

Right-Turn-On-Red Field Data Collection

Extensive field data were collected at a variety of intersections to observe the relationships between Right-Turn-On-Red (RTOR) volumes and other signalized intersection conditions. These data were compiled and then analyzed to gain insight into trends that may exist. This report has three sections: field data collection results, data analysis results, and conclusion.

1. Field data collection results

The data were collected at five intersections: three four-legged and two three-legged intersections. Exclusive and shared right turn lanes and various combinations of protected and permitted phasing were included in the data collection. Final data compilation resulted in 153 fifteen-minute time intervals, which spanned a range of v-over-c conditions. Intersection v-over-c ratio values ranged from 0.14 to 0.62 and right turn v-over-c ratio values ranged from 0.00 to 0.65. The processed data reside in an Excel file “RTORData_for_ITE_Submission.xls” that includes seven worksheets: RTOR Data, Metadata, and five that summarize the data for each intersection.

The RTOR data worksheet contains detailed data that could be used to create a model for predicting RTOR volumes. One hundred fifty-two rows are the RTOR observations and 61 columns represent fields describing different aspects of the observations. The Metadata worksheet was created to facilitate reaching a complete understanding of the dataset columns. The five intersection data summary worksheets contain descriptive information serving two purposes: one is to understand the context in which the data were collected and the other is to provide tabulated summary data by interval and by approach for each intersection. Camera fields of view and signal control phasing were given to describe the context of the data collection and two tables, Volume Data and Signal Timing Data, tabulate the summary data. To maximize volume conditions, eight data collection time intervals were selected from four hours of video for each intersection, where the time interval times are referenced to the recording begin times.

2. Data analysis results

One would expect that relationships exist between the RTOR volumes and the conflicting traffic conditions. Two possible relationships were explored: percent RTOR vs. conflicting volume and percent RTOR vs. conflicting v-over-c ratio. Analysis indicated that these conflicting traffic condition variables do little to explain variations in RTOR volume. However, if additional conditions are used, such as intersection phasing and approach geometry, some relationships with RTOR volume begin to emerge.

3. Conclusion

Using conflicting traffic conditions alone to predict RTOR volume is not recommended. Fortunately, incorporating additional information such as intersection phasing and approach geometry does have potential for RTOR volume prediction.