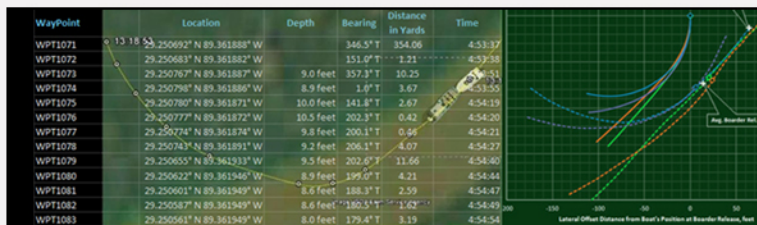


GPS Data - Windfall or Worrisome in an Accident Reconstruction



Technology can be very powerful and useful when it expands in unanticipated ways into applications it was never intended for. The broad area of technology that we commonly refer to as “wireless” can likely be traced back to the advent of radio communications. In its emergent form, it was simply the evolution of a need to communicate portably without the obvious limitations of the telegraph. The early years of this new “radio” capability modernized everything from military communication to commercial shipping. Entertainment was packaged in a new form along with inter-global communication. Today it has evolved to include wireless phones, cellular technology, Bluetooth, printers, remote controls, drones and many other familiar conveniences that were never likely imagined in the beginning.

Global Positioning System (GPS) technology is another example of an emergent technology that has had an unforeseen influence on many applications. In its infancy, GPS was conceived as a navigational aid alternative to an aging technology known as Radio Direction Finding (RDF) equipment. RDF used a directional antenna to identify an azimuth to known transmission sources for radio signals that were then triangulated for definition of your physical location on a navigational chart. GPS also used triangulation with earth satellites in well-established orbits to define a location with considerable accuracy. This minimized the line-of-sight limitations associated with the curvature of the earth as well as the sparsely available transmission sources in remote areas of the planet.

Fast forward to the present and GPS has been integrated into highly sophisticated weaponry guidance systems, navigational tools, cell phones, unmanned vehicles, tracking devices, commercial apps, emergency response networks and a host of other uses. The entire globe has now been surveyed and mapped with its capabilities. The data may be collected and sometimes stored by a variety of different devices for a variety of different purposes with an enormous range of accuracy and resolution.

As forensic engineers, we are frequently asked to download or extract GPS data from a variety of different devices depending on the nature of an event and the party’s goal. Cell phones and navigational systems aboard vehicles and vessels are common points of interest. Corroborating or debunking a vehicle’s presumed location, time, direction of travel, and speed over ground are the most common priorities. Such details can seem like “unimpeachable facts” when contrasted with opposing recounts of an incident, or the lack of surviving witnesses.

The facts however, are not nearly so convenient or tidy. As it turns out, all GPS data recorders do not have the same features, accuracies, data storage, satellite connectivity, time-stamps or ease of retrieval. Depending on the device, data may or may not even be stored, or perhaps is in an encrypted format rendering it unavailable without complex negotiation with unmotivated parties or entities.

As with other technologies, it is important to work with qualified personnel in order to navigate the complex environment of GPS data recovery, interpretation and review, as well as error evaluation. It is also critical to collect GPS data as quickly as possible, lest it be overwritten, erased or otherwise corrupted.