3. Real-World Crash Data: Crash in Tulsa, Oklahoma

As noted in my original report, I have continued to document real-world crashes. A fatal crash occurred on May 11, 2014, on Okmulgee Expressway (US-75) just south of the US-75/I-244 interchange in Oklahoma, as shown in Figure 1 (36°06'35.38" N, 96°0'41.6"W).

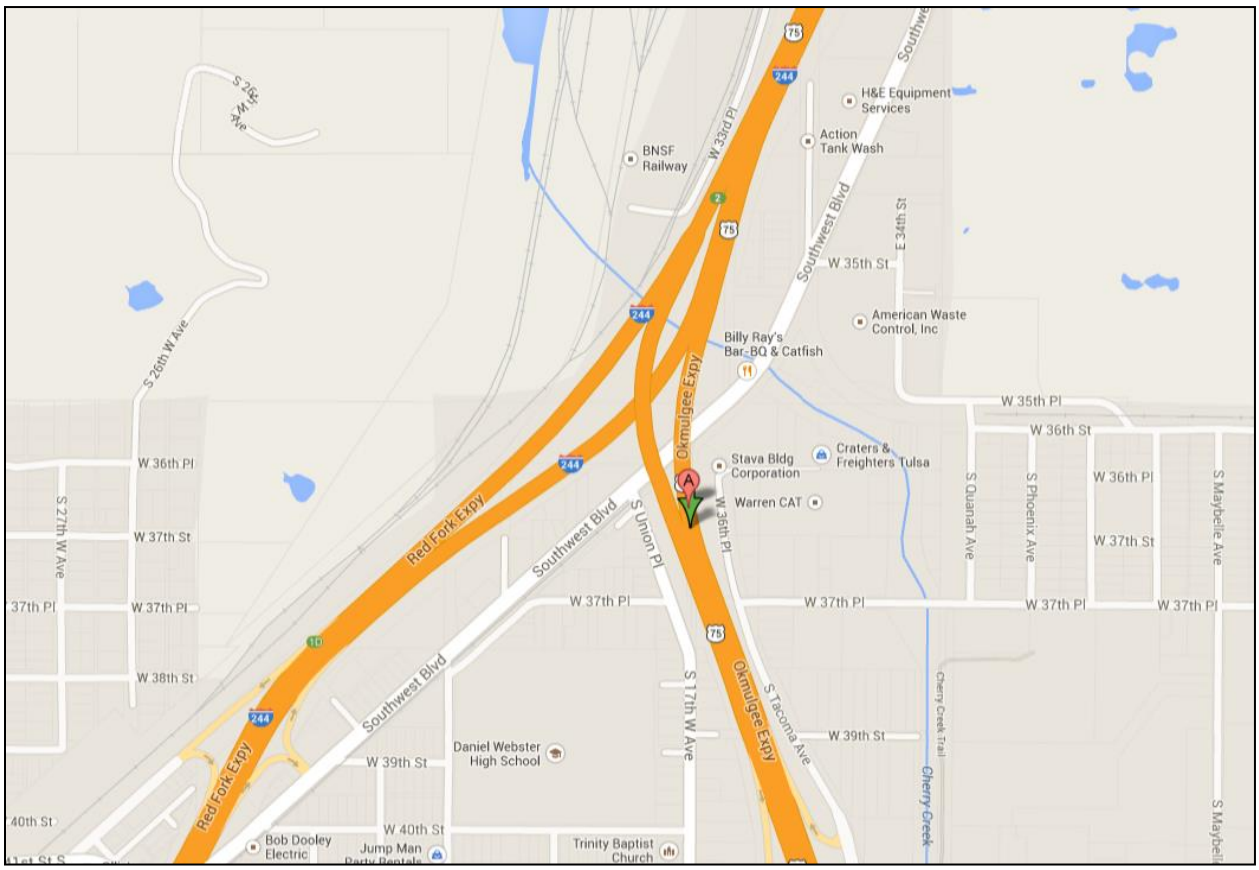

Figure 7. General Location of Crash.

According to the Accident Report, "It appears the driver simply departed the roadway to the left (west) and struck the guardrail." This is consistent with the scene diagram, as shown in Figure 8. The vehicle did not appear to be yawing and appears to have impacted the terminal nearly end-on. The impacting vehicle was a Chrysler Cirrus.

Figure 8. Accident Report.

The crash scene was several days old when I happened by it on May 18, 2014. I stopped to take a number of photographs of the scene, some of which are included herein. The damaged guardrail is shown in Figure 9.

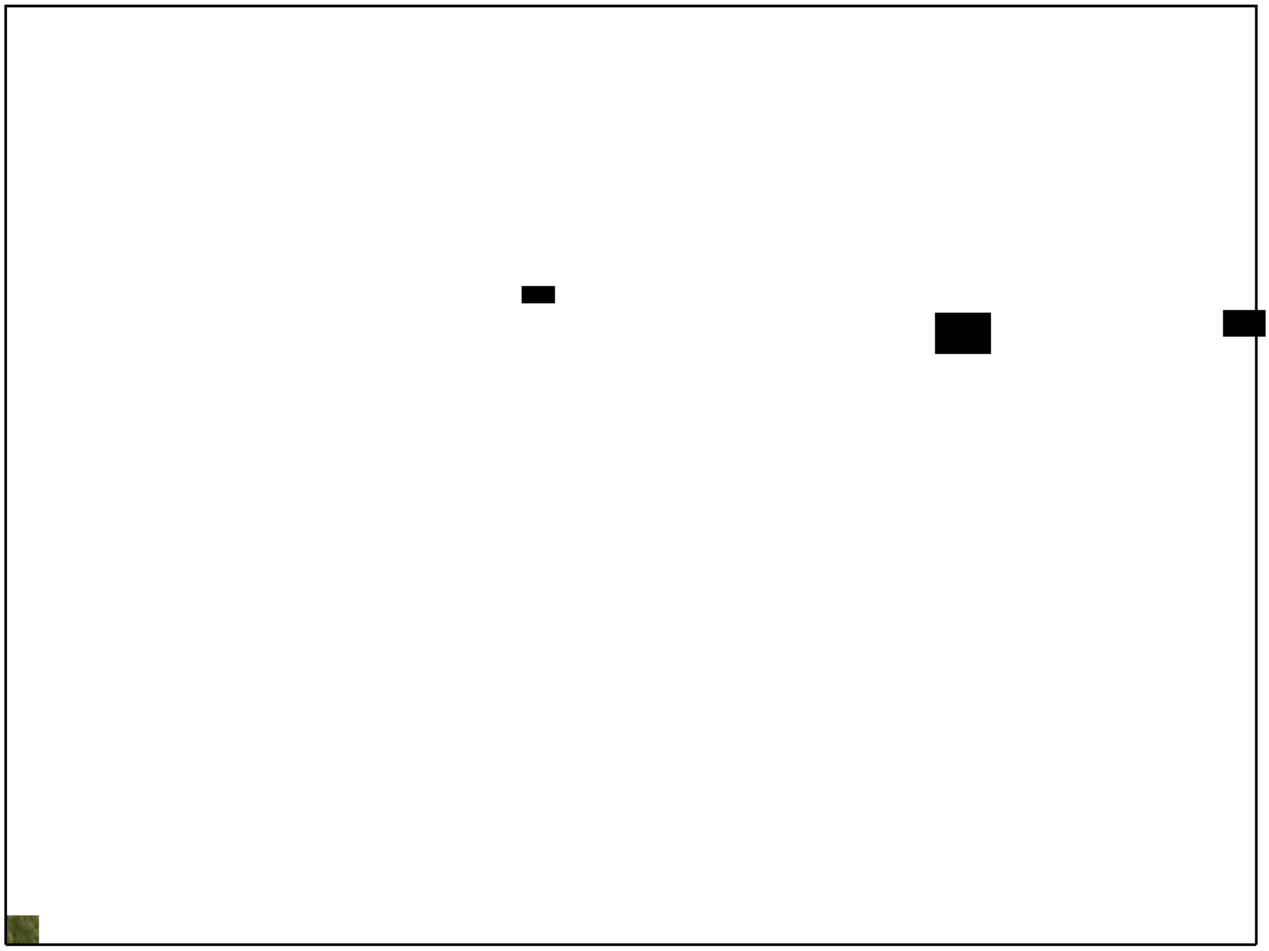

Figure 9. Crash Scene—Damaged Rail Section and Head.

I observed that the guardrail had significant buckling in the feeder chute. I recognized similar dynamic expansion as in video of the crash testing of the ET-Family of terminals. In this case, the guardrail dynamically expanded against the feeder channel and buckled in the feeder chute, as shown in Figure 10.

Figure 10. End Terminal after Impact—Dynamic Loading and Buckling into the Feeder Chute.

The overall failure was similar to the failure mode seen in static testing. A very high force level was reached, buckling the guardrail. Similarly, it appears that the extrusion process was restricted by the guardrail expanding against the feeder chute, as shown in Figure 11.

Figure 11. Overall ET-PLUS Crash View of Deformed Rail and Head.

The rail, as it entered the extruder throat, was so confined by the feeder chute that it cut into the feeder chute's channels. The guardrail was wedged against the feeder channels. A photograph of where the guardrail cut into the feeder channel is shown in Figure 12.