

Box Truck Collision with Group of Bicyclists

Near Searchlight, Nevada
December 10, 2020

On Thursday, December 10, 2020, about 9:39 a.m., a 2019 Isuzu NPR-HD box truck, being driven by a 45-year-old male, collided with a group of bicyclists and a 2019 Subaru Outback sport utility vehicle (SUV) that were traveling in the rightmost southbound lane of US Highway 95 (US-95) in Clark County, Nevada.¹ Five of the bicyclists died, one bicyclist sustained serious injuries, one bicyclist and the driver of the SUV sustained minor injuries, and the driver of the box truck was uninjured. After impact, both the SUV and the box truck came to a controlled stop on the right shoulder of the roadway (see figure 1).



Figure 1. Box truck (left) and SUV (right) at final rest. (Source: Nevada Highway Patrol; photo of SUV has been redacted by the National Transportation Safety Board)

¹ (a) In this report, all times are Pacific standard time. (b) Visit [nts.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. HWY21FH002). Use the [CAROL Query](#) to search safety recommendations and investigations.

Location	US-95 southbound near mile marker (MM) 34 outside Searchlight, Nevada
Date	December 10, 2020
Time	09:39 a.m. Pacific standard time
Involved vehicles	1 box truck, 1 SUV, 7 bicycles
Involved people	9
Injuries	5 fatal (bicyclists), 1 serious (bicyclist), 2 minor (SUV driver, bicyclist), 1 uninjured (box truck driver)
Weather	Dry, clear, and daylight
Roadway information	At the crash location, US-95 was a four-lane, divided, asphalt-paved highway. The southbound lanes were composed of two 12-foot-wide travel lanes, and the right lane was flanked by rumble strips and an 8-foot-6-inch-wide paved shoulder. The speed limit at this location was 75 mph.

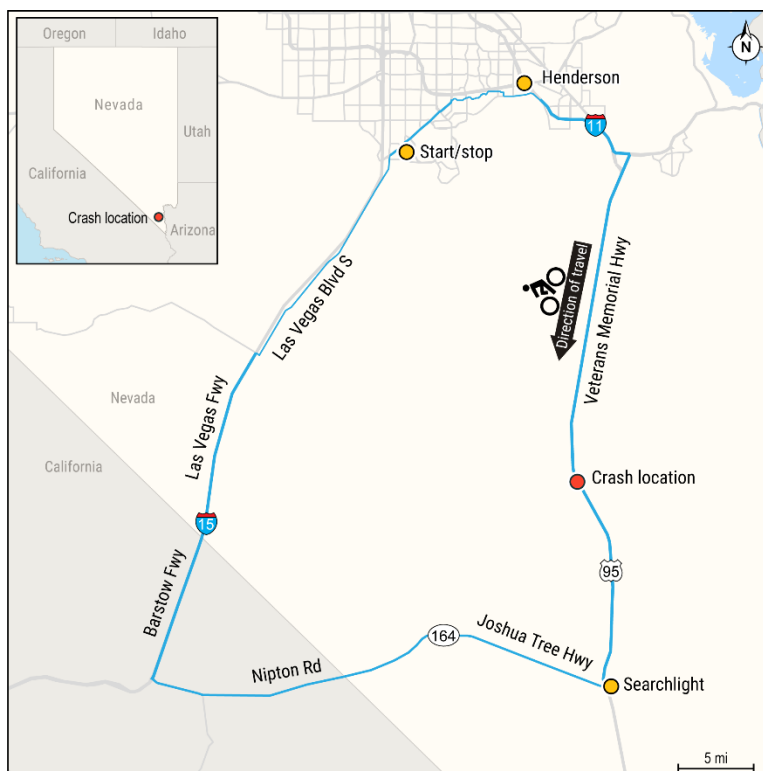


Figure 2. Bicyclists' planned ride route. Red circle indicates area where crash occurred. (Background source: Google Maps)

1. Factual Information

1.1 Background

A group of around 20 bicyclists was participating in an informally organized ride along an approximately 130-mile loop, known among local bicyclists as the “Nipton Loop,” that would conclude at their original point of departure in Henderson, Nevada (refer to figure 2). Information about the ride was spread by word of mouth and on social media, and it was not a formally sponsored event. Some bicyclists in the group had ridden the Nipton Loop at this time of year for the past 15 years. In previous years, the bicyclists had ridden exclusively on the paved shoulder of US-95. For the 2020 ride, a support and gear car was added to assist the bicyclists during the ride by carrying water, snacks, tools, and personal items; making these items available to the bicyclists at predetermined rest stops; providing parts and tools to repair bicycles if they were to break down during the ride; and transporting bicyclists and bicycles if they were unable to complete the ride. This was the first time that a group used a support and gear car on the Nipton Loop.

1.2 Event Sequence

The group began its ride about 7:10 a.m. At about 8:35 a.m., the driver of the SUV, which was functioning as the support and gear car, met up with some of the bicyclists on US-95 just south of Interstate 11, where they were waiting for three other bicyclists who had fallen behind when one of them got a flat tire. When the three bicyclists arrived, the group moved from the paved shoulder to the right travel lane of southbound US-95, with the SUV riding behind the bicyclists. As the group approached MM 34 near Searchlight, Nevada, it separated into smaller groups; one of these groups, consisting of nine bicyclists, moved behind the SUV to use it as a wind break.

At the same time, the box truck—owned by Penske Leasing and Rental Company, leased to and operated by Roadrunner Transport AZ (Roadrunner), and driven by a 45-year-old male—was also traveling south in the right lane of US-95 and approaching the SUV and bicyclists from behind. The truck struck seven bicyclists and collided with the rear left side of the SUV. The bicyclists were all wearing highly reflective gear and helmets, and at least some of the bicycles were equipped with reflectors and lights.²

² Due to the severity of the crash, the presence of lights and reflectors could not be confirmed for all of the bicycles.

The first 911 call regarding the crash was received by the Nevada Highway Patrol (NHP) at 9:39 a.m. Shortly after the crash, an off-duty firefighter/paramedic for the Las Vegas Fire Department who was driving past the scene stopped and began to render aid to the victims. A total of five fire and emergency medical services (EMS) agencies dispatched units to the crash.³ At 10:05 a.m., a fire suppression unit—Boulder City Fire Department (BCFD) Unit 510—arrived on scene. The first EMS unit, BCFD Unit 542, arrived on scene at 10:12 a.m. The seriously injured bicyclist was transported by Mercy Air to the University Medical Center of Southern Nevada (UMC) in Las Vegas, Nevada, arriving at 10:37 a.m. The SUV driver was transported on ground by Community Ambulance and arrived at UMC at 11:19 a.m. The bicyclist with minor injuries was treated on scene and declined transport.

At approximately 10:21 a.m., 40 minutes after the crash, while still at the scene, the box truck driver agreed to undergo a series of standardized field sobriety tests (SFST). Three tests were administered by an NHP trooper: the horizontal gaze nystagmus test, the walk-and-turn test, and the one-leg stand test.⁴ The driver failed the latter two tests. Two days after the crash, an NHP trooper certified as a drug recognition expert (DRE) reviewed the on-scene NHP trooper's body-worn camera video footage of the driver performing the SFSTs and determined that he was under the influence of a central nervous system (CNS) stimulant and was unable to safely operate a motor vehicle at the time of the crash.⁵

Also while on scene, the box truck driver agreed to provide a blood sample for analysis. He was driven by the NHP to Boulder City Hospital, where two vials of blood were drawn by hospital personnel at approximately 11:53 a.m. and were then analyzed by the Las Vegas Metropolitan Police Department Forensic Laboratory.⁶ A positive result was returned for amphetamine-class drugs. Confirmation analysis indicated the presence of methamphetamine at a level of 948.7 nanograms per milliliter (ng/mL) and amphetamine (a metabolite of methamphetamine) at a level of 36.4 ng/mL.

³ The Boulder City Fire Department, Community Ambulance, City of Henderson Fire Department, Clark County Fire Department, and Mercy Air were dispatched to the scene.

⁴ The SFST is a battery of tests used by trained law enforcement personnel to determine if a suspect is impaired. The horizontal gaze nystagmus test is designed to identify involuntary twitching of the eye while the test subject tracks the movement of a stimulus. The walk-and-turn and one-leg stand tests assess a subject's ability to divide attention by processing instructions, maintaining balance, and completing a basic physical task while counting aloud.

⁵ A drug recognition expert (evaluator), or DRE, is a law enforcement officer trained to recognize impairment in drivers under the influence of drugs other than, or in addition to, alcohol. For more information, please see <https://www.theiacp.org/drug-recognition-experts-dres> (accessed July 1, 2022).

⁶ The driver's blood was tested for the presence of ethanol (alcohol), amphetamines, benzodiazepines, cannabinoids, carisoprodol, cocaine, opiates, opiates-oxycodone, and PCP.

1.3 Additional Information

1.3.1 Truck Driver Experience and Precrash Activities

At the time of the crash, the truck driver held a class A Arizona commercial driver's license (CDL) with no restrictions, which he obtained in July 2018 after completing a 160-hour truck driver training course. He had more than 16 years of commercial driving experience. Investigators found no indications in the National Driver Register or the Commercial Driver's License Information System that the truck driver had any relevant infractions in his commercial driving record.⁷

According to Roadrunner, the driver began employment with the company on November 29, 2019, and he began driving a route on December 9, 2019. He had the same route—from Kingman, Arizona; to Las Vegas, Nevada; to Bullhead City, Arizona; and back to Kingman, Arizona—5 days per week for his entire employment with Roadrunner.

National Transportation Safety Board (NTSB) investigators documented the truck driver's activities in the days before the crash, from Sunday, December 6, up to the time of the crash on Thursday, December 10.⁸ Table 1 shows the driver's activities on Wednesday, December 9, 2020 (the day before the crash) and Thursday, December 10, 2020 (the day of the crash). On the day before the crash, the truck driver began his day in Kingman, Arizona, waking about 4:30 a.m. He picked up the truck and left Kingman, Arizona, around 5:30 a.m., arriving at the shipping facility in Las Vegas, Nevada, around 7:30 a.m. He then departed for Bullhead City, Arizona, arriving around 10:00 a.m. He completed his workday back in Kingman, Arizona, around 2:30 p.m.

When interviewed by NHP troopers on December 14, 2020, the driver admitted to smoking methamphetamine after work on December 9, 2020 (the day before the crash). He stated that he had used the drug in the past and had been through drug rehabilitation but had relapsed 2 months prior and had been using the drug off and on since that time. He described his usage as both a "few times" per week and "once a week." The truck driver reported that he went to bed around

⁷ The National Driver Register is a computerized database of information from 51 jurisdictions in the United States of individuals whose privilege to operate a commercial motor vehicle has been revoked, suspended, cancelled, or denied, or who have been convicted of serious traffic-related offenses. The Commercial Driver's License Information System is a nationwide computer system that enables state driver licensing agencies to ensure that each commercial driver has only one driver's license and one complete driving record.

⁸ For a complete reconstruction of the driver's activities in the days before the crash, refer to the Human Performance Group Chair Factual Report in the docket for this investigation.

9:00 p.m. on the night before the crash, and he stated that he was “tossing and turning” and got only about 4 hours of sleep.

On the day of the crash, the truck driver began his day in Kingman, Arizona, waking about 4:00 a.m. He picked up the truck and left Kingman, Arizona, around 5:00 a.m. He arrived at the shipping facility in Las Vegas, Nevada, around 8:00 a.m. and then departed Las Vegas, Nevada, for Bullhead City, Arizona, around 8:30 a.m. He was about 43 miles from the shipping facility and 57 miles from Bullhead City, Arizona, when the crash occurred around 9:39 a.m.

During the on-scene interview with the NHP, the truck driver stated that his last memory before the crash was of driving southbound on US-95. He said he did not recall seeing the bicyclists before impact. He stated many times that he must have fallen asleep and that all he remembered was the impact waking him up. The driver had two cell phones—one personal and one issued by his employer—in his possession at the time of the crash. Records from both providers indicate that the driver was not using either cell phone to make or receive a call or to send or receive a text message at or near the time of the crash. Investigators conducted a visual examination of the crash scene under conditions similar to those at the time of the crash and did not observe any unusual or distracting environmental features.

Considering the complete reconstruction of the truck driver’s activities, NTSB investigators determined that he had about 7 hours available for rest on each of the four nights preceding the crash. The truck driver admitted to not having good quality rest on at least two of those nights.

Table 1. Truck Driver’s Precrash Activity

Time	Activity	Information Source
Wednesday, December 9, 2020		
4:30 a.m.	Wakes at home in Kingman, Arizona	Written Q&A
5:30 a.m.	Departs Kingman, Arizona, for Las Vegas, Nevada	Written Q&A
6:43 a.m.	Sends SMS (first outgoing of day)	Personal cell
7:30 a.m.	Arrives at shipping facility in Las Vegas, Nevada	Written Q&A
8:30 a.m.	Departs shipping facility for Bullhead City, Arizona	Written Q&A
8:44 a.m.	Sends SMS	Personal cell
10:00 a.m.	Arrives in Bullhead City, Arizona	Written Q&A
10:20 a.m.	Leaves Bullhead City for Kingman, Arizona	Written Q&A
11:30 a.m.	Arrives in Kingman, Arizona, to make deliveries	Written Q&A
1:30 p.m.	Arrives at gas station in Kingman, Arizona	Written Q&A

Time	Activity	Information Source
1:45 p.m.	Leaves gas station in Kingman, Arizona	Written Q&A
2:30 p.m.	Completes deliveries; ends workday	Written Q&A
UNKNOWN	Uses methamphetamine	NHP interview
9:00 p.m.	Goes to bed at home in Kingman, Arizona	NHP interview
Thursday, December 10, 2020		
4:00 a.m.	Awakes at home in Kingman, Arizona	Written Q&A
4:30 a.m.	Leaves home to get truck	Written Q&A
5:00 a.m.	Leaves Kingman, Arizona, for shipping facility in Las Vegas, Nevada	Written Q&A
5:30 a.m.	Stops at Flying J in Willow Beach, Arizona	Written Q&A
5:45 a.m.	Leaves Flying J in Willow Beach, Arizona	Written Q&A
7:12 a.m.	Arrives at general merchandise retail store in Las Vegas, Nevada	Retail store surveillance still imagery
7:46 a.m.	Departs general merchandise store	Retail store surveillance still imagery
8:00 a.m.	Arrives at shipping facility in Las Vegas, Nevada	Written Q&A
8:30 a.m.	Departs shipping facility for Bullhead City, Arizona	Written Q&A
8:54 a.m.	Sends SMS (first outgoing of day)	Personal cell
9:39 a.m.	TIME OF CRASH	POLICE-REPORTED

1.3.2 Truck Driver Medical Certificate and Pre-Employment Drug Test

Although the vehicle that the truck driver was operating at the time of the crash did not require a CDL and therefore did not necessitate US Department of Transportation (DOT) drug testing, Roadrunner's owner required a DOT pre-employment alcohol and drug test on December 3, 2019, which was negative for alcohol and other tested-for drugs.⁹

In addition, investigators identified that the truck driver underwent a CDL medical exam in September 2020 as part of the Medical Review Program for CDL drivers licensed in the state of Arizona. The medical exam did not reveal any issues except for his blood pressure, which was high. Upon discovering the high blood pressure, the medical examiner stopped the exam and advised the driver to consult a

⁹ Drugs tested for included amphetamines (amphetamine and methamphetamine), MDA-analogues (MDMA and MDA), cocaine metabolites, marijuana metabolites, phencyclidine, opiates (morphine, codeine, and 6-acetylmorphine), synthetic opiates (hydromorphone and hydrocodone), and oxycodones (oxycodone and oxycodone).

doctor. The driver returned to the examiner after 1 week, at which time his blood pressure was improved but still high. As a result, the examiner qualified the driver for 3 months from the date of the initial exam (September 2020 to December 2020).

NTSB investigators submitted written questions to the truck driver following the crash. When asked, “How is your health, in general?” the driver stated “good,” and later disclosed he had high blood pressure. The driver also reported that he took blood pressure medication once per day and did not take any over-the-counter medications or herbal supplements.

1.3.3 Nipton Loop Ride

Roadway Information. The collision occurred in a rural area where US-95 was functionally classified by the Nevada Department of Transportation (NDOT) as an “other principal arterial” roadway, as defined by the American Association of State Highway and Transportation Officials (AASHTO).¹⁰ The principal arterial system (interstates, other freeways, and other principal arterial roadways) includes most—if not all—rural freeways. The geometric design and horizontal and vertical alignment of US-95 were in conformance with current Manual on Uniform Traffic Control Devices (MUTCD) guidance (DOT 2022). In the area of the crash, US-95 was not designated as a local, state, or federal bicycle route; however, it has seen increased usage by bicyclists as an alternate connection between Bicycle Route 66 and the city of Las Vegas.¹¹

AASHTO provides guidance for the development of on-road and off-road bicycle facilities (AASHTO 2018). On-road design options are shared lanes (marked and unmarked), bicycle lanes, bicycle boulevards, and paved shoulders. The use of on-road design options is most feasible on low-speed, urban roadways, and would not be appropriate for installation on high-speed, divided highways. Paved shoulders, however, are often used to accommodate bicyclists on roadways with relatively higher speeds or traffic volumes. When paved shoulders are used by bicycles on roadways without curbs and without vertical obstruction near roadways, AASHTO recommends that the shoulders be at least 4 feet wide and that they be placed on both sides of the roadway. The use of rumble strips is not recommended on shoulders used by bicyclists when there is a clear path of less than 4 feet.

¹⁰ According to the NDOT Roadway Functional Classification Map for Clark County, Nevada.

¹¹ US-95 was preliminarily designated as a US Alternate Corridor by AASHTO. An alternate corridor is a 50-mile-wide area where the state has determined that a bicycle route may be developed. Nevada Department of Transportation. 2013. [Nevada Statewide Bicycle Plan](#). Source: NDOT: Carson City, NV; 2013 (accessed July 15, 2022).

Although US-95 was not designated as a bicycle route, it provided an 8-foot-6-inch-wide outside paved shoulder, exceeding the recommended design guidance. In interviews with NTSB investigators, some bicyclists participating in the ride but not involved in the crash indicated that they had moved between the paved shoulder and the right travel lane during the ride.

Applicable State Permits and Statutes. NDOT has a system in place through which it grants permission, in the form of a temporary operating permit (TOP), for the temporary use of state roadways for purposes that fall outside of normal and legal use.¹² TOPs are available to the general public and can be used by bicyclist groups, whether for a formal sanctioned ride or an ad hoc recreational trip. NDOT indicated that the results of a permit process may range anywhere from a discussion about how the event can be conducted safely to NDOT providing traffic control, such as lane closures, depending on the circumstances of the event. The bicyclists on the December 10, 2020, recreational ad hoc ride did not request a TOP.

The SUV driver had operated a support and gear car approximately 16 or 17 times in the 10 years prior to the December 2020 ride but had never done so on the Nipton Loop. He told investigators that he was driving around 20 mph in the right travel lane with the vehicle's four-way emergency flashers activated. This approximated speed was confirmed by the SUV's airbag control module, which recorded speeds between 15.5 mph and 19.3 mph in the 5 seconds leading up to the crash. The speed limit for US-95 at the crash location was 75 mph. Under Nevada law, "a person shall not drive a motor vehicle at such a slow speed as to impede the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or in compliance with law." Further, Nevada law restricts the use of four-way flashers for nonemergency vehicles unless the vehicle is stationary (State of Nevada 2013).

¹² The "Temporary Occupancy, Special Events" permit information was accessed via the NDOT website: <https://www.dot.nv.gov/doing-business/right-of-way/permits/temporary-occupancy-special-events> (accessed July 21, 2021).

2. Analysis

The weather, which was clear and dry, was not a factor in this crash. The geometric design and combined horizontal and vertical alignment of southbound US-95 conformed to current design guidance and did not contribute to the cause or severity of this crash, nor did the regulatory, warning, route, and guide signs posted in advance of the crash location or the pavement markings in the vicinity of the crash, which conformed to current MUTCD standards (DOT 2022). US-95 is not a designated bicycle route; however, the paved outside shoulder adjacent to the southbound travel lanes of US-95 exceeded the recommended AASHTO design criteria for use as a bicycle facility and was wide enough to adequately accommodate bicycle traffic, despite the presence of continuous rumble strips.

The truck driver reported, and investigators found, that no internal or external distractions contributed to the crash. The truck driver's medical condition (high blood pressure), driving experience, and familiarity with the road and vehicle were not factors in this crash, nor was the conspicuity of the bicyclists. In addition, the emergency and first responder actions were timely and adequate.

2.1 Drug Use Among Commercial Motor Vehicle Operators

Postcrash, the truck driver failed two tests administered by the NHP to assess potential impairment. Toxicological testing of a blood sample provided by the truck driver after the crash indicated the presence of methamphetamine and amphetamine at dosages consistent with drug abuse and inconsistent with therapeutic dosage. When interviewed by NHP troopers on December 14, 2020 (four days after the crash), the truck driver admitted to smoking methamphetamine after work on December 9, 2020 (the day before the crash). He stated that he had been through drug rehabilitation in the past but relapsed 2 months prior to the crash and had been using methamphetamine off and on during that time. Based on the driver's reported last use of methamphetamine, it is likely he was in the withdrawal phase at the time of the crash.

Elevated doses or prolonged administration of methamphetamine may produce intense and overwhelming CNS effects, including exhilaration, euphoria, excitation, panic, and sexual arousal. Less frequently reported effects include hallucinations, delusions, perceptual distortions, and assaultive behavior. As time passes, the user enters the withdrawal phase, starting with CNS depression and progressing to periods of uncontrollable sleepiness and "microsleeps" that last from a few seconds to several minutes. The extensive literature on driving impairment and CNS depressants demonstrates a clear link between the two, suggesting that the CNS depression phase of withdrawing from methamphetamine stimulant intoxication

presents a significant risk of psychomotor impairment and a corresponding risk of poor driving performance (Logan 2002).

According to Penning and others (2010), studies indicate that it is especially unsafe to drive in the withdrawal phase after using most commonly abused drugs, including methamphetamine. In a review of the symptomatology of 28 drug-impaired driving cases, Logan (2002) concluded that neither the degree of impairment nor the phase of intoxication can be predicted from blood methamphetamine concentration; however, abuse can be distinguished from therapeutic use when the concentration is greater than 200 ng/mL. Additionally, several drivers in the study reported “falling asleep” while driving, which Logan indicates is highly suggestive of withdrawal-induced impairment.

Being in the withdrawal phase of amphetamine abuse causes fatigue, exhaustion, and excessive sleepiness. A study by McGregor and others (2005) found that amphetamine withdrawal symptoms appear shortly after last use and peak within 24 hours. The study further found that withdrawal syndrome is characterized principally by increases in sleeping and appetite. In general, the study’s findings support clinical reports of a “crash” period following methamphetamine use. These withdrawal symptoms are consistent with the driver’s statements regarding falling asleep and not seeing the bicyclists.

Acute sleep loss is the sleep deficit created from a single instance of inadequate sleep. In his written response to investigators’ questions, the truck driver stated that he got only about 4 hours of sleep on the night prior to the crash. The driver’s reported routine indicated an opportunity for sleep of approximately 7 hours every night, so 4 hours would represent a significant reduction from normal. Moderate sleep restriction for a single night, as little as 2 hours, has been shown to adversely affect human performance (Roehrs and others 2003). Because the driver reported having poor quality sleep on the night before the crash and at least one additional night leading up to it, he was likely experiencing acute sleep loss at the time of the crash as a result of methamphetamine use.¹³

According to the Nevada Departments of Public Safety and Transportation (2022), a total of 682 fatalities resulting from 609 fatal impaired driving crashes occurred on Nevada roadways between 2015 and 2019. Over the same period, 31% of fatal impaired driving crashes in Nevada occurred on rural roadways. The 2022 Nevada Office of Traffic Safety’s Highway Safety Plan includes strategies to reduce impaired driving crashes including, for example, driving while intoxicated courts;

¹³ Although medical records from more than a year prior to the crash reported that the driver had a history of obstructive sleep apnea and poor treatment compliance, his documented methamphetamine use on the evening before the crash greatly outweighs any contribution from this medical condition.

judicial and prosecutor education; law enforcement training; and communication, outreach, and education (Nevada Office of Traffic Safety 2021).

The NTSB has investigated commercial motor vehicle (CMV) crashes involving drug use for decades. Specifically, in the last 20 years, there have been numerous crashes in which drug use was part of the probable cause or was a contributing factor (NTSB 2017, 2016, 2015, and 2003). We previously recommended that the National Highway Traffic Safety Administration (NHTSA) evaluate and disseminate information to the states about best practices and effective safety countermeasures to help reduce fatalities, injuries, and crashes involving drug-impaired drivers.¹⁴ We also recommended that the Federal Motor Carrier Safety Administration (FMCSA) determine the prevalence of CMV drivers' use of impairing substances and develop plans to (1) reduce the use of such substances, and (2) help motor carriers address the issue by, for example, promoting best practices, expanding impairment detection training and authority, and developing performance-based evaluation methods.¹⁵ We also recommended that the FMCSA disseminate information to motor carriers about using hair testing for drug use screening.¹⁶ "Prevent Alcohol and Other Drug Impaired Driving" is on our 2021–2022 Most Wanted List (MWL) of Transportation Safety Improvements.

2.2 Protecting Vulnerable Road Users through a Safe System Approach

Highways are designed to move motor vehicles safely and efficiently, and usually do not fully meet the needs of pedestrians, bicyclists, and motorcyclists—a group known as “vulnerable road users” (VRU). Unlike motor vehicle users, VRUs lack an external structure to protect them when crashes occur and are therefore more likely to suffer a serious injury or death. According to NHTSA (2022), in 2020, 938 bicyclists died on roadways in the United States, which accounted for 2.4% of all traffic fatalities during the year. Of these fatalities, 21% occurred in rural areas. Also in 2020, an estimated 38,886 bicyclists were injured on roadways in the United States. According to the Nevada Traffic Safety Crash Facts (2021), between 2015 and 2019, there were 41 fatal bicycle crashes on Nevada roadways. Of these bicycle crashes, 5% occurred on rural roadways. One area of Nevada’s Highway Safety Plan focuses on promoting safety for pedestrians and bicyclists. The activities planned for 2022 include, for example, targeted enforcement, conspicuity enhancements, community

¹⁴ NTSB Safety Recommendation [H-18-57](#).

¹⁵ NTSB Safety Recommendations [H-15-38](#) and [-39](#).

¹⁶ NTSB Safety Recommendation [H-16-08](#).

coalition participation, advocacy, and speed management (Nevada Office of Traffic Safety 2022).

This crash occurred on US-95, a rural highway with a speed limit of 75 mph. Although not specifically designed for bicycle use, US-95 near the crash location included an 8-foot-6-inch-wide outside paved shoulder that could accommodate bicycle traffic. Had the bicyclists chosen to ride on the shoulder rather than the travel lane, the collision may have been avoided. The SUV was traveling at speeds slow enough to likely impede traffic, as well as with its four-way flashers activated. Although the SUV was not operating within the “rules of the road” in the state of Nevada, the bicyclists and SUV would have been visible to an approaching unimpaired and alert driver. According to NDOT, anyone using the roadway for purposes that fall outside of the standard rules of the road can apply for a TOP. Had the bicyclists on the December 10, 2020, ride applied for a TOP, the process would have allowed for a discussion about how the ride could have been conducted safely.

The NTSB advocates for a Safe System Approach that aims to eliminate fatal and serious injuries for all road users.¹⁷ The approach acknowledges that humans make mistakes that lead to traffic crashes and that the human body has a limited physical ability to tolerate crash forces. A Safe System Approach recognizes that safety is a shared responsibility involving multiple stakeholders, and that redundancy is essential so that if one part of the transportation system fails, road users are still protected. “Protect Vulnerable Road Users Through a Safe System Approach” is included as an issue area on the NTSB’s 2021–2022 MWL. We have recommended that NHTSA incorporate into the New Car Assessment Program tests to evaluate a car’s ability to avoid crashes with bicycles.¹⁸ We previously recommended that NHTSA, in collaboration with the Intelligent Transportation Systems Joint Program Office and the Federal Highway Administration (FHWA), expand vehicle-to-pedestrian research efforts to ensure that bicyclists and other VRUs will be incorporated into the safe deployment of connected vehicle systems.¹⁹ We also previously issued infrastructure-related recommendations to the FHWA to enhance its Proven Safety Countermeasure and Every Day Counts Program, as well as to AASHTO to revise its Guide for the Development of Bicycle Facilities.²⁰

¹⁷ See the Safe System Approach (<http://www.nts.gov>).

¹⁸ (a) NTSB Safety Recommendation [H-19-36](#). (b) NHTSA’s New Car Assessment Program focuses on safety technologies for light vehicles.

¹⁹ Safety Recommendations [H-19-37](#) and [-43](#).

²⁰ Safety Recommendations [H-19-42](#) and [-46](#).

3. Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the Searchlight, Nevada, crash was the box truck driver's impairment and fatigue stemming from his use of methamphetamine. Contributing to the crash was the decision made by the bicyclists to ride in the right travel lane of a 75-mph roadway.

3.2 Lessons Learned

Strategies are needed by NHTSA and the FMCSA to reduce fatalities, injuries, and crashes involving drug-impaired drivers. In *Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices*, the NTSB has previously recommended that NHTSA evaluate best practices and countermeasures found to be most effective in reducing fatalities, injuries, and crashes involving drug-impaired drivers, as well as provide additional guidance to the states on drug-impaired driving. The NTSB has previously recommended that the FMCSA determine the prevalence of CMV driver use of impairing substances, particularly synthetic cannabinoids, and develop a plan to reduce the use of such substances. We have also recommended that the FMCSA work with motor carrier industry stakeholders to develop a plan to aid motor carriers in addressing CMV driver use of impairing substances, particularly those not covered under current drug-testing regulations, such as by disseminating information about using hair testing for drug use screening, promoting best practices by carriers, expanding impairment detection training and authority, and developing performance-based methods of evaluation.

The NTSB advocates for a Safe System Approach to protect VRUs, including bicyclists. Safety is a shared responsibility, and efforts by federal agencies including NHTSA, the DOT's Intelligent Transportation Systems Joint Program Office, the FHWA, and AASHTO to prevent and mitigate crashes must address bicyclists and other VRUs.

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NTSB investigators worked with the **Federal Motor Carrier Safety Administration, the Nevada Highway Patrol, and the Nevada Department of Transportation** throughout this investigation.

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For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID HWY21FH002. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

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