Using Technology to Move Toward Zero Deaths

Video Analytics - Bellevue, WA

Background

In 2015, the City of Bellevue, WA adopted a Vision Zero resolution, which states the City’s goal is “to strive to achieve zero traffic deaths and serious injuries on Bellevue streets by 2030.” To work toward this goal, it was important to understand the contributing factors for these deaths and serious injuries and to develop the right tools to address them. Bellevue saw tremendous opportunities in video analytics for gathering large amounts of safety data to rapidly identify locations that have a high risk of crashes — based on near-crash incidents — but where the risk has not yet resulted in an actual crash. Bellevue partnered with Transoft Solutions, Together for Safer Roads, and PacTrans – University of Washington to conduct the first city-wide analysis of traffic camera video with the goal of improving road safety for all users.

The project leveraged the City’s existing network of 360 high-definition traffic safety cameras. The City selected 40 intersections representing different crash risks, geographic locations, land uses, population density, and road geometry.

The cameras collected data daily (16 hours per day) for a week (7 consecutive days) in September 2019, resulting in approximately 5,000 hours of footage with 8.25 million road user observations and 20,000 critical conflict interactions.

The project team used Transoft’s BriskLUMINA and BriskVANTAGE video-based road safety analytics products to process traffic camera footage to obtain traffic volume, road user speeds, near-crash event data, and speeding violations. The team then used results from this process to identify high-conflict interactions at intersections and to evaluate the efficacy of targeted road-safety improvements (refer to the project web page Figure 1 Vehicles captured on one of Bellevue’s high-definition traffic safety cameras. Source: City of Bellevue.)
The goal of this effort was to proactively address safety deficiencies at high-risk intersections, rather than waiting for fatal and serious-injury crashes to occur.

Outcome

One of the major findings of this study is that intersection conflicts or near-crash events are an accurate predictor of where future crashes could occur, as confirmed by statistical models (for additional information, please see pages 15-16 of the Crash Correlation technical report). Video-based monitoring is an effective method to obtain conflict data and provides a variety of unique benefits including the following:

- Unlike traditional traffic safety evaluation methods, which rely on a combination of historical crash records and subjective field observations, video-based monitoring can reliably identify near-crashes, classify road user types and their movements, and detect speeding infractions and lane violations.
- Cameras capture high-resolution data for ALL road users and modes of transportation within the field of view, compared to GPS or Bluetooth sensor data, which only capture a small fraction of road users.
- Video analytics are easily scalable and can readily work with existing intersection traffic camera infrastructure.
- Videos are easy for people to review and understand and can be used to improve communication of safety interventions to the public, unlike many other data collection technologies that simply provide numerical data.

Funding

Together for Safer Roads provided grant funding for this project.

For additional information, please visit the project web page or https://bellevuewa.gov/city-government/departments/transportation/safety-and-maintenance/traffic-safety/vision-zero/video-analytics. The web page also includes the following three reports: Conflict Analysis technical report, Speeding Analysis technical report, and Crash Correlation technical report.