F10 Analyses of Multiple Mobile Devices and Services in Distracted Driving Cases: Data Synchronization and Defeating Unscientific Applications of Those Data

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After attending this presentation, attendees will better understand: (1) the value of seeking all potentially relevant mobile devices and service records associated with a distracted driving case; and, (2) the value of synchronizing mobile device and service data — including text messages, Global Positioning System (GPS) track points, service provider business records, and e-911 center records — into an integrated case timeline and incident map.

This presentation will impact the forensic science community by alerting digital forensic scientists and trial lawyers to the importance of: (1) thorough investigation and examination of all mobile devices and service records associated with a distracted driving case; (2) synchronizing mobile devices and service data into an integrated case timeline and incident map in such a case; and, (3) recognizing, and reacting to, any misuse of such data.

For the defense in a criminal case to have first-in-time access to digital devices that contain potentially dispositive evidence is likely rare. Yet that is what happened when law enforcement responders from state, county, and municipal agencies had the opportunity to examine those devices first following a serious traffic accident in rural northwestern Minnesota but neglected to do so. This presentation addresses the synchronization of three sets of mobile device data to determine exactly when and where the operator of a motor vehicle was when she sent and received text messages and exactly where and when the motor vehicle accident occurred.

The criminal case that gave rise to the digital forensic investigation pertinent to this presentation was charged as criminal vehicular homicide and criminal vehicular injury. The State alleged that the defendant had made a left turn onto a two-lane highway just in front of two motorcyclists. Both motorcyclists were seriously injured in the accident; one of the motorcyclists died six days later. The State's case was essentially that the defendant was texting at or just before the moment of impact, and thus was grossly negligent.

At the accident scene, law enforcement did not seize the defendant's cell phone (an old feature phone, not a "smart phone" in any meaningful sense), nor did they seize the defendant's stand-alone GPS unit. More than four months passed before the State actually charged the defendant. Once the defendant had submitted her phone to the mobile device forensic scientist, all data relevant to the accident had been overwritten by her subsequent daily use of the device; however, on forensic examination, the GPS unit's data were found to be completely intact. Because mobile device, cell carrier, and GPS timing are based on Coordinated Universal Time (UTC) with sub-second accuracy and limited latency periods, a mobile device forensic scientist possessing multiple data sets can synchronize them and determine within a documented, small margin of error exactly where and when any given text message was sent or received during a GPS-tracked trip. In this case, the forensic scientist determined that the defendant received her last text message more than a full minute before the accident, and that, at that moment, she was in a completely different location from the accident that subsequently ensued. The jury acquitted the defendant on all felony charges.

The State also disclosed a "Google® flyover video" that it intended to introduce as a demonstrative exhibit at trial. The flyover video used the GPS track points to create a short animated video of the defendant driving her vehicle the

last several miles of the trip, culminating in the accident. Because of data and process weaknesses, including the margin of error inherent in civilian GPS devices and arbitrary movie-making choices by the "producer" the Google® flyover video playback made the defendant's driving appear deranged and was therefore profoundly prejudicial. The digital forensic scientist and lawyer worked closely together to build a motion *in limine* and supporting affidavit to successfully keep this exhibit from being seen by the jury.

Mobile Device Forensics, GPS/SMS Text Synchronization, Google® Flyover Exhibits