Use of Crowdsourced Data to Obtain Early Warning Alerts for Disabled and Abandoned Vehicles

UNIVERSITY OF CENTRAL FLORIDA

John McCombs, Ph.D Student; Adrian Sandt, Ph.D, Postdoctoral Researcher; Professor Haitham Al-Deek, Ph.D., P.E.
UCF Department of Civil, Environmental and Construction Engineering

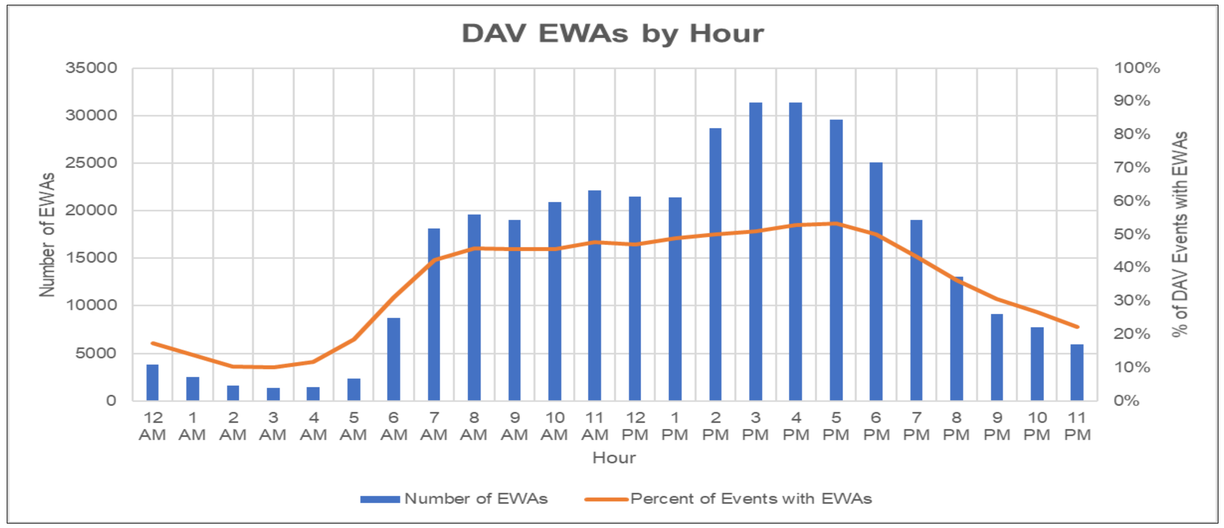
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

INTRODUCTION

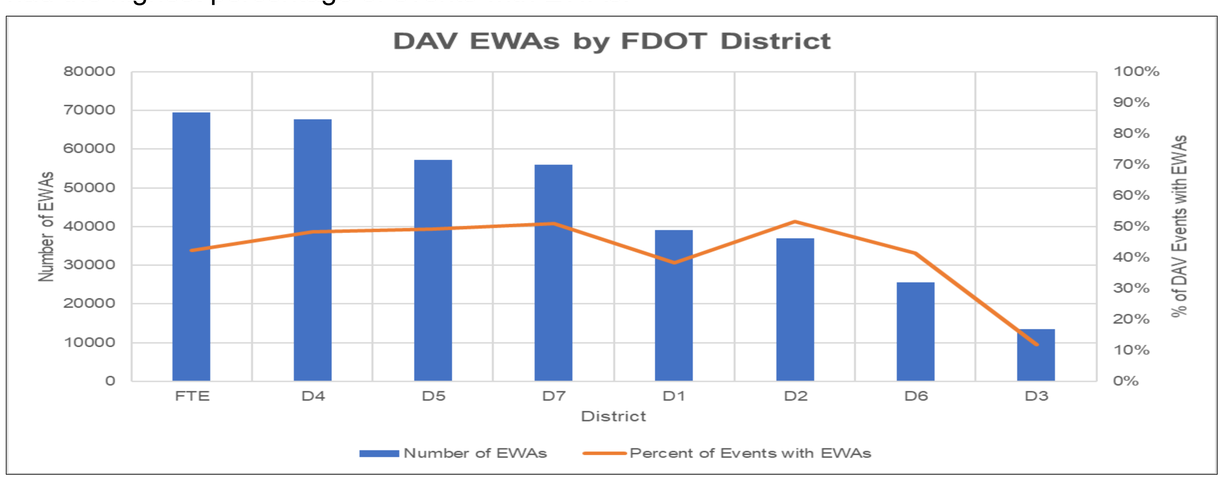
Crowdsourced data can be an effective tool to provide early warning alerts (EWAs) of incidents. The Florida Department of Transportation (FDOT) currently collects Waze alert data, but only utilizes alerts associated with crashes or severe incidents. In this study, Waze alerts associated with disabled and abandoned vehicle (DAV) events were analyzed to show how Waze alerts can provide EWAs for DAV events.

DATA ANALYSES AND RESULTS

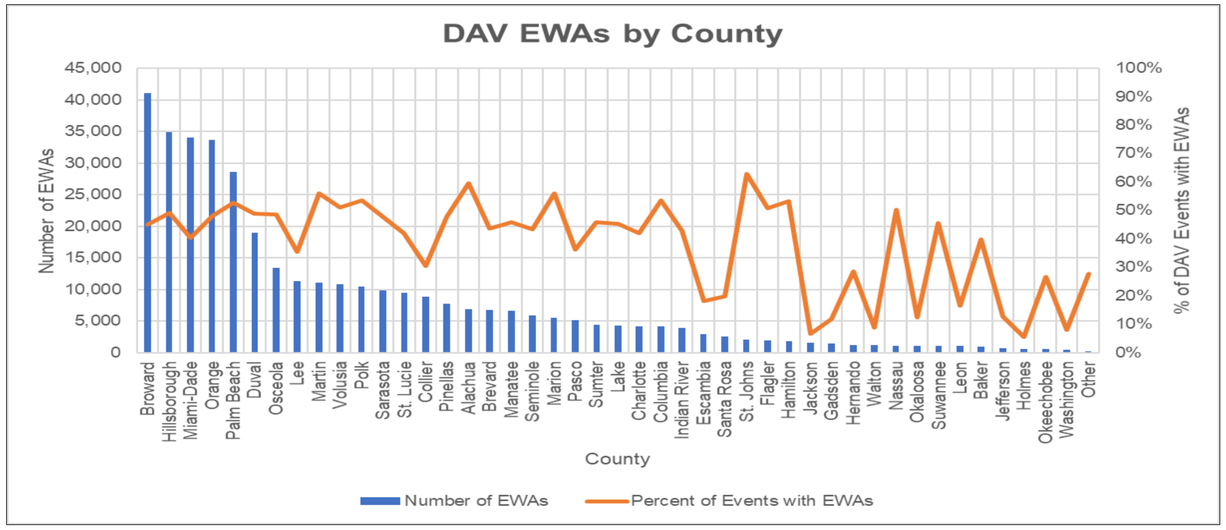
From April 2019 through June 2021, there were approximately 8 million DAV Waze alerts and 880,000 DAV SunGuide events on Florida limited access facilities. 42% of these SunGuide events had at least one Waze EWA (occurring 30 minutes or less before the SunGuide event). On average, these EWAs occurred 16 minutes before the SunGuide event. EWAs were most common between 2 PM and 7 PM, with over 50% of the events in this period having EWAs. The percentage of events with EWAs was lowest during nighttime, likely due to less Waze users being on the roadways.



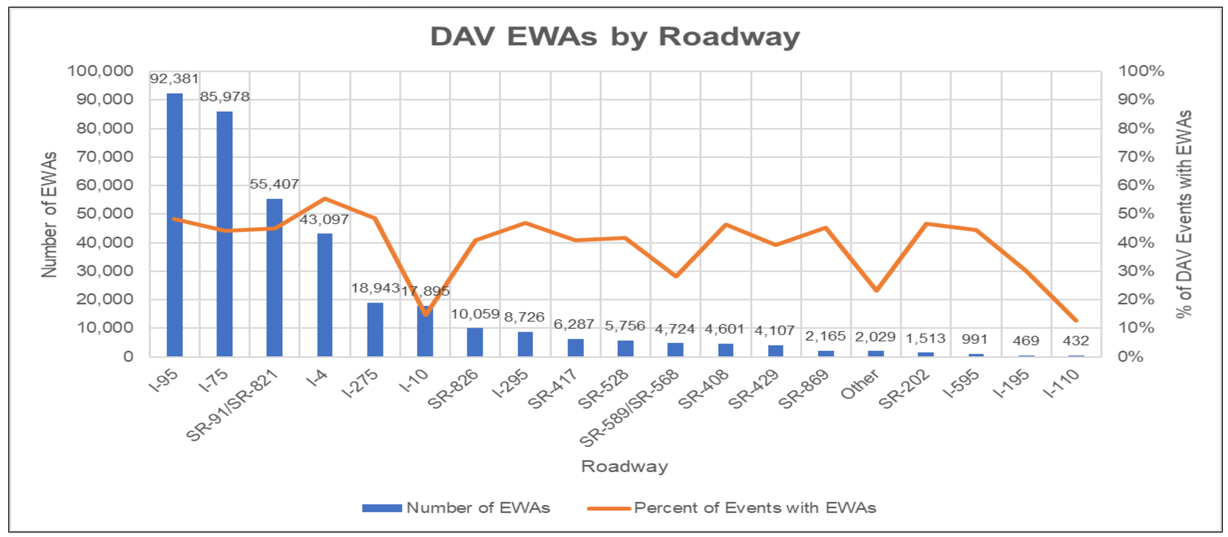
An analysis by FDOT district showed that the Florida's Turnpike Enterprise (FTE) system was the district with the highest number of EWAs, while Districts 2 (52%), 7 (51%), and 5 (49%) had the highest percentage of events with EWAs.



An analysis by Florida county showed that counties with large urban areas (Broward, Hillsborough, Miami-Dade, Orange) had the most EWAs. Counties with smaller urban areas (such as St. John's and Alachua) had the highest percentage of events with EWAs. Predominantly rural counties (such as Jackson and Holmes) had less than 10% of events with EWAs, indicating that Waze alerts would be most beneficial in urban areas.



A roadway analysis showed that longer, high-volume roadways (such as I-95 and I-75) had the most EWAs. The percentage of events with EWAs varied from 55% (I-4) to 13% (I-110).



CONCLUSIONS

The results from this research could be used by traffic management centers in Florida to identify the optimal times and locations where Waze alerts could be used as early warning indicators of DAV events. By utilizing Waze EWAs, DAVs could be more quickly detected and responded to, potentially preventing other vehicles from crashing into DAVs. These alerts could also be communicated to automated vehicles, providing vehicles more time to take appropriate precautions (such as slowing down and changing lanes) before reaching the DAV.

Disclaimer: This research was funded by FDOT . This poster and its contents, including conclusions and results, are solely those of the authors; they do not represent opinions or policies of the funding agency.