

“Under the Trooper’s Hat”

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The North Dakota Highway Patrol (NDHP) provides crash reconstruction services for motor vehicle crashes that result in death or serious injuries and have the potential for criminal charges. The NDHP treats crash scenes as potential crime scenes and completes thorough and unbiased crash investigations and reconstruction. Crash reconstruction is done to determine how and why a crash happened. This is accomplished first by interpreting the clues left by the physical evidence on the vehicles and at the scene. This evidence is used to study and reconstruct the events preceding, during, and following the crash.

The NDHP currently has fourteen members on the Crash Reconstruction Team (CRT). The members of the CRT are considered crash technicians. Technicians are specially trained and equipped to identify and gather critical evidence at crash scenes. Once they gather and compile crash evidence, it is reviewed by the CRT coordinator and may be assigned to one of the five crash reconstruction analysts. The crash reconstruction analyst will then complete a comprehensive scientific analysis of all evidence in the case by using accepted techniques to form professional opinions regarding crash causation and contributing factors.

The crash reconstruction team deals with a lot of factors, depending on the case. They answer questions such as: What events contributed to the cause of the collision? Was the driver speeding and just how fast was he/she going? Could the driver have avoided the collision? Was the passenger wearing a seat belt? Who was *really* driving the vehicle? Was the fatal collision an "accident" or was it a suicide? Were the brakes maintained properly and did this contribute to the crash? Why didn't the driver see the other car? Was a vehicle being driven at night without its lights on? Which driver's story is more truthful? The CRT can uncover other important aspects of a crash which had been previously missed or overlooked by others.

Along with scouring the scene for evidence, digital data such as engine control modules (ECM), airbag control modules (ACM), or crash data recorders (CDR) are devices installed in motor vehicles to record technical vehicle and occupant information for a brief period of time (seconds, not minutes) before, during, and after a crash. Some of the information which may be captured is the vehicle's indicated speed, brake pedal use, accelerator pedal input, steering wheel input, seatbelt status, airbag deployment performance information, crash severity, and many more driver inputs and vehicle system status information. This data is extremely useful to the crash reconstructionist in determining how and why the crash occurred.

You may have also driven by a crash scene where troopers are working with something that looks like surveying equipment. The equipment is called a total station theodolite which is a surveying instrument used to measure horizontal and vertical angles. When evidence is located, a trooper will hold a pole with a prism over the evidence. The

instrument is focused on the prism and the operator takes a "shot" by pressing a button on the data collector. An infrared beam is shot at the prism and reflected to the instrument. The operator then enters a code for that specific shot. The trooper moves the pole to another evidence location and the process continues. The total station records the distance, angle, and elevation for each "shot" or piece of evidence. This information is extremely important for the CRT to properly reconstruct a crash.

Recently the CRT acquired small Unmanned Aerial Vehicles (UAVs) for taking measurements at crash scenes. The UAV is used to capture photographs from above. The UAV may take several hundred to several thousand overlapping photos to document a scene. The photographs are loaded into a software program which renders a 3D model of the scene using photogrammetry. CRT members who operate the UAVs are certified Federal Aviation Administration (FAA) part 107 (remote pilot certificate). Certification requires a training course on FAA rules and regulations followed by passing an FAA written exam.

Always remember to MOVE OVER and SLOW DOWN when you see emergency lights. A member of a CRT and a trooper may be on the scene of a crash collecting evidence and data.

The mission of the North Dakota Highway Patrol is to make a difference every day by providing high-quality law enforcement services to keep North Dakota safe and secure. NDHP invites you to visit the FAQ section of our website: www.nd.gov/ndhp, like our Facebook page www.facebook.com/northdakotahighwaypatrol or join us on Twitter [@NDHighwayPatrol](https://twitter.com/NDHighwayPatrol) or Instagram, www.instagram.com/ndhighwaypatrol, where you can learn more about traffic safety, get tips, and read NDHP news.