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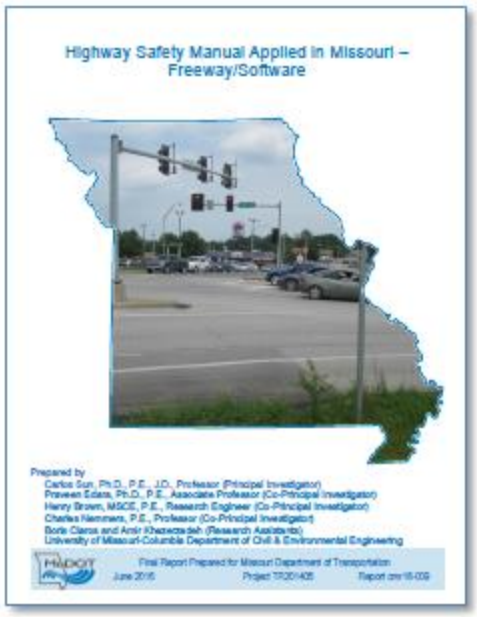
Research Summary

Highway Safety Manual Applied in Missouri – Freeway/Software



AASHTO's Highway Safety Manual (HSM) includes models for freeway segments, speed-change lanes (transitional area between mainline and ramps), ramps, and interchange terminals. These predictive models for freeway interchanges need to be calibrated to Missouri conditions. This calibration process requires detailed data types, such as crash frequencies, traffic volumes, geometrics, traffic control, and land-use. The calibration process also requires specific decisions on the correct sampling approach, determination of the influence area of terminals and interchanges, and how to locate crashes within the appropriate interchange facility.

In order to obtain samples for each interchange facility type, every single freeway interchange in Missouri was catalogued according to HSM classification. This was done since the Transportation Management System (TMS) database does not classify interchanges according to the HSM definitions. Freeways in Missouri include interstates, US highways, and Missouri highways. From this master list of all Missouri interchanges, sample sites were selected randomly while maintaining geographical coverage across all seven MoDOT districts.

HSM calibration is a data-intensive process that uses many types of data. One type is geometric data which involves the collection of characteristics such as lane width, shoulder type, median type, ramp skewness, horizontal curvature, and traffic control. Another type is AADT which is obtained by querying the MoDOT TMS database. A third data types is crash data which requires the detailed review of original crash reports, since crashes were frequently landed incorrectly.

The project calibrated various Missouri freeway interchange facilities, including diamond, partial cloverleaf, and full cloverleaf interchange terminals, and ramps and speed-change lanes. Missouri interchanges can now be modeled using these calibration values with the HSM.

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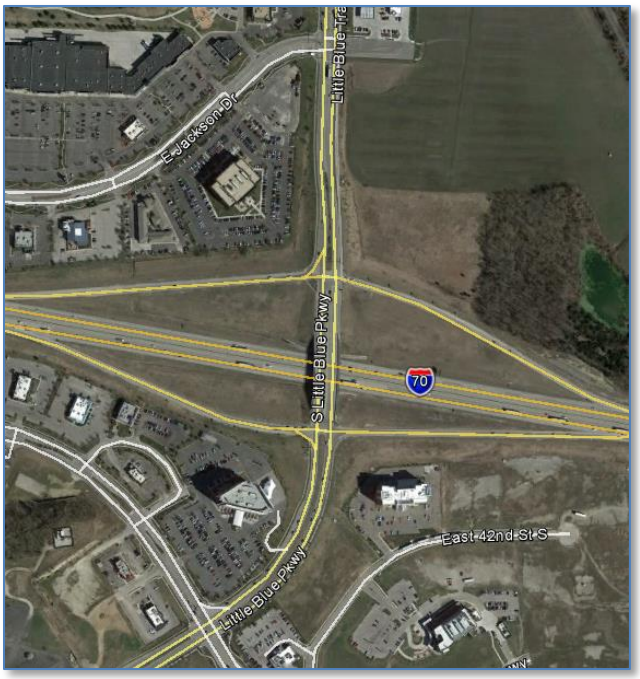

Example of Signalized Diamond Interchange Site (D4SG4) with Calibration Values of 0.853 for Fatal+Injury (FI) Crashes and 1.830 for Property-Damage-Only (PDO) Crashes

Project Information

PROJECT NAME: Highway Safety Manual-Freeways II

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PROJECT COST: $60,154

LEAD CONTRACTOR: University of Missouri-Columbia

PRINCIPAL INVESTIGATOR: Dr. Carlos Sun

REPORT NAME: Highway Safety Manual Applied in Missouri – Freeway/Software

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