DEVELOPMENT OF ENGINEERING DASHBOARD AND CAMERA SYSTEM ALLOWS FOR REAL-TIME INCIDENT MANAGEMENT IN BELLEVUE, WASHINGTON

By: City of Bellevue, Washington

IN THIS CASE STUDY YOU WILL LEARN:

1. Why the City of Bellevue looked for a real-time API dashboard and camera system to monitor and respond to traffic incidents at intersections.
2. How the integrated system allows for remote and quick response to incidents, and post incident analysis.
3. About operations and management improvements due to the integrated dashboard and camera system.

BACKGROUND

The City of Bellevue developed an API dashboard tool to integrate real-time emergency 911 dispatch data with traffic operations, video monitoring, and incident archiving. The dashboard provides a seamless process to efficiently manage 911 data for immediate response and post-event assessment of traffic incidents. The Northeast King County Regional Public Safety Communication Agency (NORCOM) in Washington state is the agency responsible for managing and dispatching emergency 911 calls for the City of Bellevue. In 2018, NORCOM received an average of 482 calls per day and many of the calls were related to traffic collisions and some led to roadway closures in Bellevue.

NORCOM has a real-time agency displaying and reporting program (RAADAR) to deliver the call types, time and locations to different agencies. RAADAR provides real-time traffic collision notifications which are forwarded as email alerts to the City of Bellevue’s operation engineers so that timely actions can be taken to address the incidents. Prior to the development of the RAADAR dashboard, responses to many critical incidents were left unattended or delayed. Previously, the verification and management of incident locations were time consuming: engineers had to open each email alert and go through multiple steps to verify and decide if an incident was critical enough to attend.

TSMO PLANNING, STRATEGIES AND DEPLOYMENT

In 2019, Bellevue decided to develop a dashboard to display the information provided by RAADAR with a GIS map and also further integrate Bellevue’s high-resolution traffic cameras. The dashboard development was a collaboration between NORCOM 911 personnel, IT software developers, police, technicians, and operation engineers.

To initiate the dashboard development process, the City of Bellevue Transportation Department engaged with NORCOM software engineers to request an Application Programming Interface (API) for the dashboard. NORCOM already had a plan to utilize...
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The core function of the API dashboard is to alert operations engineers that monitoring, assessing and addressing traffic incidents with the camera system is necessary. Traffic incidents are displayed on a GIS city map with the option to filter out other calls except traffic crashes. When an engineer receives a new alert, they select the incident for review with the option to link to a nearby camera within 200 ft. The engineer can review archived video of the incident from the stored recordings and bring up the live 360 degree cameras for traffic and incident monitoring and response. Where needed, the engineer can adjust the adaptive signal control timing parameters to alleviate congestion during and after the incidents without the need to manipulate timing plans or splits. The engineers can seamlessly set up temporary parameters and adjustments to clear the congestion caused by an incident. The camera system is also used for analysis of the causes of crashes to determine safety efforts.

COMMUNICATIONS PLANNING AND EXECUTION

The API dashboard was beta tested within the City of Bellevue prior to full use to ensure that it provides seamless functionalities that include GIS location display, event filter and live video access. The API dashboard and traffic cameras are now considered essential traffic management tools and reside on the monitor of every operations engineer.

The API dashboard has become a mission-critical tool to complement and utilize the advanced adaptive signal system in the City of Bellevue. Any major incidents are also communicated promptly to the City of Bellevue Public Information Officer (PIO) to deliver the message to the general public and related agencies until the incidents are clear. The dashboard allows the PIO to provide timely and accurate traveler information to warn road users to avoid the congested areas.
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OUTCOMES, BENEFITS AND LEARNINGS

The API dashboard is a great tool to save lives, time and money. It offers engineers a valuable tool to manage traffic by providing instant incident alerts and identify locations for real-time monitoring. The API dashboard and camera system are also an essential component of the City of Bellevue’s Vision Zero program.

With engineers actively monitoring the traffic incidents and adjusting the signal timing, congestion duration is shortened and the public experiences less travel delays. With the integration of the API dashboard and adaptive signal control system, operations staff are able to provide intersection control similar to an officer being present to direct traffic. The City of Bellevue noticed an average serious incident will take about 30 to 60 minutes to clear and return to normal depending on the severity of the collisions. Most of the time, the duration is dictated by the availability of tow trucks at the scene. Managing the incidents can easily reduce the recovery time by 50%. The dashboard and system also allow engineers to respond to multiple incidents at once and understand the correlation to each other if applicable.

For the City of Bellevue, it is just an initial step as there are plans to build on the integrated platform for other solutions, such as, integrating with third party application information (Google, Waze, Inrix, etc.), providing signal information, and allowing a public interface to receive the alerts/updates. The API dashboard has revolutionized how operation engineers manage and process traffic incidents to provide the best possible operations during each event to benefit the public. Other agencies could use a solution and approach like the City of Bellevue API dashboard and camera system to streamline and improve incident management efforts, and better manage and utilize 911 information.

In crash investigation and analysis. Due to the API dashboard, the City of Bellevue received numerous commendations for resolving disputes over traffic incidents. The combination of the API dashboard and the camera systems makes it easier for engineers to explain the signal sequence and timing or to give depositions for litigations and lawsuits.

During recent snowstorms in Bellevue, video recordings of hit and run damages to city owned property allowed the City of Bellevue Risk Department to identify the responsible party to recover all the damages. Traffic incident footage also helps identify future safety improvements to potentially prevent repeat traffic incidents and help reduce serious injuries and fatalities.

On average, the tool saves approximately 10-15 minutes of time investigating each traffic incident. Using the dashboard, engineers can promptly save the video footage of traffic incidents. In 2019, because of the alerts, engineers had saved almost 500 traffic videos. Not only does the footage help police in the investigation of the incident and post-event engineering review, but they are also available for the general public through the public disclosure request. In 2019, the City of Bellevue processed 4-5 requests weekly from legal entities, insurance companies and individuals to assist