



Project Number
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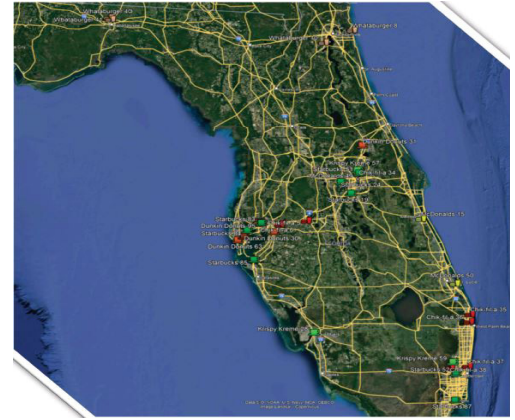
Trip Generation Study for Coffee Shop with Drive-through and Fast-Food with Drive-through

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Current Situation

As the number of drive-throughs in Florida surged during the COVID-19 pandemic, long queuing lanes at coffee shops and fast-food restaurants became a typical part of the quick-serve experience. However, the convenience of quick service has come at a price. This queue may spill onto adjacent roadways and cause unexpected impacts on everyday road user experience, resulting in increased risk for crashes and congestion.

While there are past studies on trip generation rates and queue lengths at such establishments, the Florida Department of Transportation (FDOT) could bolster road safety by better understanding these metrics in the current post-pandemic setting.



This research examined 40 sites in Florida to understand more about drive-through queuing behavior and its impact on the State roadway system in terms of both safety and throughput. These sites included the most popular quick-serve restaurants such as Dunkin', Chick-fil-A, and Starbucks.

Research Objectives

This research focused on two main objectives: (1) to analyze trip generation rates and queuing behavior at drive-through establishments and (2) to assess the accuracy of traditional estimation methods, such as the Institute of Transportation Engineers (ITE) Trip Generation Manual. Ultimately, the study aimed to develop improved models and recommendations for traffic management and infrastructure design for both fast-food and coffee shop land uses along the State roadway system.

Project Activities

The Alex Roark Engineering, PLLC research team examined 40 sites across Florida, including 20 fast-food and 20 coffee shop locations. These represented major brands like Chick-fil-A, McDonald's, Starbucks, and Dunkin'. Data collection involved measuring trip generation during peak hours, evaluating queuing patterns, and observing service times for ordering, payment, and pickup to identify inefficiencies. Researchers examined differences in operational protocols across brands and utilized video recordings to capture vehicular behavior, ensuring a comprehensive analysis of drive-through traffic patterns and dynamics. The team used advanced simulation models to study service rates and predict queue lengths under varying traffic demands. The study also assessed factors such as building size, brand-specific behaviors, and the effectiveness of current queuing theories.

Project Conclusions and Benefits

The findings provided a framework for proactive traffic management through designing safer access connections and improvements to the State roadway system. The research revealed significant variability in trip generation and queuing patterns based on brand and operational practices. The study also found that traditional models often failed to accurately estimate the impact of these establishments, underscoring the need for brand-specific data and improved simulation techniques.

For more information, please see fdot.gov/research.