TRAFFIC SAFETY AND SUBSTANCE USE TRENDS

Indiana State Epideimiological Outcomes Workgroup

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Abstract

This report presents a comprehensive analysis of traffic safety in the United States and Indiana, focusing on behavioral factors that increase crash risk. Impaired driving by alcohol, cannabis, and other drugs; distraction by cell phone use; and excessive speed are examined alongside adolescent risk behaviors such as driving after drinking, riding with impaired drivers, and failing to wear seat belts. Recent school violence data underscore the overlap among bullying, mental health vulnerabilities, and risky behaviors (IDOE 2023). Drawing on national strategies and successful models from Vision Zero and Target Zero, this report offers equity-driven, data-informed recommendations for public and population health professionals.

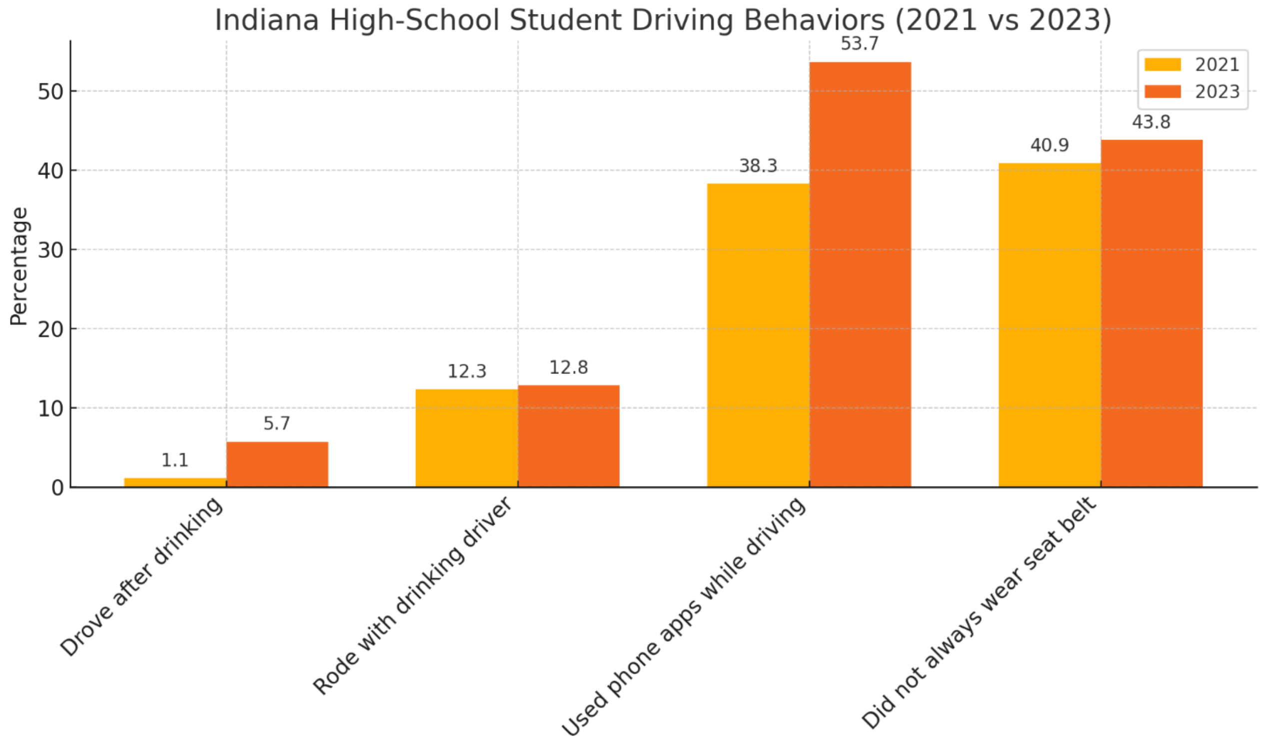
Executive Summary

From 2013 to 2023, traffic fatalities rose by 25 percent nationally before a modest decline following the pandemic peak (TRIP 2024; NHTSA 2024a). Indiana experienced a 7.3 percent increase in traffic deaths between 2021 and 2022 even as the national total fell (ICJI 2023; NHTSA 2024a). Alcohol impairment contributed to 29 percent of Indiana fatalities in 2022 (NHTSA 2024b). Distraction from cell phone use quadruples crash risk and accounted for 7.8 percent of US fatalities in 2022 (Guo & Lu 2022; NHTSA 2024a). Cannabis-related injury crashes grew by 6.5 percent from 2009 to 2019 (Farmer et al. 2022). Speed-related fatalities increased 25 percent between 2013 and 2022 (NHTSA 2024c).

As depicted in Figure 1 below, recent Youth Risk Behavior Survey data show that 5.7 percent of Indiana high-school students drove after drinking in the past 30 days compared with 1.1 percent in 2021 and 12.8 percent rode with a driver who had been drinking in 2023 (YRBS 2023; YRBS 2021). More than 53.7 percent used internet apps while driving in 2023, up from 38.3 percent in 2021, and 43.8 percent did not always wear seat belts as passengers in 2023 (YRBS 2023).

Figure 1: Driving Behaviors

2022–23 (IDOE 2023).



To address these interconnected challenges, public and population health professionals should integrate real-time crash data with hotspot mapping, expand Drug Recognition Expert training and toxicology. Developing interactive school-based curricula that address optimism bias, peer influence, bullying, and social media risks—as well as prioritizing infrastructure improvements in high-risk corridors—and piloting evidence-based frameworks such as Vision Zero and Target Zero with rigorous evaluation are also recommended.

Introduction

The combined economic and quality-of-life losses reached $1.85 trillion in 2023, reflecting medical costs, lost productivity, property damage, and the societal value of lives lost (TRIP 2024). Behavioral factors including impairment by alcohol, cannabis, and other drugs; distraction by cell phone use; and excessive speed remain dominant contributors to fatal and serious injury crashes (NHTSA 2024a). Almost 13 million motor-vehicle crashes occurred in 2022, and the Centers for Disease Control and Prevention reported that accidents were the third leading cause of death in 2022 (NSC 2024; CDC 2024). For the approximately 220,000 deaths caused by accidents, over 42,000 were caused by motor vehicle traffic crashes, which is nearly 20 percent of deaths caused by all accidents (NHTSA 2024a). Speeding, driving under the influence of substances, and distracted driving are three of the major behavioral factors involved in traffic fatalities. Substance use, especially alcohol use, is known to contribute to a high number of motor vehicle accidents. Previous research has indicated that approximately 25 percent of deaths caused by motor vehicle accidents can be attributed to drunk drivers (Sewell et al. 2010).

Understanding the primary locations, causes, and times when traffic accidents occur will help identify how funding should be allocated to reduce motor vehicle accidents. The purpose of this report is to identify these features and provide a general recommendation regarding how to improve traffic safety. The primary focus of this report will be identifying substance use trends from a traffic safety perspective and describing trends of substance use by drivers in Indiana.

Alcohol impairment quadruples crash risk at a blood alcohol concentration of 0.08 percent and increases it twelvefold at 0.15 percent (NHTSA n.d.). After decades of decline alcohol-related fatalities surged during the pandemic era returning to levels unseen since 2007 with 13, 524 deaths in 2022 (Responsibility.org 2022; NHTSA 2024b). Cannabis impairment and polydrug use have emerged as growing concerns: injury crashes involving cannabinoids increased 6.5 percent over a decade and roughly 18 percent of drivers in serious crashes test positive for two or more substances (Farmer et al. 2022; NHTSA 2022).

Distraction from cell phone use multiplies crash risk by a factor of four with visual-manual tasks such as texting accounting for nearly 87.5 percent of phone-related collisions (Guo & Lu 2022). Distracted fatalities comprised 7.8 percent of US traffic deaths in 2022 despite a 6 percent decline from 2021 (NHTSA 2024a). Speed-related crashes escalated by 25 percent between 2013 and 2022 accounting for 12,151 fatalities, with young drivers aged 15 to 20 disproportionately involved (NHTSA 2024c).

Traffic Safety Trends in the United States

Over the past decade, traffic safety trends in the United States have shown mixed outcomes, marked by periods of improvement and setbacks, particularly influenced by broader societal shifts such as the COVID-19 pandemic. From 2013 to 2023, traffic fatalities rose by 25 percent - from 32,893 to 40,990 (TRIP 2024). However, since peaking in 2021, there has been a gradual decrease in traffic-related deaths, with data from 2023 showing a 5 percent decrease in fatalities compared to 2021 (NHTSA 2024a & TRIP 2024).

Despite this progress, challenges remain. Vulnerable road users, such as pedestrians and bicyclists, have faced a greater chance of injury and death. Fatalities among pedestrians increased by 16 percent from 2018 to 2023, and bicyclist deaths increased by 29 percent in the same period. These groups now account for a significant proportion of total traffic deaths, highlighting ongoing gaps in infrastructure safety and urban planning that prioritize these road users' protection (TRIP 2024).

Motorcyclists have also experienced heightened risks, with fatalities rising by 28 percent between 2018 and 2023 (TRIP 2024). This increase correlates with higher non-helmet use rates, reflecting both behavioral challenges and insufficient enforcement of safety measures. For example, alcohol-related crash deaths increased by 29 percent from 2018 to 2022, and distraction-related fatalities increased by 16 percent in the same timeframe (NHTSA 2024a).

Efforts to improve traffic safety have led to increases in safety. Ongoing investment in safer roads, advanced vehicle technologies, and effective enforcement of traffic laws, combined with education campaigns targeting high-risk behaviors, are critical to achieving the long-term goal of zero fatalities on U.S. roads. These strategies require sustained commitment from all stakeholders, including policymakers, law enforcement, and the public, to ensure safer travel for all road users.

Seatbelt Use and Crash Severity

Seat belt use reduces fatality risk by 58 percent in passenger vehicles and 75 percent in trucks and SUVs (Kahane 2017). National compliance rose from 86 percent in 2013 to over 90 percent in 2022 yet nonuse remains a factor in half of fatal crashes (Responsibility.org 2022). Use is lower among males, younger drivers, and Black Americans, indicating the need for targeted outreach (Boyle 2023). As compared to 2013, the rates of seat belt use have increased (by ~7 percent) as compared to 2022 and remain high (>90 percent seat belt use) (Boyle 2023). Generally, seat belt use is lower in males (90.1 percent) than females (93.5 percent) (Boyle 2023). Seat belt use is usually lower in younger age groups than in lower age groups with 16-24 having the lowest at a rate of 87.7 percent and highest for 70 and older at a rate of 94.2 percent (Boyle 2023). Additionally, seat belt use appears to be lower among Black Americans (82.6 percent) than white Americans (92.6 percent) or Americans of other races (92.1 percent) (Boyle 2023). For children, appropriate use of a car seat is essential for safety. A significant majority of children are appropriately restrained, (93.3 percent in 2022), which decreases the risk of injury or fatality in the event of an accident (Boyle 2023).

Temporal and Spatial Patterns

Fatal crashes peak on Saturdays from May through September averaging 148 deaths per day on weekends versus 114 overall (NSC 2024). Rural areas account for 41 percent of traffic fatalities despite comprising only 20 percent of the population, while urban fatalities have increased since 2016 (IIHS 2024). Interstates and arterial roads host the majority of urban fatalities, and rural collector roads see the highest rural death counts (IIHS 2024). While holidays are suggested to be when most traffic fatalities occur, the National Safety Council found that Saturdays from May – September are when traffic fatalities happen most (NSC 2024). The number of traffic fatalities in rural areas has decreased from 2006 to 2022 while the number of traffic fatalities in urban areas has increased from 2009 to 2022 (IIHS 2024). More importantly, despite only containing ~20 percent of the population, 41 percent of traffic fatalities occurred in rural areas in 2022 (IIHS 2024). This trend has been prevalent since early data reports from the 1970s (IIHS 2024). This indicates that despite having a higher number of drivers, urban areas are less likely to have traffic fatalities compared to rural areas. This may be due to faster traffic in rural areas, and less available public transportation, which may contribute to higher prevalence of drunk driving.

It is important to note that urban traffic fatalities per year increased by 32 percent (17,013 to 25,023 urban traffic fatalities) from 2002 to 2022 while rural traffic fatalities per year decreased by nearly 50 percent (25,896 to 17,283 rural traffic fatalities) from 2002 to 2022 (IIHS 2024). The type of vehicle involved in a crash or whether a pedestrian or bicyclist was involved in the accident varied based on area. According to the Insurance Institute for Highway Safety, "In 2022, 68 percent of large truck occupant deaths and 65 percent of pickup occupant deaths occurred in rural areas, whereas more than 80 percent of pedestrian and bicyclist deaths occurred in urban areas. Motorcyclists were more likely to die in urban than in rural areas," (IIHS 2024). The type of road where traffic fatalities occurred varied between rural and urban areas. In 2022, interstates and freeways were the location of traffic fatalities for 14 percent of rural and 21 percent of urban fatalities (IIHS 2024). In 2022, arterial roads, or roads that are high-capacity urban roads that are near freeways or motorways, accounted for 58 percent of traffic fatalities in urban areas (IIHS 2024). In 2022, collector roads, or roads designed to move traffic from local streets to arterial roads and provide access to residential areas, accounted for 43 percent of traffic fatalities in rural areas (IIHS 2024). Local roads were the location of traffic fatalities for only 19 percent of rural and 10 percent of urban fatalities (IIHS 2024).

There is a common belief that you are more likely to be injured close to home. One research study found that 77 percent of traffic accidents occurred within 10 miles of the person's home, and the median distance was 5.5 miles (Haas et al. 2015). Pedestrians injured in motor vehicle accidents were a median of 1.1 miles from home, and bicyclists were a median of 1.2 miles from home (Haas et al. 2015).

Impact of Substance Use and Cell Phone Use While Driving on Traffic Safety

Cell phone use while driving is a major concern that contributes to a significant number of traffic accidents and fatalities. A systematic review discussed that use of cell phones increases the chance of a traffic accident by four-fold (Guo & Lu 2022). Further, visual-manual tasks, like texting or checking emails, contribute to 87.5 percent of cell phone-related crashes (Gue & Lu 2022). Cell phone use while driving is a key issue that caused 7.8 percent of traffic fatalities in 2022 (NHTSA 2024a). From 2021 to 2022, the number of traffic fatalities due to distracted driving decreased by 6.0 percent (3,521 to 3,308 of traffic fatalities) (NHTSA 2024a).

Young drivers are more likely to cause an accident related to cell phone use – it is estimated that 18 percent of accidents caused by young adults (aged 20-29 years) are attributed to cell phone use while driving (Guo & Lu 2022). This is significantly higher than middle-aged drivers (aged 30-64 years) where only 5 percent of accidents caused by middle-aged drivers are attributed to cell phone use while driving (Guo & Lu 2022). This indicates that young drivers may be a target for educational campaigns regarding the impact of cell phone use while driving.

Behavioral Contributors to Crashes

Alcohol impairment remains the leading preventable factor in fatal crashes with 13,524 alcohol-related deaths in 2022 including 9,047 at BAC $\geq$ 0.15 percent (NHTSA 2024b). Cannabis impairment contributed to a 6.5 percent rise in injury crashes from 2009 to 2019, and polydrug involvement appears in 18 percent of serious crashes (Farmer et al. 2022; NHTSA 2022). In

2023, 5.7 percent of Indiana high-school students drove after drinking in the past 30 days compared with 1.1 percent in 2021, and 12.8 percent rode with a drinking driver both years (YRBS 2023; YRBS 2021). Cell-phone distraction affected 53.7 percent of students in 2023, up from 38.3 percent in 2021, and seat belt nonuse reached 43.8 percent in 2023 versus 40.9 percent in 2021 (YRBS 2023; YRBS 2021).

Distraction from phone use increases crash risk by a factor of four and was associated with 3,308 fatalities in 2022, even though this marked a 6 percent decline from the previous year (NHTSA 2024a). Speed-related fatalities reached 12,151 in 2022, representing a 25 percent increase since 2013, with most crashes occurring between 9 p.m. and 3 a.m. (NHTSA 2024c). These behavioral patterns among young drivers highlight the urgent need for school-based prevention programs and focused enforcement efforts. Indiana reported 949 traffic fatalities in 2022, a 1.8 percent increase from 2021, while national totals declined by 1.7 percent during the same period (ICJI 2023; NHTSA 2024a). Although the state met specific targets to reduce unrestrained occupant deaths, alcohol related fatalities, and crashes involving speeding, broader goals for reducing overall fatalities were not achieved (ICJI 2023). Trends in compliance with hands free device laws and citation rates show progress, but Indiana still lacks comprehensive data on distracted driving and drug impairment, which limits the ability to monitor and respond effectively.

Alcohol-Related Traffic Accidents

Substances are well-known to impair one’s ability to drive. Alcohol is the primary substance assessed in traffic reports because it is involved in over a quarter of traffic-related deaths (NHTSA n.d.). Alcohol is a nervous system depressant that affects reaction times, muscle coordination, alertness, and judgement. The National Highway Traffic Safety Administration states that, compared to a blood alcohol content (BAC) of zero, a BAC of 0.8 increases your risk of crashing by 4, and a BAC of 0.15 increases your risk of crashing by 12 (NHTSA n.d.). In general, alcohol-related traffic fatalities have declined by 36 percent from 1982 to 2022, but since the pandemic, rates have increased to levels not seen since 2007. As compared to 2013, when alcohol-related traffic fatalities were at low levels, there has been a nearly 34 percent increase in total traffic fatalities with the rise starting in 2020 and again increasing in 2021. However, there appears to be a slight reduction (0.7 percent) from 2021 to 2022 (Responsibility.org 2022).

In 2022, a total of 13,524 were killed in alcohol-impaired driving crashes with 9,047 of those deaths caused by drivers with a BAC of 0.15 or higher (NHTSA 2024b). The number of alcohol-related traffic fatalities increased from 2013, where the number of fatalities was 10,084 (NHTSA 2024b). Approximately 92 percent of alcohol-related fatal crashes were caused by a driver that had no previous history of driving while intoxicated (Responsibility.org 2022).

Cannabis-Related Traffic Accidents

Cannabis use, like alcohol use, impairs one’s ability to drive. Cannabis use slows reaction time, causes poor coordination, and can impact your ability to judge distances while driving. The number of drivers that drove under the influence of marijuana increased from 2021 to 2022 (10,876,000 to 12,491,000) (SAMHSA 2022). An estimated 31 percent of individuals who drove under the influence of marijuana were aged 16-25 (SAMHSA 2022). Nearly 70 percent of individuals driving under the influence of marijuana were White while ~12 percent were Hispanic or Latino and ~11 percent were Black (SAMHSA 2022).

Studies estimate that, between 2009-2019, there was a 6.5 percent increase in traffic accidents leading to injury and a 2.3 percent increase in traffic fatalities due to cannabis use (Farmer et a. 2022). It has been suggested that the legalization of recreational marijuana is a small, but significant contributor to these increases. In one assessment by the NHTSA, 25.0 percent of drivers involved in an accident that resulted in a visit to a trauma center tested positive for cannabinoids (NHTSA 2022). Male drivers were more likely than female drivers to be under the influence of cannabinoids (26.8 percent vs. 20.8 percent) in accidents that resulted in a trauma center visit (NHTSA 2022).

Other Drug-Related Traffic Accidents

Use of illicit drugs is another contributor to traffic accidents. An estimated 2,343,000 individuals drove under the influence of illicit drugs other than marijuana in 2022 (SAMHSA 2022). The demographic distribution was similar to cannabis users with the majority of individuals being White (~71 percent) followed by Hispanic or Latino (~14 percent) and Black (~7 percent) (SAMHSA 2022).

The NHTSA reported that stimulants, sedatives, and opioids were the most common illicit drug (other than marijuana) used by a driver involved in accidents resulting in a trauma center visit (NHTSA 2022). The most prevalent were stimulants (9.8 percent) followed by opioids (8.6 percent) and then sedatives (7.5 percent) (NHTSA 2022). Other drugs accounted for an estimated 1.5 percent of these types of accidents (NHTSA 2022). An estimated 18 percent of drivers involved in this type of accident tested positive for 2 or more drugs (NHTSA 2022). Male drivers involved in this type of accident were more likely than female drivers to test positive for use of a stimulant (10.9 percent vs. 7.4 percent), but female drivers were more likely to test positive for opioids (8.9 percent vs. 8.5 percent) or sedatives (9.4 percent vs. 6.7 percent) (NHTSA 2022).

Impact of Speeding on Traffic Safety

Speeding is one of the three major behavioral factors that cause traffic accidents and traffic fatalities. It is well known that driving at higher speeds increases the risk for injury or death due to a traffic accident. Driving at high speeds causes a driver to have less time to react to avoid a collision due to longer braking distance among other factors (Institute for Road Safety Research 2012). The faster you go, the more likely a crash will cause a fatality. Additionally, driving during poor road conditions such as icy roads, heavy rain, fog, or snow increases the risk of motor vehicle accident due to speeding.

Over the past few decades, speeding has been estimated to be involved in one-third of all accidents, and in 2022, 29 percent of traffic fatalities involved speeding (NHTSA 2024c).

Speeding-related traffic fatalities has increased by 25 percent from 2013 to 2022 – increasing from 9,696 in 2013 to 12,151 in 2022 (NHTSA 2024c). Drivers under the age of 45 are more likely to be involved in a speeding-related traffic fatality, and according to the NHTSA, "Thirty-five percent of male drivers and 19 percent of female drivers in the 15-to-20 age group involved in fatal traffic crashes in 2022 were speeding, the highest among the age groups," (NHTSA 2024c). Importantly, motorcyclists are at a high risk of being involved in a fatal traffic accident if they were speeding – 35 percent of traffic fatalities related to speeding involved motorcycles (NHTSA 2024c).

Alcohol use was found to be common by drivers in fatal traffic crashes that also were speeding with 38 percent of speeding drivers in fatal crashes registering a BAC of 0.08 or higher (NHTSA 2024c). Further, data from 2022 found that for individuals aged 25-74, speeding drivers that caused traffic fatalities were twice as likely to be alcohol impaired (BAC >0.08) (NHTSA 2024c). In 2022, the majority of accidents caused by speeding with alcohol-impaired drivers occurred between 9pm and 3am (NHTSA 2024c).

Traffic Safety Trends in Indiana

From 2014-2022, there has been an increase in total traffic fatalities and in incapacitating injuries in Indiana (ICJI 2023). In Indiana, 949 traffic fatalities occurred in 2022 (NHTSA 2024a). From 2021 to 2022, there was a 1.8 percent increase in traffic fatalities in Indiana, while the national average decreased by 1.7 percent (NHTSA 2024a). However, other reports indicate that the number of traffic fatalities in Indiana has risen by over 7 percent (ICJI 2023). Fatalities caused by drivers under the age of 20 and in un-helmeted motorcyclists both decreased (ICJI 2023). Overall, the Indiana Criminal Justice Institute (ICJI) found that the 2022 goals to reduce traffic fatalities and serious injuries in traffic crashes were not met (ICJI 2023). However, several key goals were met including (ICJI 2023):

- Alcohol-impaired driving fatalities
- Speeding-related fatalities
- Motorcyclist Fatalities
- Bicyclist Fatalities

Seat Belt Use in Indiana

If not wearing a seat belt, individuals were 8-12 times more likely to be killed in a car accident than those who were wearing seat belts. In Indiana, 56 percent of passengers killed in crashes were not wearing seat belts, according to a 2020 report (Thelin 2020). Another report indicated that, in Indiana, 36.7 percent of passenger fatalities from vehicle accidents were due to a lack of seat belt use (ICJI 2023). Since 2012, traffic fatalities caused by a lack of seat belt use were the highest in 2019 (ICJI 2023). While a lack of seat belt use still contributes to a significant amount of traffic fatalities, rates of fatalities caused by a lack of seat belt use have been declining since 2019, although rates are still higher than in 2012-2015 (ICJI 2023). Rates of seat belt use have significantly increased since 2001, and in cars, rates of use have increased from 76.0 percent in 2001 to 93.3 percent in 2022 while, in trucks, rates of use have increased from 41.9 percent to 93.9 percent (ICJI 2023).

Cell Phone Use by Drivers in Indiana

In Indiana, data regarding cell phone use while driving is limited. The 2020 hands-free law has been suggested to improve roadway safety. However, more data is needed to provide an understanding of cell phone use and its relationship to traffic accidents and fatalities in Indiana.

Alcohol-Related Traffic Fatalities in Indiana

In Indiana, 29 percent of traffic-related deaths involved alcohol-impaired drivers, which is similar to the national average of 32 percent (NHTSA 2024b). From 2013 to 2022, the number of alcohol-related traffic fatalities per 100,000 in Indiana rose by 29.7 percent, which is slightly higher than the national average of 27.3 percent (Responsibility.org 2022). Only 10 states had a reduction in alcohol-related traffic fatalities from 2013 – 2022 (Responsibility.org 2022). Importantly, Indiana saw a significant decrease in the number of alcohol-impaired driving fatalities from 2021 to 2022 (223 to 156) (ICJI 2023).

Cannabis-Related & Other Drug-Related Traffic Accidents in Indiana

Like data about cell phone use, traffic related safety data regarding cannabis and other drugs in Indiana is limited. Most data regarding substance use and traffic safety in Indiana discussed "impaired driving," which includes alcohol use. However, the ICJI indicates that the number of citations issued for operating a vehicle while intoxicated due to drugs rose from 857 in 2016 to 1,261 in 2020. Most individuals arrested appear to be males, regardless of age group. Further, 63.5 percent of citations were issued to Whites, 14.2 percent were issued to Blacks, and 2.3 percent were issued to Hispanics. The most citations were issued in Marion County followed by Tippecanoe, Wayne, Huntington, and Vigo counties, respectively. (ICJI n.d.)

Speeding-Related Traffic Accidents in Indiana

Speeding-related fatalities in Indiana remained similar from 2012 to 2021, but there was a decrease of 51 from 2021 to 2022 (ICJI 2023). However, the number of collisions due to speeding rose from 17,475 in 2021 to 18,098 in 2022 (Palmer et al. 2023). Additionally, the number of speeding citations and arrests (during grant-funded enforcement) declined dramatically from 2021 (38,924) to 2022 (30,473) (ICJI 2023). A report by the Indiana University Public Policy Institute found that the number of traffic fatalities that were speed related is estimated to be 28.1 percent (Palmer et al. 2023). Marion county, followed by Lake and Allen counties, respectively, had the most speed-related collisions (Palmer et al. 2023). Speeding accounted for 13 percent of all motorcycle crashes in Indiana in 2022 (Palmer et al. 2023). Young males, aged 15-20, were most likely to be speeding, and 11 percent of males and 6 percent of female drivers aged 15–20 involved in a traffic accident were speeding (Palmer et al. 2023).

Highlighting Disparities

The variations in seat-belt compliance by race and age translate directly into unequal traffic safety outcomes. With Black Americans buckling up at just 82.6 percent compared with over 92 percent among White and other racial groups, Black drivers and passengers are at substantially higher risk of serious injury or death in a crash (Boyle 2023). This gap may reflect differences in enforcement, trust in law enforcement, or targeted outreach. Similarly, the lowest compliance among drivers aged 16 to 24 (87.7 percent) versus seniors over 70 (94.2 percent) suggests that newer drivers do not adopt protective habits as readily (Boyle 2023).

Rural adolescents warrant special attention. Although they make up only 20 percent of the population, rural residents account for 41 percent of traffic fatalities (IIHS 2024). For youth growing up in rural areas, there are longer travel distances, higher speeds on two-lane roads, and fewer alternatives to driving amplify risk. Moreover, adolescents who experience cyberbullying (26.5 percent statewide) or who have mental health challenges (64.1 percent bullied) may turn to substance use or distracted driving as coping mechanisms (IDOE 2023). These intersecting vulnerabilities call for culturally and geographically tailored interventions that address both protective behaviors, such as consistent seat-belt use, and underlying social stressors.

Behavioral Science Insights

Young drivers' optimism bias leads them to believe they are less likely than their peers to be involved in a crash (Weinstein 1987). This misperception reduces the effectiveness of generic "drive safe" messages. Peer norms also exert powerful influence: when teens believe "everyone else" uses a phone at stoplights or speed limits are optional, risky behaviors become self-fulfilling (Simons-Morton et al. 2011). School-based programs that enlist popular students as safety ambassadors, combined with public pledges to "drive unimpaired," harness positive peer pressure to reshape group expectations.

Case Studies of Successful Initiatives

New York City's Vision Zero demonstrated that combining automated enforcement with targeted roadway redesign can yield rapid, measurable reductions in fatalities. The city installed speed cameras in school zones and red-light cameras at high-crash intersections, while redesigning streets with pedestrian refuge islands and tighter turning radii. Within one-year, pedestrian deaths fell by 10 percent (NYC DOT 2014). Indiana could adapt this model by co-locating sobriety checkpoints with speed-camera corridors and piloting roadway "complete street" designs in urban and rural hotspots. Oregon's Target Zero framework shows the value of data-driven collaboration. The state Department of Transportation (DOT) used hotspot analysis to identify the top 5 percent of road segments by fatal and serious crashes then convened local law enforcement, community leaders, and public health officials to implement tailored interventions, from increased Drug Recognition Expert (DRE) patrols to public education campaigns. Over three years, Oregon achieved an 8 percent reduction in statewide fatalities (Oregon Department of Transportation, 2023). Embedding substance-use prevention specialists in these local coalitions can ensure that impaired-driving countermeasures address alcohol, cannabis, and emerging drug trends comprehensively.

Policy Levers for Prevention

Engineering solutions deliver proven safety benefits. Converting traditional intersections to modern roundabouts has been associated with a 72 to 80 percent reduction in injury crashes and a 35 to 47 percent reduction in all crashes (Retting, Persaud, Garder, & Lord, 2001). High visibility crosswalk treatments featuring enhanced pavement markings, advance yield lines, pedestrian refuge islands, and improved lighting can decrease pedestrian injury crashes by up to 40 percent and reduce total pedestrian crash rates by 42 percent (Federal Highway Administration, n.d.; Chen et al., 2013). Expanding Drug Recognition Expert training and embedding standardized toxicology screening into every serious injury and fatal crash investigation ensures that impairment from alcohol, cannabis, and other substances is consistently detected and addressed. School and community-based programs that integrate anti bullying curricula, mental health support, and media literacy training build adolescent resilience and disrupt the social and emotional drivers of risky driving behaviors.

Indiana currently lacks uniform toxicology protocols for crash investigations and comprehensive metrics on distracted driving enforcement. Establishing a centralized GIS enabled crash database will enable real time mapping of incidents, identification of emerging hotspots, and strategic allocation of enforcement and engineering resources. Deploying mobile DRE units, especially in rural and underserved areas, will extend the reach of impairment detection. Comprehensive data collection and transparent sharing across law enforcement, public health, and planning agencies will support rigorous evaluation of interventions and inform iterative policy refinements.

Recommendations for Traffic Safety in Indiana

Improving traffic safety in Indiana requires a multifaceted approach combining enhanced enforcement, infrastructure improvements, public education, and targeted interventions for vulnerable populations. Enforcing traffic laws is crucial for deterring risky behaviors such as speeding, impaired driving, and failure to use seat belts. Citations have decreased in recent years, which indicates better driving behaviors. However, further educational campaigns and incentives, like reduced insurance rates for safe drivers, could further improve traffic safety in Indiana.

Identify High Risk Areas

By identifying high-risk areas and times through crash data analysis, law enforcement can implement targeted strategies like sobriety checkpoints and saturation patrols. Increased visibility of these efforts, coupled with the deployment of automated enforcement systems such as speed and red-light cameras, can further enhance compliance with traffic regulations.

Recommended actionable steps:

- Conduct needs assessments to identify areas of high crashes, fatalities, and poor regulation
- Conduct pilot studies to determine efficacy of specific interventions

Educate on the Role of Impaired Driving under Any Substance

Addressing impaired driving remains a key priority. Expanding educational campaigns about the dangers of alcohol and drug-impaired driving, particularly targeting young drivers and repeat offenders, is essential. Healthcare providers and community organizations can play a vital role in screening for substance use and offering treatment referrals. Further, rates of drug-impaired driving need to be better understood within Indiana. Data collection regarding drug-impaired driving could provide better insights into causes of traffic accidents.

Recommended actionable steps:

- Invest in outreach campaigns that discuss how drugs impair driving, the cost of DUI or DWI (financially and personally), and more
- For students that drive, conducting an outreach program in school increases awareness of impaired driving issues and consequences

Improve High-Risk Areas

Indiana's road infrastructure must be adapted to prioritize safety for all users. High-crash locations should be prioritized for upgrades, such as installing roundabouts, improving signage, and enhancing lighting. Pedestrian and cyclist safety can be bolstered by creating safe crossing points and reducing speed limits in heavily trafficked areas. Investments in data collection and analysis will enhance Indiana's ability to make informed decisions about traffic safety. Partnerships among law enforcement, public health agencies, and community groups can further facilitate the sharing of data and best practices.

Recommended actionable steps:

- Integrate real-time data systems and conduct in-depth crash investigations to provide insights into underlying causes and identify effective solutions
- Improve data sharing practices; creating a centralized database could improve visibility in issues and allow for better collaboration

Improve Measures for Higher Risk Populations

Special attention should be given to protecting vulnerable populations. Strengthening Graduated Driver Licensing (GDL) laws, such as extending supervised driving periods and restricting nighttime driving, can mitigate risks for teen drivers. Similarly, programs supporting aging drivers in assessing their abilities and finding alternative transportation options are essential.

Recommended actionable steps:

- Develop stricter laws for teen drivers
- Provide accessible transportation options for aging drivers

Public education and community engagement are foundational to building safer roads. Behavioral change campaigns promoting seatbelt use, distraction-free driving, and adherence to speed limits must be evidence-based and widely accessible. Social media and mobile apps offer effective platforms for delivering safety messages.

Finally, Indiana should pilot innovative traffic safety programs and rigorously evaluate their outcomes. Metrics such as crash rates and behavior change should guide adjustments and expansion of successful initiatives. Sharing the results of effective programs can build public support and encourage broader adoption across the state. By integrating these strategies, Indiana can foster safer roads, reduce fatalities and injuries, and encourage more responsible road use statewide. Public and population health professionals should harness integrated crash, enforcement, and behavioral data to guide highly targeted interventions. Partnering with schools to develop interactive scenario-based modules that address optimism bias, peer influence, bullying, and social media risks will engage adolescents in adopting safer driving and riding practices. Expanding automated enforcement such as speed camera corridors and sobriety checkpoints during identified peak risk periods will enhance compliance with traffic laws. Infrastructure investments should prioritize the corridors and neighborhoods highlighted by hotspot analysis, incorporating roundabouts, high visibility crossings, pedestrian refuges, and traffic calming measures. Finally, piloting and rigorously evaluating Vision Zero and Target Zero frameworks through mixed methods studies will build the evidence base needed to scale the most effective strategies across Indiana.

Conclusion

Traffic fatalities in the United States and Indiana remain unacceptably high despite decades of progress in vehicle safety and roadway design. Impaired driving, distraction, and excessive speed continue to claim more than 40 000 lives each year nationwide and nearly 1 000 lives in Indiana alone. Adolescent risk behaviors such as driving after drinking, riding with impaired drivers, and distracted driving mirror adult patterns and underline the importance of early prevention and sustained education.

Addressing these challenges demands an integrated strategy that brings together public health, transportation, law enforcement, education, community organizations, and private sector partners. Real-time crash data systems and hotspot mapping enable precise targeting of enforcement and engineering interventions. Expanding Drug Recognition Expert training and standardized toxicology screening ensures that impairment beyond alcohol is detected and addressed. School- and community-based programs that combine behavioral science insights with anti-bullying and media literacy components can reshape youth norms around safety and responsibility. Infrastructure improvements such as roundabouts in high-risk corridors, enhanced lighting, and traffic calming measures create safer conditions for all road users. Equity must guide every action. Disparities in seat belt use, impaired driving, and injury risk among racial, ethnic, and geographic groups call for culturally tailored outreach and resources. Rural and urban communities face distinct challenges that require locally driven solutions supported by state and federal funding.

Clear metrics and regular reporting are essential to maintain momentum and accountability. Establishing interim milestones for fatality reductions, serious injuries, and behavior change indicators will help stakeholders assess progress and adapt strategies. Transparent public dashboards and community engagement forums can foster shared ownership of safety goals and reinforce positive change. By piloting and rigorously evaluating frameworks such as Vision Zero and Target Zero, Indiana can scale proven solutions statewide. Sustained collaboration among policymakers, practitioners, researchers, and community leaders will drive continuous improvement. With coordinated effort, data-driven decision making, and an unwavering commitment to equity, Indiana can move decisively toward the ultimate goal of zero traffic deaths.

References

A National Transportation Research Nonprofit (TRIP). (2024). Addressing America's traffic safety crisis: examining the causes of increasing U.S. traffic fatalities and identifying solutions to improve traffic safety. https://tripnet.org/wp-content/uploads/2024/07/TRIP_Addressing_Americas_Traffic_Safety_Crisis_Report_July_2024.pdf

Boyle, L. (2023). Occupant restraint use in 2022: Results from the NOPUS Controlled Intersection Study (Report No. DOT HS 813 523). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813523

Centers for Disease Control and Prevention. (2021). 2021 YRBS presentation: Youth risk behavior survey, Indiana high school data.

Centers for Disease Control and Prevention. (2023). YRBS 2023 Slides FINAL: Youth risk behavior survey, Indiana high school data.

Centers for Disease Control and Prevention. (2024, October 24). Leading causes of death. National Center for Health Statistics. https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

Chen, L., Chen, C., Ewing, R., McKnight, C. E., Srinivasan, R., & Roe, M. (2013). Safety countermeasures and crash reduction in New York City experience and lessons learned. Accident Analysis & Prevention, 50, 312–322. https://doi.org/10.1016/j.aap.2012.03.008

Farmer, C. M., Monfort, S. S., & Woods, A. N. (2022). Changes in traffic crash rates after legalization of marijuana: Results by crash severity. Journal of Studies on Alcohol and Drugs, 83(4), 494–501. https://doi.org/10.15288/jsad.2022.83.494

Federal Highway Administration. (n.d.). Crosswalk visibility enhancements. U.S. Department of Transportation. https://highways.dot.gov/safety/proven-safety-countermeasures/crosswalk-visibility-enhancements

Guo, F., & Lu, D. (2022). How many crashes does cellphone use contribute to? Population attributable risk of cellphone use while driving. Journal of Safety Research, 82, 385–391. https://doi.org/10.1016/j.jsr.2022.07.005

Haas, B., Doumouras, A. G., Gomez, D., de Mestral, C., Boyes, D. M., Morrison, L., & Nathens, A. B. (2015). Close to home: An analysis of the relationship between location of residence and location of injury. The Journal of Trauma and Acute Care Surgery, 78(4), 860–865. https://doi.org/10.1097/TA.0000000000000595

Indiana Criminal Justice Institute. (2023). FY2022 Annual Evaluation Report – Traffic Safety Division. https://www.in.gov/cji/traffic-safety/files/FY22-Annual-Report.pdf

Indiana Criminal Justice Institute. (n.d.). OWI Dashboard. https://www.in.gov/cji/research/crash-statistics/owi-dashboard/

Indiana Department of Education. (2023). School violence prevention proposal needs assessment.

Insurance Institute for Highway Safety. (2024). Fatality facts 2022: Urban/rural comparison. https://www.iihs.org/topics/fatality-statistics/detail/urban-rural-comparison Institute for Road Safety Research. (2012). SWOV Fact sheet: The relation between speed and crashes. https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa1304/Resources3/08 percent20-percent20The percent20Relation percent20Between percent20Speed percent20and percent20Crashes.pdf

Kahane, C. J. (2017). Fatality reduction by seat belts in the center rear seat and comparison of occupants' relative fatality risk at various seating positions (Report No. DOT HS 812 369). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812369.pdf

National Highway Traffic Safety Administration. (n.d.). Drunk driving. https://www.nhtsa.gov/risky-driving/drunk-driving

National Highway Traffic Safety Administration. (2022). Alcohol and drug prevalence among seriously or fatally injured road users (Report No. DOT HS 813 399). https://rosap.ntl.bts.gov/view/dot/65623/dot_65623_DS1.pdf

National Highway Traffic Safety Administration. (2024a). Overview of motor vehicle traffic crashes in 2022 (Report No. DOT HS 813 560). U.S. Department of Transportation. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813560

National Highway Traffic Safety Administration. (2024b). State alcohol-impaired-driving estimates: 2022 data (Traffic Safety Facts. Report No. DOT HS 813 579). National Center for Statistics and Analysis. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813579

National Highway Traffic Safety Administration. (2024c). Speeding: 2022 data (Traffic Safety Facts. Report No. DOT HS 813 582). National Center for Statistics and Analysis. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813582

National Safety Council. (2024). Motor vehicle injury facts. https://injuryfacts.nsc.org/motor-vehicle/overview/introduction/New York City Department of Transportation. (2014). Vision Zero action plan. https://www.nyc.gov/html/dot/downloads/pdf/vision-zero-action-plan.pdf

Oregon Department of Transportation. (2023). Target Zero strategic plan. https://www.oregon.gov/odot/safety/Documents/Target-Zero-Plan.pdf

Palmer, J., Siler, J., & Ruess, L. (2023). Indiana crash facts 2022. Indiana University Public Policy Institute. https://www.in.gov/cji/research/files/2022-TS-Fact-Book-Full-Report-1-22-24-with-crash-form.pdf

Responsibility.org. (2022). State of drunk driving fatalities report 2022. https://www.responsibility.org/wp-content/uploads/2024/10/2022-State-of-Drunk-Driving-Report.pdf

Retting, R. A., Persaud, B. N., Garder, P. E., & Lord, D. (2001). Crash and injury reduction following installation of roundabouts in the United States. American Journal of Public Health, 91(4), 628–631. https://doi.org/10.2105/AJPH.91.4.628

Sewell, R. A., Poling, J., & Sofuoglu, M. (2010). The effect of cannabis compared with alcohol on driving. The American Journal on Addictions, 18(3), 185–193. https://doi.org/10.1080/10550490902786934

Simons-Morton, B. G., Lerner, N., & Singer, J. (2011). The observed effects of teenage passengers on the risky driving behavior of teenage drivers. Accident Analysis & Prevention, 43(1), 269–273. https://doi.org/10.1016/j.aap.2010.08.017

Substance Abuse and Mental Health Services Administration. (2022). Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2021 and 2022. https://www.samhsa.gov/data/sites/default/files/reports/rpt42728/NSDUHDetailedTabs2022/NSDUHDetailedTabs2022/NSDUHDetTabsSect8pe2022.htm#tab8.35a

Substance Abuse and Mental Health Services Administration. (2024). Key substance use and mental health indicators in the United States: Results from the 2023 National Survey on Drug Use and Health. https://www.samhsa.gov/data /sites/default/files/reports/rpt47095/National percent20Report/National percent20Report/2023-nsduh-annual-national.pdf

Thelin, R. (2020). Occupant protection 2020. Indiana University Public Policy Institute. https://www.in.gov/cji/research/files/TS-Occupant-Protection-2020_IU-PPI.pdf

U.S. Department of Transportation. (2022). National Roadway Safety Strategy. https://highways.dot.gov/safety/roadway-safety/strategic-plan

Weinstein, N. D. (1987). Unrealistic optimism about susceptibility to health problems: Conclusions from a community-wide sample. Journal of Behavioral Medicine, 10(5), 481–500. https://doi.org/10.1007/BF00846146