Evaluation of the Impact of Queue Trucks with Navigation Alerts Using Connected Vehicle Data

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Abstract

Back of queue crashes on Interstates are a major concern for all state transportation departments. In 2020, Indiana DOT begin deploying queue warning trucks with message boards, flashers and digital alerts that could be transmitted to navigation systems such as Waze. This study reports on the deployment and impact evaluation of digital alerts on 19 Queue trucks in Indiana. A novel analysis of queue warning trucks equipped with digital alerts was conducted during the months of May-July in 2021 using connected vehicle data.

Case Example

Speed Legend (mph)

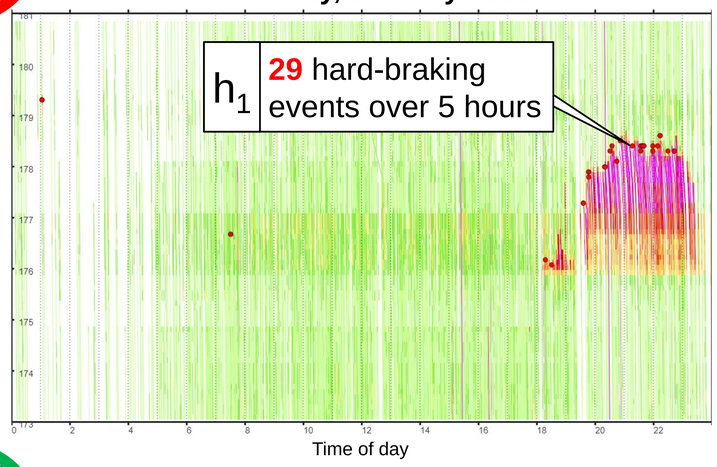
No Data | > 65 | 55 to 64 | 45 to 54 | 35 to 44 | 25 to 34 | 15 to 24 | 0 to 14

Hard-braking Event (**0.27g** / 2.67 m/s^2)

Queue Warning Truck Location

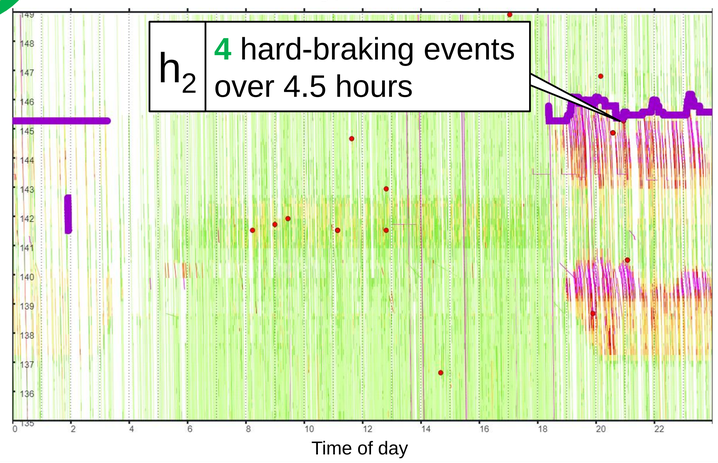
Queue Warning Truck Absent

Thursday, 27th May 2021

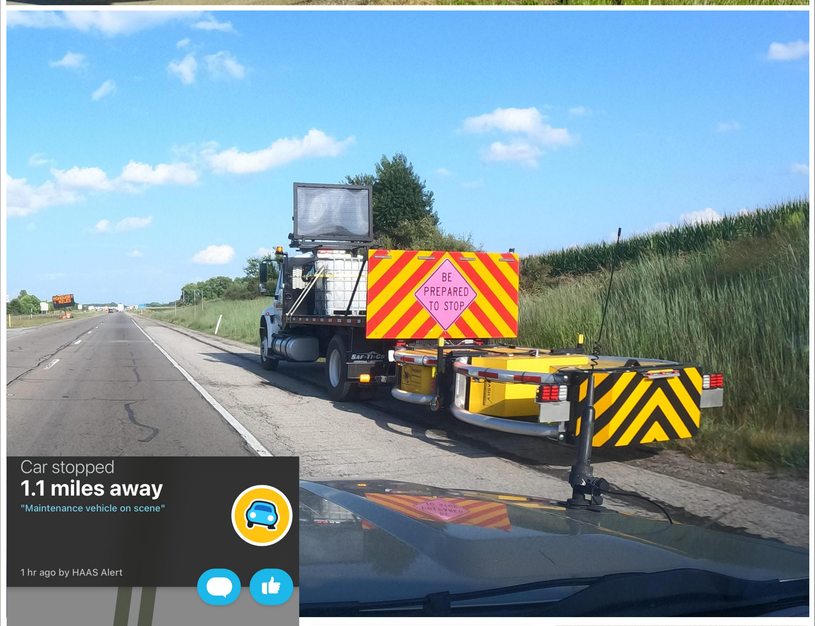


Queue Warning Truck Present

Wednesday, 26th May 2021

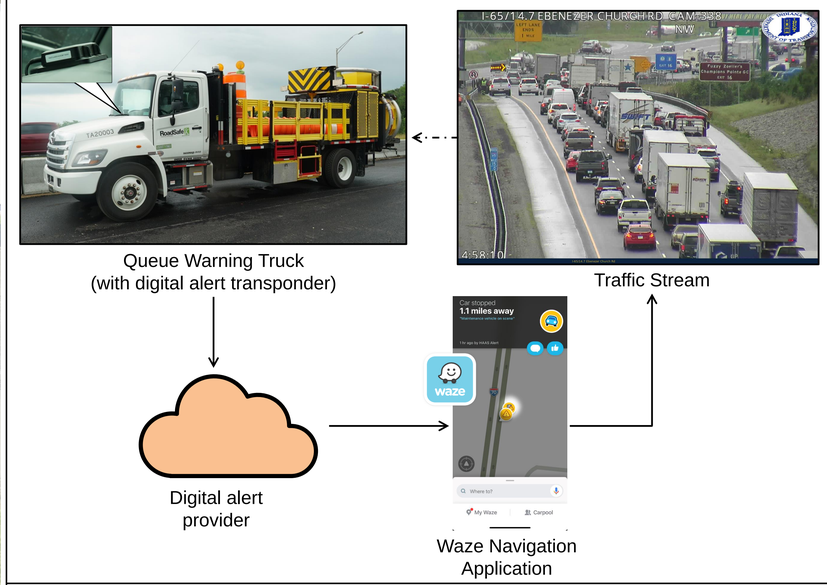


Queuing Warning Trucks

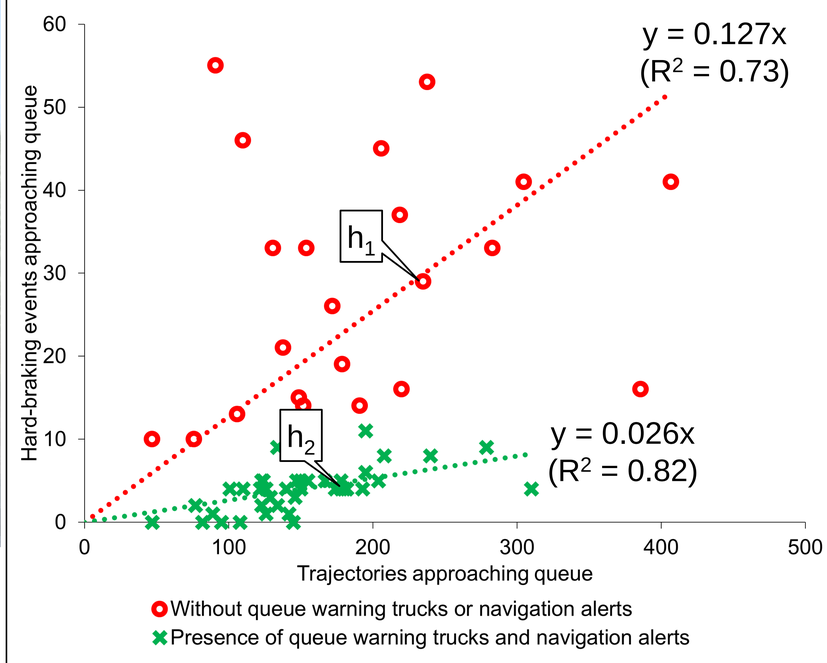


Published Study

High-level structure of data transfer



Hard-braking events and trajectories approaching queues



Analysis of nearly 370 hours of queuing showed an **80% reduction** in hard-braking events when Queue Warning Trucks with digital alerts were present.