

# Maryland Department of Transportation



## SCOHTS Safety Management Subcommittee Roundtable Report Maryland September, 2016

- Following a record year low for traffic-related fatalities in 2014 (443), Maryland experienced a drastic reversal of this trend in 2015. Five hundred twenty-one (521) persons lost their lives on Maryland roadways in 2015, a 17% increase from the previous year, exceeding the national upward curve and the highest single year increase for the state in over thirty years. As the data is analyzed for possible explanations the following factors are clear:
  - The improved economy across the region, reduced joblessness and the low price of gasoline increased Maryland's Vehicle Miles Travelled (VMT) by 2.37%;
  - According to a report released by FHWA Maryland had the single largest increase in VMT in the 1-year period from March, 2015 to March, 2016, a 6.1% overall increase.
  - Impaired Driving, Lack of Belt Use, and Speed factors tend to represent over 60% of all passenger vehicle crashes;
  - Unlike national trends, Pedestrian Fatalities in Maryland had a slight decrease;
  - Motorcycle involved fatalities increased slightly while Heavy Truck involved fatalities increased by nearly 40% (from 46 to 62).

### Pedestrian Safety Analysis

Generally in Maryland, there are on average 2,720 pedestrian-involved crashes in the state each year, resulting in 2,329 pedestrians injured and 105 pedestrians killed. Given the vexing nature of this problem the MDOT's Maryland Highway Safety Office (MHSO) commissioned a study through the University of Maryland's National Study Center (NSC) to conduct a 360° epidemiologic analysis of crashes resulting in seriously and fatally injured pedestrians.

- The NSC looked closely at four years of crash data (2011 thru 2014) along with associated hospital and Medical Examiner toxicology reports. Injury severity determinations were based on police reports utilizing the KABCO (1-5) scale with all 4's and 5's examined.
- An 85 page analytical report was published in late spring, 2016 with numerous revelations. A summary of some of the report findings includes the following:
  - Approximately ½ of the serious/fatal injury crashes occurred during the 8-hour period between 4PM and midnight, and that significantly more serious/fatal injury crashes occurred in the dark.
  - Only 23% of serious/fatal injury crashes occurred at an intersection and that in nearly 40% of the serious/fatal injury crashes the pedestrian was documented to be in the roadway unlawfully.
  - Fatally injured pedestrians were found to be culpable in 72% of their crashes as opposed to seriously injured pedestrians in 56% of the crashes in which they were involved.
  - Approximately 5.5% of serious/fatal injury crashes involved an impaired driver whereas Medical Examiner toxicology data revealed

that nearly one-half (47%) of fatally injured pedestrians were impaired by alcohol, drugs, or both.

- The number of pedestrian fatalities has changed very little over the past several years and each region of the State faces different challenges trying to prevent pedestrian crashes. The MHSO is teaming with SHA to support a FHWA project led by TransAnalytics that will utilize Maryland crash data in conjunction with SHRP2 Safety Data. The project, entitled “Toward a Better Understanding of Vulnerable Road User Safety Issues,” will analyze information from the two datasets to help identify behavioral and engineering countermeasures that may be implemented to reduce pedestrian injuries and fatalities in the Maryland, as well as demonstrate the utility of the SHRP2 dataset. As with the SHRP2 effort, the goal of this project is to provide a comprehensive review of pedestrian crashes in the State that will help direct enforcement and behavioral interventions.
- The NSC provides spatial and temporal (time of day, day of week, month) analysis for pedestrian-involved crashes, and also provides spatial analysis of the type and circumstances of the crash (e.g., pedestrian not in a crosswalk, wearing dark clothing). With the advantage of the NSC having access to multiple traffic records data sets, such as driver and registered vehicle data, analysis can be conducted using these integrated data sets. For the pedestrian safety analysis, the NSC is able to link the crash report with the driver file and determine the area of residence of the driver involved in a crash with a pedestrian. For example, in pedestrian crashes in Annapolis over a three-year period, nearly half of the drivers involved resided in the Annapolis area. The depth of the analysis provided by the NSC supports partners conducting enforcement and educational initiatives.

### **Innovative Countermeasure to Assist Law Enforcement:**

The use of a data-driven approach is critical to allocating resources to prevent alcohol-related traffic crashes, injuries, and deaths in Maryland. The Washington College GIS Lab has supported the Maryland State Police (MSP) State Police Impaired Driving Reduction Effort (SPIDRE) team since its inception and continues to provide in-depth spatial analysis to help guide SPIDRE’s deployments and to evaluate their efforts in post-operational reports. Beyond SPIDRE, Washington College GIS analysts support the many Maryland impaired driving efforts through a wide variety of data products, hands-on support, and training.

The products and analysis provided by Washington College were made possible by their highly qualified team of GIS experts who are collecting and maintaining data for a risk terrain analysis of impaired driving in Maryland. Risk terrain modeling is an approach to spatial analysis that uses GIS to attribute qualities of the real world environment to places on digitized maps. When combined with routing analysis it is an effective data-driven tool for law enforcement. Most law enforcement agencies do not have access to all of the data they need (e.g., crashes, citations, liquor license locations, etc.), or the analysts to download, update, correct, and map/analyze the data. Washington College is able to coordinate all of the data collection, storage, and distribution of datasets needed for law enforcement to make data-driven decisions on determining locations for DUI checkpoints and saturation patrols.

Washington College worked with jurisdiction liquor boards and developed a one-of-its-kind statewide liquor board license database, which included information about licensee locations and hours, as well as violations. Matching this dataset with crash and DUI arrests data allows the analysts to paint a picture of high density DUI activity areas to be targeted with enforcement and educational strategies.

In addition to static maps and documents, Washington College maintains an online mapping system for alcohol-related traffic data. The online system (which is currently being upgraded and will be launched this fall as RAVEN, or the Risk Analysis of Vehicle and Environment Network) and the static maps were instrumental in planning for a Booze and Belts High Visibility Enforcement (HVE) campaign, and a multi-jurisdictional effort dubbed '40 on 40,' an initiative heavily focused on high density impaired crash areas along route 40 during Super Bowl weekend. This initiative was highlighted in the July edition of the Police Chief magazine:

([http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=display&article\\_id=4204&issue\\_id=72016](http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=display&article_id=4204&issue_id=72016))

Washington College's risk terrain analysis continues to provide critical analysis and maps for law enforcement initiatives during impaired driving campaign waves, especially for planned holiday HVE efforts.

The illustration below is a GIS map produced by Washington College that plots areas of high incidence of Impaired Driving crashes. It also points out (red blocks) locations of high priority licensed liquor establishments (those usually selling alcohol in the late night hours). The various colored routes indicate likely routes taken by Impaired Driving offenders based on their place of arrest and home locations. The circles indicate likely areas for police saturation patrols. This map location is the northern portion of Anne Arundel County, Maryland near BWI Airport.

