D18 Roadside Tire Mark: A Useful Source of Supplementary Evidence

Zygmunt M. Gorski, BA, London, ON N5W 1G5, CANADA*

Learning Overview: The goal of this presentation is to educate attendees about the characteristics and meaning of tire marks on roadsides that, in specific instances, can provide supplementary evidence to improve the quality of an investigation.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by drawing attention to the fact that the identification and interpretation of roadside tire marks can provide additional, useful evidence in some types of investigations.

Tire marks have been previously studied for identification of specific vehicles in hit-and-run incidents or in interpreting road surface marks that lead to calculations of vehicle speed or vehicle motion. Less focus has been drawn to the useful information that can be obtained from studying tire marks left on roadsides on soft surfaces such as gravel, sand, or a combination thereof, typically found on roadway shoulders. Vehicular travel on hard pavement is difficult to detect unless there is substantial frictional force that causes visible markings. Even tire marks on snow-covered, hard-paved surfaces can be quickly obliterated by passing traffic.

In contrast, tire imprints on softer shoulders are more easily created and less often destroyed. The quality and visibility of these markings are affected by time, environmental conditions, and the characteristics of the soft surface itself. Their presence will also vary with respect to the type of roadway involved and the likelihood that vehicles egress onto a roadside for select reasons. Identification and interpretation of these markings can be useful in instances such as police traffic stops, which may become significant where witness information needs to be compared to the physical evidence, where vehicular loss-of-control needs to identified, and where roadway safety deficiencies need to detected.

This presentation will discuss characteristics of tire marks caused by vehicles in positive and negative acceleration. Differences in tire marks caused by changes in direction will also be discussed. The angle of departure of vehicles obtained from tire marks can be related to differences in driver behavior such as loss of control, medical episodes, and falling asleep. Differences in tire marks will be discussed in terms of front and rear wheel drive vehicles as well as overlapping tire marks as related to differences in time/date of occurrence.

Roadway maintenance procedures such as re-grading of shoulders will be discussed as these play a large role in the softness of the surface and whether tire marks are likely to be created. Re-grading causes the removal of any previous markings and an investigator who is familiar with the characteristics of a freshly re-graded shoulder will also become aware that almost all vehicle motions will produce well-defined impressions. Alternatively, shoulders experiencing long durations of dry conditions combined with a clay-like composition may allow few opportunities for leaving identifiable markings.

This presentation will focus on tire marks that were created by naturalistic driving on public roadways with less focus on marks created from controlled testing. While controlled testing may be useful in highlighting specific characteristics of tire marks, the investigator will encounter roadside tire marks in less than ideal conditions where various influences may be at play making identification and interpretation more difficult. There is some benefit gained in providing the investigator with such real-life scenarios.

Roadside Tire Marks, Interpretation of Tire Marks, Tire Marks

*Presenting Author