

December 12, 2023

Mr. Dane DeKrey, Attorney at Law
Ringstrom & DeKrey
814 Center Avenue, Suite 5
Moorhead, Minnesota 56560

RE: State of North Dakota vs. [REDACTED]
My Case No. 202305-2387

Dear Mr. DeKrey:

I am writing in regard to a two-vehicle collision which occurred on [REDACTED]. This letter outlines my preliminary findings and conclusions regarding this case.

The information used for the completion of this letter includes the following: North Dakota Motor Vehicle Crash report, numerous photos of the scene, physical evidence and involved vehicles, North Dakota Highway Patrol (NDHP) incident and supplemental reports, forensic mapping and diagrams completed by NDHP personnel, post-collision inspection reports from NDHP personnel, reconstruction related calculations completed by Trooper [REDACTED] Crash Data Retrieval report from the Toyota imaged by Trooper Steenstrup on September 1, 2022, and vehicle specifications for the Toyota and Nissan.

At your request, I have completed a technical review and analysis of the law enforcement investigation in this case and will provide an itemized summary for the following issues: area of impact and impact speed.

- 1) Area of impact – The NDSP reconstruction report, completed by Trooper [REDACTED] indicates the area of impact occurred in the westbound lane of travel. The law enforcement investigation concludes the Nissan Altima, driven by Mr. [REDACTED] [REDACTED] drifted into the eastbound lane of travel. The investigation further reports an eastbound Toyota Corolla, driven by [REDACTED] [REDACTED] [REDACTED] attempted to avoid the collision by swerving left and into the westbound lane. According to the investigation, the Nissan returned to its westbound lane and an inline collision occurred.

Based on my review of the law enforcement materials, the physical evidence in this case, and my damage analysis, it is clearly supported that the area of impact occurred in the westbound lane. Additionally, my damage analysis for both the Nissan and Toyota support law enforcement's conclusion that the Nissan was returning from the eastbound lane when the collision occurred.

- 2) Impact speed – The NDHP reconstruction report outlines the methodologies used to determine the impact speeds for the involved vehicles. One methodology includes using the event data recorder (EDR) information from the Toyota to analyze the change of velocity and impact speed of the Nissan. Another methodology involves using a momentum analysis to determine the impact speeds of the involved vehicles. It should be noted that both methods are routinely utilized and commonly accepted in the crash reconstruction community.

Trooper ██████ concludes the impact speed of the Nissan was between 64 and 80 mph. He further concludes the impact speed of the Toyota was between 25 and 33 mph. According to the Toyota's airbag control module, it was traveling 67.1 mph 4.6 seconds before the collision. The speed limit for Highway 13 is 65 mph.

According to Trooper ██████ reconstruction report, he concludes the Nissan was likely traveling near the higher end of the speed range. Trooper ██████ states, "This range is likely underreported due to a lack of published data affecting coefficients of friction discussed above."

As with any speed estimation technique, there is uncertainty with the involved variables. In this case, Trooper ██████ used the EDR data from the Toyota to calculate the change of velocity for the Nissan. This method involves using the change of velocity from the Toyota and the actual weights from both vehicles.

Trooper ██████ references the Institute of Police Technology & Management (IPTM) in his reconstruction report and uses IPTM worksheets in his analysis. Current IPTM training and published research shows there is uncertainty with the change of velocity values obtained from airbag control modules. IPTM training suggests the accuracy of the change of velocity data is +/- 10 percent. It does not appear Trooper ██████ accounts for this potential uncertainty in his analysis.

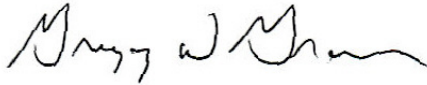
There is also uncertainty in all of the variables used in a momentum analysis. As Trooper ██████ pointed out, there is uncertainty with the actual frictional values experienced by both vehicles. Additionally, and most important, the approach and departure angles experienced by the vehicles can create a mathematically sensitive solution. In other words, small changes in some of the angles can yield large changes in the calculated result. This is especially true when evaluating inline collisions and collisions where the vehicles experience pre- and post-collision rotation (as seen with this collision). It should be noted when evaluating the approach angles, they are determined by the direction of the velocity vector and not the direction the vehicle is pointing at impact.

I do not see any significant errors in Trooper [REDACTED] calculations, specifically with the impact speed of the Nissan being between 64 and 80 mph. When considering the above uncertainties, I believe it is just as possible the Nissan was traveling 64 mph, which is below the 65-mph speed limit.

Lastly, you asked for me to include a biographical sketch outlining my qualifications. I served the law enforcement community for 26 years and retired as a sergeant with the St. Paul, Minnesota Police Department. I earned accreditation from the Accredited Commission for Traffic Accident Reconstruction (A.C.T.A.R.) since 1994. To date, I have over 4,000 hours of training in various areas of traffic collision investigation and reconstruction, including the analysis of event data recorder information.

These opinions are based on a reasonable degree of accident reconstruction certainty. The above conclusions are based on the information available to me at this time. If new information arises, the above conclusions may change.

Submitted by,



Gregory Gravesen, ACTAR #592
Accredited Accident Reconstruction Specialist

