



Right-Turn Lane Effects on Unsignalized Intersection: A Before-and-After Study of Right-Turn Lane Implementation on Unsignalized Intersection

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INTRODUCTION

The purpose of adding the right turn lane is to reduce the amount of the conflict caused in the major road from cars turning right on to the minor road. Typically, the right turn lane can improve the capacity of the through lane by removing the slower vehicles from the traffic flow and provide space for deceleration before turning. However, the effectiveness of the right turn lane still worth to be examined by real-world examples.

This study is aimed to evaluate the safety and cost effectiveness for a new implementation of a right turn lane which is located in Ashton Lane, Auburn, AL. In order to achieve this purpose, a before and after study was applied for this case study during the peak hour, 4 to 6pm. According to the number of conflicts and related calculations, the results can be concluded that the right turn lane can reduce the number of conflicts, increase driver speed and save time due to the conflict. In addition the value of time saved for this segment also provide as a result.

BACKGROUND OF THE STUDY SITE

- **Location:** a three-leg intersection of College Street and Ashton Lane, Auburn, AL
- **Speed Limit:** 55mph
- **Before:** No right turn lane. Almost every time a driver needed to turn right onto Ashton Lane to build up traffic behind them and cause multiple conflicts.
- **After:** A right turn lane was implemented. The number of conflicted was observed decreasing.
- **Peak Hour Volume:** 1100 vehicles/hour
- **Segment Length:** 481.4 ft

METHODOLOGY

- Step 1** • 48 Hours Video Record for Study Site at weekdays (For both before and after period) The position of 3 cameras are labeled on the planform of the study site.
- Step 2** • Video Analysis, count the conflicts made by right turn vehicles for both before and after period.
- Step 3** • Perform the before-after study, compare the difference of conflict number for each period. Estimate the speed difference..
- Step 4** • Calculate the time saved for road users due to the implementation of the right turn lane. Convert the time saved to value for users. Applying the economic analysis.



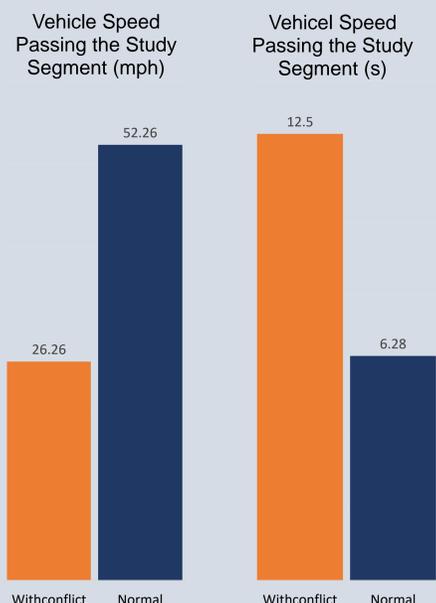
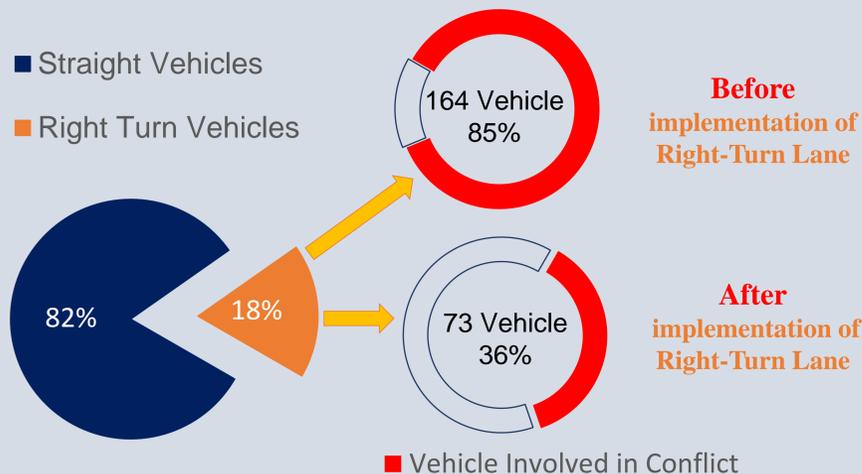
Before implementation of Right-Turn Lane

North College St./Ashton Ln

After implementation of Right Turn Lane

RESULTS & CONCLUSION

Before and After Comparison Number of Conflict Made by Right Turn Vehicle In Peak-Hour Period



Travel Time Saved Per Vehicle	6 s
Value of Time saved Per Vehicle	\$0.03
Value of time saved in Peak-Hour Period	\$2.73
Value of time saved annually for road users	\$15,500

Summary

- The benefits of the right turn lane Implementation can be summarized as follow:
 - The conflict that caused by right turn vehicle can be reduced by 49% and there are 91 conflicts will be reduced every day during the peak hour, on average. The implemented right turn lane would save user's value of time for \$15,500 annually.
- Future Analysis Recommendations:
 - The cost/benefit model should be developed to evaluate the right turn lane implementation
 - Further cost effectiveness such as fuel saved value should be calculated

Reference:

1. AASHTO, (2010), *Highway Safety Manual, Chapter 7: Economic Appraisal*, American Association of State Highway and Transportation Officials, Washington, USA.
 2. AASHTO, (2010), *User and Non-user Benefit Analysis for Highways, Chapter 5: User Benefit Analysis Modules*, American Association of State Highway and Transportation Officials, Washington, USA.