Understanding Patterns in Marijuana-Impaired Traffic Crashes: A Case Study on Louisiana

Subasish Das, Ph.D., Associate Transportation Researcher, Texas A&M Transportation Institute (s-das@tti.tamu.edu)
Ly-Na Tran, Student Assistant, Texas A&M Transportation Institute (lynattran22@tamu.edu)
Bita Maraghehpour, Research Assistant, Texas A&M Transportation Institute (bitamaraghehpour@tamu.edu)

Abstract
• In Louisiana, crashes involving marijuana have increased by 195 percent (from 2010 to 2016).
• This study collected seven years of marijuana-involved crash data from Louisiana to identify the key association factors and their patterns.
• The research team identifies the hidden association patterns of key attributes from the complex crash dataset using the cluster correspondence analysis.

Methodology
• Used a text searching algorithm to determine the crashes associated with the keywords: "marijuana," "cannabis," and "benzodiazepine."
• From the total crash data, 808 marijuana involved crashes were identified from 2010–2016 crash data.
• Applied cluster correspondence analysis to determine the patterns of the key associations from complex nature of crash data.

Key Findings
• The biplot display depicts two clusters are near to the origin (Cluster 2 and Cluster 3), two clusters (Cluster 1, 4) are within the ranges of the origin. The rest clusters (Cluster 5, and Cluster 6) have large distances from the origin.
• Some of the key clusters are: single-vehicle crashes during dark with no streetlights, multi-vehicle rear-end crashes at two-lane roadways with separation, multiple vehicle head-on crashes at two-lane roadways with no separation, female drivers at the intersection involved in multiple-vehicle right-angle crashes, careless single-vehicle crashes, and open country interstate crashes.

Conclusions
• The reactions of cannabis consumption are difficult to acquire, but its effect on driving is considered as less severe than alcohol.
• Six different clusters of attribute groups were identified using the analytical method.
• Swerving in the lane, slower reaction time, impaired decision-making, impaired driving performance, and risk-taking are just some of the side effects drivers suffer under the influence of marijuana.