Objective

The purpose of the BAD is two-fold: Increase public safety by delivering valuable crime statistics to authorized Department of Transportation (DoT) workers as well as local public safety officers. This in-turn will help to reduce traffic congestion by quickly notifying DoT employees of areas that have been blocked due to illegal activity. The drivers can then change their driving route in real time to avoid said areas. The second objective of the BAD is to assist the local police in analyzing crime data by utilizing various machine learning algorithms. This information can help officers construct beat routes by highlighting patterns of infraction committed by local crime organizations.

Web Application

The Bad Area Detector System

Software, Languages and Tools

- Node-RED
- Raspbian OS
- Python
- HTML
- IBM Cloud
- Express.js
- Node.js
- React.js
- Redux.js
- Google Maps API
- Carbon Design System
- Cloud Foundry

Challenges

The IBM Cloud

There are many services offered in the IBM Cloud that were viable options to create the BAD. Learning all the services and creating an efficient design to minimize costs proved to be a major hurdle.

IBM Cloud Tutorials

Most tutorials explaining how to use services are written by the community and not monitored by IBM’s engineers. Therefore, there are many tutorials that are not updated as the Cloud evolves making learning difficult.

Analytics

Given the large size of the dataset and features, extracting discernible statistics that would be useful for public safety took much trial and error. In the end it was found that a random forest machine learning model provided the best results for crime prediction.

Background

The Industrial Internet of Things generally refers to sensors placed on industrial equipment to monitor health status and energy use. However, we have extended its purpose to assist in elevating awareness of crimes to authorized individuals by utilizing microcomputers in various police stations. The microcomputers format and send police dispatch information to the IBM Cloud where the data is placed in a short term NoSQL Database. The data is eventually transferred to a long term storage database where the information can be displayed in the BAD Web Application or analyzed using machine learning algorithms in the Watson Studio.