CALIBRATION OF VISSIM AND QUICKZONE PROGRAMS FOR WORK ZONE TRAFFIC IMPACT ANALYSIS

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ABSTRACT

Work zone traffic impact analysis software can help improve the efficiency of implementation of work zones. Due to the wide use, this study calibrated and validated VISSIM and QuickZone work zone models. The calibration was demonstrated using two case studies: a long-term work zone located on I-44, and a short-term work zone located on I-70. Both work zones involved one lane closure on a three-lane freeway. The calibrated parameter values are recommended for future calibration applications. VISSIM usually needs complicated calibration and validation processes. Thesis developed a process of using regression models to quickly get candidate parameter sets. And statistical tests was used to compare simulation hourly travel time to the field data, instead of just comparing the maximum daily value. QuickZone calibration for Missouri work zones was initiated in this thesis. Capacity was the calibration parameter. Calibration were performed based on delay and queue length. Least squares estimation was used to determine the parameter capacity value that generates the least total delay error. Sensitivity analyses of VISSIM driving behavior parameters. CC1, CC2 and CC7 exhibited effects on travel time. Regression models for calculating candidate parameters were developed and the optimal parameter values for both work zones were calculated. The calibration method, regression models and optimal parameter values were recommended for future calibration efforts.