Exploring Crash Data with Tableau

Skylar Knickerbocker
Research Engineer, InTrans, sknick@iastate.edu

Zach Hans
CWIMS Director, InTrans, zhans@iastate.edu

For most DOTs, crash data is presented very traditionally by evaluating only a single attribute and presenting this information as either a bar chart, line chart or in a table. This data is typically presented as a trend to show the number of crashes over time or shown in a table if multiple values are present. In Iowa, over 130+ coded or derived fields are included in the crash data but only a handful of these variables are ever presented in the crash facts in most states to avoid inundating user with hundreds of tables and charts. The problem with representing data this way is the inability to understand the relationships between the attributes or to quickly understand the trend/most significant causes.

An interactive crash dashboard can provide users the ability to ask question and be provided immediate information for that question. User can also begin digging into the data to understand relationships within the crash data that they can use to improve safety. As part of an effort with the Iowa DOT's Motor Vehicle Enforcement (MVE) and the Iowa State Patrol (ISP), an interactive dashboard was developed which focused on heavy trucks which officers could use to target their enforcement. The dashboard is intended for officers to be more data driven in their enforcement strategies as well as using current crash data rather than data from multiple years ago.

The web-based dashboard (https://reactor.ctre.iastate.edu/heavy-truck-crash-tool/) is separated into eight modules which organize similar crash attributes together. For example the 'Time' module includes crash statistics such as time of day, day of week, lighting conditions and month. Users begin on an overview page (left image) which provides a basic description and some initial context filters. The dashboard is entirely interactive which allows users to navigate between the module then hover over the charts to see more information or use any of the charts as filters to dive deeper into a specific crash attribute. Hovering over any of the charts will provide a trendline for the corresponding variable by federal fiscal year such as in the image in the right below which shows the increasing trend while hovering over driver distraction. Selecting a variable (or multiple) will filter all of the charts across all modules to only include data for that corresponding attribute. This allows user to explore the relationship between variables by understanding the impacts specific attributes have on other crash attributes. The Iowa State Patrol began prioritizing vehicles that were following too close after they identified that the "Followed too close" major cause increased when they filtered the dashboard by the routes they covered and the types of crashes they were focused on preventing. The functionality of the heavy truck dashboard has allowed MVE and ISP to continually improve and update their enforcement strategies to most effectively improve heavy truck safety in Iowa.

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