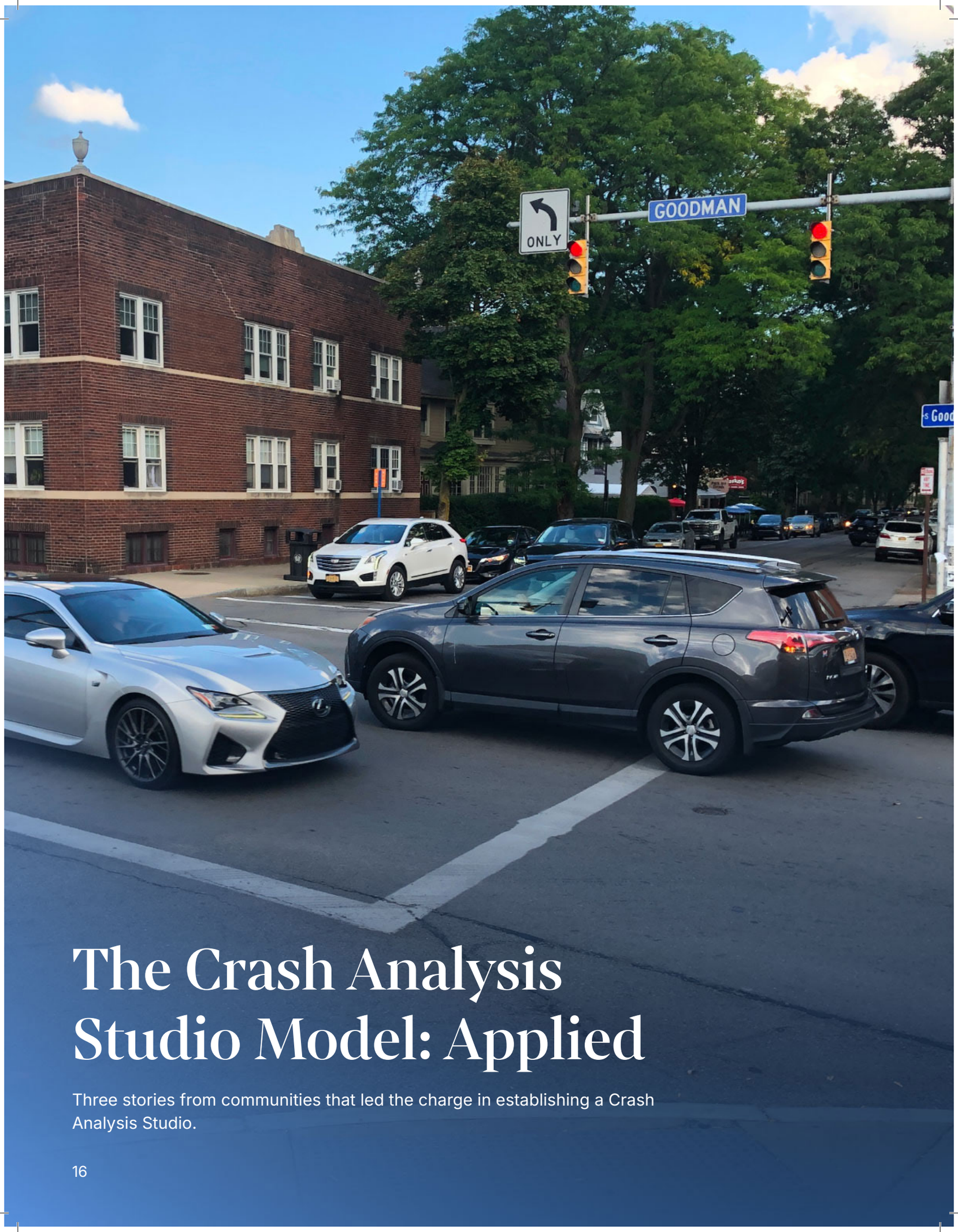
The reality is that crashes are caused by multiple factors, including the design of streets, roads and intersections. When a traumatic crash occurs, local officials need to identify all the contributing factors and learn all they can from the experience. They can then use this knowledge to reduce the tragic number of deaths and traumatic injuries occurring within their community.

Since its launch in January 2023, the Crash Analysis Studio has been used to assemble multidisciplinary teams, along with affected individuals, to examine deadly crashes across the U.S. and Canada.

Participants in these sessions don't seek to determine blame. Instead, they ask what changes could be made to prevent the next crash from occurring. **Best of all, some of their recommended actions have led to tangible changes, from the reconfiguration of dangerous streets to the revision of design guidelines.**

The Strong Towns Crash Analysis Studio is a tool for local leaders, both inside and outside of government, who want to move beyond merely assigning blame and set a new standard of care for traffic safety.

> "Allport says Strong Towns has given him a little more hope about the future of Durango's streets.
>
> 'It was amazing how quickly they could diagnose the issues and how decisively they came up with improvements. It made you realize that these kinds of situations are so common, and the solutions so well-known at this point that there's little reason for it to take years and years of study to come up with a fix.'"
>
> **Andrew Allport,**
> *Co-director of Bike Durango*
>
> **Tracy Ross,**
> *The Colorado Sun*
>
> Durango, Colorado



The Crash Analysis Studio Model: Applied

Three stories from communities that led the charge in establishing a Crash Analysis Studio.

CRASH STUDIO SESSION	HIGH-SPEED ROAD DESIGN IN URBAN AREAS	DESIGN THAT INADEQUATELY ACCOUNTS FOR PEOPLE WALKING AND BIKING	DANGEROUS INTERSECTION DESIGN	VISIBILITY AND LIGHTING ISSUES	DEVIATION FROM THE DESIGNER'S INTENT
Indianapolis, In.	✓	✓	✓	✓	✓
Hyattsville, Md.	✓	✓	✓		
Richmond, Va.	✓		✓	✓	
Meridian, Idaho	✓	✓			
Bradenton, Fla.	✓	✓	✓		
Amarillo, Texas	✓	✓		✓	
Brandon, Manitoba			✓	✓	✓
Charlotte, N.C.	✓	✓	✓	✓	
Ottawa, Ontario	✓	✓		✓	
Huntsville, Ala.	✓	✓	✓	✓	✓
Denver, Colo.	✓	✓	✓		
Rochester, N.Y.	✓		✓	✓	
Carlsbad, Calif.	✓	✓	✓		
San Antonio, Texas	✓		✓		
Grand Junction, Colo.	✓	✓	✓	✓	
Nice, Calif.	✓	✓		✓	
State College, Pa.	✓	✓	✓	✓	
Durango, Colo.		✓		✓	✓

Design factors that contributed to crashes analyzed in Crash Analysis Studios, January 2023-June 2024.

Indianapolis, Indiana

READ MORE ABOUT INDIANAPOLIS:

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> "People keep saying something has to be done, but assume someone else has to do it."
>
> **Damon Richards,**
> *Executive director of Bike Indianapolis*

"One of the best urban biking experiences in the U.S." crosses East 86th Street in Indianapolis. However, among other risk factors, the design of the crossing gives drivers no indication that there is an increased risk of collision. Now, the city is taking the lead to address these design shortcomings rapidly.

On October 28, 2021, Frank Radaker was riding his bicycle, as he did on a near-daily basis, when a car struck and killed him. He was the seventh cyclist since July of that same year to die on Indianapolis' streets. In fact, in 2021, the Indianapolis Metropolitan Planning Organization[3] reported more than 200 traffic deaths, with their map displaying at least five within a mile of where Radaker was struck and killed. "We're on track for one of the deadliest years for traffic violence in Indianapolis, right after setting a record last year," said Damon Richards, executive director of Bike Indianapolis[4]. "People keep saying something has to be done, but assume someone else has to do it."

Unwilling to accept Radaker's death as an inevitable consequence of living in Indianapolis, Connie Schmucker nominated the crash that took his life to the Crash Analysis Studio.

Radaker was killed where the Monon Trail — a Rails-to-Trails paved path that spans Central Indiana — intersects with East 86th Street, a hallmark stroad. East 86th Street supports five lanes of traffic at 35 mph. If a person walking or biking were struck by a vehicle traveling at this speed, they would end up hospitalized at best; at worst, they would succumb to their injuries on the spot. Moreover, at 35 mph, a driver requires at least 350 feet of roadway to safely react to any unanticipated objects or people on the road.

At a glance, however, the speed limit feels appropriate for East 86th Street. Every commercial space in the vicinity features a driveway and a parking lot. The corridor is less of a place to linger and more of a place to get through. Virtually nothing in the area is designed to be accessed by anything other than a personal vehicle.

Except, "one of the best urban biking experiences in the U.S." goes right through East 86th Street. Hikers and bikers are dumped onto a road that doesn't accommodate them and drivers are taken by surprise. This fundamental incompatibility has made this intersection a dreaded segment of every trail user's ride. In 2021, it led Radaker to his death.

The Crash Analysis Studio gave local advocates, city officials and engineers an opportunity to confront the culpability of the intersection in his death. Rather than focus on who was more at fault, driver or cyclist, the Studio focused on how the road's design contributed to and elevated the stakes of the crash.

The Studio's panelists devised several recommendations for the city, some of them as simple as installing more obvious signage to alert drivers of the impending trail crossing. Luckily for grieving panelists, they have allies in the city. The problem is not the lack of political will, but the built-in bureaucracy that serves as an impediment to incremental change. As of July 2024, however, Indianapolis is trying something new.

After the Studio

In July 2024, Indianapolis announced a program that eliminates many of the political barriers that have long prevented the city from taking immediate action in the aftermath of crashes. Better yet, the Community Powered Infrastructure initiative encourages residents to take action themselves with guidance and tools from the Department of Public Works.

"Community Powered Infrastructure supplements the work of our engineering team by empowering residents to help make more immediate changes they would like to see in their neighborhoods," the department's director told the local news. "When residents are involved, projects are more likely to reflect the true needs and desires of the community."

Initiatives like this fortify the city's crisis response to a crash and lessen the chances of another happening. They also have preventative value: Locals intimately know what their neighborhoods need and the dangers they face. If they're able to pioneer change, they can address those needs and dangers before a fatal crash takes place.

These changes are bearing fruit. Already, the department has installed temporary bollards along crash-prone sites as it plans and budgets for more permanent design solutions.

Huntsville, Alabama

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On June 7, 2021, 37-year-old Joshua Gurley was riding his bicycle on University Drive in Huntsville, Alabama, when he wanted to make a turn onto Julia Street. He began crossing when he thought the coast was clear, yet halfway across University Drive, he was struck by a car. The driver didn't see him in time to stop. Gurley was pronounced dead at the scene.

The resulting police report concluded that Gurley must have failed to obey traffic signals at the time of the collision, a miscalculation he paid for with his life. Yet, locals familiar with the area refused to accept that the crash could be boiled down to the slip-up of one cyclist.

For locals, University Drive is dangerous by design. Between 2015 and 2022, it witnessed 62 pedestrian and 16 bicyclist deaths, far more than any other road in Huntsville. A death toll that high should prompt a deeper investigation into why this road happens to be more dangerous than others like it. That's why Larry Mason nominated the crash that claimed Gurley's life to the Crash Analysis Studio.

A death toll that high should prompt a deeper investigation into why this road happens to be more dangerous than others like it.

During the Studio, Melany Alliston of Toole Design immediately noted that the road's signage, lane widths and overall design suggest that it's meant to function as a highway more than a connection to commerce. "The overall character [of this road] through its visual cues is that it is a highway to connect to other highways."

Unlike other highways, however, University Drive can't promise speed or seamlessness because it has too many points of conflict. It puts people walking in the path of those driving, and it puts people driving to the restaurants and businesses along the road's perimeter in conflict with those traveling through the area at and above the posted

speed limit of 45 mph. One speed study even found that 60% of drivers exceeded the speed limit in a 55-minute period.

At these speeds, vehicles should not be freely mixing with people traveling by foot or bicycle, yet the road supports and even encourages these modes of mobility. For one, the bus stop produces foot traffic. Many of the people walking to and from the bus stop are subject to interrupted sidewalk connections, which force them to cross University Drive at regular intervals or risk walking on the road's edge.

Between 2015 and 2022, University Drive in Huntsville, Alabama, was the site of 78 pedestrian and bicyclist deaths. Sites like this are a clear starting point for cities seeking to address traffic crashes using the Crash Analysis Studio model.

There are also residential subdivisions within a short walking distance of University Drive's amenities, like Family Dollar and the gas station market. Many would prefer to "play Frogger," as one local described it, by crossing where it's convenient instead of navigating to the nearest designated crosswalk, hundreds of feet away.

"If they want to keep this a highway, then other road users should be discouraged from going on it," Edward Erfurt, Strong Towns' director of community action, remarked after examining the road's design. "But they have to decide whether this is for cars or people. That's what it comes down to."

Recent investments in bus connectivity to the area make it evident that University Drive will continue to accommodate multiple modes of mobility, in which case, Huntsville needs to take steps to ensure that nondrivers are truly protected from the high speeds the road supports. A panel of concerned locals, engineers and field experts at the Crash Analysis Studio helped devise a set of short- and long-term recommendations for the city, some of which would be temporary and yet transformative for tomorrow's road users.

Firstly, city officials must prioritize the visibility of people walking and biking by re-striping existing crosswalks, reducing visual clutter, and installing better illumination at existing crossings. The Studio participants also suggest reducing the lane width of the center turning lane — which measures 16 feet — to accommodate a pedestrian refuge. This can be done temporarily, using the tools and protocols deployed during road work, and later made permanent through the use of concrete, for example. A center lane refuge will act as a buffer between different road users and caution drivers to slow down as they approach the intersection. Slower speeds are ultimately what will make the road safer for everyone.

Rochester, New York

At first glance, South Goodman Street in Rochester, New York, doesn't appear to be an example of unsafe design. It features wide sidewalks, a mix of low-rise retail and residential buildings, and controlled intersections with crosswalks and overhead lighting.

Yet, on December 22, 2022, Edgar Santa Cruz and his dog Rosie were struck and killed by a car while crossing South Goodman Street at an intersection with Park Avenue. The crash occurred at 5:51 p.m. on a rainy day at a four-way intersection with a traffic light.

An investigation by local law enforcement determined that Santa Cruz entered the intersection with a green light and a walk signal and that the driver of the car ran a red light before making fatal contact. Authorities deemed the driver's actions the cause of the crash and charged him with various traffic-related violations resulting in death.

But Evan Lowenstein, the friend and colleague of Santa Cruz who nominated the crash, wanted a deeper examination of the causes, as well as action taken to prevent future tragedies. A panel including Strong Towns staff, traffic engineers, city of Rochester staff, and friends and neighbors of the victim held the 2023 session.

Participants immediately found it striking that the scene of the crash was so different from what safety advocates and planning professionals typically consider a dangerous scene, such as a suburban arterial in which high-speed car traffic meshes with other road users.

But when the expert panel dug deeper, it found several elements that would endanger people walking or biking. The street connected to a state road and interstate highway, resulting in through traffic inappropriate for a residential neighborhood. Strong Towns member Lowenstein conducted a radar gun study of vehicle speeds in the corridors around the crash site and found that 54% of drivers traveled above the posted 30 mph limit, with 4% going above 40 mph, a speed that is almost always fatal to pedestrians. The sidewalks had outdated curb cuts that reduced protection from cars rounding corners. In addition, the overhead lighting was placed in a way that failed to highlight the silhouettes of people and obstacles in a driver's path.

City officials in Rochester, New York, participated in the Crash Analysis Studio process for South Goodman Street, earning praise from locals.

This investigation showed how site-specific and fine-grained the elements leading up to a crash can be, as well as the necessity for local officials and leaders to be closely involved in evaluating causes and seeking changes.

The panel prepared a specific set of recommendations based on its analysis of the crash site and surrounding neighborhood. They included lowering local speed limits from 30 mph to 25 or 20 mph, trying new low-cost configurations to reduce road width, and reconfiguring curbs and intersections to fit revised ADA standards.

> Participants in this Studio generally had praise for Rochester officials (some of whom participated in the session) as being committed to improving safety. They're united in seeking a greater level of urgency at all levels of community and government in the wake of a fatal crash.

After the Studio

One of the streets around the crash site was scheduled for remilling, and the panel submitted its recommendations to planning officials in time to influence the final project, which got underway in 2024.

In addition, Rochester has already started modifying traffic lights in the neighborhood to enhance visibility to drivers, and higher visibility crosswalks are specified for future remilling projects.

Statement on Municipal Liability

A culture that prioritizes public safety doesn't seek to blame individuals. Instead, it encourages professionals to have open dialogue on ways to improve. This can be very difficult. To avoid these conversations, transportation professionals often assert that the city exposes itself to liability for damages if they discuss — let alone acknowledge — any potential failings.

There are three responses to this assertion:

First, local governments generally have limits on their liability for traffic crashes. Some have outright immunity. Check with your city attorney to see what your state or province provides. In nearly all cases, the potential damages are far too low to prompt hesitation to open dialogue.

Second, the best defense is an active program of improvement. For car crashes, nearly every claim brought against local governments is one of negligence. Actively working to identify and correct deficiencies is the opposite of negligence. Courts have historically given great deference to cities when they make discretionary decisions. Holding a Crash Analysis Studio is the best defense against a negligence claim.

Third, what good is shielding a city from liability if the cost is measured in its citizen's lives? When it comes to traffic safety, the moral and ethical calling of all local leaders is to reduce the number of fatalities and traumatic injuries. Fear of liability should never keep local officials from openly investigating, acknowledging and addressing the many factors contributing to automobile crashes.

Next Steps

Visit strongtowns.org/crashstudio to access:

- The complete collection of Crash Analysis Studio records, including recordings, recommendations and findings, stories, and more.
- A free course on conducting your own Crash Analysis Studio.
- More resources.

If you are a city leader or elected official and want to learn more about the Crash Analysis Studio model, email **studio@strongtowns.org**.

If you want to bring Strong Towns to your community to speak about the Crash Analysis Studio model or building safer streets, visit **strongtowns.org/speaking**.

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