NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, D.C. 20594

January 5, 2017

Personal Electronic Device (PED)

Specialist's Factual Report
By Sean Payne

1. EVENT SUMMARY

Location: New Orleans, Louisiana
Date: February 20, 2016
Operator: Norfolk Southern
NTSB Number: DCA16FR003

On February 20, 2016, at approximately 6:10 a.m. central standard time (CST), Norfolk Southern (NS) Train 298 struck and fatally injured a NS Terminal Trainmaster on main track 2 at milepost 186 of the NE Subdivision, Alabama Division. The visibility conditions at the time of the accident were very poor with low lying fog.

2. DETAILS OF INVCSTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following PED device:

Recorder Manufacturer/Model: **iPhone 5s**
IMEI Number: **358813057295218**

2.1. iPhone 5s Description

The Apple iPhone is a touch-screen operated smart-phone capable of voice calling, text messaging, email, photo/video recording, audio (music) playback, and numerous other specialized functions depending on configuration. The unit is capable of accessing wireless networks using the IEEE 801.11n protocol (WiFi[1]) and other wireless devices supporting Bluetooth[2]. Specialized functions are supported by additional user-installed program applications (Apps). Application data is stored in non-volatile memory[3] and may include call logs, text messaging logs, image, video, and position location information. In addition, specialized application data may be stored in a proprietary file structure using numerous file formats including: binary, ASCII, HTML, SQL, etc. The amount and type of data stored varies based on the software version and configuration of the specific device.

[1] WiFi – A local area wireless computer network technology that allows electronic devices to connect to a network.
[2] Bluetooth – A wireless technology standard for exchanging data over short distances.
[3] Non-volatile memory – NVM – Semiconductor memory that does not need power applied to retain data.

2.1.1. Data Recovery

The iPhone 5 was delivered to the lab and exhibited only damage to the device's touchscreen. The touchscreen was found to be covered in clear, office type tape. The device was functional and the password was provided. The device was read out using laboratory forensic PED software and protocols. Figure 1 is a photo of the device and the included case as received.

Figure 1. Exterior of iPhone 5s.

2.1.2. Data Description

All electronic files recovered were consistent with normal PED usage. Data recovered from the device is summarized below.

This particular PED was determined to be the user's business phone. Records indicate the individual also maintained a separate PED for the user's own personal use.

Text Messages

Three text messages were present on the device on the morning of the accident prior to the accident. At 0503:03 a message was received asking "You still need a crew?" At 0508:38 the PED user replied, "I'll let you know in about an hour." At 0512:15, the PED user sent a message that said, "532 on hand, 276 in yard, 157 enroute."

At 0622:24 an incoming text message was received that read, "Are you ok ? Where are you 22q hit a trespasser at lake front." The message showed as incoming/read, however, when the device was forensically downloaded, the software indicated the phone was powered on after the accident before reaching the NTSB laboratory and this message was likely not read by the PED user.

Between the accident data and March 3, 2016, approximately 66 text messages were present on the device. The majority of these text messages were sent through what appeared to be an automated Norfolk Southern messaging system. Some work related messages from other users were received during this time. These work related messages

were not relevant to the investigation, however, they were still displayed on the PED activity graphic shown in figure 2.

All text messages present on the PED were reviewed and were mostly work related. A few messages within group text message activity suggested that users refrain from using “corporate phones” for personal discussions and that the messages be relocated to individual’s private phones. This activity was related to discussing outside of work activity (meeting for meals for example). None of the text messages were determined to be relevant to the accident investigation.

Images/Videos

None of the photographs found on the device were determined to have relevance to the investigation. The last photograph was captured by the user at 22:43:30 CST on February 18, 2016. The images and video recordings were mostly work related and were determined to be non-pertinent to the investigation.

Email History

The email history present on the device at the time of examination was determined to have no relevance to the investigation.

Calls

On the morning of the accident, sevens calls (both outgoing and incoming were received on the device. The first missed call was received on February 20, 2016 at 0613:45. A number of other missed calls were present on the device up until February 23, 2016 at 1853:31. Table 1 summarizes those communications

Table 1. Calls received or dialed on the device on the morning of February 20, 2016.

Received, Dialed or Missed	Time (CST)	Duration
Received	2/19/2016 - 2300:03	2m 07 sec
Received	2/19/2016 - 2314:01	2m 12 sec
Dialed	2/19/2016 - 2316:52	36 sec
Dialed	2/19/2016 - 2317:39	57 sec
Dialed	2/19/2016 - 2344:30	24 sec
Received	2/19/2016 - 2346:38	15 sec
Received	2/20/2016 - 0224:47	1m 01 sec

Voicemails

Two voicemails on the morning of the accident were received to the PED post-accident. Both were received in rapid succession around 0617 CST and were about 15 seconds in duration. The messages inquired about the PED user's awareness of the struck individual in the vicinity of the accident.

All other voicemails and deleted voicemails were reviewed and were found to be non-pertinent to the investigation.

Browser History and Application Usage

Internet history was reviewed and was determined to be mostly work or transportation industry related. Internet history was determined to be non-pertinent to the investigation.

Between February 14, 2016, and February 18, 2016, there was indication of usage of a real estate application. Within the preceding approximate 8 months there was also usage of the same application. Specific time instances were not quantified.

72 Hour History[4]

A graphic of the user's 72 hour history based on PED usage information recovered from the forensic examination software was created. Blue indications in the timeline represent activity on the device, the software does not provide a key to differentiate between light blue colored entries and dark blue colored entries, nor does the software give the user to identify the specific type of cellular network interaction. White blocks indication portions of time in which the device was not interacted with over a cellular network. The specific type of interaction could not be quantified using the forensic software. Figure 2 represents the user's PED activity for the previous 72 hours. The black cross-hatched area indicates the period of time after the accident. During this time, the device received a number of texts, calls and voicemails which were not responded to.

Using this particular PED to quantify rest hours was deemed to be inconclusive, as the activity history only indicates when the user was interfacing with a cellular network. Additionally, the individual involved in this accident also utilized his own, separate PED, which the NTSB was not able to examine.

[4] PED usage history addresses only the device covered in this report, and does not account for personal activity that may have occurred on other devices such as the user's own PED which the NTSB was unable to examine.

Figure 2. PED usage during 72 hours prior to the accident.