Observations have shown that certain land uses in Florida have experienced vehicular traffic queueing spillover onto the adjacent roadway system. This study evaluates two of these land uses for trip generation and queueing to better understand the operations and to better predict and subsequently prevent this queueing spillover.

Trip Generation Study

for Coffee Shop with Drive-through and Fast-Food with Drive-through

Drew Roark, PE and Bill Oliver, PE

October 2024

FDOT AGREEMENT NO. BEF47
FPID # 4423251B201
FINAL REPORT

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Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Florida Department of Transportation.

Technical Report Documentation

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle	5. Report Date
Trip Generation Study Fast-Food with Drive-Through & Coffee Shops with Drive-Through	June 2024
6. Performing Organization Code	
7. Author(s) Drew Roark, Bill Oliver	8. Performing Organization Report No.
9. Performing Organization Name and Address Alex Roark Engineering, PLLC 2017 Chimney Swift Hollow Tallahassee, Florida 32312	10. Work Unit No. (TRAIS)
11. Contract or Grant No. BEF47	
12. Sponsoring Agency Name and Address Florida Department of Transportation 605 Suwannee Street, MS 19 Tallahassee, FL 32399-0450	13. Type of Report and Period Covered Draft Final Report, 2/10/2024-6/28/2024
14. Sponsoring Agency Code	
15. Supplementary Notes	

16. Abstract

A traffic impact study may be required for proposed development projects that generate significant vehicular traffic as a result of the development. The purpose of the Traffic Impact Analysis (TIA) is to identify the adequacy of the existing transportation infrastructure to accommodate any changes in trips generated by a proposed development/redevelopment and the associated increase in traffic volumes on the surrounding roadway network. If impacts are identified, potential mitigation measures (on-site or off-site) can be proposed and evaluated. When adverse transportation impacts are expected on Strategic Intermodal System (SIS) facilities, FDOT must work with local governments and other transportation agencies to identify and agree upon mitigation measures. The TIA is used to decide whether the location and design of driveway(s) being considered are necessary to provide reasonable access to private property consistent with the safety and convenience of the public.

Trip generation is the first step in a Traffic Impact Analysis and is the number of trips originating in or destined for a particular development or traffic analysis zone. Routinely, the Institute of Transportation Engineers (ITE) Trip Generation Manual is utilized to predict the number of trips generated by a development, but sometimes there is not enough data to discern the actual differences in trip generation from one similar site to another. Additionally, the impact of these fast-food restaurants and coffee shops associated with differing operations from site to site and the impact on the state facilities can be missed. Our objective was to accurately assess impacts to the state roadway system due to excessive driveway queuing from internal drive-through lanes because of high volume/high generator land uses when located adjacent to state roadway facilities. Site trips and queueing information will be collected for these two land uses at multiple sites throughout the State of Florida. The development of specific traffic impacts for these specific generators will promote the design of safer access connections and promote all necessary improvements to the state roadway are determined in the preliminary phase of review. We hypothesize that within the same land use, there are significant differences in trip generation and operations from site to site and development to development, which may explain why some site's queues spillover onto the state highway system and others do not. Developing accurate trip generation data and estimating queues will assist the decision-making process and ultimately benefit the safety and operation of the state roadway systems.

17. Key Words	18. Distribution Statement
access management, trip generation, queue, drive-through	

19. Security Classification (of this report)	20. Security Classification (of this page)	21. No. of Pages	22. Price
Unclassified		144	

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is responsible for protecting Florida roadways and providing the traveling public with a safe and efficient transportation system. As part of that effort, FDOT works with local agencies when new developments are proposed to ensure that the traffic associated with these developments does not adversely impact the transportation system.

The study was initiated because queue spillover onto the adjacent roadway system has been observed at fast-food restaurants with drive-through and coffee/donut shops with drive-through. This spillover can cause significant traffic operational and safety issues for the traveling public.

This study collected trip generation and queueing information for a total of 40 sites (20 fast-food and 20 coffee/donut shops) at various locations around the State of Florida. Three brands in each land use were collected. They included Chick-fil-A, McDonalds, and Whataburger for the fast-food category and Starbucks, Dunkin' Donuts, and Krispy Kreme for the coffee/donut shop category.

The standard source for trip generation estimates is the ITE Trip Generation manual. The trip generation measured for these land uses was compared to the ITE trip generation rates. The results showed that for both land use categories, the difference in trip generation was significant. Chick-fil-A generated nearly twice the ITE estimate, McDonalds approximately equal to the ITE estimate, and Whataburger less than ITE in every case. Similarly for the coffee shop land use, Starbucks generated significantly more trips than ITE predicted, Dunkin' Donuts higher in most cases, but significantly lower in a couple of locations, and Krispy Kreme only 36 percent of the ITE estimate.

Independent variables used in the estimating procedures were evaluated, including square footage of the building and adjacent street traffic volumes. The most commonly used independent variable in these estimates for these sites is the square footage of the building. While there is some correlation between the adjacent street traffic and the trip generation associated with the site, there was no improvement in accuracy in using the adjacent street traffic volume over the square footage of the buildings. The conclusion drawn from this analysis is that the most significant independent variable in estimating trips associated with these land uses is the brand.

To address queueing, this study evaluated the classical traffic engineering queueing equations for application to drive-throughs. The classical equations apply an exponential probability distribution function, and queues theoretically go to infinity as the volume approaches the lane capacity. This is due to the value (1-v:c ratio) in the denominator of the equation to predict queues. As the v:c (volume to capacity) ratio approaches 1.0, the computed queue is infinitely large. The queue can only be

infinitely large if vehicles arrive in the drive-through lane at an infinitely large rate. This does not occur in the field. In reality, there will be time periods when arriving volumes exceed drive-through lane capacity and a queue builds, but usually the rate of arrivals slows, and the queue dissipates as the drive-through operators catch up to the arrivals.

Over 3,200 vehicles were observed in fast-food and coffee/donut shop drive-through lanes. Vehicle service times were found to be best described by a log-normal, not exponential, distribution. The trip generation data supported developing vehicle arrival patterns in 15-minute intervals. We found that there is no "one-size fits all" when it comes to queueing. Different restaurants or sales operations have very different operation rates, and the lengths of queues vary based on two variables – the arrival rate and the service rate. Another significant difference between queueing in traffic streams (i.e., at traffic signals) is that there is consistency and predictability provided by the operation of the computer systems that control the signals. With drive-throughs, the performance of humans operating these systems often varies, with faster performance when there are higher traffic demands.

In this study, microsimulation was applied to a variety of service rates (or lane capacity) and variety of demand volumes in a "sequential toll-booth" type of simulation to develop a family of curves by which 90th percentile queue lengths can be predicted (Figure ES-1). Each curve is associated with a given lane capacity, in ten vehicle-per-hour intervals. To find the 90th percentile queue (in vehicles) one can enter the graph at the expected hourly volume along the "x" axis, move vertically to the curve associated with the service rate (or drive-through capacity), then horizontally to the "Y" axis to determine the estimated 90th percentile queue.

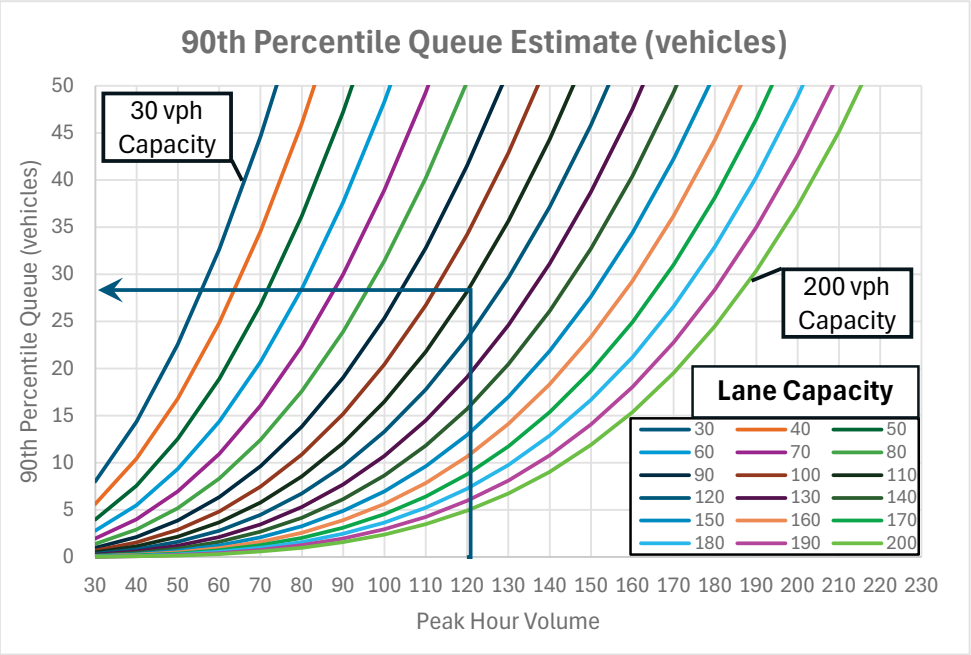

FIGURE ES-1: MICRO-SIMULATION ANALYSES GRAPH -TO FIND THE 90TH PERCENTILE QUEUE (IN VEHICLES), ENTER THE GRAPH ALONG THE "X" AXIS AT THE EXPECTED HOURLY VOLUME (E.G., 120 VPH), MOVE VERTICALLY TO THE CURVE ASSOCIATED WITH THE SERVICE RATE (OR LANE CAPACITY, HERE 110 VPH), THEN HORIZONTALLY TO THE "Y" AXIS TO READ THE NUMBER OF VEHICLES EXPECTED IN QUEUE (HERE, 28 VEHICLES).

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1 PROJECT BACKGROUND

FDOT is responsible for protecting Florida roadways and providing the traveling public with a safe and efficient transportation system. As part of that effort, FDOT works with local agencies when new developments are proposed to ensure that the traffic associated with these developments does not overly impact the transportation system.

Over time, there have been observations of previously approved developments' impacts on the surrounding transportation system that exceeded expectations. This includes queueing from drive-throughs spilling over onto the adjacent roadways. For some locations, this has become a regular occurrence and not an anomaly. Two specific land uses in which this condition has been observed are the fast-food and coffee shop uses. However, not all fast-food or coffee shop uses were demonstrating this characteristic.

This study sought to define the characteristics of these land uses that experienced excessive impacts and determine how to better anticipate these potential impacts to prevent their occurrence in the future.

There are well-established practices of evaluating traffic impacts associated with development, commonly referred to as traffic impact analyses or traffic impact studies. This study evaluates the breakdown in that process. The two primary factors in a Traffic Impact Analysis for a development of this type include the trip generation estimation and the queueing analysis.

The estimation of trip generation for a site has long been established primarily using the Institute of Transportation Engineers Trip Generation Manual which takes other traffic count information from multiple similar sites around the country and develops equations that approximate newly proposed similar developments.

2 LITERATURE REVIEW

During March 2020, through April 2022, drive-through lane business at quick-serve restaurants (QSR's) surged due to the COVID-19 pandemic. Some restaurant chains have recently reported that upwards of sixty percent of their business came through their drive-through windows. In addition, certain restaurant chains have proven very popular with their customers, and they are generating much more traffic than predicted by industry-standard references (notably the ITE Trip Generation reference). Traffic demands at "high-traffic" QSR's have resulted in drive-through lane queues extending out into the adjacent roadways causing congestion and elevated risk of crashes.

Internet searches have yielded studies where trip generation rates and queue lengths at QSR's have been observed, but the majority of these observations were made of a "pre-pandemic" condition. The Florida DOT has commissioned this study of "high-traffic" QSR's to provide more current information regarding QSR drive-through lanes and to provide advice on the design and operation of drive-through lanes.

The initial task of this study was to provide an overview of current knowledge related to these land uses regarding trip generation, queueing, and site circulation -- to identify relevant theories, methods and gaps in the existing knowledge. Findings are presented in the following sections.

- Queueing Theory and Analysis
- Trip Generation Literature
- Innovative Drive-Through Lane Operations and Design
- Takeaways for This Study

2.1 Queueing Theory and Analysis

Queueing is a complicated phenomenon. Queue lengths in QSR drive-through lanes depend on the rate and pattern with which customers arrive in the drive-through lane, the time it takes to order, pay for, prepare, and deliver the order, if a vehicle exiting the drive-through lane can flow freely or is hampered by on-site circulation or congestion at the site driveway, the ordering, payment, and preparation technologies used, the number and layout of the drive-through lanes, and the interaction of all these facets. In addition, each of these facets has an associated variance, which must also be considered.

In the review of recent (2020 and 2021) traffic analyses submitted to regulatory agencies in support of drive-through lane design [sources 5,7], two documents are cited in support of the analysis procedures: Chapter 8 of Transportation Research Board Special Report 165, "Traffic Flow Theory – A Monograph" [source 1], and ITE's Transportation and Land Development [source 2]. Both of these references present the same classical theory on queueing models and their application to traffic engineering issues (e.g. parking lot occupancy, queueing at traffic signals and toll booths). The predictive equations in these references are deterministic, based on certain arrival and service time distributions. If the situation under review matches these assumptions, the equations are consistent and predictable. However, while these equations are well accepted for their circumstances, they address queueing events that are isolated and are not influenced by adjacent conditions – a situation which is rare.

From a traffic flow perspective, the drive-through transaction occurs in four sequential stations: placing the order, making payment, picking up the order, and exiting the system. The classical equations can address each of these stations in isolation, but if traffic at one station backs up into an upstream station the deterministic models are disrupted. The closer these stations are to each other, the greater the likelihood of station-to-station interference. The distance between each of these stations will affect how frequently such backups could occur, so the physical layout of the drive-through lanes and stations will affect the efficiency of the system and queueing.

Additional options in the operation of a drive-through station are that sometimes the ordering step is facilitated with an "order board and speaker" or by a human with an internet-connected handheld device. An emerging ordering method offered by some stores is through the internet. Regarding payment, sometimes the payment step is at a "stand-alone" station, sometimes it is combined with the human or internet ordering function, or is sometimes combined with the order pick-up station. And, finally, the lane discipline is relevant. Sometimes internet orders are handled through the drive-through lane and sometimes not at all, with a separate lane allowing internet customers to by-pass the order station and advance to pick-up or to park in designated internet order pick-up spaces.

One source [17] in 1981, recognizing the lack of a deterministic procedure to evaluate the sequential queuing problem, recommended applying deterministic equations to the least-efficient station of the drive-through lane for the queueing analysis. However, the reference also acknowledges that approach is less than optimal. In addition, the article identifies the need for additional data collection of drive-through lanes and application of "microcomputer programs" for analysis as desirable.

After outreach to University of Florida/McTrans Center staff, our search has not identified development of deterministic equations to address a sequential series of queueing events that may affect each other. The advice of academia seems to quickly shift to advocating the use of computerized simulation techniques to analyze and test operational and design alternatives [source 16]. The advice is that application of a capable traffic flow micro-simulation model is better-suited to integrate the many facets and options of drive-thru operations.

Micro-simulation models developed for traffic flow simulation provide the ability to implement the stations of the drive-through transaction physically and to-scale, and to program the variances of service times of the various operations at each station of the process. Queues can then be estimated by undertaking probabilistic stochastic modeling of the various operating alternatives and physical layouts.

Advantages of a simulation model include:

- Simulation models can model traffic demands that build to exceed system capacity for a while, then dissipate over a period of time, whereas deterministic equations are limited to conditions where the average hourly system capacity is not exceeded.
- A simulation model can be used to investigate a wide variety of "what-if" questions about the real-world system. It is much easier to predict the effects of the changes in a simulation model than it is in a real-world system.
- Time can be compressed in a simulation model. For example, in our case, we need to study the performance of a real-world system. If we choose field experiments, it will be time-consuming and costly. But in a simulation model, scenarios can be tested economically.
- A simulation model can be used to study a complex real-world system. For a real-world system, it will be difficult to build a deterministic mathematical model. Such a model is based on the assumptions about a real-world system. Compared with the simulation model, there will be more assumptions in the mathematical model as the information about the real-world system is less precise and hard to measure [source 10].

In this study, we measured the performance of the order-board/speaker and human order/pay ordering protocol, the stand-alone payment protocol, and the pick-up only and pay/pick-up protocols so these parameters can be used to evaluate specific development proposals.

2.2 Trip Generation Literature

Other studies have been made of the trip generating characteristics of fast-food and coffee shops that were discovered in the search for contemporary literature on this topic. Much of these data are of pre-pandemic conditions. A frequently observed theme in QSR industry literature is that the fast-food and drive-through experience has changed significantly from pre-pandemic, to during pandemic, and in post-pandemic times [11,12,13,14].

The most widely known collection of studies is the ITE trip generation reference [9]. For this study, land use code 934, Fast-Food Restaurant with Drive-Through Window and land use code 937, Coffee/Donut Shop with Drive-Through Window are relevant. An example plot of the ITE studies for the Saturday peak hour of the fast-food restaurant is provided in Figure III-1. Additional excerpts from this reference for other peak periods of demand are provided in Appendix A of this document for Fast-Food and Coffee Shop land uses. Typical of both land uses is that the studies show very weak (or no) correlation of traffic generation with the size of, or number of employees working at the facility, pointing out the need to find better methods of predicting traffic generation. Indications of the ITE trip generation data are that fast-food restaurants are busiest during the Saturday midday period (11:00 a.m. to 2:30 p.m.), with weekdays being a close second, and that coffee/donut shops are busiest during the weekday a.m. peak period. These findings are also confirmed in the industry literature [3,5].

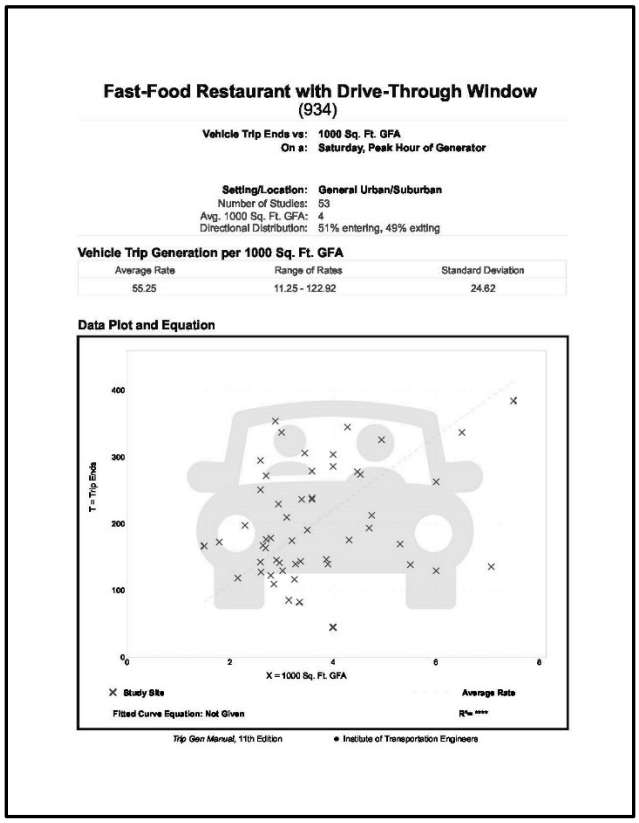

FIGURE 2-1: ITE TRIP GENERATION LUC 934 DATA PLOT
Note there is no apparent correlation between building area and trip-ends.

Table 2-1, below, summarizes the data reported in other studies found on the internet. Note that the volumes are denoted as either drive-through lane volumes or site total volumes, as some studies focused on the drive-through lanes only.

2.3 Innovative Drive-Through Lane Operations and Design

Innovations for efficient drive-through lane operations and emerging operational strategies were identified in periodicals oriented towards the QSR industry [sources 11, 12, 14, 15]. Techniques identified were:

- Advance ordering and payment via internet. In this innovation, customers could park in designated parking spaces away from the drive-through lane to receive their orders.
- Advance ordering with tablets in queue. Already implemented in many stores, this method of ordering provides for "human touch", as well as the ability to pay for the order.
- Door, rather than window, at pick-up station to allow quicker delivery of orders to "upstream" vehicles.

TABLE 2-1: SUMMARY OF FAST-FOOD AND COFFEE SHOP TRIP GENERATION STUDIES

Summary of Fast Food Trip Generation Studies

ITE LUC 934: Fast-Food Restaurant w/ Drive-Thru Window 85th %-ile[1]:				300	
Source	Store	Location	Year	Hourly Volume[2]	Max Queue
TJW	Chick-Fil-A	Upland	2017	166	26
TJW	Chick-Fil-A	Corona	2017	182	16
TJW	Chick-Fil-A	Laguna Hills	2017	162	17
TJW	Chick-Fil-A	Rancho Cucamonga	2017	170	19
Stantec	McDonald's	Petaluma, CA	2018	n/a	10
			85th %-ile of above data:	**177**	**22**

Notes:

1. These volumes are total site traffic, "walk-ins" plus drive-through.
2. These volumes are only those through the drive-through lane. Additional trip-ends would be generated by "walk-in" customers.

Summary of Coffee Shop Trip Generation Studies

ITE LUC 937: Coffee/Donut Shop w/ Drive-Thru Window 85th %-ile:				273	
Source	Store	Location	Year	A.M. PeakHour Volume	% in Drive-Through
Stantec	Starbucks	Pomona, CA	2014	180[1]	100%
CED	Not named	Rochester, NY	2008	198	63%
CED	Not named	Brighton, NY	2008	81	n/a
CED	Not named	Brighton 2, NY	2008	139	71%
CED	Not named	Victor, NY	2008	116	70%
CED	Not named	Genesseo, NY	2008	70	47%
CED	Not named	Irondequoit, NY	2008	120	68%
CED	Not named	Henrietta, NY	2008	119	78%
CED	Not named	Henrietta 2, NY	2008	155	74%
CED	Not named	Victor 2, NY	2008	105	82%
CED	Not named	Greece, NY	2008	161	74%
CED	Not named	Genesseo 2, NY	2008	57	68%
CED	Not named	Irondequoit 2, NY	2008	99	62%
CED	Not named	Henrietta 3, NY	2008	127	76%
U of Washington	Starbucks	Seattle, WA	2015	271	n/a
BES Engrg	Aroma Joe	Land-O-Lakes, FL	2023	50	74%
BES Engrg	Pineapple Espresso	St. Petersburg, FL	2023	60	100%
BES Engrg	Sips	Tampa, FL	2023	52	70%
			85th Percentile of above studies:	159	

Note:

1. Trip-ends for this site only are those through the drive-through lane(s). All others are site trip-ends.

- Parking spaces for orders taking a long time to prepare, staff training
- Special circulation for Door Dash/Uber Eats/meal delivery services.

Innovative designs for new construction that have been identified include:

- Conveyor belt delivery of orders
- Restaurants with no indoor seating, drive-through only
- Upstairs kitchen, drive-through lanes underneath.

The purpose of these innovative designs is to improve the QSR's throughput and operations. Varying site designs within the same land use will add layers of complexity when agencies attempt to assess the trip generation, site circulation, and queueing associated with these land uses. Considering only the land use and square footage of the building footprint will not accurately predict operating characteristics and potential impacts to the State highway system and adjacent roadways.

2.4 Literature Takeaways for This Study

From the literature search, we draw the following considerations for this study:

- We need to find readily available variables on which to base trip generation estimates.
- When we measure site trip generation, we also need to identify the proportion of trips that use the drive-through lane(s) as opposed to parking and entering the building.
- Much of the data available is pre-pandemic data. Inadequate consistent data is publicly reported to pass judgement on pre- vs post-pandemic drive-through lane traffic, but the literature suggests there has been a change. Industry literature suggests much heavier use of drive-through lanes has developed during the pandemic, and therefore the major investments by QSR restaurants on the drive-through experience.
- There are many different configurations, service strategies, and technologies emerging that will change the performance characteristics of drive-through lanes. It will be difficult to develop a simple set of recommendations for design of these lanes. We should make a set of "conventional" assumptions (e.g. regarding number of lanes, distance between stations, and performance of typical ordering/payment/service methods) and outline the resulting recommended queue design parameters. However, more valuable may be to establish a standardized procedure and to measure appropriate input parameters to use in the more popular and capable micro-simulation tools (e.g. Vissim, TransModeler, CORSIM) so that future analysts can undertake their own micro-simulation analysis of drive-through lanes, tailored to their specific cases.

- Micro-simulation should be applied to develop and/or review design recommendations.

3 SITE SELECTION

A total of 40 sites was included in the study. Twenty of the sites were for the fast-food with drive-through land use, and 20 sites were for the coffee shop with drive-through land use. While the specific brands that were suspected of experiencing the issues with trip generation and queueing were known, a decision was made to include three brands from each land use category. For the fast-food land use category, the three brands were Chick-fil-A, McDonalds, and Whataburger. For the coffee shop land use category, the three brands were Starbucks, Krispy Kreme, and Dunkin' Donuts. These brands were chosen partially because they are large brands with many locations which would allow inclusion of sites in varying locations and contexts around the State of Florida.

The original scope called for the sites to be in the more urbanized context classifications as defined by FDOT's context classification system. Other desirable factors in the site selection process included stand-alone sites as well as sites within strip centers or facilities with shared access, and sites that were in various areas of the State of Florida.

In the process of selecting the sites, it was quickly realized that the more urban contexts did not include these specific land uses due to the lack of drive-throughs in highly urban areas. Therefore, while there was an effort to remain in the more urban areas, the specific context classifications were modified.

Other factors affecting the final sites were area or on-site construction (if it was under construction, it was not selected), the ability to collect the data using video, and the ability to isolate the data to the patrons of the identified facility.

After the sites were identified and the data collection process was started, there were a couple of locations that went into construction before the data could be collected so those sites were changed to alternative locations.

Figure IV-1 shows a map of the selected sites.

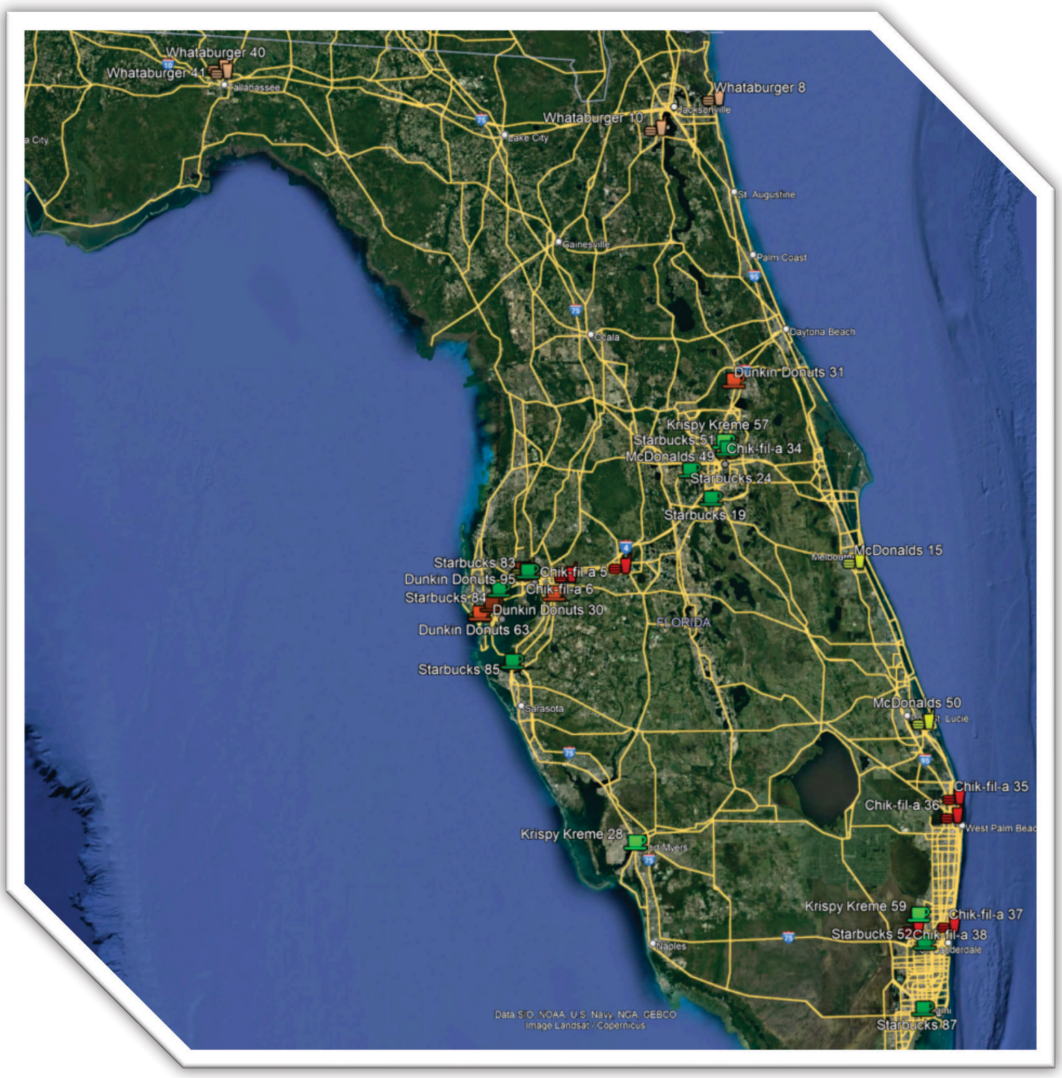

FIGURE 3-1 SELECTED SITE LOCATIONS

This map includes data from: Google Data SIO, NOAA, U.S. Navy, NGA, GEBCO Landsat / Copernicus INEGI
Imagery from the dates: 4/10/2013–newer

4 DATA COLLECTION

The data collection process took more than six months to complete. Initially video cameras were set up to record vehicular traffic entering and exiting the site. The traffic associated with the specific land use was isolated to ensure the traffic volumes would be representative of that site.

Additionally, the traffic that utilized the drive-throughs versus parking and entering the facility were identified so that a percentage of site traffic that elected to use the drive-through could be predicted.

Further, for queue estimation purposes, the service times in the drive-through were sampled. There are three distinct service times that when added together make up the overall service time for the drive-through. They include the order time, the payment time, and the food pick up time. Recognizing that some of those times could be impacted by the queue itself, e.g. the time may be longer if you cannot pull forward because there is a vehicle in front of you, if the time was "queue inhibited" this information was noted.

While the initial scope identified the AM and PM Peak Periods as is standard for traffic impact analyses, a decision was made to modify these periods for each of the land uses. The standard peak hour analysis period is PM (one hour between 4-6pm), and sometimes AM (one hour between 7-9am). The Institute of Transportation Engineers trip generation information identifies the peak hour of the fast-food land use to occur on Saturday midday (lunch), but with weekday midday hours nearly equal to the Saturday midday peak. Also, the coffee shop land use has a clear AM weekday peak hour, with PM significantly less. For traffic impact analyses, the analyses include the overall peak traffic period which may or may not be at the same time as the land use peak generation. For this reason, it was desirable to include the fast-food land use during the weekday PM Peak Hour as well. Therefore, a decision was made to change the data collection time periods to weekday midday, weekday PM, and Saturday midday for the fast-food land use, and to weekday AM for the coffee shop land use.

During the data collection process, some sites were difficult to isolate the specific traffic associated with the land use due to shared-use parking and other issues. Therefore, those sites were supplemented with counts that included video of patrons walking from the parking lot into the entry door of the facility.

This data was utilized to estimate the trip generation rates for each of the land uses during the specified time periods. The data collected for this study is included in Appendix B?.

5 ANALYSIS

5.1 Trip Generation Analysis

5.1.1 Trip Generation Dynamics

This section seeks to answer the following questions:

- How does the trip generation vary among the sites collected for each of the land uses?
- Using common independent variables, like square footage of the building, how does ITE trip generation compare to the measured trip generation?
- What independent variables can be utilized to accurately predict trip generation for these land uses?
- What method should be used to estimate trip generation for these land uses?

The trip count information for all of the sites are included in summary tables in Appendix C.

5.1.2 Measured Trip Generation of the Fast-Food with Drive-Through Land Use

The trip counts for the fast-food sites were collected for three time periods. These included the weekday midday (lunch), weekday p.m., and Saturday midday (lunch).

A total of 20 fast-food sites were collected for these time periods. There were nine Chick-fil-A sites, seven McDonalds sites, and four Whataburger sites collected.

Each of the brands had the highest trip counts during the same time period, the weekday midday time period. The Saturday midday time period was relatively close to the weekday midday time period, and the weekday p.m. was the lowest. The average hourly count for all sites were 288, 263, and 185 for the weekday midday, Saturday midday, and weekday p.m. time periods, respectively.

The maximum hourly trip generation for each of the sites is shown in Figure 5-1.

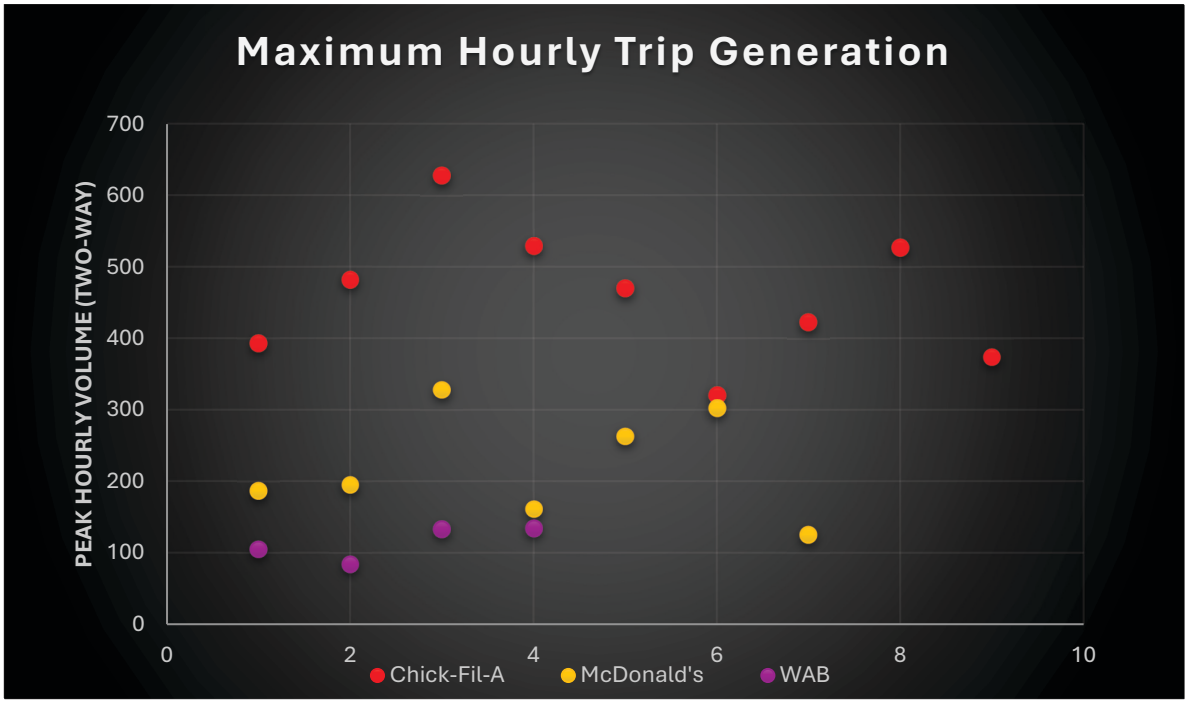

FIGURE 5-1 MAXIMUM FAST-FOOD TRIP GENERATION

As can be seen in Figure 5-1, while there is variation within each brand, the maximum trip generation is clearly distinguishable between the brands. It is also noted that there is almost no overlap in maximum trip generation between the brands.

Since traffic impact analyses focus on the overall peak hour of traffic, which includes the traffic on the adjacent street system, and the adjacent street traffic typically is far greater than the trip generation of a site, and that adjacent street traffic typically peaks during the weekday PM peak period, the following weekday PM peak period data was similarly analyzed. The weekday PM peak hourly traffic for the fast-food sites is shown in Figure 5-2.

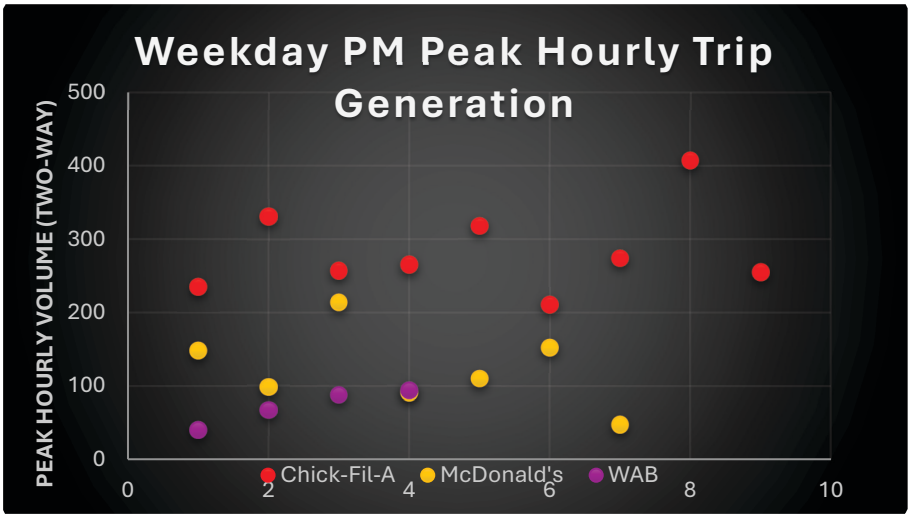

FIGURE 5-2 WEEKDAY PM PEAK HOUR FAST-FOOD TRIP GENERATION

Again, there is variation within each brand, however, there are clearly distinguishable differences in weekday PM Peak Hour trips associated with each of the brands. Also, while there is slightly more overlap between the brands, there is still a clear separation between the brands.

5.1.3 Measured Trip Generation of the Coffee Shop With Drive-Through Land Use

The trip counts for the coffee shop sites were collected for weekday AM peak time period.

A total of 20 coffee shop sites were collected for this time period. There were nine Starbucks sites, seven Dunkin' sites, and four Krispy Kreme sites collected.

Figure VI-3 shows the weekday AM peak hour trip generation for the coffee shop sites collected.

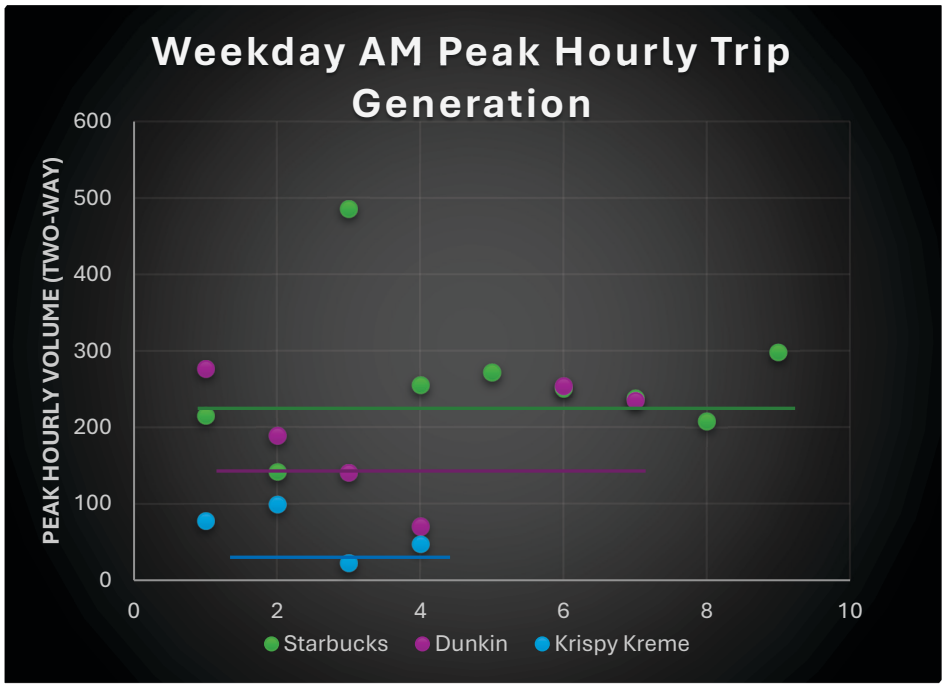

FIGURE 5-3 WEEKDAY AM PEAK HOUR COFFEE SHOP TRIP GENERATION

As can be seen in Figure 5-3, while there is variation within each brand, the trip generation is again distinguishable between the brands. The average AM Peak Hour trip generation was 263, 194, and 61 for Starbucks, Dunkin', and Krispy Kreme, respectively.

5.1.4 Comparison of ITE Trip Generation to the Measured Fast-Food with Drive-Through Land Use

The trip generation estimate using the Institute of Transportation Engineers (ITE) Trip Generation Manual was compared to the measured trip generation for the fast-food sites. The commonly used building square footage was used as the independent variable for the ITE Trip Generation estimate. The building square footage information was estimated by measuring the square footage of the building space from aerial photography. Figure VI-4 shows the comparison of the ITE trip generation estimate to the measured trip generation for the fast-food sites in the typical PM Peak Hour.

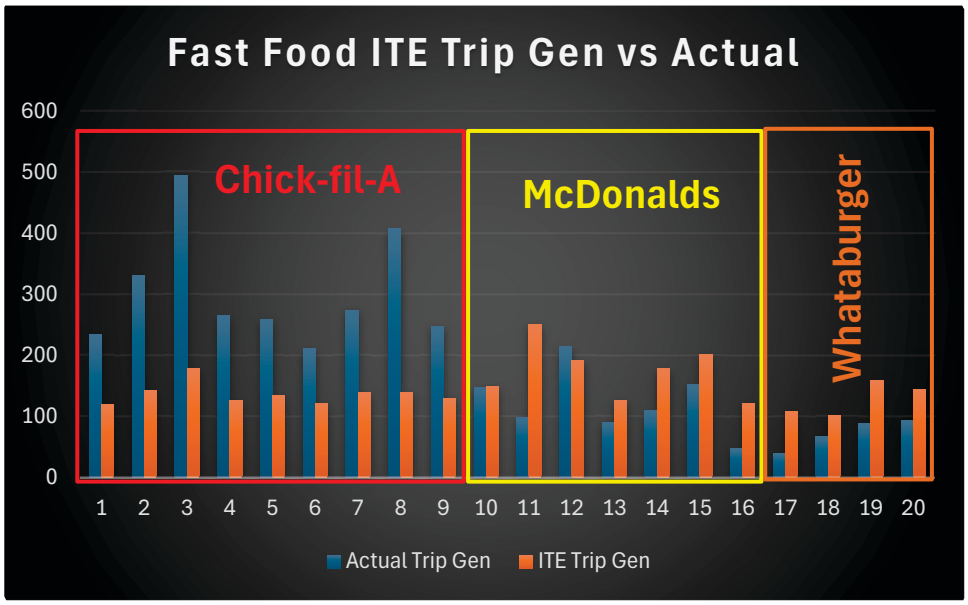

FIGURE 5-4 ITE TRIP GENERATION VS. MEASURED TRIPS FOR FAST-FOOD SITES.

As is shown in Figure 5-4, Chick-fil-A sites generated far more trips than ITE predicted in every case. For McDonalds, most sites were overpredicted by ITE, with one site underpredicted and one site accurately predicted. For Whataburger sites, ITE overpredicted in every case.

This data again show a clear difference between brands in trip generation. The theories on the reasoning for the differences between brands include brand loyalty/preference as well as the brands operating models. These theories were developed in cooperation with the subsequent sections on queueing analysis. Operating models identify what the brand prioritizes. While most brands will prioritize speed and efficiency to maximize sales, not all brands have the same priorities. Whataburger's website, for example, states "every Whataburger is made to order, right when it's ordered.", this means that each order is custom ordered which likely affects the speed of order fulfillment and subsequently the number of trips generated.

While it would be expected that an estimated trip generation would not be exact for any specific site, these data demonstrate that the ITE trip generation estimates are consistently inaccurate for Chick-fil-A and Whataburger. For Chick-fil-A, the ITE trip generation estimate was low by an average of 166 PM peak hour trips, or ITE was about 55% low, on average during the PM peak hour. Conversely, ITE overpredicted trip generation for Whataburger by an average of 57 PM peak hour trips or by 78%. It should be noted that this study only evaluated three fast-food brands, so this same assessment could be applied to many other fast-food brands. It should also be noted that the square footages of the buildings for all sites were relatively similar, so using square footage alone as an independent variable and ITE trip generation, the estimated number of trips generated are also relatively similar; however, the measured trip generation is significantly different.

5.1.5 Comparison of ITE Trip Generation to the Measured Coffee Shop with Drive-Through Land Use

Similar to the fast-food sites, the trip generation estimate using the Institute of Transportation Engineers (ITE) Trip Generation Manual was compared to the measured trip generation for the coffee shop sites. For the coffee shop sites, the AM Peak Hour trip generation was used for both ITE and the measured trips. The commonly used building square footage was used as the independent variable for the ITE Trip Generation estimate. The building square footage information was estimated by measuring the square footage of the building space from aerial photography. Figure 5-5 shows the comparison of the ITE trip generation estimate to the measured trip generation for the coffee shop sites in the typical PM Peak Hour.

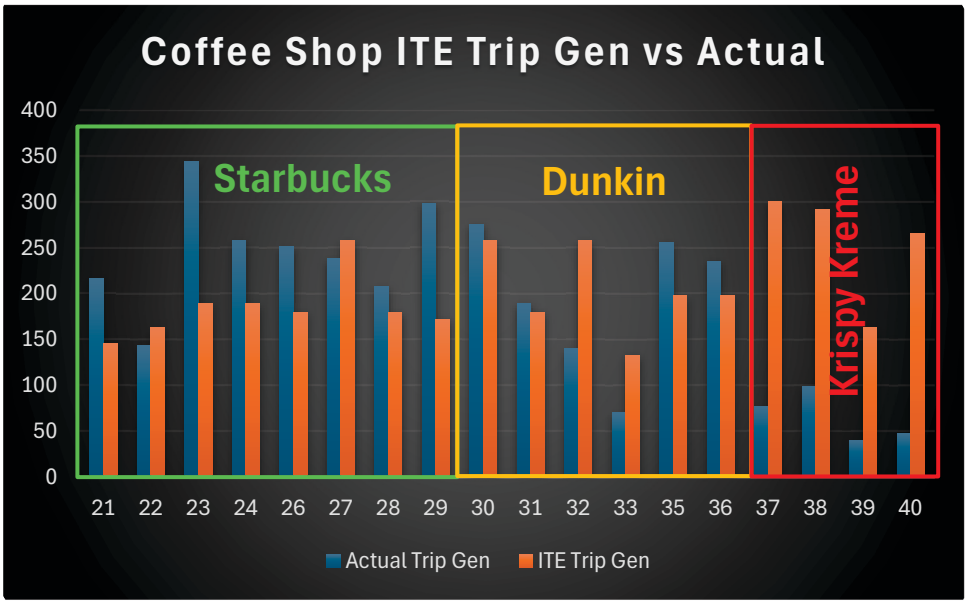

FIGURE 5-5 ITE TRIP GENERATION VS. MEASURED TRIPS FOR COFFEE SHOP SITES.

As is shown in Figure 5-5, Starbucks generated more trips than was predicted by ITE in 7 out of 9 cases. On average, ITE under-predicts trips for Starbucks by 60 trips in the AM Peak Hour or 32.5%

For Dunkin', two of the six sites were fairly accurate while the remaining four sites were over-predicted or under-predicted (two over and two under). In the two cases where ITE over-predicted the site trip generation for Dunkin' sites, the difference was significant with an average of 91 trips over.

For Krispy Kreme, ITE significantly over-predicted in every case. On average, ITE Trip Generation over predicted the Krispy Kreme AM Peak Hour trip generation by 190 trips or 287%. This data again shows a clear difference between brands in trip generation.

5.1.6 Recommended Approach for Trip Generation of the Fast-Food with Drive-Through Land Use

The results of this study showed that the trip generation for fast-food with drive-through land use can vary significantly by brand. There are a variety of possible reasons for the differences by brand including brand loyalty, preference, and operating models.

There are several possible independent variables that could be used to estimate trip generation using ITE Trip Generation including square footage of the building, number of employees, seats, and adjacent street traffic. Square footage of the building is by far the most common independent variable used in the estimation of trip generation. Using this method compared to the measured trip generation showed that the accuracy of the estimate could be significantly diminished.

Therefore, to ensure an accurate estimate of trip generation for fast-food sites with drive-throughs, acquiring supplemental information that is specific to the brand is critical. This information may be acquired through traffic counts at existing locations of that brand, or possibly from the companies themselves.

If ITE Trip Generation is used to estimate trip generation for fast-food sites with drive-throughs, caution should be used, and the brand should be considered for potential adjustments.

5.1.7 Recommended Approach for Trip Generation of the Coffee Shop with Drive-Through Land Use

Similarly, trip generation for coffee shops with drive-through land use can vary significantly by brand. There are a variety of possible reasons for the differences by brand including brand loyalty, preference, and operating models.

There are several possible independent variables that could be used to estimate trip generation using ITE Trip Generation including square footage of the building, seats, and adjacent street traffic. Square footage of the building is by far the most common independent variable used in the estimation of trip generation. Using this method compared to the measured trip generation showed that the accuracy of the estimate could be diminished.

Therefore, to ensure an accurate estimate of trip generation for coffee shop sites with drive-throughs, acquiring supplemental information that is specific to the brand is critical. This information may be acquired through traffic counts at existing locations of that brand, or possibly from the companies themselves.

If ITE Trip Generation is used to estimate trip generation for fast-food sites with drive-throughs, caution should be used, and the brand should be considered for potential adjustments.

5.2 Queueing Analysis

5.2.1 Queueing Dynamics

This section seeks to answer the following questions:

- Are there significant differences in the times required for ordering, payment, and pickup operations?
- Are there significant differences between fast-food and coffee/donut operations?
- Are there significant differences between brand operations?
- How well do the "classical equations" predict queue length?
- Are there better ways to predict queue lengths?

Order times, payment times, and pickup times for fast-food restaurants and coffee/donut shops were tabulated and are summarized in Tables 5-1 and 5-2, respectively. These tables summarize the times by drive-through lane operating protocol and time of day.

Three operational protocols are in common operation as follows:

- Order, pay, then pickup (three stations/windows)
- Order/pay, then pickup (two stations/windows)
- Order, then pay/pickup (two stations/windows)

Order Times

During the times observed, McDonald's sites surveyed made use of a three-step protocol – protocol one; order, pay, then pickup. All but one of the Chick-fil-A's used protocol two, the order/pay, then pickup protocol (the different one used protocol three), and all of the Whataburger sites and coffee/donut shops used protocol three, the order, then pay/pickup protocol.

The peak hour volumes of traffic observed in the fast-food restaurant drive-through lanes ranged from 12 to 190. Individual order times at fast-food restaurants ranged from three seconds to 16:16 (sixteen minutes and 16 seconds). The shorter order times were likely mobile app orders. The portion of vehicles passing through in five seconds or less was recorded as 4.4 percent. Average order times at fast-food restaurants were on the order of one minute. Not surprisingly, average order times at Chick-fil-A (order and pay) were 11 seconds longer than for McDonald's (order only). Whataburger exhibited the longest order times (order only), 23 seconds longer than the same protocol McDonald's.

The peak hour volumes observed in coffee/donut shop drive-through lanes ranged from six to 107. Individual order times at coffee/donut shops ranged from zero seconds (in

one case) to 6:03 (six minutes and 3 seconds). Only 1.1 percent of the vehicles were recorded as passing through in five seconds or less. Average order times at the

TABLE 5-1: FAST FFOOD PERFORMANCE PARAMETERS, INHIBITED > 15 SEC

Fast Food Performance Parameters, Inhibited >15 sec

		Time Period					Queue-Inhibited?	
	Protocol	Weekday Lunch	Weekday Supper	Saturday Lunch	All Periods	Total Count	Yes	No
Number of Vehicles								
Chick-Fil-A	1	14	16	9	39	39	36	3
Chick-Fil-A	2	217	200	209	626	626	598	28
Chick-Fil-A	3	174	133	55	362	362	361	1
McDonald's	1	324	227	453	1,004	1004	477	527
Whataburger	3	126	83	107	316	316	276	40
					Total:	2,347	1,748	599
Order Times (mm:ss.s)							**Capacity (vehicles/hr)**	
Chick-Fil-A	1	00:42.1	00:51.2	00:33.2	00:43.8	39	82	
Chick-Fil-A	2	00:49.9	01:17.5	01:03.4	01:03.2	626	57	
Chick-Fil-A	3	00:38.0	00:36.2	01:23.0	00:44.2	362	82	
McDonald's	1	00:47.2	00:59.8	00:51.9	00:52.1	1004	69	
Whataburger	3	01:20.9	01:12.0	01:10.2	01:14.9	316	48	
					Total:	2,347		
Payment Times (mm:ss.s)								
Chick-Fil-A	1	00:21.5	00:23.6	00:20.0	00:22.0	39	164	
McDonald's	1	00:31.0	00:38.8	00:32.8	00:33.6	1,004	107	
					Total:	1,043		
Pickup Times -- All (mm:ss.s)								
Chick-Fil-A	1	00:23.6	00:43.6	00:38.6	00:35.3	39	102	
Chick-Fil-A	2	01:09.1	01:06.2	01:08.2	01:07.9	626	53	
Chick-Fil-A	3	00:47.4	02:50.3	01:14.5	01:36.7	362	37	
McDonald's	1	00:36.4	00:52.7	00:35.5	00:39.7	1,004	91	
Whataburger	3	02:22.6	02:57.9	02:32.6	02:35.3	316	23	
					Total:	2,347		
Pickup Times -- Not Inhibited (mm:ss.s)								
Chick-Fil-A	1	00:15.0	-	00:39.0	00:23.0	3	157	
Chick-Fil-A	2	01:29.8	01:23.3	01:27.6	01:27.4	28	41	
Chick-Fil-A	3	00:56.0	--	--	00:56.0	1	64	
McDonald's	1	00:33.3	00:52.9	00:33.9	00:38.2	527	94	
Whataburger	3	04:22.5	03:02.6	03:19.9	03:30.6	40	17	
					Total:	599		
Pickup Times -- Queue Inhibited (mm:ss.s)								
Chick-Fil-A	1	00:25.1	00:43.6	00:38.5	00:36.3	36	99	
Chick-Fil-A	2	01:08.6	01:05.9	01:06.4	01:07.0	598	54	
Chick-Fil-A	3	00:47.4	02:50.3	01:14.5	01:36.8	361	37	
McDonald's	1	00:39.5	00:52.4	00:37.3	00:41.4	477	87	
Whataburger	3	02:11.2	02:56.9	02:25.5	02:27.3	276	24	
					Total:	1,748		
Total Times (mm:ss.s)								
Chick-Fil-A	1	02:24.4	02:59.4	02:29.8	02:40.0	39		
Chick-Fil-A	2	04:31.7	05:21.8	04:14.3	04:41.9	626		
Chick-Fil-A	3	03:58.7	07:15.1	09:31.7	06:01.4	362		
McDonald's	1	03:20.6	03:51.1	03:21.4	03:27.8	1004		
Whataburger	3	07:59.5	07:35.5	07:12.8	07:37.4	316		
					Total:	2,347		

Note: Protocol 1=Order, Pay, Pickup, 2=Order/Pay, then Pickup, 3=Order, then Pay/Pickup.

TABLE 5-2: COFFEE/DONUT SHOP PERFORMANCE PARAMETERS, INHIBITED > 18 SEC

Coffee/Donut Shop Performance Parameters, Inhibited >18 sec

		Time Period	Queue-Inhibited?	
	Protocol	Weekday A.M.	Yes	No
Number of Vehicles				
Starbucks	3	583	491	92
Dunkin Donuts	3	485	398	87
Krispy Kreme	3	89	42	47
			931	226

			Capacity (vph/lane)
Order Times (mm:ss.s)			
Starbucks	3	00:41.7	86
Dunkin Donuts	3	00:27.1	133
Krispy Kreme	3	00:36.4	99

Pickup Times -- All (mm:ss.s)			
Starbucks	3	00:46.6	77
Dunkin Donuts	3	00:39.6	91
Krispy Kreme	3	01:35.9	38

Pickup Times -- Not Inhibited (mm:ss.s)			
Starbucks	3	00:56.2	64
Dunkin Donuts	3	00:53.4	67
Krispy Kreme	3	01:58.7	30

Pickup Times -- Queue Inhibited (mm:ss.s)			
Starbucks	3	00:44.8	80
Dunkin Donuts	3	00:36.6	98
Krispy Kreme	3	01:10.3	51

Total Times (mm:ss.s)		
Starbucks	3	03:08.0
Dunkin Donuts	3	01:59.9
Krispy Kreme	3	03:13.1

Note: All are protocol 3=Order, then Pay/Pickup.

TABLE 5-3 FAST-FOOD RESTAURANT PERFORMANCE BY SITE AND PERIOD

Fast Food Restaurant Performance by Site and Period

Brand	Site	Period	Drive-Through Hourly Volume	Order lanes	Average Order Time	Order Capacity per Lane	Pay Lanes	Pay Time	Pay Lane Capacity	Pickup Lanes	Average Pickup Time	Pickup Capacity per Lane	Rate/Lane based on 15-minute increments	Best Estimate Capacity per Lane
Chick-Fil-A	1	1	156	2	00:34.9	103			0	1	00:28.7	125		157
Chick-Fil-A	1	2	93	2	00:44.4	81			0	1	00:38.8	93		94
Chick-Fil-A	1	3	117	2	00:17.8	202			0	1	01:14.3	48		118
Chick-Fil-A	2	1	140	2	00:34.3	105			0	1	00:28.4	127		141
Chick-Fil-A	2	2	104	2	00:49.6	73			0	1	00:33.8	107		107
Chick-Fil-A	2	3	100	2	00:46.5	77			0	1	00:44.4	81		101
Chick-Fil-A	3	1	182	3	01:33.1	39			0	2	02:00.4	30		92
Chick-Fil-A	3	2	150	3	01:49.3	33			0	2	02:10.9	28		76
Chick-Fil-A	3	3	190	3	02:08.0	28			0	2	01:53.7	32		96
Chick-Fil-A	4	1	76	2	00:45.0	80	1	00:21.5	167	1	00:31.6	114		114
Chick-Fil-A	4	2	74	2	00:58.2	62	1	00:23.6	153	1	00:41.5	87		87
Chick-Fil-A	4	3	102	2	00:41.9	86	1	00:20.0	180	1	00:51.5	70		103
Chick-Fil-A	5	1	159	2	00:26.4	136			0	1	00:17.6	205		205
Chick-Fil-A	5	2	95	2	00:49.2	73			0	1	00:53.2	68		96
Chick-Fil-A	5	3	116	2	01:24.9	42			0	1	01:35.1	38		117
Chick-Fil-A	6	1	135	2	00:44.2	82			0	1	00:35.4	102		136
Chick-Fil-A	6	2	88	2	00:40.9	88			0	1	00:32.0	112		112
Chick-Fil-A	6	3	108	2	01:03.7	57			0	1	00:45.9	78		109
Chick-Fil-A	7	1	147	2	00:38.3	94			0	1	00:45.2	80		148
Chick-Fil-A	7	2	95	2	00:54.4	66			0	1	01:04.7	56		96
Chick-Fil-A	7	3	108	2	01:03.2	57			0	1	01:22.1	44		109
Chick-Fil-A	8	1	82	2	01:10.0	51			0	1	02:53.3	21		83
Chick-Fil-A	8	2	65	2	02:26.7	25			0	1	01:45.7	34		66
Chick-Fil-A	8	3	79	2	01:14.3	48			0	1	00:59.3	61		80
Chick-Fil-A	9	1	96	1	00:38.0	95			0	1	00:47.4	76	108	108
Chick-Fil-A	9	2	80	1	00:36.2	100			0	1	02:50.3	21	92	92
Chick-Fil-A	9	3	87	1	01:23.0	43			0	1	01:14.5	48	48	88
McDonald's	10	1	57	2	01:10.7	51	1	00:40.6	89	1	00:54.3	66		66
McDonald's	10	2	49	2	00:53.3	68	1	00:42.9	84	1	01:01.3	59		59
McDonald's	10	3	59	2	01:04.2	56	1	00:44.9	80	1	01:01.5	59		60
McDonald's	11	1	43	2	00:58.9	61	1	00:33.5	108	1	00:24.7	146	64	108
McDonald's	11	2	35	2	01:12.9	49	1	00:34.6	104	1	00:29.5	122	56	56
McDonald's	11	3	63	2	01:06.5	54	1	00:34.0	106	1	00:29.8	121	88	106
McDonald's	12	1	93	2	00:48.7	74	1	00:29.1	124	1	00:33.6	107		107
McDonald's	12	2	59	2	00:46.1	78	1	00:33.8	106	1	00:53.4	67		67
McDonald's	12	3	83	2	00:43.2	83	1	00:27.0	133	1	00:25.5	141	92	133
McDonald's	13	1	58	2	00:46.3	78	1	00:31.6	114	1	00:50.6	71	96	96
McDonald's	13	2	31	2	01:22.9	43	1	00:52.0	69	1	01:22.9	43	48	48
McDonald's	13	3	44	2	01:03.1	57	1	00:52.5	69	1	01:07.1	54	56	56
McDonald's	14	1	81	1	00:40.9	88	1	00:29.7	121	1	00:33.3	108		88
McDonald's	14	2	38	1	00:27.7	130	1	00:38.9	93	1	01:12.3	50		50
McDonald's	14	3	62	1	00:22.0	164	1	00:11.5	314	1	00:20.5	176		164
McDonald's	15	1	101	2	00:23.7	152	1	00:22.6	159	1	00:22.0	164		159
McDonald's	15	2	52	2	00:32.7	110	1	00:26.0	138	1	00:31.8	113		113
McDonald's	15	3	74	2	00:45.5	79	1	00:21.6	167	1	00:21.0	172		79
McDonald's	16	1	41	1	00:34.9	103	1	00:29.8	121	1	00:33.4	108		103
McDonald's	16	2	14	1	00:24.4	148			0	1	00:48.4	74		74
McDonald's	16	3	25	1	00:42.7	84	1	00:36.9	98	1	00:35.6	101		84
WhataBurger	17	1	30	1	01:24.4	43			0	1	02:10.3	28	32	32
WhataBurger	17	2	14	1	01:01.1	59			0	1	02:33.9	23	24	24
WhataBurger	17	3	22	1	00:55.5	65			0	1	02:19.7	26	36	36
WhataBurger	18	1	20	1	01:29.4	40			0	1	02:50.9	21	28	28
WhataBurger	18	2	12	1	01:31.0	40			0	1	05:00.6	12	21	21
WhataBurger	18	3	20	1	01:16.4	47			0	1	02:26.4	25	35	35
WhataBurger	19	1	32	1	01:10.4	51			0	1	02:53.6	21		33
WhataBurger	19	2	31	1	01:07.4	53			0	1	02:05.8	29		32
WhataBurger	19	3	23	1	01:10.4	51			0	1	02:53.6	21		24
WhataBurger	20	1	33	1	01:08.7	52			0	1	01:35.5	38		38
WhataBurger	20	2	29	1	01:09.8	52			0	1	02:04.8	29		30
WhataBurger	20	3	24	1	01:43.7	35			0	1	02:58.8	20		25

TABLE 5-4 COFFEE/DONUT SHOP PERFORMANCE BY SITE AND PERIOD

Coffee/Donut Shop Performance by Site and Period

Brand	Sit	Peri	Drive-Through Hourly Volum	Volume/ Lane	Order lanes	Average Order Time	Order Capacity per Lane	Pickup Lanes	Average Pickup Time	Pickup Capacity per Lane	Best Est Capacity per Lane
Starbucks	21	1	67	67	1	00:30.4	118	1	00:51.6	70	70
Starbucks	22	1	47	47	1	01:00.0	60	1	00:46.0	78	60
Starbucks	23	1	72	72	1	00:58.5	62	1	00:46.9	77	77
Starbucks	24	1	82	82	1	00:30.5	118	1	00:39.2	92	92
Starbucks	25	1	78	78	1	00:29.6	122	1	00:40.8	88	88
Starbucks	26	1	79	79	1	00:29.7	121	1	00:56.0	64	80
Starbucks	27	1	64	64	1	00:39.4	91	1	00:54.3	66	66
Starbucks	28	1	73	73	1	00:42.0	86	1	00:44.5	81	81
Starbucks	29	1	52	52	1	00:47.8	75	1	00:53.4	67	67
Dunkin'	30	1	95	95	1	00:23.7	152	1	00:56.4	64	96
Dunkin'	31	1	80	80	1	00:31.5	114	1	00:37.5	96	96
Dunkin'	32	1	57	57	1	00:24.2	149	1	00:54.0	67	67
Dunkin'	33	1	26	26	1	00:23.1	156	1	01:02.1	58	58
Dunkin'	34	1	70	70	1	00:37.3	96	1	01:40.4	36	71
Dunkin'	35	1	107	107	1	00:22.7	158	1	00:24.0	150	150
Dunkin'	36	1	77	77	1	00:36.7	98	1	00:40.9	88	88
Krispy Kreme	37	1	22	22	1	00:44.3	81	1	01:38.8	36	36
Krispy Kreme	38	1	29	29	1	00:35.5	101	1	01:42.9	35	35
Krispy Kreme	39	1	9	9	1	00:21.4	168	1	01:06.8	54	54
Krispy Kreme	40	1	6	6	1	00:26.0	138	1	01:47.9	33	33

coffee/donut shops were shorter than for the fast-food restaurants, ranging from 27 to 44 seconds. The average order time for all observations at coffee/donut shops was 35 seconds.

Average order times by store and time period (Tables 5-3 and 5-4) ranged from 17.8 seconds (at a Chick-fil-A on a Saturday lunch period) to 2:28 (at a Chick-fil-A on a weekday evening), but no general trend was evident of the time periods that engendered the quickest or longest order times (e.g., weekday lunch, weekday dinner, or Saturday lunch). It does appear that restaurants serving the greatest number of customers performed at a higher capacity than those serving lesser numbers, regardless of brand. Store average order times at coffee/donut shops are about half that of the fast-food restaurants, ranging from 21 to 60 seconds.

The service times suggest fast-food restaurant order station capacities of 48 to 69 vehicles per hour, and coffee/donut shop order station capacities of 85 to 133 vehicles per hour.

The distributions of order times were also plotted for fast-food restaurants and coffee/donut shops, separately. The distributions are illustrated in Figures VI-6 and VI-7. The distributions exhibit a pattern that is characteristically a log-normal distribution, which differs from the assumption of exponentially distributed service times used in the classical queue length equations. The log-normal and exponential probability distribution curves are also illustrated in the figures.

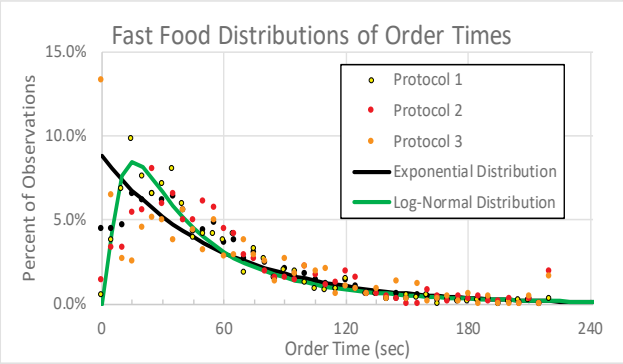

FIGURE 5-6 FAST-FOOD DISTRIBUTIONS GRAPH

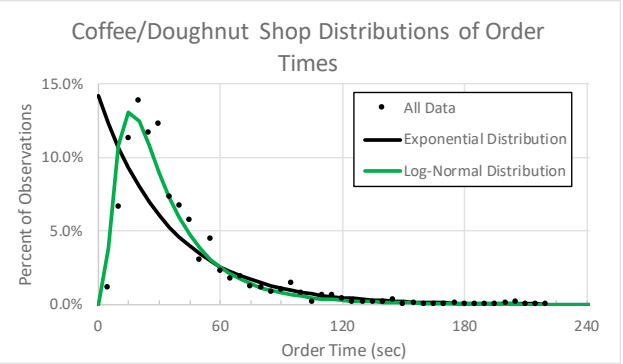

FIGURE 5-7 COFFEE/DONUT SHOP DISTRIBUTIONS GRAPH

Payment Times

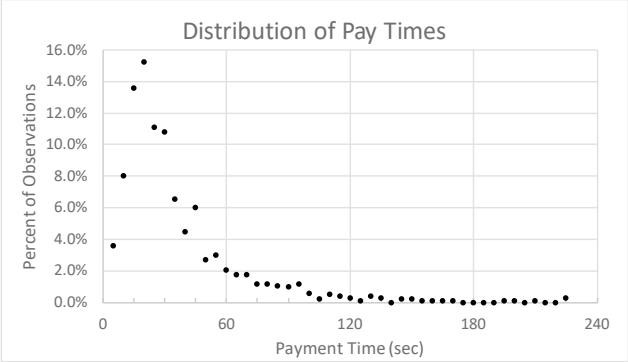

FIGURE 5-8 DISTRIBUTION OF PAY TIMES GRAPH

Drive-through lanes using the three-step protocol included all McDonald's and a small number of Chick-fil-A transactions (a temporary intermediate payment station was set up at one Chick-fil-A location). Where "stand-alone" payment windows were provided, only one lane existed. Figure 5-8 illustrates the distribution of pay times observed, again exhibiting a log-normal service time distribution pattern. Observed times for payment ranged from one second to 4:06, and site average pay times ranged from 11.5 to 52.3 seconds. Average pay time for all observations was 33.5 seconds. This average service time supports a payment station capacity value of 107 vehicles per hour. The payment function did not appear to constrain drive-through lane capacity.

Pickup Times

Service times at the pickup window are potentially influenced by the presence of a queue waiting to pick up orders. On the one hand, once an order is placed, if there

are no vehicles at the pickup window, the vehicle can proceed directly to the pickup window and wait for the order to be prepared. On the other hand, if there are vehicles ahead, the vehicle will take longer to arrive at the pickup window, giving more time for the order to be completed and waiting. It would be reasonable that the pickup times for "queue-inhibited" vehicles would be shorter than vehicles that are "not queue-inhibited". Service times that were inhibited by queueing were separated from operations where upstream queues did not inhibit operations by the field data team. Typically, the order station and pickup station are separated by 100 to 150 feet, a distance which can be comfortably traversed within 15 seconds if there are no vehicles ahead in the drive-through lane.

Tables 5-1 and 5-2 separate the service time observations between those vehicles that are and are not queue-inhibited. At Chick-fil-A's, 97 percent (995 of 1,028 observations) were determined to be queue-inhibited, and at Whataburger 87 percent (276 of 316 observations) were determined to be queue-inhibited, so the ability to assess the un-inhibited pickup performance (speed of order preparation) was minimal. The observations at McDonald's were more evenly divided and provide a better basis for comparison. At McDonald's, the service time differences at the pickup window between queue inhibited and not inhibited were very small, only 3 seconds, and the pickup times for inhibited vehicles were actually the longer (but not statistically significant).

At the coffee/donut shops, queue inhibition appears to have played a role. As was done for the fast-food restaurants, queue-inhibited and non-queue-inhibited vehicles were noted by the data collection team. Based on these observations, a travel time between the order station and pickup window of 18 seconds was established to differentiate between queue-inhibited vehicles and those that were not. 931 of the 1,157 observations were determined to be queue-inhibited, and the queue-inhibited service times are consistently greater than the "not-inhibited" by margins of 12 to 48 seconds.

Thus, while queue inhibition is likely to be a service time issue when volumes are light, they become less important when volumes are higher and approach lane capacity – which is the focus of this study. This analysis is based on the mixture of inhibited and non-inhibited performance observed at each site, and the majority of observations were of queue-inhibited conditions.

For fast-food restaurants, individual recorded times spent at the pickup station ranged from zero to 16:26, and average times spent at the pickup station for individual restaurants averaged from 17.6 seconds to just over five minutes. The distribution of pickup times is illustrated in Figure 5-6 and 5-7.

Observations made were that Protocol 1 drive-through lanes (McDonald's) have a more tightly constrained distribution of service times than the other protocols, and a shorter (40-second) dwell time at the pickup station. This time is even shorter than the time spent ordering. These characteristics would be consistent with having spent some time at the payment window to enable the order to "catch up" with the vehicle; however, at Chick-fil-A (where no payment is collected, either) pickup times were longer -- averaging 68 to 97 seconds. In addition, the high proportion of pickup times exceeding 225 seconds for protocol 3 (predominantly Whataburger) suggests a different mode of preparing orders that takes longer than Chick-fil-A or McDonald's.

The average pickup station dwell times of 68 to 97 seconds at Chick-fil-A and 40 seconds at McDonald's suggest drive-through lane capacities of 37 and 90 vehicles per hour.

Pay/pickup times for the coffee/donut shops are illustrated in Figure VI-9. Of interest is that the pay/pickup procedures of Krispy Kreme are on the order of 1.5 to two minutes, whereas the same procedures for Starbucks and Dunkin' Donuts are on the order of 40 to 46 seconds. This illustrates how differently drive-through lanes can operate by brand.

Individual recorded times spent at the pickup station for coffee/donut shops ranged from one second to 4:52, and times spent at the pickup station for individual stores averaged from 40 seconds to 96 seconds. The distribution of pickup times is illustrated in Figure 5-7.

The average pay/pickup station dwell times of 39.6 and 46.6 seconds respectively at Dunkin' Donuts and Starbucks, where hourly volumes averaged 70 (range of 26 to 107) vehicles suggest drive-through lane capacities of 77 to 91 vehicles per hour; however, shorter median dwell times of 33 seconds at both brands suggest a higher capacity of 109 vehicles per hour per lane are possible. At Krispy Kreme, where drive-fast through hourly volumes averaged 17 (range of 6 to 29) vehicles, the average and median pay/pickup dwell times were 95.9 and 61.5 seconds, with associated capacities of 38 to 58 vehicles per hour.

Similarly to the order time service rate distribution, the pickup times follow a log-normal distribution. The observed pickup times are longer than the order times, meaning that the pickup operation will control queueing.

Drive-Through Lane Capacity

Capacities of the drive-through lanes at each store were estimated using three techniques – using the above sampling of service times at each step of the operation (which then leads to identification of the capacity of the service point), checking against the throughput volume during the peak hours and, in the cases where a

complete inventory of vehicles passing through the drive-through lane was recorded, by considering the maximum 15-minute flow rate.

TABLE 5-5 PERCENTILE STORAGE AVERAGE FLOW RATES

The sampling of service times led to per lane capacities ranging from 12 to 202 vehicles per hour for fast-food restaurants, and 33 to 150 vehicles per hour for coffee/donut shops.

Percentile Store Average Flow Rates (vehicles per hour)					
Brand	50%	75%	85%	90%	95%
Chick-Fil-A	95	116	139	149	158
McDonald's	57	63	81	83	93
Whataburger	23	30	31	32	32

The traffic count of vehicles in the drive-through lanes provided another measure of lane capacity, particularly at Chick-fil-A, where the vast majority of vehicles were identified as being "queue-inhibited." The range of 95th percentile count volumes varied significantly, ranging from 32 vehicles per hour at Whataburger to almost 160 vehicles per hour at Chick-fil-A.

TABLE 5-6 PERCENTILE STORAGE AVERAGE FLOW RATES

In the case of coffee/donut shops, the traffic count of vehicles in the drive-through lanes did not provide a good measure of lane capacity because there was a considerable proportion of "not-inhibited" traffic due to the lower traffic volumes (e.g., there were lapses in flow rates). However, the observed flow rates at Starbucks and Dunkin' Donuts do provide a lower end "check" against the capacities estimated from the pay/pickup dwell times. Table 5-6 summarizes the observed volumes at the various stores studied, supporting capacities at these brands in excess of 80 to 100 vehicles per hour.

Percentile Store Average Flow Rates (vehicles per hour)					
Brand	50%	75%	85%	90%	95%
Starbucks	72	78	80	82	n/a
Dunkin'	77	87	96	100	103
Krispy Kreme	16	24	26	27	28

TABLE 5-7 FAST-FOOD RESTAURANT FLOW RATE IN ROLLING 15-MINUTE INCREMENTS

At eight sites, it was possible to record and tabulate data on every vehicle passing through the drive-through lane. By tabulating the number of vehicles served in rolling 15-minute periods (in five-minute increments (e.g., 12:00 to 12:15, 12:05 to 12:20, 12:10 to 12:25, etc.), peak period service rates as indicated in Table 5-7 and 5-8 were found. These rates are likely near the maximum flow rate the lanes are capable of, as there were no more than four percent "not-inhibited" arrivals in seven of the eight cases (ten percent at the eighth) at the pay/pickup window for the maximum flow rate periods.

Fast-Food Restaurant Flow Rate in Rolling 15-Minute Increments					
Site	9	9	11	13	13
Period	1	2	2	1	2
Brand	Chick-Fil-A		McDonald's		
Rate (vph)	108	133	133	108	92

TABLE 5-8 COFFEE/DONUT SHOP FLOW RATE IN ROLLING 15-MINUTE INCREMENTS

Coffee/Donut Shop Flow Rate in Rolling 15-Minute Increments

Site	25	28	29	31	35
Brand	Starbucks			Dunkin Donuts	
Maximum Hourly Observed Flow Rate	92	80	80	92	112

In summary, for Coffee/Donut Shops, service capacities of 103 to 133 vehicles per hour are reasonable in the order stage, and capacities of 92 to 112 are reasonable for the faster Starbucks and Dunkin' Donuts operations, and on the order of 60 vehicles per hour for Krispy Kreme.

Given the observed variation in drive-through lane operation and performance, it is not possible to determine one particular lane capacity value to apply to all drive-through lanes. From the data collected, it is possible to identify ranges of capacity that seem reasonable for a given brand, but there is no assurance this level of performance will be maintained or how well a new type of drive-through operation will perform.

It would be unfair to require a fast-performing drive-through operation to use performance parameters from a slower, more complicated operating scheme. But, allowing a more complicated operating scheme to use fast-performing parameters would result in excessive queueing. This leads to a permitting quandary. An envisioned solution to this quandary is for a business seeking a drive-through lane operation to identify the performance their business operation is willing to commit to as a condition of their permit. If the drive-through operation leads to queues that cannot be accommodated on-site, then revocation of the permit could be used as an incentive for the business to improve its operations.

Summary

This section summarizes the key findings of the queueing data analysis.

Drive-through lane performance varied substantially by demands. Where volumes were high, service times were short. This was observed regardless of store brand, suggesting that human performance will respond to the demands.

Drive-through lane performance was not consistent by brand. Regardless of brand, some lanes provided faster service than others.

Drive-through lane performance is affected by business philosophy and in-house order preparation times, which will vary by store brand and type of operation (fast-food, banking, prescription pick-up, dry cleaner pickup,

Generally, pay/pickup times are greater than the order times, so the pay/pickup operation will control the drive-through lane capacity. An exception was at McDonald's, where pickup times were shorter than order times. McDonald's compensates for this by often providing two order lanes, which then feed into one pickup lane.

The assumptions of the classical equations of exponentially distributed service times were not confirmed. The observations of this study indicate the log-normal service rate distribution provides a better "fit".

5.2.2 Application of Classical Queueing Equations

The classical deterministic equations were applied to field observations in order to evaluate the accuracy of the classical equations and to estimate a range of the utilization ratio within which the classical equations might provide reasonable queue length estimates. The equations were applied to the collected data in two strategies.

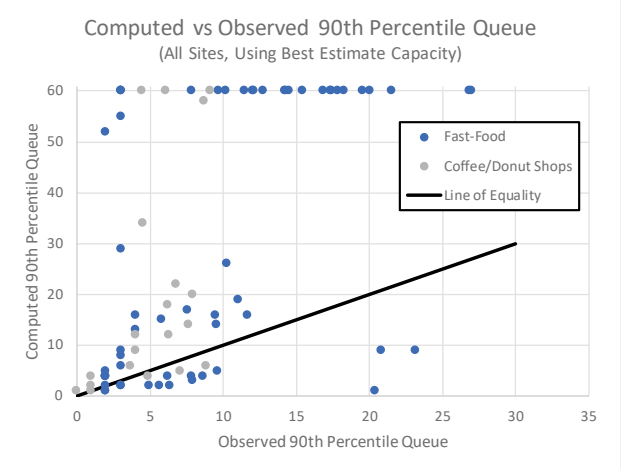

FIGURE 5-9 COMPUTED VS. OBSERVED 90TH PERCENTILE QUEUE GRAPH

First, the "best estimate" site-specific service rates were applied to the observed traffic counts and 90th percentile (or greater, since the assumed Poisson arrivals distribution is applicable to integers only) queues were calculated. The results of this initial analysis are illustrated in Figure 5-9, which plots the computed queue length versus the observed queue length. The graph illustrates that the computed queues are longer than the observed queues in 59 of the 80 cases. Good results would be indicated if the points in the graph were clustered around the line of equality. In 24 of the 80 cases a 60-vehicle queue was computed, which was an artificial upper limit to queue length at which the queue length computational algorithm was terminated. This result occurred where the utilization factor (volume:capacity ratio) approached 1.00 and suggests that the estimated drive-through lane capacities in those cases were too small, resulting in overly long estimated queue lengths. The RMS error computed with the 60-vehicle cap was 30.24.

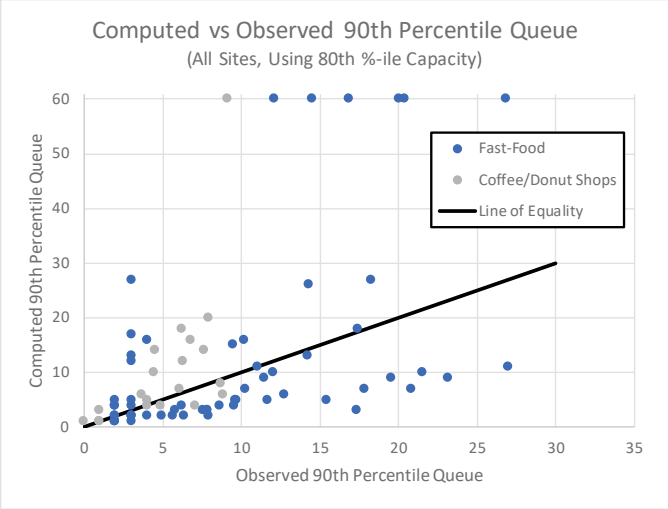

FIGURE 5-10 COMPUTED VS. OBSERVED 90TH PERCENTILE QUEUE GRAPH

The second analysis used faster service rates and higher capacities based on the distribution of service times observed. The 80th percentile lane capacities for each store brand were used – 118, 108, and 35 vehicles per hour, respectively, for Chick-fil-A, McDonald's, and Whataburger, and 84, 96, and 43 vehicles per hour for Starbucks, Dunkin' Donuts, and Krispy Kreme. This method reduced the number of cases where the algorithm terminated at a 60-vehicle queue to seven of 80 cases, but still many of the estimated queue lengths were significantly different, both higher and lower, than the observed values (RMS error of 14.6). This analysis illustrates the inaccuracy of the classical queue length equations to predict drive-through lane queues.

Discussion of Classical Equations

The classical deterministic queueing equations used in traffic engineering literature to estimate queue lengths rely on the average service time per vehicle, the rate of the demand flow at a Poisson arrival pattern and assume an exponential service time distribution. As noted in the literature review, the equations are well documented in traffic engineering literature (e.g. Transportation Research Board Special Report 165 "Traffic Flow Theory", 1975, and others). The equations were developed for, and are applicable to, single points of transaction (such as traffic signals, toll booths, or drive-in bank windows).

A drive-through lane operation is different, having at least two, sometimes three, points of transaction – the order window, sometimes a separate payment window, and a pickup window -- in sequence. The ordering process for one vehicle can occur simultaneously with a pickup operation for a different vehicle, and several vehicles can wait in queue between the two points.

The classical equations rely on the ratio of volume to the capacity of the service lane, a parameter referred to in the literature as the utilization ratio. Traffic engineers would relate to this ratio as a volume:capacity ratio. As this ratio approaches or exceeds 1.0,

the number of vehicles in queue increases exponentially. This is unrealistic, as an infinite number of vehicles is not likely to arrive at the drive-through lane. Realistically, arrivals decline as the peak demand periods end. A simple example of the failure of the classical equations is that, as the utilization ratio approaches 1.0, the addition of one vehicle in volume results in the queue growing by more than one vehicle.

The classical equations do not address the sequential nature of the drive-through lane operation. A common misapplication when the procedures of TRB Special Report 165, *Traffic Flow Theory*, or ITE's *Transportation and Land Development* are applied is the use of service window capacities based on total drive-through time (from beginning of order to departing the pickup window). Derr et al. [17] correctly remind us that the service time at the "bottleneck point" in the process is the proper service time to apply – but they also warn this method is still subject to other limitations and offer a "ballpark" queue length estimate.

Derr, et al, also developed nine geometric design considerations. In *Queueing at Drive-Up Windows*, they state:

> *A search of the literature has found nothing concerning the geometric design considerations for single-lane drive-up windows at fast-food restaurants, banking institutions, etc. Some authors have discussed the trip generation rates for fast-food restaurants (5,-6). Other studies have looked at multilane banking systems (7,8). Surely, some experience-based guidelines must have been written, but they have not made it into the standard traffic engineering references. Therefore, a list of general design considerations follows that are aimed at providing operational efficiency for single-lane drive-ups:*
>
> *1. When facing the establishment, the drive-up should be located on the left side of the building. This location will result in a counterclockwise flow pattern with the maximum use of the available space and allow the longest queue. (The major problem with wrapping the queue around the building is the conflict with the pedestrians who use the facility.)*
> *2. The drive-up-window operation should have at least two stations, one for ordering and the other for delivery.*
> *3. Storage lengths for each station should be based on the arrival rate and service at that station. If the menu board is the critical activity in the system, then the queue storage for that area should be designed by using the outlined procedure. If the service window is the critical element, the combined service and menu queue length should be checked.*
> *4. It should be noted that a drive-up facility may result in a reduction in the number of effective parking spaces on the existing property due to the queue blocking the parking spaces. Additional land might have to be purchased to meet the parking requirements in the subdivision and/or zoning regulations.*
> *5. There should be a bypass lane or another convenient exit to an existing street so that vehicles not wanting to use the drive-up facility can leave the premises without passing through the drive-up window.*
> *6 . The drive-up-window lane should be a minimum of 12 ft wide from face-of-curb to face-of-curb.*

7. The turning radius should not be less than 15 ft on any curve used in the drive-up operation.
8. The minimum vertical clearance should be 9 ft to accommodate recreational vehicles and vans.
9. Parking spaces located beyond the end of the drive-up window should be designated for use by those drive-up patrons whose orders are long in preparation. The driver would be told to park and the order would then be brought out to patron's vehicle.

Finally, as was determined in this research effort, the distributions of service times observed for drive-through lanes fit a log-normal, rather than exponential, distribution.

Application of Micro-Simulation

Micro-simulation was applied to:

- Predict queues based on overload situations, recognizing that traffic demand through drive-through lanes tapers off after a peak period (which classical equations do not),
- To test the interaction of service times at the order station and pickup window – when the order function can feed vehicles to the pickup window at a faster rate than the pickup window can accommodate, then the pickup function will control queueing. However, if both functions have similar service time distributions, limitations at the order window may detract from the efficiency of the pickup operation.
- To compare overall accuracy of micro-simulation results with field observations, particularly in high-demand conditions.

Micro-simulation is able to address many of the shortcomings of the classical equations in that they can model varying traffic volumes by time period (e.g. traffic volumes can be allowed to dissipate after a peak period, thus allowing a queue to dissipate), can model various distributions of service times (e.g. various lane capacities), can model sequential transaction windows, and can model different drive-through lane configurations. Because traffic demands exceeding capacities are carried over into subsequent time intervals, queues can build and dissipate as they do in practice.

Caliper Corporation's TransModeler micro-simulation software was applied to estimate queue lengths. Based on the observations of service times, a distribution of service rates was applied which reflected the log-normal service time distribution. The toll booth model in TransModeler was used, modified to make use of 20 groups of drivers, each with its own average service time. The service time distributions were generated by the collected data and would therefore follow the log-normal distribution. The service times assigned to the 20 cohorts of the vehicles were determined in increments of varying size, seeking to distribute the time changes between cohorts as equally as possible. The service rate distributions used are provided in Appendix D.

When the order time and pickup time data for the fast-food restaurants and the coffee/donut shops are compared, it becomes evident that both types of drive-

through lanes operate with similar characteristics. While actual performance of the drive-through lanes can vary significantly by brand and by store, at a given rate of performance, the distribution (or variance) of performance is similar. This is illustrated in Figure 5-11, which plots, for each store, the ratio of the standard deviation of the natural log of service time against the average natural log of service times. First, the (average of natural log of) order and pickup operations at coffee /donut shops and fast-food restaurants span the same general range of values. In addition, the variance of service times (indicated by the ratio of the natural logs of standard deviation to natural log of the average order time) also span a similar range of values. In addition, there is a general trend evident in the data of a declining ratio of standard deviation to average value as the service times get larger, for both land uses. This suggests that similar parameters and calculations can be used with confidence whether evaluating a fast-food restaurant or a coffee/donut shop, provided a service rate (e.g. vehicles per hour) for the operation can be established.

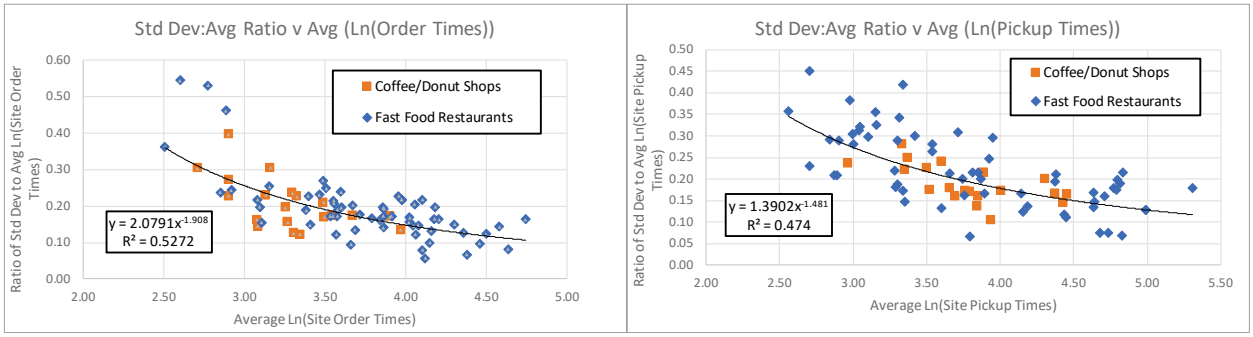

FIGURE 5-11 SERVICE TIME DISTRIBUTIONS USED IN MICRO-SIMULATION ANALYSIS

This information was used to create a series of service time distributions used in the micro-simulation analysis. Different service time distributions were developed with a range of drive-through capacity values from 30 vehicles per hour to 205 vehicles per hour, which were then incorporated into the toll booth model.

A traffic arrival pattern for a four-hour period in 15-minute increments (11:00 a.m. until 3:00 p.m.) was developed using the trip generation data observed in this study as well as the 15-minute tabulation of volumes for fast-food restaurants and coffee/donut shops provided in the ITE Trip Generation reference, 11th Edition. Worksheets supporting this derivation are provided in Appendix E. A series of 15-minute volume profiles were developed for peak hour volumes ranging from 40 to 200. A table providing these volume distributions is provided in Appendix E. (Note that the 40 to 200 vehicles per hour refer to the peak hour volume, the total volume over the four-hour simulation time was greater.)

In most cases, the order station capacity was greater than the pickup station capacity, as two order lanes are often provided but only one lane at the pickup station. In these cases, the pickup station was the critical link in the operation.

TransModeler was applied to create a graph which illustrates the relationship between traffic demand, service lane capacity, and 90th percentile queue length (Figure 5-12). The general relationship is that for a given traffic demand, the queue is longer for lower lane capacities, and shorter for greater lane capacities.

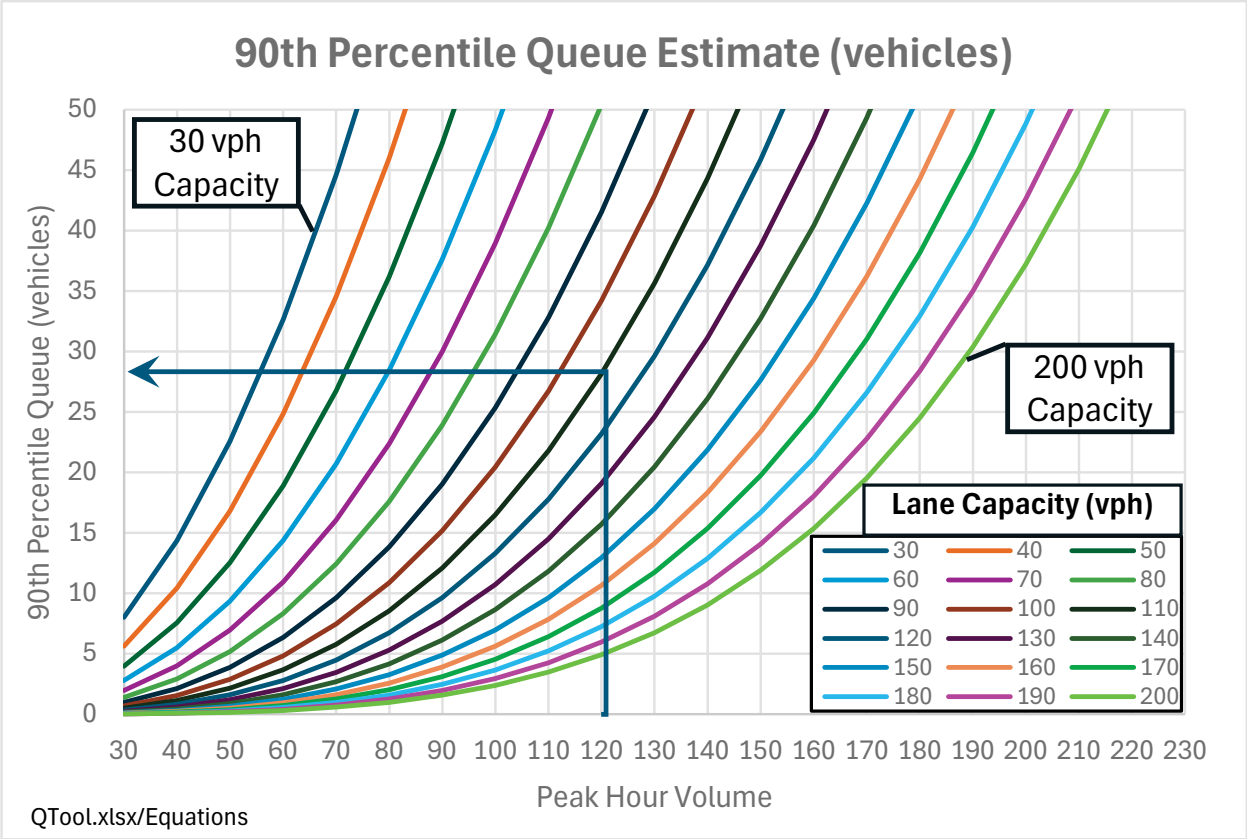

FIGURE 5-12 MICROSIMULATION 90TH PERCENTILE QUEUE ESTIMATE CURVES GRAPH

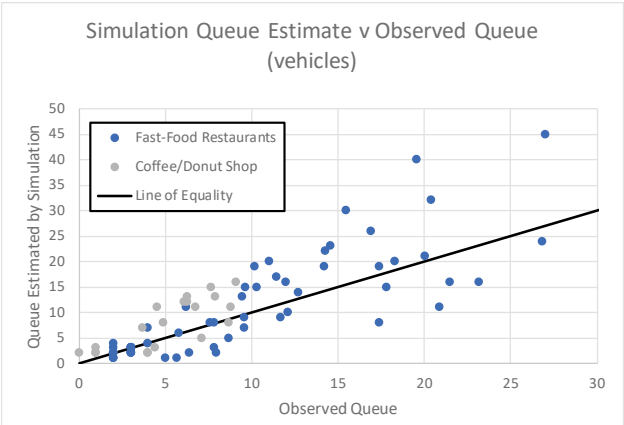

FIGURE 5-13 SIMULATION QUEUE VS. OBSERVED QUEUE GRAPH

This graph was then used to estimate the 90th percentile queue length for the 80 field datapoints, given the lane volume and the "best estimate" lane capacity. The results

are shown in Figure 5-13, and the points agree with an RMS error of 5.5, compared with the 30.24 of the classical equations.

Micro-simulation Model Application Guidance

Tests were run to determine the effects on drive-through lane capacity if two (or more) stations with roughly the same capacity are developed. Because of the random interaction of one station with the other, a loss of about10 percent of capacity occurred.

Further, tests were run to assess if the distance between the order and pickup stages influences the capacity of the lane. This was tested at a distance of 145 feet (five vehicles of "buffer" distance) compared to 235 feet (eight vehicles of "buffer." These distances are typical of sites seen in the field. The indications are that a longer distance results in more capacity, as there is less chance of delays at one stage affecting the performance of the other. In the case tested, however, the difference was on the order of a 5- to 10-percent reduction.

If two lanes of service capacity are provided, then the reviewer should confirm which step of the drive-through operation is the constraining stage. The capacity of a second lane does not necessarily double the capacity of the operation. Microsimulation tests indicate that a second continuous lane with no merges required will add 85 to 90 percent of a lane. If a merge then diverge is required, a further restriction on capacity would occur.

Findings:

1. Different brands desire different customer experiences. Some prioritize speed and are set up to fulfill orders quickly, while others preserve their ability to customize orders.
2. Drive-through lane operators need to furnish information describing their operating speed and be willing to design to accommodate the parameters they submit for permit approval. If their operations create problems that spill into adjacent streets, agencies need to be able to shut down the drive-through operation or otherwise compel the operators to find cures.
3. High volumes and low capacities cause long queues. If a site has high volumes, they need fast service to manage queues. If lower volumes, then they may wish to indulge in slower service speeds.

5.2.3 Recommended Approach to Estimating Queues in Drive-Throughs

An example of evaluating the needed queue storage length follows:

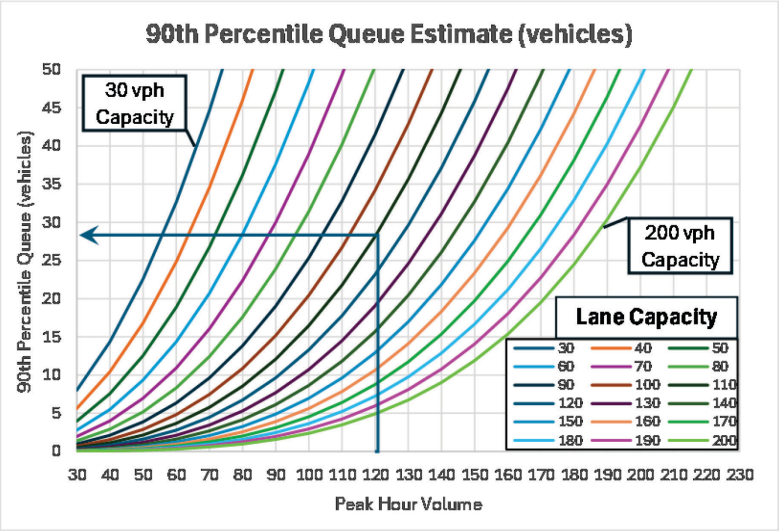

FIGURE 5-14 MICROSIMULATION 90TH PERCENTILE QUEUE ESTIMATE CURVES GRAPH

A developer proposes to construct a fast-food restaurant with two order lanes and one pickup lane. The developer indicates they expect 90 peak hour trips through the drive-through lane and based on the chain's operations, they can serve vehicles at an average pace of 80 vehicles per hour. To find the needed queue storage, enter the Queue Lengths graph at the volume = 90 point along the horizontal axis, and move vertically to the 80 vph queue length curve, then traverse horizontally to the vertical axis to read a 90th percentile queue of 20 vehicles. The site plan should then be reviewed to ensure 20 vehicles can be accommodated without (a) extending off-site and (b) without impeding the movement of other vehicles and pedestrians on-site.

6 Summary of Recommendations

6.1 Findings of This Study

This study evaluated both the trip generation and queueing associated with Fast-Food with Drive-Through and Coffee/Donut Shop with Drive-Through land uses to determine the cause of traffic spillover onto adjacent roadways. This study determined that the trip generation rates associated with the Fast-Food with Drive-Through and Coffee/Donut Shop with Drive-Through land uses vary greatly based on the brand of the business. While one of the three brands selected in each land use category were intentionally selected, the other two were mostly randomly selected. However, in both land use categories, there were distinct differences between each brand. When compared to the ITE Trip Generation estimates, each brand also varied uniquely from the ITE estimates with one brand significantly over predicted, one brand roughly accurate, and one brand significantly under predicted.

In evaluating the queues for these land uses in the drive-throughs, we started with the classical queueing equations used in traffic engineering. The classical equations used to estimate queues in traffic engineering do not fit well when estimating queues in drive-through operations. Because the denominator includes a "1-v:c ratio" as the v:c ratio approaches 1.0, the queue estimate goes to infinity. The queue can only be infinitely large if vehicles arrive in the drive-through lane at an infinitely large rate. This does not happen in real life. In reality, there will be time periods when arriving volumes exceed drive-through lane capacity and a queue builds, but usually the rate of arrivals drops off, and the queue dissipates as the drive-through operators catch up to the arrivals.

We observed over 3,200 vehicles in fast-food and coffee/donut shop drive-through lanes and found that service times are best described by a log-normal distribution (not exponential) and set up a 15-minute vehicle arrival pattern based on out trip-generation observations.

What we found is that we could not generalize when it comes to queueing in drive-throughs. Different restaurants or sales operations have very different operation rates, and the lengths of queues vary based on two variables – the arrival rate and the service rate. We also found that these human-operated systems often respond and perform faster when there is a surge in arrivals.

The collected data allowed us to set up a variety of micro-simulation analyses, where we varied the service rates (or lane capacity) and varied the volumes in a toll-booth type of simulation and developed a family of curves with which 90th percentile queue lengths can be predicted. With a given lane capacity and an expected hourly volume, the estimated 90th percentile queue can be determined.

6.2 Future Study Needed

Additional study of these land uses could include additional brands to establish more accurate trip generation rates by brand. Additionally, the drive-through capacities (i.e. performance) for each brand could be studied to ensure proper inputs to estimate drive-through queues.

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Appendix A
ITE Trip Generation Excerpts

Excerpts from the ITE Trip Generation reference, 11th Edition are provided herein. Data for the peak hours only are included, as queues are evaluated on a peak period basis. Only those data plots with more than five studies are included.

Land Use: 934
Fast-Food Restaurant with Drive-Through Window

Description

This land use includes any fast-food restaurant with a drive-through window. This type of restaurant is characterized by a large drive-through and large carry-out clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. The restaurant does not provide table service. A patron generally orders from a menu board and pays before receiving the meal. A typical duration of stay for an eat-in patron is less than 30 minutes. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alaska, Alberta (CAN), California, Colorado, Florida, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

163, 164, 168, 180, 181, 241, 245, 278, 294, 300, 301, 319, 338, 340, 342, 358, 389, 438, 502, 552, 577, 583, 584, 617, 640, 641, 704, 715, 728, 810, 866, 867, 869, 885, 886, 927, 935, 962, 977, 1050, 1053, 1054

Land Use: 937
Coffee/Donut Shop with Drive-Through Window

Description

This land use includes any coffee and donut restaurant that has a drive-through window as well as a walk-in entrance area at which a patron can purchase and consume items. The restaurant sells freshly brewed coffee (along with coffee-related accessories) and a variety of food/drink products such as donuts, bagels, breads, muffins, cakes, sandwiches, wraps, salads, and other hot and cold beverages. The restaurant marketing and sales may emphasize coffee beverages over food (or vice versa).

A coffee/donut shop typically holds long store hours (more than 15 hours) with an early morning opening. Limited indoor seating is generally provided for patrons, but table service is not provided.

Coffee/donut shop without drive-through window (Land Use 936) and coffee/donut shop with drive-through window and no indoor seating (Land Use 938) are related uses.

Additional Data

The sites were surveyed in the 1990s, the 2000s, and the 2010s in California, Colorado, Connecticut, Illinois, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New York, Ontario (CAN), Pennsylvania, Quebec (CAN), Tennessee, Vermont, Washington, and Wisconsin.

Specialized Land Use Data

One study was conducted during the pandemic in 2020. Twelve sites were counted in Illinois and Missouri during the AM and PM adjacent street peak hours. The data have not been incorporated within the overall ITE trip generation database and are not reflected in the data plots for this land use. Consideration for their inclusion will be given for the 12th Edition of *Trip Generation Manual* after additional post-pandemic data are collected. Overall, the pandemic counts yielded an AM adjacent street peak weighted average rate of 84 vehicle trips per 1,000 square feet GFA, roughly equivalent to the pre-pandemic average. The PM adjacent street peak rate was 56 (roughly 40 percent higher than the pre-pandemic value). The higher PM peak rate for these coffee/donut shops conforms with anecdotal observations that with the temporary or permanent closures of many restaurants during the pandemic, the drive-through restaurants that were open did a brisk business even during their off-peak periods.

Source Numbers

594, 599, 615, 617, 618, 621, 622, 635, 639, 712, 714, 725, 726, 728, 853, 854, 892, 903, 928, 959, 979, 982, 1004, 1042, 1044

Appendix B

Data Collected by Site

Table of Contents

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 2
Site Name: Chick-Fil-A
Address: 234 W State Rd 436, Altamonte Springs, FL 32714
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3600 s.f.
AADT on Adjacent Street: 44000
Distance Order to Pickup: 225 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	18	16	34
11:15	50	29	79
11:30	37	34	71
11:45	49	33	82
12:00	60	40	100
12:15	53	50	103
12:30	55	50	105
12:45	50	35	85

Peak Hour Volume: 393
Peak Hour D (inbound): 0.555
% to Drive-Through: 71.5%
90th %-ile Queue: 12.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	3
11:10	5
11:15	3
11:20	6
11:25	4
11:30	7
11:35	2
11:40	2
11:45	4
11:50	8
11:55	12
12:00	5
12:05	2
12:10	7
12:15	16
12:20	13
12:25	16
12:30	12
12:35	9
12:40	12
12:45	11
12:50	10
12:55	10
13:00	8

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	0	0
00:05.0	00:10.0	4	0	9
00:10.0	00:15.0	3	0	1
00:15.0	00:20.0	0	0	2
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	2	0	1
00:30.0	00:35.0	1	0	1
00:35.0	00:40.0	2	0	1
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	0	0	1
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	1
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	1	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

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Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 2
Site Name: Chick-Fil-A
Address: 234 W State Rd 436, Altamonte Springs, FL 32714
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3600 s.f.
AADT on Adjacent Street: 44000
Distance Order to Pickup: 225 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	41	33	74
16:15	22	22	44
16:30	29	29	58
16:45	35	23	58
17:00	26	29	55
17:15	33	31	64
17:30	25	31	56
17:45	39	19	58

Peak Hour Volume: 235
Peak Hour D (inbound): 0.540
% to Drive-Through: 73.6%
90th %-ile Queue: 6.6

Queue Observations (Total Queue):

Time	Vehicles
16:00	4
16:05	1
16:10	3
16:15	7
16:20	0
16:25	2
16:30	3
16:35	3
16:40	1
16:45	1
16:50	2
16:55	4
17:00	7
17:05	7
17:10	6
17:15	2
17:20	2
17:25	3
17:30	2
17:35	3
17:40	5
17:45	3
17:50	4
17:55	5
18:00	3

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	1
00:05.0	00:10.0	1	0	2
00:10.0	00:15.0	2	0	3
00:15.0	00:20.0	1	0	4
00:20.0	00:25.0	3	0	2
00:25.0	00:30.0	1	0	1
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	2	0	1
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	1
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	1	0	1
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	1
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 2
Site Name: Chick-Fil-A
Address: 234 W State Rd 436, Altamonte Springs, FL 32714
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3600 s.f.
AADT on Adjacent Street: 44000
Distance Order to Pickup: 225 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	33	26	59
11:15	38	33	71
11:30	28	26	54
11:45	26	32	58
12:00	43	37	80
12:15	39	42	81
12:30	40	32	72
12:45	40	35	75

Peak Hour Volume: 308
Peak Hour D (inbound): 0.526
% to Drive-Through: 72.1%
90th %-ile Queue: 8.4

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	4
11:10	2
11:15	11
11:20	4
11:25	4
11:30	5
11:35	1
11:40	4
11:45	5
11:50	1
11:55	1
12:00	1
12:05	10
12:10	12
12:15	6
12:20	3
12:25	4
12:30	1
12:35	4
12:40	3
12:45	4
12:50	3
12:55	4
13:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	5	0	0
00:05.0	00:10.0	6	0	2
00:10.0	00:15.0	5	0	2
00:15.0	00:20.0	4	0	1
00:20.0	00:25.0	1	0	3
00:25.0	00:30.0	2	0	1
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	1	0	0
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	0	0	2
00:55.0	01:00.0	0	0	3
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	2
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	1
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	1
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	0	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 3
Site Name: Chick-Fil-A
Address: 6350 S Semoran Blvd, Orlando, FL 32822
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4300 s.f.
AADT on Adjacent Street: 56700
Distance Order to Pickup: 200 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	50	38	88
11:15	35	47	82
11:30	48	37	85
11:45	58	52	110
12:00	70	54	124
12:15	61	58	119
12:30	57	70	127
12:45	51	61	112

Peak Hour Volume: 482
Peak Hour D (inbound): 0.510
% to Drive-Through: 56.7%
90th %-ile Queue: 10

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	2
11:10	6
11:15	9
11:20	2
11:25	0
11:30	1
11:35	1
11:40	6
11:45	7
11:50	10
11:55	6
12:00	5
12:05	2
12:10	8
12:15	10
12:20	6
12:25	3
12:30	8
12:35	9
12:40	8
12:45	9
12:50	11
12:55	12
13:00	8

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	3
00:10.0	00:15.0	2	0	2
00:15.0	00:20.0	0	0	1
00:20.0	00:25.0	3	0	3
00:25.0	00:30.0	2	0	1
00:30.0	00:35.0	1	0	2
00:35.0	00:40.0	4	0	0
00:40.0	00:45.0	1	0	0
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 3
Site Name: Chick-Fil-A
Address: 6350 S Semoran Blvd, Orlando, FL 32822
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4300 s.f.
AADT on Adjacent Street: 56700
Distance Order to Pickup: 200 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	38	35	73
16:15	37	37	74
16:30	37	33	70
16:45	35	38	73
17:00	38	32	70
17:15	43	50	93
17:30	46	49	95
17:45	44	22	66

Peak Hour Volume: 331
Peak Hour D (inbound): 0.517
% to Drive-Through: 61.0%
90th %-ile Queue: 12

Queue Observations (Total Queue):

Time	Vehicles
16:00	1
16:05	4
16:10	5
16:15	5
16:20	6
16:25	11
16:30	3
16:35	0
16:40	5
16:45	10
16:50	9
16:55	10
17:00	12
17:05	12
17:10	6
17:15	6
17:20	12
17:25	6
17:30	4
17:35	4
17:40	2
17:45	8
17:50	12
17:55	11
18:00	12

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	2
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	3
00:15.0	00:20.0	3	0	2
00:20.0	00:25.0	1	0	2
00:25.0	00:30.0	0	0	1
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	1	0	0
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	2	0	1
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

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Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 3
Site Name: Chick-Fil-A
Address: 6350 S Semoran Blvd, Orlando, FL 32822
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4300 s.f.
AADT on Adjacent Street: 56700
Distance Order to Pickup: 200 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	37	32	69
11:15	27	27	54
11:30	37	35	72
11:45	48	42	90
12:00	32	39	71
12:15	49	39	88
12:30	35	28	63
12:45	52	51	103

Peak Hour Volume: 325
Peak Hour D (inbound): 0.517
% to Drive-Through: 59.3%
90th %-ile Queue: 9.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	2
11:10	2
11:15	7
11:20	2
11:25	3
11:30	2
11:35	3
11:40	6
11:45	3
11:50	3
11:55	5
12:00	4
12:05	7
12:10	3
12:15	5
12:20	9
12:25	7
12:30	6
12:35	10
12:40	10
12:45	7
12:50	7
12:55	9
13:00	10

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	0	1
00:05.0	00:10.0	1	0	1
00:10.0	00:15.0	1	0	3
00:15.0	00:20.0	3	0	3
00:20.0	00:25.0	4	0	3
00:25.0	00:30.0	2	0	1
00:30.0	00:35.0	2	0	1
00:35.0	00:40.0	2	0	0
00:40.0	00:45.0	1	0	2
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	1	0	3
00:55.0	01:00.0	3	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	2
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	1	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	1	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	1	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 5
Site Name: Chick-Fil-A
Address: 4625 Florida Ave S, Lakeland, FL 33813
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 3>2

Size: 5400 s.f.
AADT on Adjacent Street: 41000
Distance Order to Pickup: 165 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	32	28	60
11:15	37	34	71
11:30	53	40	93
11:45	69	56	125
12:00	42	73	115
12:15	32	45	77
12:30	37	34	71
12:45	48	40	88

Peak Hour Volume: 410
Peak Hour D (inbound): 0.491
% to Drive-Through: 94.6%
90th %-ile Queue: 7

Queue Observations (Total Queue):

Time	Vehicles
11:00	11
11:05	5
11:10	6
11:15	1
11:20	7
11:25	5
11:30	10
11:35	2
11:40	6
11:45	6
11:50	4
11:55	5
12:00	3
12:05	4
12:10	7
12:15	6
12:20	2
12:25	0
12:30	5
12:35	2
12:40	3
12:45	1
12:50	3
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	0	0	0
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	1
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	5	0	1
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	3
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	2	0	1
02:00.0	02:05.0	2	0	2
02:05.0	02:10.0	3	0	1
02:10.0	02:15.0	2	0	1
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	3
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	0	0	1
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 5
Site Name: Chick-Fil-A
Address: 4625 Florida Ave S, Lakeland, FL 33813
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 3>2

Size: 5400 s.f.
AADT on Adjacent Street: 41000
Distance Order to Pickup: 165 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	20	18	38
16:15	32	21	53
16:30	32	34	66
16:45	32	34	66
17:00	32	34	66
17:15	24	34	58
17:30	24	26	50
17:45	28	26	54

Peak Hour Volume: 257
Peak Hour D (inbound): 0.502
% to Drive-Through: 112.8%
90th %-ile Queue: 5.6

Queue Observations (Total Queue):

Time	Vehicles
16:00	4
16:05	1
16:10	5
16:15	4
16:20	6
16:25	2
16:30	0
16:35	1
16:40	2
16:45	3
16:50	5
16:55	2
17:00	5
17:05	5
17:10	5
17:15	1
17:20	3
17:25	1
17:30	2
17:35	4
17:40	3
17:45	5
17:50	6
17:55	6
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	0	0	0
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	0	0	0
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	2	0	0
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	1	0	2
01:10.0	01:15.0	1	0	1
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	5	0	2
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	2	0	2
02:00.0	02:05.0	2	0	1
02:05.0	02:10.0	2	0	1
02:10.0	02:15.0	1	0	2
02:15.0	02:20.0	1	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	1
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	1	0	0
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	1	0	1
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	2

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 5
Site Name: Chick-Fil-A
Address: 4625 Florida Ave S, Lakeland, FL 33813
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 3>2

Size: 5400 s.f.
AADT on Adjacent Street: 41000
Distance Order to Pickup: 165 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	75	66	141
11:15	91	71	162
11:30	82	85	167
11:45	69	70	139
12:00	84	76	160
12:15	60	73	133
12:30	57	66	123
12:45	68	80	148

Peak Hour Volume:	**628**
Peak Hour D (inbound):	**0.519**
% to Drive-Through:	**58.2%**
90th %-ile Queue:	**14**

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	4
11:10	10
11:15	10
11:20	9
11:25	10
11:30	14
11:35	8
11:40	10
11:45	14
11:50	9
11:55	12
12:00	8
12:05	10
12:10	14
12:15	18
12:20	15
12:25	11
12:30	4
12:35	6
12:40	5
12:45	8
12:50	4
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	0	0	0
00:40.0	00:45.0	0	0	1
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	2	0	1
01:10.0	01:15.0	3	0	1
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	0	0	2
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	2	0	0
01:35.0	01:40.0	0	0	1
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	1	0	1
01:50.0	01:55.0	2	0	1
01:55.0	02:00.0	1	0	2
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	2
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	1
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	1	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	1	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	2	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 6
Site Name: Chick-Fil-A
Address: 1504 E Brandon Blvd, Brandon, FL 33511
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 59000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	42	42	84
11:15	42	42	84
11:30	42	42	84
11:45	62	53	115
12:00	44	60	104
12:15	48	49	97
12:30	50	50	100
12:45	46	50	96

Peak Hour Volume: 416
Peak Hour D (inbound): 0.490
% to Drive-Through: 37.2%
90th %-ile Queue: 7

Queue Observations (Total Queue):

Time	Vehicles
11:00	5
11:05	4
11:10	5
11:15	5
11:20	6
11:25	7
11:30	2
11:35	7
11:40	6
11:45	4
11:50	1
11:55	4
12:00	1
12:05	5
12:10	3
12:15	9
12:20	3
12:25	10
12:30	7
12:35	1
12:40	2
12:45	5
12:50	3
12:55	4
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	2
00:05.0	00:10.0	2	1	2
00:10.0	00:15.0	0	3	1
00:15.0	00:20.0	0	3	7
00:20.0	00:25.0	6	3	6
00:25.0	00:30.0	6	1	13
00:30.0	00:35.0	7	2	4
00:35.0	00:40.0	8	0	7
00:40.0	00:45.0	7	1	3
00:45.0	00:50.0	1	0	3
00:50.0	00:55.0	3	0	4
00:55.0	01:00.0	5	0	0
01:00.0	01:05.0	3	0	1
01:05.0	01:10.0	1	0	1
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	3	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	1	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 6
Site Name: Chick-Fil-A
Address: 1504 E Brandon Blvd, Brandon, FL 33511
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 59000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	30	32	62
16:15	37	35	72
16:30	38	37	75
16:45	25	31	56
17:00	15	26	41
17:15	29	22	51
17:30	19	23	42
17:45	24	22	46

Peak Hour Volume: 265
Peak Hour D (inbound): 0.491
% to Drive-Through: 56.7%
90th %-ile Queue: 7

Queue Observations (Total Queue):

Time	Vehicles
16:00	2
16:05	5
16:10	6
16:15	1
16:20	5
16:25	7
16:30	8
16:35	3
16:40	4
16:45	3
16:50	1
16:55	4
17:00	4
17:05	5
17:10	2
17:15	3
17:20	4
17:25	6
17:30	8
17:35	1
17:40	5
17:45	3
17:50	7
17:55	5
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	2	0
00:10.0	00:15.0	3	3	0
00:15.0	00:20.0	3	3	5
00:20.0	00:25.0	5	0	9
00:25.0	00:30.0	3	4	2
00:30.0	00:35.0	4	2	6
00:35.0	00:40.0	3	0	5
00:40.0	00:45.0	1	1	10
00:45.0	00:50.0	3	0	6
00:50.0	00:55.0	4	1	1
00:55.0	01:00.0	1	0	2
01:00.0	01:05.0	2	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	2	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	5	0	1
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	1	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	1	0	0
02:05.0	02:10.0	1	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	1	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 6
Site Name: Chick-Fil-A
Address: 1504 E Brandon Blvd, Brandon, FL 33511
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 59000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	61	65	126
11:15	54	61	115
11:30	77	62	139
11:45	73	76	149
12:00	58	64	122
12:15	46	50	96
12:30	51	50	101
12:45	51	60	111

Peak Hour Volume:	**529**
Peak Hour D (inbound):	**0.501**
% to Drive-Through:	**38.6%**
90th %-ile Queue:	**7**

Queue Observations (Total Queue):

Time	Vehicles
11:00	5
11:05	7
11:10	4
11:15	7
11:20	3
11:25	4
11:30	6
11:35	3
11:40	8
11:45	5
11:50	4
11:55	5
12:00	7
12:05	3
12:10	4
12:15	3
12:20	6
12:25	9
12:30	5
12:35	4
12:40	7
12:45	3
12:50	3
12:55	7
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	1	0	0
00:10.0	00:15.0	1	3	1
00:15.0	00:20.0	2	3	4
00:20.0	00:25.0	7	2	3
00:25.0	00:30.0	5	0	1
00:30.0	00:35.0	4	0	7
00:35.0	00:40.0	4	0	1
00:40.0	00:45.0	1	1	2
00:45.0	00:50.0	2	0	1
00:50.0	00:55.0	2	0	4
00:55.0	01:00.0	0	0	1
01:00.0	01:05.0	2	0	2
01:05.0	01:10.0	1	0	1
01:10.0	01:15.0	1	0	1
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	0	0	1
01:40.0	01:45.0	0	0	2
01:45.0	01:50.0	1	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 8
Site Name: Whataburger
Address: 1201 Atlantic Blvd, Neptune Beach, FL 32266
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3300 s.f.
AADT on Adjacent Street: 36500
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	14	13	27
11:15	9	11	20
11:30	22	14	36
11:45	9	13	22
12:00	11	12	23
12:15	8	15	23
12:30	12	7	19
12:45	8	9	17

Peak Hour Volume: 105
Peak Hour D (inbound): 0.514
% to Drive-Through: 54.8%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	0
11:10	1
11:15	0
11:20	0
11:25	0
11:30	1
11:35	1
11:40	3
11:45	1
11:50	1
11:55	2
12:00	2
12:05	1
12:10	1
12:15	2
12:20	2
12:25	1
12:30	0
12:35	1
12:40	1
12:45	2
12:50	0
12:55	0
13:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	1	0	1
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	4	0	0
00:30.0	00:35.0	2	0	1
00:35.0	00:40.0	3	0	1
00:40.0	00:45.0	6	0	4
00:45.0	00:50.0	3	0	1
00:50.0	00:55.0	4	0	0
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	3	0	4
01:05.0	01:10.0	2	0	1
01:10.0	01:15.0	3	0	2
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	2	0	4
01:25.0	01:30.0	1	0	3
01:30.0	01:35.0	2	0	1
01:35.0	01:40.0	0	0	1
01:40.0	01:45.0	2	0	3
01:45.0	01:50.0	1	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	1	0	2
02:00.0	02:05.0	0	0	2
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	1
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	1	0	1
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	1
02:35.0	02:40.0	1	0	1
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	2	0	0
02:50.0	02:55.0	1	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	1
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	4	0	9

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 8
Site Name: Whataburger
Address: 1201 Atlantic Blvd, Neptune Beach, FL 32266
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3300 s.f.
AADT on Adjacent Street: 36500
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	5	5	10
16:15	3	4	7
16:30	5	5	10
16:45	4	3	7
17:00	5	5	10
17:15	6	7	13
17:30	2	4	6
17:45	4	2	6

Peak Hour Volume: 40
Peak Hour D (inbound): 0.500
% to Drive-Through: 70.6%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
16:00	1
16:05	0
16:10	0
16:15	0
16:20	0
16:25	0
16:30	0
16:35	0
16:40	0
16:45	0
16:50	0
16:55	0
17:00	0
17:05	1
17:10	0
17:15	0
17:20	0
17:25	0
17:30	1
17:35	0
17:40	0
17:45	0
17:50	0
17:55	0
18:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	1	0	1
00:15.0	00:20.0	2	0	0
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	3	0	0
00:30.0	00:35.0	2	0	2
00:35.0	00:40.0	0	0	0
00:40.0	00:45.0	1	0	1
00:45.0	00:50.0	1	0	0
00:50.0	00:55.0	1	0	1
00:55.0	01:00.0	1	0	0
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	2
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	2	0	0
01:50.0	01:55.0	1	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	1	0	1
02:05.0	02:10.0	1	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	1
02:35.0	02:40.0	1	0	1
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	8

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 8
Site Name: Whataburger
Address: 1201 Atlantic Blvd, Neptune Beach, FL 32266
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3300 s.f.
AADT on Adjacent Street: 36500
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	8	4	12
11:15	9	8	17
11:30	9	9	18
11:45	8	10	18
12:00	7	8	15
12:15	11	5	16
12:30	9	15	24
12:45	6	7	13

Peak Hour Volume: 73
Peak Hour D (inbound): 0.479
% to Drive-Through: 64.2%
90th %-ile Queue: 1.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	1
11:20	1
11:25	1
11:30	0
11:35	0
11:40	0
11:45	0
11:50	0
11:55	0
12:00	0
12:05	0
12:10	0
12:15	0
12:20	2
12:25	2
12:30	2
12:35	1
12:40	1
12:45	1
12:50	1
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	1	0	0
00:15.0	00:20.0	2	0	0
00:20.0	00:25.0	2	0	1
00:25.0	00:30.0	6	0	2
00:30.0	00:35.0	5	0	1
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	3	0	2
00:45.0	00:50.0	1	0	0
00:50.0	00:55.0	3	0	3
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	2	0	1
01:05.0	01:10.0	2	0	2
01:10.0	01:15.0	2	0	0
01:15.0	01:20.0	1	0	4
01:20.0	01:25.0	0	0	1
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	1	0	1
01:35.0	01:40.0	1	0	1
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	1	0	1
01:50.0	01:55.0	1	0	0
01:55.0	02:00.0	0	0	1
02:00.0	02:05.0	2	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	2
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	2
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	0	0	2
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	1
03:15.0	59:59.5	0	0	8

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 10
Site Name: Whataburger
Address: 289 Blanding Blvd, Orange Park, FL 32073
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3100 s.f.
AADT on Adjacent Street: 62000
Distance Order to Pickup: 80 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	6	9	15
11:15	8	3	11
11:30	11	11	22
11:45	10	12	22
12:00	6	8	14
12:15	11	8	19
12:30	7	8	15
12:45	6	11	17

Peak Hour Volume: 77
Peak Hour D (inbound): 0.494
% to Drive-Through: 52.3%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	2
11:20	0
11:25	0
11:30	2
11:35	2
11:40	3
11:45	1
11:50	1
11:55	1
12:00	0
12:05	0
12:10	0
12:15	1
12:20	1
12:25	1
12:30	2
12:35	2
12:40	1
12:45	1
12:50	0
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	1	0	1
00:25.0	00:30.0	0	0	0
00:30.0	00:35.0	2	0	2
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	3	0	1
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	1	0	2
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	2	0	1
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	1	0	1
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	2	0	1
01:35.0	01:40.0	0	0	1
01:40.0	01:45.0	1	0	1
01:45.0	01:50.0	2	0	1
01:50.0	01:55.0	2	0	1
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	1	0	0
02:05.0	02:10.0	1	0	0
02:10.0	02:15.0	1	0	0
02:15.0	02:20.0	1	0	1
02:20.0	02:25.0	0	0	2
02:25.0	02:30.0	1	0	3
02:30.0	02:35.0	1	0	0
02:35.0	02:40.0	1	0	1
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	9

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 10
Site Name: Whataburger
Address: 289 Blanding Blvd, Orange Park, FL 32073
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3100 s.f.
AADT on Adjacent Street: 62000
Distance Order to Pickup: 80 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	5	5	10
16:15	8	7	15
16:30	6	7	13
16:45	4	3	7
17:00	10	9	19
17:15	8	8	16
17:30	8	5	13
17:45	8	11	19

Peak Hour Volume: 67
Peak Hour D (inbound): 0.507
% to Drive-Through: 35.1%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
16:00	0
16:05	0
16:10	0
16:15	0
16:20	0
16:25	1
16:30	0
16:35	1
16:40	0
16:45	0
16:50	0
16:55	0
17:00	1
17:05	1
17:10	1
17:15	0
17:20	0
17:25	0
17:30	2
17:35	0
17:40	1
17:45	0
17:50	0
17:55	1
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	2	0	0
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	2	0	0
00:45.0	00:50.0	1	0	0
00:50.0	00:55.0	1	0	2
00:55.0	01:00.0	1	0	0
01:00.0	01:05.0	1	0	1
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	1	0	1
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	3	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	1	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	1	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	1	0	1
03:15.0	59:59.5	1	0	11

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 10
Site Name: Whataburger
Address: 289 Blanding Blvd, Orange Park, FL 32073
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3100 s.f.
AADT on Adjacent Street: 62000
Distance Order to Pickup: 80 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	7	8	15
11:15	13	11	24
11:30	14	9	23
11:45	8	10	18
12:00	7	12	19
12:15	9	7	16
12:30	11	11	22
12:45	11	12	23

Peak Hour Volume:	**84**
Peak Hour D (inbound):	**0.500**
% to Drive-Through:	**48.8%**
90th %-ile Queue:	**1.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	1
11:20	0
11:25	1
11:30	2
11:35	0
11:40	1
11:45	0
11:50	2
11:55	2
12:00	0
12:05	0
12:10	0
12:15	0
12:20	0
12:25	1
12:30	0
12:35	1
12:40	1
12:45	1
12:50	0
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	0	0	1
00:30.0	00:35.0	2	0	2
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	6	0	2
00:45.0	00:50.0	2	0	0
00:50.0	00:55.0	2	0	2
00:55.0	01:00.0	3	0	1
01:00.0	01:05.0	1	0	1
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	2
01:20.0	01:25.0	2	0	2
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	1	0	2
01:40.0	01:45.0	2	0	1
01:45.0	01:50.0	1	0	3
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	1	0	1
02:05.0	02:10.0	1	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	1	0	1
02:40.0	02:45.0	0	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	1	0	3
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	1	0	0
03:15.0	59:59.5	0	0	7

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 15
Site Name: McDonald's
Address: 1179 Malabar Rd, Palm Bay, FL 32907
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 7600 s.f.
AADT on Adjacent Street: 23000
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	19	24	43
11:15	12	12	24
11:30	9	14	23
11:45	16	10	26
12:00	14	16	30
12:15	22	20	42
12:30	13	19	32
12:45	17	17	34

Peak Hour Volume: 138
Peak Hour D (inbound): 0.478
% to Drive-Through: 64.8%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	1
11:10	0
11:15	1
11:20	1
11:25	1
11:30	1
11:35	1
11:40	1
11:45	0
11:50	1
11:55	0
12:00	0
12:05	2
12:10	1
12:15	0
12:20	0
12:25	0
12:30	3
12:35	0
12:40	1
12:45	1
12:50	1
12:55	1
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	5
00:05.0	00:10.0	0	2	14
00:10.0	00:15.0	1	13	18
00:15.0	00:20.0	2	12	13
00:20.0	00:25.0	7	13	8
00:25.0	00:30.0	9	10	5
00:30.0	00:35.0	5	2	3
00:35.0	00:40.0	9	5	4
00:40.0	00:45.0	6	5	3
00:45.0	00:50.0	3	6	3
00:50.0	00:55.0	3	4	0
00:55.0	01:00.0	4	1	1
01:00.0	01:05.0	2	0	0
01:05.0	01:10.0	6	2	0
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	5	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	2	2	0
01:35.0	01:40.0	2	1	0
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	1	1	1
01:50.0	01:55.0	2	0	0
01:55.0	02:00.0	2	0	0
02:00.0	02:05.0	3	0	0
02:05.0	02:10.0	2	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	1	0	0
02:35.0	02:40.0	1	0	0
02:40.0	02:45.0	1	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	1	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 15
Site Name: McDonald's
Address: 1179 Malabar Rd, Palm Bay, FL 32907
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 7600 s.f.
AADT on Adjacent Street: 23000
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	14	11	25
16:15	15	8	23
16:30	11	12	23
16:45	12	15	27
17:00	9	12	21
17:15	10	3	13
17:30	13	17	30
17:45	10	9	19

Peak Hour Volume:	**98**
Peak Hour D (inbound):	**0.531**
% to Drive-Through:	**68.1%**
90th %-ile Queue:	**2.6**

Queue Observations (Total Queue):

Time	Vehicles
16:00	0
16:05	1
16:10	2
16:15	1
16:20	0
16:25	1
16:30	3
16:35	1
16:40	0
16:45	2
16:50	0
16:55	0
17:00	0
17:05	0
17:10	0
17:15	0
17:20	0
17:25	0
17:30	3
17:35	3
17:40	1
17:45	2
17:50	0
17:55	0
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	3	4
00:05.0	00:10.0	0	2	7
00:10.0	00:15.0	3	5	10
00:15.0	00:20.0	1	9	6
00:20.0	00:25.0	2	7	8
00:25.0	00:30.0	3	11	8
00:30.0	00:35.0	2	7	2
00:35.0	00:40.0	3	6	5
00:40.0	00:45.0	6	4	4
00:45.0	00:50.0	2	0	3
00:50.0	00:55.0	5	1	2
00:55.0	01:00.0	2	3	0
01:00.0	01:05.0	6	3	3
01:05.0	01:10.0	4	0	0
01:10.0	01:15.0	1	2	1
01:15.0	01:20.0	1	1	1
01:20.0	01:25.0	0	1	0
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	6	1	1
01:35.0	01:40.0	3	0	1
01:40.0	01:45.0	3	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	2	0	0
02:00.0	02:05.0	2	0	0
02:05.0	02:10.0	1	0	0
02:10.0	02:15.0	2	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	1	0	0
02:35.0	02:40.0	1	0	0
02:40.0	02:45.0	2	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	1	0
03:15.0	59:59.5	1	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 15
Site Name: McDonald's
Address: 1179 Malabar Rd, Palm Bay, FL 32907
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 7600 s.f.
AADT on Adjacent Street: 23000
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	14	14	28
11:15	23	22	45
11:30	35	25	60
11:45	15	29	44
12:00	26	20	46
12:15	24	20	44
12:30	21	27	48
12:45	13	22	35

Peak Hour Volume: 195
Peak Hour D (inbound): 0.513
% to Drive-Through: 63.2%
90th %-ile Queue: 3.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	0
11:15	1
11:20	0
11:25	0
11:30	4
11:35	5
11:40	3
11:45	4
11:50	2
11:55	0
12:00	2
12:05	2
12:10	1
12:15	3
12:20	1
12:25	1
12:30	1
12:35	2
12:40	3
12:45	2
12:50	2
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	7
00:05.0	00:10.0	1	3	17
00:10.0	00:15.0	2	13	16
00:15.0	00:20.0	3	14	14
00:20.0	00:25.0	3	14	9
00:25.0	00:30.0	7	16	9
00:30.0	00:35.0	5	14	5
00:35.0	00:40.0	9	8	4
00:40.0	00:45.0	5	6	4
00:45.0	00:50.0	4	2	2
00:50.0	00:55.0	4	5	5
00:55.0	01:00.0	6	1	2
01:00.0	01:05.0	4	0	2
01:05.0	01:10.0	7	1	2
01:10.0	01:15.0	5	1	2
01:15.0	01:20.0	6	1	0
01:20.0	01:25.0	8	1	0
01:25.0	01:30.0	3	0	2
01:30.0	01:35.0	3	0	0
01:35.0	01:40.0	3	0	0
01:40.0	01:45.0	3	1	0
01:45.0	01:50.0	3	0	0
01:50.0	01:55.0	2	0	0
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	2	0	1
02:05.0	02:10.0	1	2	0
02:10.0	02:15.0	2	0	2
02:15.0	02:20.0	2	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	1	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	1	0
02:50.0	02:55.0	1	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 18
Site Name: McDonald's
Address: 3191 S John Young Pkwy, Kissimmee, FL 34746
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4500 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 170 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	26	19	45
11:15	12	15	27
11:30	16	20	36
11:45	21	12	33
12:00	29	25	54
12:15	17	21	38
12:30	25	32	57
12:45	22	16	38

Peak Hour Volume: 187
Peak Hour D (inbound): 0.497
% to Drive-Through: 61.3%
90th %-ile Queue: 3.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	1
11:10	4
11:15	1
11:20	1
11:25	0
11:30	2
11:35	1
11:40	1
11:45	1
11:50	2
11:55	1
12:00	2
12:05	0
12:10	3
12:15	1
12:20	2
12:25	3
12:30	1
12:35	5
12:40	2
12:45	1
12:50	1
12:55	4
13:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	2	0
00:10.0	00:15.0	0	1	3
00:15.0	00:20.0	1	1	2
00:20.0	00:25.0	1	6	2
00:25.0	00:30.0	2	3	2
00:30.0	00:35.0	5	3	1
00:35.0	00:40.0	1	0	3
00:40.0	00:45.0	2	1	1
00:45.0	00:50.0	1	1	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	2	1	0
01:00.0	01:05.0	0	1	0
01:05.0	01:10.0	1	2	1
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	1	0
01:20.0	01:25.0	0	0	1
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	2
01:35.0	01:40.0	1	0	2
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	1	1	1
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	1	0
02:10.0	02:15.0	2	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	2	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 18
Site Name: McDonald's
Address: 3191 S John Young Pkwy, Kissimmee, FL 34746
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4500 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 170 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	13	16	29
16:15	20	19	39
16:30	21	16	37
16:45	10	15	25
17:00	20	13	33
17:15	19	20	39
17:30	18	20	38
17:45	19	19	38

Peak Hour Volume: 148
Peak Hour D (inbound): 0.514
% to Drive-Through: 65.0%
90th %-ile Queue: 3

Queue Observations (Total Queue):

Time	Vehicles
16:00	2
16:05	1
16:10	0
16:15	0
16:20	0
16:25	2
16:30	2
16:35	1
16:40	1
16:45	1
16:50	0
16:55	1
17:00	1
17:05	1
17:10	4
17:15	3
17:20	4
17:25	1
17:30	1
17:35	1
17:40	3
17:45	1
17:50	3
17:55	1
18:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	1	1
00:10.0	00:15.0	0	2	0
00:15.0	00:20.0	2	1	1
00:20.0	00:25.0	2	2	2
00:25.0	00:30.0	2	4	3
00:30.0	00:35.0	4	3	1
00:35.0	00:40.0	2	0	0
00:40.0	00:45.0	0	1	2
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	2	0	1
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	1	0	1
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	2	2
01:15.0	01:20.0	1	2	1
01:20.0	01:25.0	2	1	0
01:25.0	01:30.0	1	1	0
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	1
01:55.0	02:00.0	0	0	1
02:00.0	02:05.0	0	0	2
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	1	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	1	0	1
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 18
Site Name: McDonald's
Address: 3191 S John Young Pkwy, Kissimmee, FL 34746
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4500 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 170 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	13	10	23
11:15	27	19	46
11:30	20	23	43
11:45	23	14	37
12:00	26	22	48
12:15	22	28	50
12:30	14	18	32
12:45	19	23	42

Peak Hour Volume: 178
Peak Hour D (inbound): 0.539
% to Drive-Through: 61.0%
90th %-ile Queue: 5

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	0
11:10	0
11:15	0
11:20	4
11:25	5
11:30	1
11:35	1
11:40	1
11:45	1
11:50	1
11:55	1
12:00	2
12:05	5
12:10	4
12:15	8
12:20	4
12:25	2
12:30	5
12:35	4
12:40	1
12:45	2
12:50	1
12:55	3
13:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	0
00:05.0	00:10.0	0	1	1
00:10.0	00:15.0	0	1	2
00:15.0	00:20.0	1	3	1
00:20.0	00:25.0	2	2	1
00:25.0	00:30.0	1	2	1
00:30.0	00:35.0	0	1	3
00:35.0	00:40.0	0	0	2
00:40.0	00:45.0	2	3	0
00:45.0	00:50.0	1	0	2
00:50.0	00:55.0	3	3	3
00:55.0	01:00.0	2	2	2
01:00.0	01:05.0	2	1	1
01:05.0	01:10.0	1	3	1
01:10.0	01:15.0	2	0	0
01:15.0	01:20.0	2	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	1	1	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	3	1	0
01:40.0	01:45.0	1	0	1
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	1	1
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	1	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	2

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 19
Site Name: Starbucks
Address: 3721 W Vine St, Kissimmee, FL 34741
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 1900 s.f.
AADT on Adjacent Street: 64390
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	24	23	47
11:15	9	9	18
11:30	15	15	29
11:45	18	18	35
12:00	12	12	24
12:15	12	12	24
12:30	18	18	35
12:45	30	29	59

Peak Hour Volume:	**142**
Peak Hour D (inbound):	**0.505**
% to Drive-Through:	**66.4%**
90th %-ile Queue:	**4**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	1
11:10	0
11:15	1
11:20	3
11:25	0
11:30	1
11:35	1
11:40	4
11:45	5
11:50	1
11:55	3
12:00	0
12:05	3
12:10	2
12:15	0
12:20	5
12:25	0
12:30	3
12:35	3
12:40	2
12:45	1
12:50	1
12:55	4
13:00	4

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	1
5	10	1	0	1
10	15	0	0	4
15	20	2	0	3
20	25	4	0	3
25	30	2	0	5
30	35	0	0	5
35	40	7	0	7
40	45	4	0	3
45	50	4	0	5
50	55	10	0	2
55	60	3	0	8
60	65	7	0	4
65	70	0	0	2
70	75	2	0	4
75	80	1	0	0
80	85	2	0	1
85	90	3	0	1
90	95	3	0	1
95	100	1	0	0
100	105	0	0	0
105	110	0	0	0
110	115	1	0	1
115	120	2	0	0
120	125	1	0	0
125	130	1	0	0
130	135	0	0	0
135	140	0	0	0
140	145	1	0	1
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 21
Site Name: Starbucks
Address: Commons Shop'g Ctr, 2535 Howell Branch Rd, Casselberry, FL 32751
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 1700 s.f.
AADT on Adjacent Street: 47000
Distance Order to Pickup: 100 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
7:00	32	31	63
7:15	11	10	21
7:30	24	23	47
7:45	26	26	52
8:00	16	16	31
8:15	29	29	58
8:30	37	36	73
8:45	26	26	52

Peak Hour Volume: 215
Peak Hour D (inbound): 0.505
% to Drive-Through: 62.2%
90th %-ile Queue: 3

Queue Observations (Total Queue):

Time	Vehicles
7:00	1
7:05	0
7:10	0
7:15	2
7:20	1
7:25	2
7:30	0
7:35	1
7:40	0
7:45	1
7:50	0
7:55	0
8:00	1
8:05	5
8:10	1
8:15	2
8:20	1
8:25	2
8:30	2
8:35	3
8:40	4
8:45	3
8:50	3
8:55	3
9:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	0
10	15	0	0	2
15	20	3	0	2
20	25	6	0	3
25	30	5	0	3
30	35	3	0	1
35	40	5	0	1
40	45	2	0	2
45	50	1	0	1
50	55	2	0	0
55	60	0	0	0
60	65	0	0	1
65	70	0	0	2
70	75	0	0	2
75	80	0	0	3
80	85	0	0	1
85	90	0	0	2
90	95	0	0	1
95	100	0	0	0
100	105	0	0	1
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 24
Site Name: Starbucks
Address: 7910 Winter Garden Vineland Rd, Windermere, FL 34786
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2200 s.f.
AADT on Adjacent Street: 29000
Distance Order to Pickup: 105 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	40	30	70
11:15	48	42	90
11:30	49	46	95
11:45	54	52	106
12:00	56	48	104
12:15	72	58	130
12:30	58	50	108
12:45	75	68	143

Peak Hour Volume: 485
Peak Hour D (inbound): 0.538
% to Drive-Through: 27.5%
90th %-ile Queue: 3

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	3
11:10	1
11:15	2
11:20	3
11:25	5
11:30	2
11:35	1
11:40	0
11:45	2
11:50	3
11:55	2
12:00	2
12:05	1
12:10	1
12:15	3
12:20	3
12:25	3
12:30	1
12:35	3
12:40	2
12:45	1
12:50	1
12:55	3
13:00	3

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	2
10	15	2	0	1
15	20	4	0	2
20	25	1	0	4
25	30	0	0	3
30	35	2	0	5
35	40	1	0	6
40	45	3	0	3
45	50	3	0	3
50	55	4	0	3
55	60	4	0	3
60	65	3	0	2
65	70	5	0	1
70	75	0	0	3
75	80	3	0	2
80	85	1	0	0
85	90	2	0	1
90	95	2	0	0
95	100	2	0	0
100	105	0	0	0
105	110	0	0	0
110	115	1	0	0
115	120	1	0	0
120	125	1	0	1
125	130	0	0	0
130	135	0	0	1
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 26
Site Name: Krispy Kreme
Address: 5310 W Irlo Bronson Memorial Hwy, Kissimmee, FL 34746
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3100 s.f.
AADT on Adjacent Street: 37500
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	4	4	8
11:15	4	4	8
11:30	3	3	6
11:45	9	9	18
12:00	5	5	10
12:15	1	1	2
12:30	8	8	16
12:45	8	8	16

Peak Hour Volume: 47
Peak Hour D (inbound): 0.513
% to Drive-Through: 25.6%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	0
11:15	0
11:20	0
11:25	0
11:30	1
11:35	2
11:40	0
11:45	0
11:50	0
11:55	3
12:00	1
12:05	0
12:10	0
12:15	0
12:20	0
12:25	0
12:30	0
12:35	1
12:40	0
12:45	1
12:50	0
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	2	0	0
10	15	0	0	0
15	20	1	0	0
20	25	0	0	1
25	30	1	0	0
30	35	4	0	0
35	40	1	0	0
40	45	0	0	1
45	50	0	0	1
50	55	1	0	2
55	60	0	0	0
60	65	0	0	0
65	70	0	0	0
70	75	0	0	0
75	80	0	0	0
80	85	0	0	0
85	90	0	0	0
90	95	0	0	1
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	1
135	140	0	0	0
140	145	0	0	1
145	150	0	0	0
150	155	0	0	1
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	2

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 28
Site Name: Krispy Kreme
Address: 4904 S Cleveland Ave, Fort Myers, FL 33907
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3500 s.f.
AADT on Adjacent Street: 49500
Distance Order to Pickup: 60 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	10	7	17
11:15	11	8	19
11:30	12	15	27
11:45	5	6	11
12:00	11	8	19
12:15	11	9	20
12:30	5	9	14
12:45	6	4	10

Peak Hour Volume: 77
Peak Hour D (inbound): 0.506
% to Drive-Through: 56.3%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	2
11:15	0
11:20	0
11:25	0
11:30	1
11:35	1
11:40	1
11:45	1
11:50	0
11:55	1
12:00	0
12:05	1
12:10	2
12:15	1
12:20	0
12:25	0
12:30	1
12:35	0
12:40	1
12:45	0
12:50	0
12:55	1
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	1
5	10	1	0	0
10	15	4	0	0
15	20	4	0	3
20	25	6	0	2
25	30	7	0	1
30	35	4	0	1
35	40	4	0	1
40	45	1	0	0
45	50	1	0	1
50	55	1	0	0
55	60	1	0	0
60	65	0	0	4
65	70	3	0	3
70	75	1	0	0
75	80	2	0	1
80	85	0	0	4
85	90	0	0	1
90	95	0	0	4
95	100	0	0	1
100	105	0	0	0
105	110	1	0	1
110	115	0	0	1
115	120	0	0	1
120	125	0	0	0
125	130	0	0	2
130	135	0	0	1
135	140	0	0	0
140	145	0	0	1
145	150	0	0	1
150	155	0	0	1
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	2
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	2	0	4

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 30
Site Name: Dunkin Donuts
Address: 11404 US-301, Riverview, FL 33578
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2200 s.f.
AADT on Adjacent Street: 50500
Distance Order to Pickup: 75 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	36	32	68
11:15	29	31	60
11:30	35	29	64
11:45	44	38	82
12:00	36	31	67
12:15	30	33	63
12:30	27	29	56
12:45	37	30	67

Peak Hour Volume: 276
Peak Hour D (inbound): 0.525
% to Drive-Through: 65.3%
90th %-ile Queue: 7.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	4
11:05	5
11:10	0
11:15	3
11:20	4
11:25	4
11:30	7
11:35	8
11:40	9
11:45	8
11:50	2
11:55	1
12:00	4
12:05	5
12:10	2
12:15	2
12:20	0
12:25	3
12:30	4
12:35	0
12:40	3
12:45	2
12:50	1
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	0
10	15	4	0	1
15	20	4	0	1
20	25	8	0	1
25	30	5	0	3
30	35	2	0	5
35	40	2	0	3
40	45	2	0	1
45	50	0	0	3
50	55	0	0	0
55	60	0	0	0
60	65	0	0	0
65	70	0	0	3
70	75	0	0	0
75	80	0	0	0
80	85	0	0	0
85	90	0	0	1
90	95	0	0	1
95	100	0	0	1
100	105	0	0	1
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	1
130	135	0	0	2
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 31
Site Name: Dunkin Donuts
Address: 54 N Charles Richard Beall Blvd, DeBary, FL 32713
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2100 s.f.
AADT on Adjacent Street: 24000
Distance Order to Pickup: 75 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	23	21	44
11:15	20	23	43
11:30	25	21	46
11:45	21	26	47
12:00	26	19	45
12:15	22	22	44
12:30	23	30	53
12:45	21	17	38

Peak Hour Volume: 189
Peak Hour D (inbound): 0.497
% to Drive-Through: 85.1%
90th %-ile Queue: 5

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	5
11:20	0
11:25	0
11:30	2
11:35	2
11:40	3
11:45	4
11:50	6
11:55	3
12:00	1
12:05	3
12:10	5
12:15	4
12:20	3
12:25	2
12:30	3
12:35	3
12:40	5
12:45	0
12:50	1
12:55	0
13:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	1	0	1
5	10	8	0	9
10	15	18	0	20
15	20	27	0	24
20	25	19	0	22
25	30	23	0	9
30	35	11	0	12
35	40	11	0	6
40	45	10	0	1
45	50	5	0	8
50	55	4	0	5
55	60	3	0	7
60	65	2	0	5
65	70	3	0	6
70	75	0	0	3
75	80	0	0	4
80	85	3	0	2
85	90	1	0	2
90	95	3	0	1
95	100	2	0	0
100	105	0	0	4
105	110	1	0	1
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	1
130	135	0	0	1
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	1
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 34
Site Name: Chick-Fil-A
Address: 2448 E Colonial Dr, Orlando, FL 32803
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4100 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 125 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	52	52	104
11:15	46	49	95
11:30	62	52	114
11:45	49	56	105
12:00	52	60	112
12:15	65	59	124
12:30	61	58	119
12:45	58	57	115

Peak Hour Volume: 470
Peak Hour D (inbound): 0.502
% to Drive-Through: 63.8%
90th %-ile Queue: 18

Queue Observations (Total Queue):

Time	Vehicles
11:00	14
11:05	15
11:10	18
11:15	11
11:20	11
11:25	7
11:30	16
11:35	10
11:40	16
11:45	17
11:50	16
11:55	18
12:00	20
12:05	18
12:10	19
12:15	10
12:20	8
12:25	13
12:30	14
12:35	17
12:40	16
12:45	13
12:50	17
12:55	11
13:00	12

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	1
00:05.0	00:10.0	3	0	2
00:10.0	00:15.0	2	0	7
00:15.0	00:20.0	6	0	6
00:20.0	00:25.0	1	0	3
00:25.0	00:30.0	4	0	2
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	1	0	0
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	2	0	1
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 34
Site Name: Chick-Fil-A
Address: 2448 E Colonial Dr, Orlando, FL 32803
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4100 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 125 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	25	39	64
16:15	29	24	53
16:30	44	36	80
16:45	40	40	80
17:00	31	38	69
17:15	41	32	73
17:30	54	42	96
17:45	33	39	72

Peak Hour Volume: 318
Peak Hour D (inbound): 0.522
% to Drive-Through: 57.2%
90th %-ile Queue: 18

Queue Observations (Total Queue):

Time	Vehicles
16:00	12
16:05	11
16:10	6
16:15	3
16:20	6
16:25	5
16:30	5
16:35	12
16:40	14
16:45	18
16:50	20
16:55	11
17:00	12
17:05	6
17:10	7
17:15	4
17:20	9
17:25	13
17:30	10
17:35	9
17:40	12
17:45	18
17:50	16
17:55	17
18:00	20

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	1	0	0
00:10.0	00:15.0	1	0	2
00:15.0	00:20.0	1	0	3
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	2	0	1
00:30.0	00:35.0	1	0	1
00:35.0	00:40.0	0	0	2
00:40.0	00:45.0	2	0	0
00:45.0	00:50.0	1	0	2
00:50.0	00:55.0	1	0	1
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	1	0	1
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 34
Site Name: Chick-Fil-A
Address: 2448 E Colonial Dr, Orlando, FL 32803
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4100 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 125 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	47	56	103
11:15	46	39	85
11:30	55	53	108
11:45	47	54	101
12:00	45	48	93
12:15	58	41	99
12:30	52	50	102
12:45	52	50	102

Peak Hour Volume: 401
Peak Hour D (inbound): 0.516
% to Drive-Through: 56.2%
90th %-ile Queue: 16

Queue Observations (Total Queue):

Time	Vehicles
11:00	17
11:05	15
11:10	9
11:15	6
11:20	14
11:25	14
11:30	13
11:35	10
11:40	11
11:45	10
11:50	10
11:55	9
12:00	8
12:05	11
12:10	14
12:15	11
12:20	16
12:25	15
12:30	16
12:35	14
12:40	16
12:45	16
12:50	13
12:55	15
13:00	14

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	1	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	1	0	1
00:35.0	00:40.0	0	0	1
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	3	0	1
00:50.0	00:55.0	1	0	1
00:55.0	01:00.0	0	0	2
01:00.0	01:05.0	3	0	0
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	0	0	2
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	2	0	1
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	1	0	0
01:55.0	02:00.0	0	0	1
02:00.0	02:05.0	1	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	1	0	1
02:15.0	02:20.0	2	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	1
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	1	0	0
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 35
Site Name: Chick-Fil-A
Address: 1262 Northlake Blvd, Lake Park, FL 33403
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3700 s.f.
AADT on Adjacent Street: 40500
Distance Order to Pickup: 100 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	30	30	60
11:15	36	34	70
11:30	44	36	80
11:45	40	33	73
12:00	48	42	90
12:15	34	39	73
12:30	41	34	75
12:45	48	34	82

Peak Hour Volume: 320
Peak Hour D (inbound): 0.534
% to Drive-Through: 78.8%
90th %-ile Queue: 23

Queue Observations (Total Queue):

Time	Vehicles
11:00	20
11:05	21
11:10	19
11:15	9
11:20	7
11:25	11
11:30	23
11:35	21
11:40	25
11:45	23
11:50	23
11:55	21
12:00	22
12:05	17
12:10	17
12:15	16
12:20	21
12:25	18
12:30	17
12:35	20
12:40	21
12:45	10
12:50	20
12:55	12
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	1	0	1
00:10.0	00:15.0	2	0	3
00:15.0	00:20.0	3	0	3
00:20.0	00:25.0	1	0	4
00:25.0	00:30.0	4	0	4
00:30.0	00:35.0	2	0	3
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	0	0	2
00:45.0	00:50.0	2	0	2
00:50.0	00:55.0	0	0	1
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	2	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	1	0	0
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	1	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 35
Site Name: Chick-Fil-A
Address: 1262 Northlake Blvd, Lake Park, FL 33403
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3700 s.f.
AADT on Adjacent Street: 40500
Distance Order to Pickup: 100 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	31	35	66
16:15	25	24	49
16:30	26	24	50
16:45	22	24	46
17:00	24	26	50
17:15	22	15	37
17:30	28	22	50
17:45	30	22	52

Peak Hour Volume: 211
Peak Hour D (inbound): 0.493
% to Drive-Through: 84.6%
90th %-ile Queue: 18.6

Queue Observations (Total Queue):

Time	Vehicles
16:00	9
16:05	12
16:10	20
16:15	17
16:20	15
16:25	15
16:30	5
16:35	6
16:40	14
16:45	18
16:50	15
16:55	19
17:00	14
17:05	11
17:10	9
17:15	9
17:20	7
17:25	13
17:30	19
17:35	18
17:40	13
17:45	7
17:50	8
17:55	9
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	1	0	2
00:15.0	00:20.0	0	0	5
00:20.0	00:25.0	0	0	3
00:25.0	00:30.0	5	0	4
00:30.0	00:35.0	4	0	4
00:35.0	00:40.0	3	0	2
00:40.0	00:45.0	2	0	1
00:45.0	00:50.0	2	0	1
00:50.0	00:55.0	4	0	1
00:55.0	01:00.0	3	0	0
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 35
Site Name: Chick-Fil-A
Address: 1262 Northlake Blvd, Lake Park, FL 33403
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3700 s.f.
AADT on Adjacent Street: 40500
Distance Order to Pickup: 100 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	36	30	66
11:15	31	35	66
11:30	35	32	67
11:45	42	29	71
12:00	30	36	66
12:15	29	30	59
12:30	44	30	74
12:45	30	28	58

Peak Hour Volume: 270
Peak Hour D (inbound): 0.537
% to Drive-Through: 74.7%
90th %-ile Queue: 15

Queue Observations (Total Queue):

Time	Vehicles
11:00	15
11:05	11
11:10	15
11:15	14
11:20	10
11:25	10
11:30	2
11:35	13
11:40	16
11:45	13
11:50	15
11:55	14
12:00	15
12:05	17
12:10	14
12:15	13
12:20	15
12:25	11
12:30	12
12:35	13
12:40	14
12:45	15
12:50	13
12:55	15
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	0	0	1
00:30.0	00:35.0	1	0	2
00:35.0	00:40.0	1	0	4
00:40.0	00:45.0	3	0	10
00:45.0	00:50.0	3	0	5
00:50.0	00:55.0	3	0	1
00:55.0	01:00.0	3	0	0
01:00.0	01:05.0	2	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	1	0	1
01:15.0	01:20.0	2	0	0
01:20.0	01:25.0	2	0	2
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	2	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 36
Site Name: Chick-Fil-A
Address: 2070 Palm Beach Lakes Blvd, West Palm Beach, FL 33409
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 48000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	45	50	95
11:15	48	46	94
11:30	56	54	110
11:45	48	49	97
12:00	48	54	102
12:15	58	56	114
12:30	34	45	79
12:45	46	41	87

Peak Hour Volume: 423
Peak Hour D (inbound): 0.496
% to Drive-Through: 70.2%
90th %-ile Queue: 8.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	10
11:05	7
11:10	9
11:15	4
11:20	6
11:25	10
11:30	7
11:35	5
11:40	7
11:45	6
11:50	6
11:55	7
12:00	2
12:05	6
12:10	5
12:15	3
12:20	4
12:25	5
12:30	7
12:35	8
12:40	2
12:45	2
12:50	5
12:55	7
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	1	0	4
00:10.0	00:15.0	0	0	7
00:15.0	00:20.0	3	0	4
00:20.0	00:25.0	3	0	2
00:25.0	00:30.0	0	0	2
00:30.0	00:35.0	5	0	0
00:35.0	00:40.0	7	0	1
00:40.0	00:45.0	2	0	2
00:45.0	00:50.0	5	0	0
00:50.0	00:55.0	3	0	2
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	3	0	1
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	2
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	1
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 36
Site Name: Chick-Fil-A
Address: 2070 Palm Beach Lakes Blvd, West Palm Beach, FL 33409
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 48000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	30	42	72
16:15	39	32	71
16:30	33	31	64
16:45	30	35	65
17:00	34	24	58
17:15	25	46	71
17:30	36	24	60
17:45	42	43	85

Peak Hour Volume:	**274**
Peak Hour D (inbound):	**0.500**
% to Drive-Through:	**69.5%**
90th %-ile Queue:	**9.2**

Queue Observations (Total Queue):

Time	Vehicles
16:00	6
16:05	10
16:10	6
16:15	10
16:20	12
16:25	8
16:30	7
16:35	2
16:40	8
16:45	4
16:50	3
16:55	6
17:00	8
17:05	4
17:10	5
17:15	3
17:20	2
17:25	1
17:30	3
17:35	5
17:40	4
17:45	3
17:50	5
17:55	3
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	1
00:10.0	00:15.0	0	0	2
00:15.0	00:20.0	3	0	0
00:20.0	00:25.0	1	0	1
00:25.0	00:30.0	3	0	1
00:30.0	00:35.0	1	0	3
00:35.0	00:40.0	2	0	4
00:40.0	00:45.0	0	0	2
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	5	0	0
00:55.0	01:00.0	1	0	2
01:00.0	01:05.0	2	0	1
01:05.0	01:10.0	1	0	2
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	3	0	0
01:20.0	01:25.0	0	0	1
01:25.0	01:30.0	1	0	2
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	1	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 36
Site Name: Chick-Fil-A
Address: 2070 Palm Beach Lakes Blvd, West Palm Beach, FL 33409
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 48000
Distance Order to Pickup: 120 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	38	38	76
11:15	51	45	96
11:30	34	48	82
11:45	48	37	85
12:00	37	43	80
12:15	40	44	84
12:30	42	34	76
12:45	40	37	77

Peak Hour Volume: 343
Peak Hour D (inbound): 0.499
% to Drive-Through: 63.3%
90th %-ile Queue: 11

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	9
11:10	8
11:15	13
11:20	10
11:25	11
11:30	8
11:35	11
11:40	11
11:45	12
11:50	11
11:55	8
12:00	11
12:05	11
12:10	7
12:15	7
12:20	7
12:25	10
12:30	9
12:35	11
12:40	8
12:45	11
12:50	10
12:55	8
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	1
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	0	0	1
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	0	0	3
00:40.0	00:45.0	2	0	2
00:45.0	00:50.0	3	0	0
00:50.0	00:55.0	2	0	2
00:55.0	01:00.0	4	0	1
01:00.0	01:05.0	3	0	1
01:05.0	01:10.0	3	0	4
01:10.0	01:15.0	2	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	2
01:45.0	01:50.0	2	0	0
01:50.0	01:55.0	0	0	1
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 37
Site Name: Chick-Fil-A
Address: 2650 N Federal Hwy, Fort Lauderdale, FL 33306
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 54500
Distance Order to Pickup: 110 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	68	57	125
11:15	61	61	122
11:30	40	41	81
11:45	61	59	120
12:00	69	67	136
12:15	56	64	120
12:30	73	60	133
12:45	66	72	138

Peak Hour Volume: 527
Peak Hour D (inbound): 0.501
% to Drive-Through: 31.0%
90th %-ile Queue: 10

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	3
11:10	2
11:15	4
11:20	4
11:25	3
11:30	4
11:35	4
11:40	5
11:45	7
11:50	6
11:55	8
12:00	8
12:05	7
12:10	9
12:15	9
12:20	8
12:25	7
12:30	9
12:35	10
12:40	12
12:45	11
12:50	10
12:55	10
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	2	0	1
00:05.0	00:10.0	1	0	1
00:10.0	00:15.0	0	0	1
00:15.0	00:20.0	3	0	0
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	2	0	0
00:35.0	00:40.0	0	0	1
00:40.0	00:45.0	4	0	0
00:45.0	00:50.0	2	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	5	0	1
01:10.0	01:15.0	3	0	3
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	3	0	0
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	1	0	1
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	2	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	2
02:00.0	02:05.0	2	0	1
02:05.0	02:10.0	1	0	3
02:10.0	02:15.0	0	0	1
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	2
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	1	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	1	0	0
03:00.0	03:05.0	1	0	1
03:05.0	03:10.0	1	0	1
03:10.0	03:15.0	0	0	1
03:15.0	59:59.5	0	0	17

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 37
Site Name: Chick-Fil-A
Address: 2650 N Federal Hwy, Fort Lauderdale, FL 33306
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 54500
Distance Order to Pickup: 110 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	50	41	91
16:15	47	47	94
16:30	59	59	118
16:45	49	44	93
17:00	50	52	102
17:15	38	48	86
17:30	60	42	102
17:45	54	61	115

Peak Hour Volume: 407
Peak Hour D (inbound): 0.504
% to Drive-Through: 31.9%
90th %-ile Queue: 15.6

Queue Observations (Total Queue):

Time	Vehicles
16:00	11
16:05	12
16:10	15
16:15	18
16:20	15
16:25	15
16:30	16
16:35	11
16:40	7
16:45	6
16:50	7
16:55	8
17:00	8
17:05	7
17:10	8
17:15	8
17:20	8
17:25	18
17:30	11
17:35	7
17:40	7
17:45	6
17:50	5
17:55	6
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	1
00:10.0	00:15.0	0	0	2
00:15.0	00:20.0	1	0	0
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	2	0	4
00:30.0	00:35.0	0	0	2
00:35.0	00:40.0	2	0	2
00:40.0	00:45.0	0	0	1
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	2	0	1
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	2	0	0
01:20.0	01:25.0	1	0	1
01:25.0	01:30.0	0	0	2
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	0	0	2
01:40.0	01:45.0	5	0	1
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	1	0	2
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	2	0	0
02:05.0	02:10.0	3	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	3
02:20.0	02:25.0	1	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	2
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	1	0	1
02:45.0	02:50.0	1	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	1	0	0
03:00.0	03:05.0	0	0	1
03:05.0	03:10.0	1	0	1
03:10.0	03:15.0	1	0	0
03:15.0	59:59.5	12	0	7

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 37
Site Name: Chick-Fil-A
Address: 2650 N Federal Hwy, Fort Lauderdale, FL 33306
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 4200 s.f.
AADT on Adjacent Street: 54500
Distance Order to Pickup: 110 ft
Protocol: Order/Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	69	58	127
11:15	62	62	124
11:30	72	71	143
11:45	56	60	116
12:00	59	60	119
12:15	53	49	102
12:30	56	60	116
12:45	60	59	119

Peak Hour Volume:	**510**
Peak Hour D (inbound):	**0.508**
% to Drive-Through:	**30.4%**
90th %-ile Queue:	**7.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	5
11:05	7
11:10	4
11:15	6
11:20	1
11:25	1
11:30	2
11:35	4
11:40	3
11:45	4
11:50	5
11:55	2
12:00	4
12:05	6
12:10	7
12:15	1
12:20	8
12:25	5
12:30	2
12:35	4
12:40	12
12:45	9
12:50	7
12:55	3
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	2
00:15.0	00:20.0	0	0	3
00:20.0	00:25.0	1	0	1
00:25.0	00:30.0	4	0	6
00:30.0	00:35.0	1	0	2
00:35.0	00:40.0	3	0	3
00:40.0	00:45.0	3	0	2
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	5	0	3
00:55.0	01:00.0	2	0	1
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	4	0	1
01:10.0	01:15.0	2	0	1
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	2	0	5
01:25.0	01:30.0	2	0	1
01:30.0	01:35.0	2	0	2
01:35.0	01:40.0	2	0	1
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	2	0	1
01:55.0	02:00.0	0	0	1
02:00.0	02:05.0	3	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 38
Site Name: Chick-Fil-A
Address: 12600 W Sunrise Blvd, Sunrise, FL 33323
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3900 s.f.
AADT on Adjacent Street: 33000
Distance Order to Pickup: 115 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	21	20	41
11:15	26	23	49
11:30	33	28	61
11:45	46	36	82
12:00	35	52	87
12:15	42	39	81
12:30	46	46	92
12:45	53	52	105

Peak Hour Volume: 366
Peak Hour D (inbound): 0.483
% to Drive-Through: 57.0%
90th %-ile Queue: 8

Queue Observations (Total Queue):

Time	Vehicles
11:00	3
11:05	3
11:10	3
11:15	0
11:20	3
11:25	2
11:30	3
11:35	5
11:40	7
11:45	5
11:50	7
11:55	6
12:00	8
12:05	8
12:10	5
12:15	9
12:20	3
12:25	3
12:30	3
12:35	6
12:40	8
12:45	8
12:50	5
12:55	7
13:00	4

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	46	0	16
00:05.0	00:10.0	16	0	18
00:10.0	00:15.0	10	0	17
00:15.0	00:20.0	6	0	13
00:20.0	00:25.0	10	0	14
00:25.0	00:30.0	6	0	9
00:30.0	00:35.0	14	0	9
00:35.0	00:40.0	8	0	6
00:40.0	00:45.0	8	0	5
00:45.0	00:50.0	7	0	4
00:50.0	00:55.0	5	0	8
00:55.0	01:00.0	6	0	8
01:00.0	01:05.0	1	0	6
01:05.0	01:10.0	2	0	2
01:10.0	01:15.0	5	0	1
01:15.0	01:20.0	6	0	2
01:20.0	01:25.0	0	0	4
01:25.0	01:30.0	0	0	2
01:30.0	01:35.0	3	0	1
01:35.0	01:40.0	2	0	2
01:40.0	01:45.0	1	0	2
01:45.0	01:50.0	1	0	3
01:50.0	01:55.0	5	0	3
01:55.0	02:00.0	0	0	4
02:00.0	02:05.0	1	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	1	0	1
02:15.0	02:20.0	0	0	5
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	2
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	1	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	2	0	0
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	3

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 38
Site Name: Chick-Fil-A
Address: 12600 W Sunrise Blvd, Sunrise, FL 33323
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3900 s.f.
AADT on Adjacent Street: 33000
Distance Order to Pickup: 115 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	39	38	77
16:15	31	37	68
16:30	28	29	57
16:45	26	27	53
17:00	23	24	47
17:15	13	22	35
17:30	41	12	53
17:45	28	39	67

Peak Hour Volume: 255
Peak Hour D (inbound): 0.486
% to Drive-Through: 61.3%
90th %-ile Queue: 9

Queue Observations (Total Queue):

Time	Vehicles
16:00	6
16:05	8
16:10	7
16:15	9
16:20	9
16:25	8
16:30	7
16:35	5
16:40	8
16:45	8
16:50	5
16:55	2
17:00	7
17:05	7
17:10	6
17:15	5
17:20	4
17:25	4
17:30	8
17:35	4
17:40	4
17:45	9
17:50	9
17:55	9
18:00	9

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	41	0	1
00:05.0	00:10.0	28	0	2
00:10.0	00:15.0	6	0	1
00:15.0	00:20.0	5	0	4
00:20.0	00:25.0	6	0	2
00:25.0	00:30.0	6	0	2
00:30.0	00:35.0	1	0	2
00:35.0	00:40.0	3	0	0
00:40.0	00:45.0	4	0	6
00:45.0	00:50.0	5	0	4
00:50.0	00:55.0	0	0	4
00:55.0	01:00.0	3	0	2
01:00.0	01:05.0	4	0	0
01:05.0	01:10.0	0	0	3
01:10.0	01:15.0	4	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	2	0	1
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	0	0	6
01:35.0	01:40.0	2	0	2
01:40.0	01:45.0	1	0	8
01:45.0	01:50.0	1	0	3
01:50.0	01:55.0	0	0	3
01:55.0	02:00.0	0	0	2
02:00.0	02:05.0	0	0	3
02:05.0	02:10.0	0	0	2
02:10.0	02:15.0	0	0	2
02:15.0	02:20.0	0	0	2
02:20.0	02:25.0	0	0	1
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	1	0	1
02:35.0	02:40.0	1	0	2
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	0	0	2
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	1	0	1
03:00.0	03:05.0	1	0	0
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	1	0	1
03:15.0	59:59.5	5	0	53

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 38
Site Name: Chick-Fil-A
Address: 12600 W Sunrise Blvd, Sunrise, FL 33323
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3900 s.f.
AADT on Adjacent Street: 33000
Distance Order to Pickup: 115 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	26	55	81
11:15	38	56	94
11:30	31	56	87
11:45	38	73	111
12:00	29	53	82
12:15	21	59	80
12:30	36	65	101
12:45	30	54	84

Peak Hour Volume: 374
Peak Hour D (inbound): 0.364
% to Drive-Through: 64.3%
90th %-ile Queue: 15.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	11
11:05	16
11:10	14
11:15	14
11:20	13
11:25	11
11:30	11
11:35	11
11:40	14
11:45	14
11:50	15
11:55	18
12:00	16
12:05	14
12:10	14
12:15	15
12:20	13
12:25	13
12:30	11
12:35	11
12:40	11
12:45	11
12:50	9
12:55	14
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	2
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	0	0	1
00:30.0	00:35.0	0	0	1
00:35.0	00:40.0	1	0	4
00:40.0	00:45.0	2	0	2
00:45.0	00:50.0	1	0	2
00:50.0	00:55.0	0	0	7
00:55.0	01:00.0	4	0	0
01:00.0	01:05.0	2	0	5
01:05.0	01:10.0	6	0	6
01:10.0	01:15.0	6	0	1
01:15.0	01:20.0	7	0	3
01:20.0	01:25.0	5	0	2
01:25.0	01:30.0	3	0	1
01:30.0	01:35.0	4	0	2
01:35.0	01:40.0	1	0	1
01:40.0	01:45.0	2	0	5
01:45.0	01:50.0	3	0	3
01:50.0	01:55.0	4	0	2
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	1	0	2
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	1	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	2	0	1
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	1
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 40
Site Name: Whataburger
Address: 1101 Thomasville Rd, Tallahassee, FL 32303
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4800 s.f.
AADT on Adjacent Street: 16500
Distance Order to Pickup: 125 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	16	17	33
11:15	22	8	30
11:30	11	14	25
11:45	20	21	41
12:00	13	18	31
12:15	13	15	28
12:30	16	14	30
12:45	22	22	44

Peak Hour Volume:	**133**
Peak Hour D (inbound):	**0.519**
% to Drive-Through:	**46.6%**
90th %-ile Queue:	**2.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	1
11:10	0
11:15	2
11:20	1
11:25	1
11:30	1
11:35	0
11:40	0
11:45	0
11:50	0
11:55	1
12:00	1
12:05	0
12:10	0
12:15	0
12:20	2
12:25	1
12:30	0
12:35	2
12:40	3
12:45	2
12:50	5
12:55	5
13:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	2	0	0
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	2	0	0
00:40.0	00:45.0	0	0	2
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	3	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	1	0	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	2
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	1	0	0
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	1	0	1
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	8

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 40
Site Name: Whataburger
Address: 1101 Thomasville Rd, Tallahassee, FL 32303
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4800 s.f.
AADT on Adjacent Street: 16500
Distance Order to Pickup: 125 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	9	8	17
16:15	15	12	27
16:30	8	15	23
16:45	10	10	20
17:00	11	7	18
17:15	6	8	14
17:30	5	6	11
17:45	5	5	10

Peak Hour Volume: 88
Peak Hour D (inbound): 0.500
% to Drive-Through: 69.6%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
16:00	0
16:05	0
16:10	2
16:15	0
16:20	1
16:25	4
16:30	2
16:35	1
16:40	0
16:45	1
16:50	0
16:55	2
17:00	0
17:05	0
17:10	0
17:15	2
17:20	1
17:25	1
17:30	0
17:35	0
17:40	0
17:45	1
17:50	0
17:55	1
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	1	0	0
00:20.0	00:25.0	1	0	0
00:25.0	00:30.0	3	0	2
00:30.0	00:35.0	1	0	1
00:35.0	00:40.0	1	0	4
00:40.0	00:45.0	2	0	1
00:45.0	00:50.0	0	0	2
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	3	0	2
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	2	0	1
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	1
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	3	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	1
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	5

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 40
Site Name: Whataburger
Address: 1101 Thomasville Rd, Tallahassee, FL 32303
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4800 s.f.
AADT on Adjacent Street: 16500
Distance Order to Pickup: 125 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	8	7	15
11:15	9	9	18
11:30	9	10	19
11:45	7	9	16
12:00	7	8	15
12:15	11	4	15
12:30	14	13	27
12:45	6	6	12

Peak Hour Volume:	**73**
Peak Hour D (inbound):	**0.534**
% to Drive-Through:	**57.7%**
90th %-ile Queue:	**1**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	0
11:20	2
11:25	0
11:30	0
11:35	0
11:40	1
11:45	1
11:50	0
11:55	0
12:00	0
12:05	1
12:10	0
12:15	1
12:20	0
12:25	0
12:30	1
12:35	2
12:40	0
12:45	0
12:50	0
12:55	0
13:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	2	0	0
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	2	0	0
00:40.0	00:45.0	0	0	2
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	3	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	1	0	0
01:30.0	01:35.0	0	0	1
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	2
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	1	0	0
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	1	0	1
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	1
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	8

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 41
Site Name: Whataburger
Address: 2586 N Monroe St, Tallahassee, FL 32303
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4400 s.f.
AADT on Adjacent Street: 36000
Distance Order to Pickup: 170 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	17	16	33
11:15	14	19	33
11:30	14	15	29
11:45	18	17	35
12:00	16	15	31
12:15	18	21	39
12:30	12	17	29
12:45	16	17	33

Peak Hour Volume: 134
Peak Hour D (inbound): 0.493
% to Drive-Through: 49.6%
90th %-ile Queue: 3

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	2
11:10	2
11:15	0
11:20	1
11:25	2
11:30	3
11:35	0
11:40	1
11:45	1
11:50	1
11:55	0
12:00	3
12:05	3
12:10	2
12:15	1
12:20	1
12:25	3
12:30	1
12:35	0
12:40	0
12:45	0
12:50	0
12:55	1
13:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	0	0	2
00:40.0	00:45.0	1	0	2
00:45.0	00:50.0	5	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	1	0	1
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	2	0	1
01:10.0	01:15.0	2	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	1	0	1
01:25.0	01:30.0	0	0	2
01:30.0	01:35.0	1	0	0
01:35.0	01:40.0	1	0	1
01:40.0	01:45.0	0	0	1
01:45.0	01:50.0	0	0	2
01:50.0	01:55.0	1	0	1
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	2	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	1
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	2
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 41
Site Name: Whataburger
Address: 2586 N Monroe St, Tallahassee, FL 32303
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4400 s.f.
AADT on Adjacent Street: 36000
Distance Order to Pickup: 170 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	15	11	26
16:15	11	11	22
16:30	11	12	23
16:45	7	13	20
17:00	14	8	22
17:15	8	10	18
17:30	17	14	31
17:45	12	11	23

Peak Hour Volume:	**94**
Peak Hour D (inbound):	**0.543**
% to Drive-Through:	**56.8%**
90th %-ile Queue:	**2**

Queue Observations (Total Queue):

Time	Vehicles
16:00	0
16:05	1
16:10	1
16:15	2
16:20	2
16:25	0
16:30	0
16:35	0
16:40	0
16:45	2
16:50	0
16:55	0
17:00	1
17:05	1
17:10	1
17:15	1
17:20	3
17:25	2
17:30	2
17:35	0
17:40	0
17:45	1
17:50	0
17:55	2
18:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	2	0	0
00:25.0	00:30.0	0	0	0
00:30.0	00:35.0	2	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	3	0	1
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	2	0	1
01:05.0	01:10.0	0	0	2
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	1
01:25.0	01:30.0	0	0	2
01:30.0	01:35.0	1	0	1
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	1	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	0	0	1
02:25.0	02:30.0	2	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	4

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 41
Site Name: Whataburger
Address: 2586 N Monroe St, Tallahassee, FL 32303
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4400 s.f.
AADT on Adjacent Street: 36000
Distance Order to Pickup: 170 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	13	7	20
11:15	15	13	28
11:30	12	15	27
11:45	12	8	20
12:00	16	20	36
12:15	11	9	20
12:30	11	13	24
12:45	12	14	26

Peak Hour Volume: 111
Peak Hour D (inbound): 0.495
% to Drive-Through: 43.1%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	3
11:10	1
11:15	0
11:20	1
11:25	1
11:30	1
11:35	0
11:40	1
11:45	1
11:50	1
11:55	2
12:00	1
12:05	0
12:10	2
12:15	2
12:20	2
12:25	0
12:30	1
12:35	0
12:40	0
12:45	3
12:50	1
12:55	0
13:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	0	0	0
00:15.0	00:20.0	0	0	0
00:20.0	00:25.0	0	0	0
00:25.0	00:30.0	0	0	0
00:30.0	00:35.0	0	0	0
00:35.0	00:40.0	1	0	1
00:40.0	00:45.0	0	0	1
00:45.0	00:50.0	0	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	1	0	0
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	0	0	1
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	1	0	1
01:45.0	01:50.0	0	0	1
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	1	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	1	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	1	0	0
02:40.0	02:45.0	0	0	1
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	0	3

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 49
Site Name: McDonald's
Address: 2701 E Colonial Dr, Orlando, FL 32803
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 5800 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	37	25	62
11:15	35	29	64
11:30	48	35	83
11:45	44	40	84
12:00	41	38	79
12:15	37	45	82
12:30	38	43	81
12:45	35	32	67

Peak Hour Volume:	**328**
Peak Hour D (inbound):	**0.518**
% to Drive-Through:	**54.9%**
90th %-ile Queue:	**6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	6
11:10	4
11:15	2
11:20	3
11:25	2
11:30	1
11:35	5
11:40	3
11:45	6
11:50	4
11:55	5
12:00	3
12:05	3
12:10	5
12:15	3
12:20	5
12:25	7
12:30	5
12:35	5
12:40	5
12:45	3
12:50	6
12:55	8
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	0
00:05.0	00:10.0	2	2	5
00:10.0	00:15.0	1	2	3
00:15.0	00:20.0	2	4	1
00:20.0	00:25.0	1	1	1
00:25.0	00:30.0	1	0	0
00:30.0	00:35.0	0	2	0
00:35.0	00:40.0	0	0	0
00:40.0	00:45.0	1	1	3
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	1	0
00:55.0	01:00.0	2	1	1
01:00.0	01:05.0	0	1	1
01:05.0	01:10.0	3	0	0
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	3	1	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	1	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 49
Site Name: McDonald's
Address: 2701 E Colonial Dr, Orlando, FL 32803
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 5800 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	25	20	45
16:15	22	23	45
16:30	24	29	53
16:45	17	18	35
17:00	27	19	46
17:15	20	23	43
17:30	41	32	73
17:45	26	26	52

Peak Hour Volume: 214
Peak Hour D (inbound): 0.533
% to Drive-Through: 52.0%
90th %-ile Queue: 5

Queue Observations (Total Queue):

Time	Vehicles
16:00	2
16:05	2
16:10	2
16:15	5
16:20	2
16:25	0
16:30	2
16:35	1
16:40	3
16:45	7
16:50	5
16:55	5
17:00	1
17:05	2
17:10	1
17:15	2
17:20	2
17:25	2
17:30	5
17:35	2
17:40	2
17:45	2
17:50	2
17:55	4
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	1
00:05.0	00:10.0	0	0	2
00:10.0	00:15.0	2	6	0
00:15.0	00:20.0	2	2	1
00:20.0	00:25.0	1	1	2
00:25.0	00:30.0	4	1	2
00:30.0	00:35.0	2	0	0
00:35.0	00:40.0	0	1	0
00:40.0	00:45.0	0	1	1
00:45.0	00:50.0	0	1	0
00:50.0	00:55.0	2	1	3
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	1	0	1
01:05.0	01:10.0	0	0	2
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	2	0
01:20.0	01:25.0	1	1	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	1	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 49
Site Name: McDonald's
Address: 2701 E Colonial Dr, Orlando, FL 32803
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 5800 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 130 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
12:00	33	24	57
12:15	31	31	62
12:30	23	24	47
12:45	33	30	63
13:00	27	29	56
13:15	30	40	70
13:30	24	22	46
13:45	32	33	65

Peak Hour Volume: 237
Peak Hour D (inbound): 0.797
% to Drive-Through: 58.8%
90th %-ile Queue: 3

Queue Observations (Total Queue):

Time	Vehicles
12:00	1
12:05	0
12:10	0
12:15	1
12:20	0
12:25	0
12:30	3
12:35	1
12:40	2
12:45	4
12:50	3
12:55	1
13:00	1
13:05	0
13:10	1
13:15	1
13:20	1
13:25	2
13:30	1
13:35	1
13:40	5
13:45	2
13:50	1
13:55	1
14:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	6	6
00:05.0	00:10.0	3	13	29
00:10.0	00:15.0	6	20	27
00:15.0	00:20.0	16	29	19
00:20.0	00:25.0	17	15	6
00:25.0	00:30.0	13	11	8
00:30.0	00:35.0	13	7	5
00:35.0	00:40.0	14	9	5
00:40.0	00:45.0	11	12	11
00:45.0	00:50.0	5	4	7
00:50.0	00:55.0	10	4	2
00:55.0	01:00.0	5	2	7
01:00.0	01:05.0	4	2	2
01:05.0	01:10.0	2	1	0
01:10.0	01:15.0	3	0	1
01:15.0	01:20.0	1	1	2
01:20.0	01:25.0	3	0	1
01:25.0	01:30.0	1	1	0
01:30.0	01:35.0	3	2	0
01:35.0	01:40.0	1	0	1
01:40.0	01:45.0	2	0	0
01:45.0	01:50.0	1	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	2	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	1	0	0
02:10.0	02:15.0	0	1	1
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	2	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 50
Site Name: McDonald's
Address: 970 SE Federal Hwy, Stuart, FL 34994
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 34000
Distance Order to Pickup: 150 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:30	16	13	29
11:45	10	13	23
12:00	22	11	33
12:15	21	17	38
12:30	23	31	54
12:45	16	20	36
13:00	17	14	31
13:15	16	21	37

Peak Hour Volume: 161
Peak Hour D (inbound): 0.509
% to Drive-Through: 70.2%
90th %-ile Queue: 5.6

Queue Observations (Total Queue):

Time	Vehicles
11:30	0
11:35	1
11:40	0
11:45	0
11:50	0
11:55	0
12:00	0
12:05	2
12:10	1
12:15	5
12:20	7
12:25	8
12:30	6
12:35	0
12:40	0
12:45	2
12:50	1
12:55	1
13:00	1
13:05	2
13:10	4
13:15	1
13:20	0
13:25	1
13:30	3

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	5	3
00:05.0	00:10.0	1	13	9
00:10.0	00:15.0	14	18	9
00:15.0	00:20.0	10	12	9
00:20.0	00:25.0	10	13	5
00:25.0	00:30.0	4	10	6
00:30.0	00:35.0	4	3	6
00:35.0	00:40.0	7	3	6
00:40.0	00:45.0	8	5	8
00:45.0	00:50.0	8	3	7
00:50.0	00:55.0	4	2	4
00:55.0	01:00.0	5	1	4
01:00.0	01:05.0	9	2	1
01:05.0	01:10.0	3	1	4
01:10.0	01:15.0	2	1	0
01:15.0	01:20.0	1	1	2
01:20.0	01:25.0	2	2	2
01:25.0	01:30.0	2	1	0
01:30.0	01:35.0	1	1	3
01:35.0	01:40.0	1	1	0
01:40.0	01:45.0	1	0	1
01:45.0	01:50.0	0	3	1
01:50.0	01:55.0	0	0	2
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	2	0	1
02:05.0	02:10.0	2	0	1
02:10.0	02:15.0	0	0	3
02:15.0	02:20.0	1	0	1
02:20.0	02:25.0	0	2	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	2
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	1
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	1	0	0
03:15.0	59:59.5	0	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 50
Site Name: McDonald's
Address: 970 SE Federal Hwy, Stuart, FL 34994
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 34000
Distance Order to Pickup: 150 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	13	7	20
16:15	11	10	21
16:30	12	10	22
16:45	9	16	25
17:00	10	7	17
17:15	15	12	27
17:30	5	11	16
17:45	5	4	9

Peak Hour Volume:	**91**
Peak Hour D (inbound):	**0.505**
% to Drive-Through:	**67.5%**
90th %-ile Queue:	**1**

Queue Observations (Total Queue):

Time	Vehicles
16:00	1
16:05	0
16:10	1
16:15	1
16:20	1
16:25	1
16:30	1
16:35	3
16:40	1
16:45	1
16:50	0
16:55	1
17:00	0
17:05	1
17:10	1
17:15	0
17:20	0
17:25	0
17:30	3
17:35	1
17:40	1
17:45	0
17:50	0
17:55	0
18:00	1

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	2	3
00:05.0	00:10.0	1	1	1
00:10.0	00:15.0	0	5	1
00:15.0	00:20.0	2	4	2
00:20.0	00:25.0	1	11	3
00:25.0	00:30.0	3	4	3
00:30.0	00:35.0	1	0	2
00:35.0	00:40.0	5	3	2
00:40.0	00:45.0	4	4	5
00:45.0	00:50.0	2	1	4
00:50.0	00:55.0	1	2	3
00:55.0	01:00.0	3	1	1
01:00.0	01:05.0	2	5	1
01:05.0	01:10.0	4	1	1
01:10.0	01:15.0	2	0	2
01:15.0	01:20.0	2	0	0
01:20.0	01:25.0	4	3	0
01:25.0	01:30.0	1	1	2
01:30.0	01:35.0	1	1	3
01:35.0	01:40.0	1	1	0
01:40.0	01:45.0	0	0	2
01:45.0	01:50.0	1	0	2
01:50.0	01:55.0	2	1	1
01:55.0	02:00.0	1	0	1
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	1	1	1
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	1	0	0
02:20.0	02:25.0	1	0	0
02:25.0	02:30.0	1	1	0
02:30.0	02:35.0	0	1	1
02:35.0	02:40.0	2	0	0
02:40.0	02:45.0	1	0	2
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	1	0	1
02:55.0	03:00.0	1	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	1	0	0
03:15.0	59:59.5	2	2	5

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 50
Site Name: McDonald's
Address: 970 SE Federal Hwy, Stuart, FL 34994
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 3800 s.f.
AADT on Adjacent Street: 34000
Distance Order to Pickup: 150 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	14	9	23
11:15	14	17	31
11:30	10	10	20
11:45	15	11	26
12:00	15	16	31
12:15	9	13	22
12:30	10	12	22
12:45	9	8	17

Peak Hour Volume:	**108**
Peak Hour D (inbound):	**0.500**
% to Drive-Through:	**82.3%**
90th %-ile Queue:	**2**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	2
11:10	1
11:15	1
11:20	2
11:25	0
11:30	1
11:35	0
11:40	3
11:45	0
11:50	0
11:55	2
12:00	1
12:05	0
12:10	3
12:15	1
12:20	0
12:25	0
12:30	0
12:35	1
12:40	0
12:45	2
12:50	1
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	4	4
00:05.0	00:10.0	0	1	4
00:10.0	00:15.0	2	4	7
00:15.0	00:20.0	6	7	2
00:20.0	00:25.0	5	3	4
00:25.0	00:30.0	6	9	6
00:30.0	00:35.0	5	6	3
00:35.0	00:40.0	6	2	5
00:40.0	00:45.0	5	7	8
00:45.0	00:50.0	5	4	3
00:50.0	00:55.0	1	4	2
00:55.0	01:00.0	8	3	1
01:00.0	01:05.0	4	1	0
01:05.0	01:10.0	4	2	2
01:10.0	01:15.0	1	3	0
01:15.0	01:20.0	4	2	2
01:20.0	01:25.0	2	1	1
01:25.0	01:30.0	2	3	2
01:30.0	01:35.0	2	3	3
01:35.0	01:40.0	0	1	1
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	1	1	1
01:50.0	01:55.0	1	1	2
01:55.0	02:00.0	0	2	0
02:00.0	02:05.0	2	1	0
02:05.0	02:10.0	0	0	1
02:10.0	02:15.0	0	1	3
02:15.0	02:20.0	0	0	1
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	1	2
02:30.0	02:35.0	2	0	1
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	1	1	1
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	1	0	1
03:05.0	03:10.0	1	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	2	1	5

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 51
Site Name: Starbucks
Address: 3011 E Colonial Dr, Orlando, FL 32803
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2200 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 95 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	22	21	43
11:15	22	21	43
11:30	33	32	65
11:45	38	38	76
12:00	22	21	43
12:15	30	30	60
12:30	33	32	65
12:45	44	43	87

Peak Hour Volume:	**255**
Peak Hour D (inbound):	**0.506**
% to Drive-Through:	**63.5%**
90th %-ile Queue:	**6.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	3
11:05	5
11:10	4
11:15	3
11:20	1
11:25	6
11:30	4
11:35	2
11:40	2
11:45	2
11:50	3
11:55	2
12:00	2
12:05	4
12:10	4
12:15	3
12:20	7
12:25	7
12:30	7
12:35	4
12:40	2
12:45	3
12:50	2
12:55	3
13:00	4

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	1
5	10	1	0	3
10	15	1	0	1
15	20	3	0	1
20	25	6	0	1
25	30	4	0	4
30	35	2	0	1
35	40	1	0	0
40	45	1	0	0
45	50	0	0	3
50	55	1	0	1
55	60	0	0	0
60	65	0	0	2
65	70	0	0	0
70	75	0	0	1
75	80	0	0	0
80	85	0	0	0
85	90	0	0	1
90	95	0	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	0	0	0
115	120	1	0	0
120	125	0	0	1
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 52
Site Name: Starbucks
Address: 4593 S University Dr, Davie, FL 33328
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2400 s.f.
AADT on Adjacent Street: 52000
Distance Order to Pickup: 110 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	20	22	42
11:15	27	25	52
11:30	36	33	69
11:45	33	34	67
12:00	23	27	50
12:15	42	32	74
12:30	40	39	79
12:45	36	33	69

Peak Hour Volume: 272
Peak Hour D (inbound): 0.518
% to Drive-Through: 55.3%
90th %-ile Queue: 4.6

Queue Observations (Total Queue):

Time	Vehicles
11:00	2
11:05	1
11:10	0
11:15	1
11:20	1
11:25	0
11:30	2
11:35	0
11:40	0
11:45	0
11:50	4
11:55	1
12:00	3
12:05	5
12:10	3
12:15	4
12:20	0
12:25	2
12:30	4
12:35	3
12:40	2
12:45	4
12:50	7
12:55	7
13:00	4

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	3	0	3
5	10	12	0	5
10	15	23	0	20
15	20	19	0	19
20	25	21	0	16
25	30	17	0	16
30	35	9	0	6
35	40	11	0	5
40	45	6	0	5
45	50	1	0	5
50	55	6	0	6
55	60	3	0	9
60	65	1	0	2
65	70	0	0	2
70	75	1	0	3
75	80	1	0	2
80	85	0	0	2
85	90	1	0	2
90	95	1	0	1
95	100	2	0	3
100	105	0	0	2
105	110	2	0	0
110	115	0	0	1
115	120	0	0	1
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	3
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	1	0	2

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 57
Site Name: Krispy Kreme
Address: 1031 S Orlando Ave, Winter Park, FL 32789
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3400 s.f.
AADT on Adjacent Street: 26500
Distance Order to Pickup: 100 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	11	10	21
11:15	17	13	30
11:30	10	14	24
11:45	11	13	24
12:00	8	6	14
12:15	16	11	27
12:30	13	13	26
12:45	9	11	20

Peak Hour Volume:	**99**
Peak Hour D (inbound):	**0.495**
% to Drive-Through:	**58.9%**
90th %-ile Queue:	**4**

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	0
11:10	1
11:15	2
11:20	6
11:25	4
11:30	6
11:35	4
11:40	1
11:45	0
11:50	0
11:55	0
12:00	0
12:05	0
12:10	0
12:15	0
12:20	1
12:25	2
12:30	2
12:35	0
12:40	0
12:45	2
12:50	0
12:55	1
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	1	0	0
5	10	3	0	0
10	15	5	0	1
15	20	1	0	0
20	25	0	0	0
25	30	2	0	0
30	35	1	0	0
35	40	1	0	2
40	45	1	0	0
45	50	1	0	1
50	55	1	0	0
55	60	0	0	4
60	65	0	0	2
65	70	0	0	0
70	75	2	0	1
75	80	0	0	1
80	85	0	0	1
85	90	0	0	0
90	95	0	0	1
95	100	0	0	0
100	105	1	0	0
105	110	0	0	2
110	115	0	0	0
115	120	1	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	1
145	150	0	0	1
150	155	0	0	0
155	160	0	0	0
160	165	0	0	1
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	2

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 59
Site Name: Krispy Kreme
Address: 10010 W McNab Rd, Tamarac, FL 33321
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 1900 s.f.
AADT on Adjacent Street: 23000
Distance Order to Pickup: 45 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
7:00	3	3	6
7:15	2	2	4
7:30	2	2	4
7:45	1	1	2
8:00	5	5	10
8:15	3	3	6
8:30	0	0	0
8:45	1	1	2

Peak Hour Volume: 22
Peak Hour D (inbound): 0.500
% to Drive-Through: 82.4%
90th %-ile Queue: 0

Queue Observations (Total Queue):

Time	Vehicles
7:00	0
7:05	0
7:10	0
7:15	0
7:20	0
7:25	0
7:30	0
7:35	0
7:40	0
7:45	0
7:50	0
7:55	0
8:00	0
8:05	0
8:10	0
8:15	0
8:20	0
8:25	0
8:30	0
8:35	0
8:40	1
8:45	0
8:50	0
8:55	1
9:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	1	0	0
5	10	3	0	0
10	15	5	0	1
15	20	2	0	0
20	25	0	0	1
25	30	0	0	1
30	35	1	0	1
35	40	0	0	0
40	45	0	0	0
45	50	1	0	1
50	55	0	0	1
55	60	0	0	1
60	65	0	0	1
65	70	0	0	1
70	75	0	0	1
75	80	0	0	0
80	85	0	0	0
85	90	0	0	0
90	95	1	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	3
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	1
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 62
Site Name: Dunkin Donuts
Address: 700 34th St N, St. Petersburg, FL 33713
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 4500 s.f.
AADT on Adjacent Street: 41500
Distance Order to Pickup: 85 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	14	8	22
11:15	10	15	25
11:30	23	16	39
11:45	15	23	38
12:00	19	13	32
12:15	14	16	30
12:30	18	22	40
12:45	6	7	13

Peak Hour Volume: 140
Peak Hour D (inbound): 0.507
% to Drive-Through: 79.8%
90th %-ile Queue: 4

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	1
11:10	1
11:15	1
11:20	2
11:25	0
11:30	4
11:35	4
11:40	2
11:45	2
11:50	4
11:55	1
12:00	2
12:05	6
12:10	0
12:15	1
12:20	2
12:25	1
12:30	2
12:35	3
12:40	2
12:45	1
12:50	3
12:55	3
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	2	0	0
10	15	1	0	0
15	20	7	0	1
20	25	5	0	1
25	30	6	0	1
30	35	0	0	6
35	40	1	0	2
40	45	2	0	2
45	50	0	0	3
50	55	1	0	2
55	60	0	0	0
60	65	0	0	1
65	70	0	0	0
70	75	0	0	1
75	80	0	0	1
80	85	0	0	1
85	90	0	0	0
90	95	0	0	0
95	100	0	0	1
100	105	0	0	0
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	1
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	1
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 63
Site Name: Dunkin Donuts
Address: 6101 Gulf Blvd, St Pete Beach, FL 33706
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2600 s.f.
AADT on Adjacent Street: 20100
Distance Order to Pickup: 60 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
7:00	5	4	9
7:15	6	7	13
7:30	8	9	17
7:45	5	4	9
8:00	11	9	20
8:15	9	9	18
8:30	8	9	17
8:45	6	9	15

Peak Hour Volume: 70
Peak Hour D (inbound): 0.486
% to Drive-Through: 75.9%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
7:00	0
7:05	0
7:10	0
7:15	1
7:20	0
7:25	0
7:30	0
7:35	0
7:40	0
7:45	0
7:50	0
7:55	0
8:00	0
8:05	0
8:10	0
8:15	0
8:20	0
8:25	0
8:30	0
8:35	0
8:40	1
8:45	0
8:50	1
8:55	1
9:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	2	0	1
5	10	4	0	0
10	15	11	0	1
15	20	3	0	1
20	25	7	0	2
25	30	6	0	4
30	35	2	0	2
35	40	2	0	3
40	45	2	0	2
45	50	2	0	5
50	55	3	0	4
55	60	0	0	0
60	65	0	0	3
65	70	0	0	3
70	75	0	0	2
75	80	0	0	2
80	85	0	0	0
85	90	0	0	2
90	95	0	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	0	0	2
115	120	0	0	1
120	125	0	0	1
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	1
160	165	0	0	0
165	170	0	0	1
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	1
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 79
Site Name: McDonald's
Address: 4443 W Kennedy Blvd, Tampa, FL 33607
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 5400 s.f.
AADT on Adjacent Street: 38000
Distance Order to Pickup: 90 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	18	22	40
11:15	20	12	32
11:30	40	24	64
11:45	34	39	73
12:00	39	43	82
12:15	22	22	44
12:30	18	25	43
12:45	33	27	60

Peak Hour Volume:	**263**
Peak Hour D (inbound):	**0.513**
% to Drive-Through:	**59.8%**
90th %-ile Queue:	**8**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	4
11:10	1
11:15	6
11:20	6
11:25	4
11:30	5
11:35	5
11:40	8
11:45	8
11:50	6
11:55	7
12:00	8
12:05	8
12:10	5
12:15	6
12:20	4
12:25	1
12:30	2
12:35	3
12:40	11
12:45	5
12:50	1
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	0
00:05.0	00:10.0	2	2	2
00:10.0	00:15.0	3	3	2
00:15.0	00:20.0	5	10	2
00:20.0	00:25.0	4	3	9
00:25.0	00:30.0	0	3	3
00:30.0	00:35.0	4	1	3
00:35.0	00:40.0	3	2	1
00:40.0	00:45.0	2	3	1
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	0	0	2
01:00.0	01:05.0	0	0	2
01:05.0	01:10.0	1	0	0
01:10.0	01:15.0	0	1	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	1	0	1
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	2	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	1	1	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 79
Site Name: McDonald's
Address: 4443 W Kennedy Blvd, Tampa, FL 33607
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 5400 s.f.
AADT on Adjacent Street: 38000
Distance Order to Pickup: 90 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	16	20	36
16:15	9	12	21
16:30	15	14	29
16:45	12	12	24
17:00	12	9	21
17:15	10	16	26
17:30	9	5	14
17:45	9	10	19

Peak Hour Volume:	**110**
Peak Hour D (inbound):	**0.473**
% to Drive-Through:	**73.9%**
90th %-ile Queue:	**2.6**

Queue Observations (Total Queue):

Time	Vehicles
16:00	1
16:05	0
16:10	1
16:15	2
16:20	1
16:25	2
16:30	2
16:35	0
16:40	3
16:45	4
16:50	1
16:55	0
17:00	0
17:05	0
17:10	0
17:15	2
17:20	2
17:25	0
17:30	0
17:35	0
17:40	2
17:45	3
17:50	1
17:55	0
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	0
00:05.0	00:10.0	3	1	0
00:10.0	00:15.0	4	3	0
00:15.0	00:20.0	6	5	0
00:20.0	00:25.0	1	1	1
00:25.0	00:30.0	3	3	0
00:30.0	00:35.0	0	0	1
00:35.0	00:40.0	2	1	2
00:40.0	00:45.0	1	1	4
00:45.0	00:50.0	1	0	1
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	0	0	1
01:00.0	01:05.0	0	2	2
01:05.0	01:10.0	0	2	3
01:10.0	01:15.0	0	2	2
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	1	0
01:25.0	01:30.0	0	1	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	2
01:55.0	02:00.0	0	0	2
02:00.0	02:05.0	1	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	1
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	1
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 79
Site Name: McDonald's
Address: 4443 W Kennedy Blvd, Tampa, FL 33607
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 5400 s.f.
AADT on Adjacent Street: 38000
Distance Order to Pickup: 90 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	16	19	35
11:15	26	19	45
11:30	21	20	41
11:45	22	22	44
12:00	21	25	46
12:15	14	18	32
12:30	16	16	32
12:45	17	15	32

Peak Hour Volume:	**176**
Peak Hour D (inbound):	**0.511**
% to Drive-Through:	**68.6%**
90th %-ile Queue:	**3**

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	3
11:10	1
11:15	0
11:20	2
11:25	3
11:30	4
11:35	0
11:40	1
11:45	4
11:50	3
11:55	1
12:00	2
12:05	1
12:10	1
12:15	0
12:20	2
12:25	1
12:30	3
12:35	3
12:40	1
12:45	2
12:50	0
12:55	1
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	7	5
00:05.0	00:10.0	5	19	13
00:10.0	00:15.0	12	2	5
00:15.0	00:20.0	6	4	4
00:20.0	00:25.0	2	0	1
00:25.0	00:30.0	1	3	1
00:30.0	00:35.0	3	0	0
00:35.0	00:40.0	2	0	1
00:40.0	00:45.0	1	0	3
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	1	0	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	1	1	0
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 80
Site Name: McDonald's
Address: 1905 N Dale Mabry Hwy, Tampa, FL 33607
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 6100 s.f.
AADT on Adjacent Street: 57000
Distance Order to Pickup: 140 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	17	22	39
11:15	28	28	56
11:30	24	28	52
11:45	34	29	63
12:00	47	34	81
12:15	33	38	71
12:30	35	29	64
12:45	34	52	86

Peak Hour Volume: 302
Peak Hour D (inbound): 0.493
% to Drive-Through: 67.5%
90th %-ile Queue: 5

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	2
11:10	5
11:15	4
11:20	3
11:25	2
11:30	5
11:35	4
11:40	3
11:45	3
11:50	3
11:55	5
12:00	5
12:05	5
12:10	4
12:15	5
12:20	3
12:25	4
12:30	3
12:35	0
12:40	2
12:45	4
12:50	3
12:55	4
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	2	0	0
00:05.0	00:10.0	8	8	7
00:10.0	00:15.0	8	12	15
00:15.0	00:20.0	13	12	10
00:20.0	00:25.0	4	5	6
00:25.0	00:30.0	3	5	6
00:30.0	00:35.0	5	3	1
00:35.0	00:40.0	2	3	1
00:40.0	00:45.0	2	2	2
00:45.0	00:50.0	0	0	0
00:50.0	00:55.0	1	0	1
00:55.0	01:00.0	1	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	2	0	0
01:10.0	01:15.0	0	0	1
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	1
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	1	1	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	1	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 80
Site Name: McDonald's
Address: 1905 N Dale Mabry Hwy, Tampa, FL 33607
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 6100 s.f.
AADT on Adjacent Street: 57000
Distance Order to Pickup: 140 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	22	24	46
16:15	16	21	37
16:30	19	14	33
16:45	15	16	31
17:00	15	16	31
17:15	19	13	32
17:30	22	28	50
17:45	19	20	39

Peak Hour Volume:	**152**
Peak Hour D (inbound):	**0.493**
% to Drive-Through:	**69.4%**
90th %-ile Queue:	**4.6**

Queue Observations (Total Queue):

Time	Vehicles
16:00	3
16:05	4
16:10	4
16:15	2
16:20	3
16:25	3
16:30	0
16:35	4
16:40	5
16:45	2
16:50	2
16:55	1
17:00	2
17:05	0
17:10	1
17:15	2
17:20	0
17:25	2
17:30	5
17:35	5
17:40	0
17:45	2
17:50	0
17:55	0
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	0
00:05.0	00:10.0	6	2	1
00:10.0	00:15.0	3	6	7
00:15.0	00:20.0	9	8	3
00:20.0	00:25.0	1	5	5
00:25.0	00:30.0	2	5	5
00:30.0	00:35.0	5	4	1
00:35.0	00:40.0	3	0	5
00:40.0	00:45.0	1	0	2
00:45.0	00:50.0	2	1	4
00:50.0	00:55.0	0	3	1
00:55.0	01:00.0	0	1	0
01:00.0	01:05.0	2	0	1
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	2	0	0
01:25.0	01:30.0	0	0	2
01:30.0	01:35.0	0	1	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	1	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 80
Site Name: McDonald's
Address: 1905 N Dale Mabry Hwy, Tampa, FL 33607
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 2>1

Size: 6100 s.f.
AADT on Adjacent Street: 57000
Distance Order to Pickup: 140 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	35	25	60
11:15	33	32	65
11:30	40	33	73
11:45	22	31	53
12:00	22	32	54
12:15	31	21	52
12:30	33	32	65
12:45	25	20	45

Peak Hour Volume: 251
Peak Hour D (inbound): 0.518
% to Drive-Through: 56.8%
90th %-ile Queue: 5

Queue Observations (Total Queue):

Time	Vehicles
11:00	3
11:05	4
11:10	8
11:15	0
11:20	1
11:25	1
11:30	4
11:35	5
11:40	4
11:45	0
11:50	1
11:55	1
12:00	0
12:05	2
12:10	4
12:15	8
12:20	5
12:25	3
12:30	3
12:35	1
12:40	3
12:45	5
12:50	4
12:55	4
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	1	1	0
00:05.0	00:10.0	2	5	10
00:10.0	00:15.0	4	11	5
00:15.0	00:20.0	8	7	12
00:20.0	00:25.0	3	5	4
00:25.0	00:30.0	1	5	4
00:30.0	00:35.0	2	5	2
00:35.0	00:40.0	3	1	2
00:40.0	00:45.0	0	1	3
00:45.0	00:50.0	3	3	0
00:50.0	00:55.0	2	0	1
00:55.0	01:00.0	2	0	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	2	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	4	0	0
01:20.0	01:25.0	1	0	0
01:25.0	01:30.0	1	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	1	0	0
01:40.0	01:45.0	1	0	0
01:45.0	01:50.0	2	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	1	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 82
Site Name: McDonald's
Address: 6855 Gulf Blvd, St Pete Beach, FL 33706
Time Period: Weekday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3700 s.f.
AADT on Adjacent Street: 20100
Distance Order to Pickup: 120 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	14	11	25
11:15	12	11	23
11:30	19	20	39
11:45	19	14	33
12:00	11	17	28
12:15	11	14	25
12:30	10	10	20
12:45	11	8	19

Peak Hour Volume: 125
Peak Hour D (inbound): 0.512
% to Drive-Through: 63.6%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	1
11:10	1
11:15	0
11:20	1
11:25	1
11:30	2
11:35	1
11:40	2
11:45	1
11:50	3
11:55	1
12:00	1
12:05	1
12:10	2
12:15	0
12:20	1
12:25	0
12:30	1
12:35	1
12:40	2
12:45	0
12:50	1
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	2	1
00:05.0	00:10.0	1	0	4
00:10.0	00:15.0	2	3	2
00:15.0	00:20.0	2	3	0
00:20.0	00:25.0	0	2	3
00:25.0	00:30.0	1	0	2
00:30.0	00:35.0	4	0	0
00:35.0	00:40.0	0	0	1
00:40.0	00:45.0	2	0	0
00:45.0	00:50.0	1	2	0
00:50.0	00:55.0	1	0	0
00:55.0	01:00.0	0	3	1
01:00.0	01:05.0	1	0	0
01:05.0	01:10.0	0	1	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	1	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	1
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 82
Site Name: McDonald's
Address: 6855 Gulf Blvd, St Pete Beach, FL 33706
Time Period: Weekday Supper
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3700 s.f.
AADT on Adjacent Street: 20100
Distance Order to Pickup: 120 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
16:00	7	3	10
16:15	8	4	12
16:30	6	5	11
16:45	5	4	9
17:00	7	8	15
17:15	3	3	6
17:30	4	4	8
17:45	6	7	13

Peak Hour Volume: 47
Peak Hour D (inbound): 0.553
% to Drive-Through: 52.2%
90th %-ile Queue: 1

Queue Observations (Total Queue):

Time	Vehicles
16:00	0
16:05	0
16:10	0
16:15	1
16:20	0
16:25	0
16:30	0
16:35	1
16:40	1
16:45	0
16:50	0
16:55	0
17:00	0
17:05	0
17:10	0
17:15	0
17:20	0
17:25	0
17:30	1
17:35	0
17:40	1
17:45	0
17:50	0
17:55	1
18:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	0	1
00:05.0	00:10.0	0	0	0
00:10.0	00:15.0	1	0	0
00:15.0	00:20.0	1	0	0
00:20.0	00:25.0	1	0	1
00:25.0	00:30.0	0	0	0
00:30.0	00:35.0	1	0	0
00:35.0	00:40.0	1	0	0
00:40.0	00:45.0	0	0	0
00:45.0	00:50.0	0	0	2
00:50.0	00:55.0	0	0	0
00:55.0	01:00.0	0	0	0
01:00.0	01:05.0	0	0	0
01:05.0	01:10.0	0	0	0
01:10.0	01:15.0	0	0	0
01:15.0	01:20.0	0	0	0
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	0	0	0
01:30.0	01:35.0	0	0	0
01:35.0	01:40.0	0	0	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	1
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	0	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 82
Site Name: McDonald's
Address: 6855 Gulf Blvd, St Pete Beach, FL 33706
Time Period: Saturday Lunch
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3700 s.f.
AADT on Adjacent Street: 20100
Distance Order to Pickup: 120 ft
Protocol: Order, Pay, Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	13	14	27
11:15	9	9	18
11:30	14	8	22
11:45	7	13	20
12:00	16	11	27
12:15	4	12	16
12:30	15	7	22
12:45	5	13	18

Peak Hour Volume:	**87**
Peak Hour D (inbound):	**0.529**
% to Drive-Through:	**55.4%**
90th %-ile Queue:	**1**

Queue Observations (Total Queue):

Time	Vehicles
11:00	0
11:05	0
11:10	1
11:15	1
11:20	0
11:25	1
11:30	2
11:35	1
11:40	0
11:45	1
11:50	0
11:55	0
12:00	0
12:05	0
12:10	2
12:15	1
12:20	1
12:25	1
12:30	0
12:35	1
12:40	1
12:45	0
12:50	1
12:55	0
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	00:05.0	0	1	3
00:05.0	00:10.0	2	2	1
00:10.0	00:15.0	1	2	3
00:15.0	00:20.0	2	2	0
00:20.0	00:25.0	3	1	3
00:25.0	00:30.0	1	2	0
00:30.0	00:35.0	1	3	1
00:35.0	00:40.0	6	2	1
00:40.0	00:45.0	0	2	3
00:45.0	00:50.0	1	0	2
00:50.0	00:55.0	0	0	1
00:55.0	01:00.0	0	1	0
01:00.0	01:05.0	0	0	1
01:05.0	01:10.0	0	1	0
01:10.0	01:15.0	1	0	0
01:15.0	01:20.0	0	0	1
01:20.0	01:25.0	0	0	0
01:25.0	01:30.0	1	1	2
01:30.0	01:35.0	2	1	0
01:35.0	01:40.0	0	1	0
01:40.0	01:45.0	0	0	0
01:45.0	01:50.0	0	0	0
01:50.0	01:55.0	0	0	0
01:55.0	02:00.0	0	0	0
02:00.0	02:05.0	0	0	0
02:05.0	02:10.0	0	0	0
02:10.0	02:15.0	0	0	0
02:15.0	02:20.0	0	0	0
02:20.0	02:25.0	0	0	0
02:25.0	02:30.0	1	0	0
02:30.0	02:35.0	0	0	0
02:35.0	02:40.0	0	0	0
02:40.0	02:45.0	0	0	0
02:45.0	02:50.0	0	0	0
02:50.0	02:55.0	0	0	0
02:55.0	03:00.0	0	0	0
03:00.0	03:05.0	0	0	0
03:05.0	03:10.0	0	0	0
03:10.0	03:15.0	0	0	0
03:15.0	59:59.5	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 83
Site Name: Starbucks
Address: 1600 W Kennedy Blvd, Tampa, FL 33606
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2100 s.f.
AADT on Adjacent Street: 32500
Distance Order to Pickup: 120 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	36	30	66
11:15	27	29	56
11:30	29	29	58
11:45	35	33	68
12:00	28	28	56
12:15	30	29	59
12:30	30	38	68
12:45	32	32	64

Peak Hour Volume:	**251**
Peak Hour D (inbound):	**0.506**
% to Drive-Through:	**61.9%**
90th %-ile Queue:	**6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	5
11:05	4
11:10	5
11:15	3
11:20	4
11:25	6
11:30	5
11:35	5
11:40	5
11:45	4
11:50	5
11:55	5
12:00	0
12:05	2
12:10	4
12:15	4
12:20	5
12:25	3
12:30	6
12:35	4
12:40	5
12:45	6
12:50	6
12:55	3
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	0
10	15	0	0	0
15	20	3	0	0
20	25	5	0	0
25	30	7	0	1
30	35	5	0	4
35	40	1	0	3
40	45	1	0	5
45	50	0	0	2
50	55	0	0	0
55	60	0	0	0
60	65	0	0	2
65	70	1	0	1
70	75	1	0	0
75	80	0	0	1
80	85	0	0	0
85	90	0	0	1
90	95	0	0	1
95	100	0	0	0
100	105	0	0	1
105	110	0	0	2
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 84
Site Name: Starbucks
Address: 8801 4th St N, St. Petersburg, FL 33702
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 3000 s.f.
AADT on Adjacent Street: 30500
Distance Order to Pickup: 125 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	33	23	56
11:15	24	26	50
11:30	23	29	52
11:45	35	27	62
12:00	29	25	54
12:15	35	33	68
12:30	30	24	54
12:45	28	31	59

Peak Hour Volume: 238
Peak Hour D (inbound): 0.542
% to Drive-Through: 49.4%
90th %-ile Queue: 7

Queue Observations (Total Queue):

Time	Vehicles
11:00	5
11:05	3
11:10	4
11:15	2
11:20	2
11:25	3
11:30	2
11:35	1
11:40	2
11:45	3
11:50	4
11:55	5
12:00	7
12:05	6
12:10	5
12:15	5
12:20	6
12:25	7
12:30	8
12:35	8
12:40	7
12:45	3
12:50	4
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	0	0	0
10	15	3	0	1
15	20	1	0	1
20	25	2	0	3
25	30	5	0	2
30	35	4	0	2
35	40	2	0	3
40	45	0	0	1
45	50	3	0	1
50	55	0	0	2
55	60	1	0	1
60	65	0	0	0
65	70	0	0	0
70	75	1	0	0
75	80	0	0	3
80	85	1	0	1
85	90	0	0	0
90	95	0	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	1
130	135	0	0	1
135	140	0	0	0
140	145	1	0	0
145	150	0	0	1
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 85
Site Name: Starbucks
Address: 102 Manatee Ave E, Bradenton, FL 34208
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2100 s.f.
AADT on Adjacent Street: 20500
Distance Order to Pickup: 90 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
7:00	13	18	31
7:15	27	23	50
7:30	29	26	55
7:45	29	29	58
8:00	21	24	45
8:15	25	19	44
8:30	22	24	46
8:45	24	24	48

Peak Hour Volume: 208
Peak Hour D (inbound): 0.510
% to Drive-Through: 68.9%
90th %-ile Queue: 5.6

Queue Observations (Total Queue):

Time	Vehicles
7:00	2
7:05	0
7:10	2
7:15	0
7:20	2
7:25	3
7:30	2
7:35	4
7:40	3
7:45	3
7:50	3
7:55	4
8:00	0
8:05	4
8:10	4
8:15	2
8:20	6
8:25	6
8:30	5
8:35	6
8:40	4
8:45	3
8:50	3
8:55	1
9:00	4

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	2	0	9
10	15	6	0	12
15	20	22	0	16
20	25	9	0	10
25	30	12	0	11
30	35	16	0	12
35	40	11	0	7
40	45	11	0	6
45	50	6	0	7
50	55	9	0	3
55	60	5	0	7
60	65	3	0	6
65	70	6	0	3
70	75	2	0	2
75	80	2	0	3
80	85	1	0	2
85	90	1	0	2
90	95	2	0	3
95	100	0	0	2
100	105	0	0	0
105	110	1	0	0
110	115	1	0	2
115	120	0	0	1
120	125	0	0	2
125	130	0	0	0
130	135	0	0	0
135	140	1	0	0
140	145	1	0	1
145	150	0	0	1
150	155	1	0	0
155	160	0	0	0
160	165	0	0	1
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	1	0	1

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 87
Site Name: Starbucks
Address: 475 S Dixie Hwy, Coral Gables, FL 33146
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2000 s.f.
AADT on Adjacent Street: 79000
Distance Order to Pickup: 105 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	28	24	52
11:15	38	38	76
11:30	46	46	92
11:45	36	22	58
12:00	28	44	72
12:15	34	26	60
12:30	34	38	72
12:45	44	36	80

Peak Hour Volume: 298
Peak Hour D (inbound): 0.497
% to Drive-Through: 35.4%
90th %-ile Queue: 6

Queue Observations (Total Queue):

Time	Vehicles
11:00	4
11:05	3
11:10	2
11:15	5
11:20	6
11:25	3
11:30	5
11:35	4
11:40	1
11:45	4
11:50	6
11:55	5
12:00	4
12:05	0
12:10	2
12:15	3
12:20	4
12:25	5
12:30	6
12:35	5
12:40	3
12:45	0
12:50	0
12:55	3
13:00	7

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	1	0	1
5	10	0	0	4
10	15	5	0	8
15	20	7	0	16
20	25	13	0	12
25	30	15	0	5
30	35	9	0	5
35	40	6	0	4
40	45	11	0	4
45	50	2	0	3
50	55	6	0	3
55	60	2	0	7
60	65	1	0	1
65	70	3	0	3
70	75	3	0	5
75	80	4	0	2
80	85	2	0	2
85	90	2	0	4
90	95	2	0	2
95	100	2	0	0
100	105	1	0	2
105	110	1	0	0
110	115	2	0	1
115	120	0	0	0
120	125	0	0	1
125	130	1	0	0
130	135	1	0	1
135	140	0	0	0
140	145	1	0	0
145	150	0	0	2
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	1	0	0
175	180	0	0	1
180	185	0	0	2
185	190	0	0	0
190	195	0	0	0
195	999	0	0	2

Trip Generation and Queueing Analysis

Site Data Summary

Site Number: 93 **Note: Only drive-through counted at this site**
Site Name: Dunkin Donuts
Address: 4427 W Kennedy Blvd, Tampa, FL 33609
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: **inside other building s.f.**
AADT on Adjacent Street: 38000
Distance Order to Pickup: 105 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	0	13	13
11:15	0	19	19
11:30	0	19	19
11:45	0	15	15
12:00	0	17	17
12:15	0	16	16
12:30	0	16	16
12:45	0	10	10

Peak Hour Volume:	**70**
Peak Hour D (inbound):	**0.000**
% to Drive-Through:	**#DIV/0!**
90th %-ile Queue:	**4.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	2
11:10	1
11:15	2
11:20	4
11:25	5
11:30	7
11:35	5
11:40	2
11:45	3
11:50	2
11:55	2
12:00	2
12:05	3
12:10	3
12:15	4
12:20	1
12:25	2
12:30	2
12:35	4
12:40	4
12:45	1
12:50	2
12:55	2
13:00	0

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	0
10	15	3	0	0
15	20	5	0	0
20	25	1	0	1
25	30	2	0	0
30	35	3	0	2
35	40	1	0	0
40	45	1	0	0
45	50	1	0	2
50	55	1	0	0
55	60	0	0	1
60	65	0	0	2
65	70	0	0	1
70	75	0	0	1
75	80	0	0	1
80	85	0	0	1
85	90	0	0	1
90	95	1	0	0
95	100	0	0	0
100	105	0	0	1
105	110	1	0	0
110	115	0	0	1
115	120	0	0	0
120	125	0	0	0
125	130	0	0	1
130	135	1	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	1
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	1
175	180	0	0	0
180	185	0	0	1
185	190	0	0	0
190	195	0	0	0
195	999	0	0	3

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 94
Site Name: Dunkin Donuts
Address: 911 N Dale Mabry Hwy, Tampa, FL 33609
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2300 s.f.
AADT on Adjacent Street: 15600
Distance Order to Pickup: 90 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
7:00	49	48	97
7:15	24	24	48
7:30	24	24	48
7:45	30	30	60
8:00	18	18	36
8:15	24	24	48
8:30	43	42	85
8:45	6	6	12

Peak Hour Volume: 254
Peak Hour D (inbound): 0.503
% to Drive-Through: 83.6%
90th %-ile Queue: 2

Queue Observations (Total Queue):

Time	Vehicles
7:00	0
7:05	0
7:10	0
7:15	5
7:20	1
7:25	0
7:30	0
7:35	0
7:40	0
7:45	1
7:50	2
7:55	1
8:00	0
8:05	0
8:10	1
8:15	1
8:20	0
8:25	1
8:30	0
8:35	0
8:40	4
8:45	1
8:50	1
8:55	0
9:00	2

Drive-Through Service Time Distributions

Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	4	0	7
5	10	32	0	20
10	15	34	0	32
15	20	39	0	31
20	25	19	0	19
25	30	19	0	28
30	35	6	0	11
35	40	8	0	15
40	45	7	0	7
45	50	3	0	1
50	55	2	0	1
55	60	2	0	3
60	65	3	0	3
65	70	1	0	1
70	75	1	0	2
75	80	0	0	2
80	85	0	0	1
85	90	2	0	0
90	95	2	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	0	0	0
115	120	0	0	0
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	0	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Trip Generation and Queueing Analysis
Site Data Summary

Site Number: 95
Site Name: Dunkin Donuts
Address: 1622 W Kennedy Blvd, Tampa, FL 33606
Time Period: Weekday A.M.
Drive-Through Layout (Order>Pickup Lanes): 1>1

Size: 2300 s.f.
AADT on Adjacent Street: 32000
Distance Order to Pickup: 85 ft
Protocol: Order, Pay/Pickup

Traffic Generation:

15-Min Beginning	In	Out	Total
11:00	25	24	49
11:15	34	26	60
11:30	28	32	60
11:45	27	29	56
12:00	31	28	59
12:15	23	25	48
12:30	28	32	60
12:45	22	17	39

Peak Hour Volume:	**235**
Peak Hour D (inbound):	**0.511**
% to Drive-Through:	**63.8%**
90th %-ile Queue:	**7.6**

Queue Observations (Total Queue):

Time	Vehicles
11:00	1
11:05	3
11:10	5
11:15	8
11:20	6
11:25	5
11:30	6
11:35	7
11:40	5
11:45	6
11:50	7
11:55	4
12:00	5
12:05	6
12:10	6
12:15	8
12:20	4
12:25	2
12:30	4
12:35	4
12:40	5
12:45	6
12:50	8
12:55	6
13:00	0

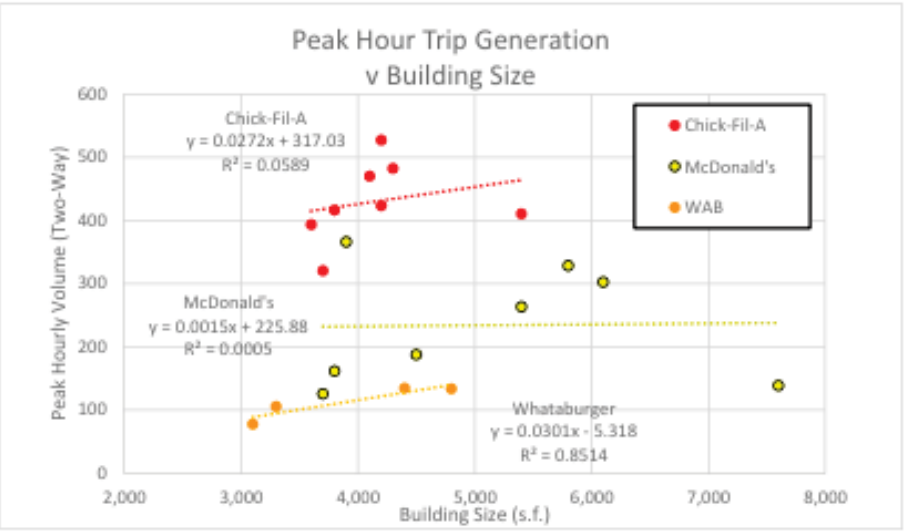
Drive-Through Service Time Distributions

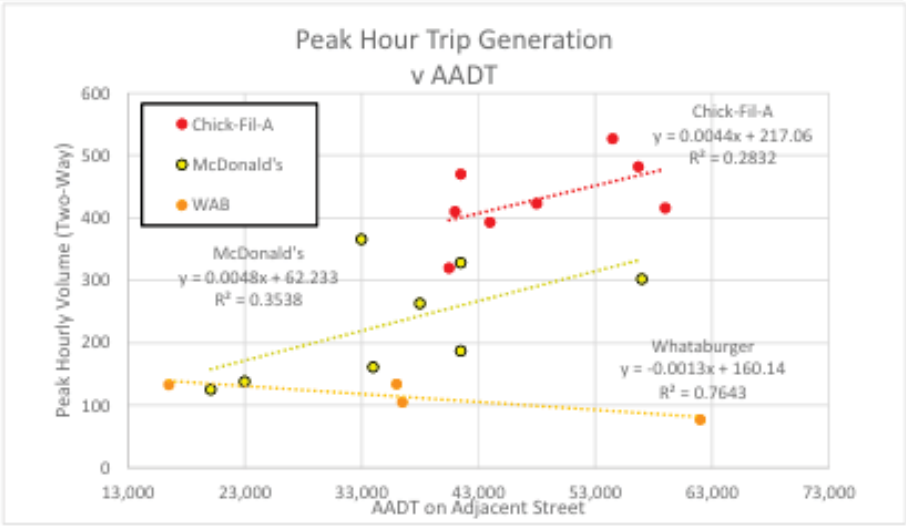
Time Interval (sec)		Order Time	Payment Time	Pickup Time
0	5	0	0	0
5	10	1	0	0
10	15	6	0	1
15	20	3	0	5
20	25	3	0	3
25	30	4	0	6
30	35	1	0	0
35	40	2	0	3
40	45	1	0	1
45	50	1	0	0
50	55	0	0	1
55	60	2	0	0
60	65	0	0	1
65	70	0	0	4
70	75	0	0	0
75	80	0	0	0
80	85	0	0	0
85	90	0	0	0
90	95	0	0	0
95	100	0	0	0
100	105	0	0	0
105	110	0	0	0
110	115	2	0	1
115	120	0	0	1
120	125	0	0	0
125	130	0	0	0
130	135	0	0	0
135	140	1	0	0
140	145	0	0	0
145	150	0	0	0
150	155	0	0	0
155	160	0	0	0
160	165	0	0	0
165	170	0	0	0
170	175	0	0	0
175	180	0	0	0
180	185	0	0	0
185	190	0	0	0
190	195	0	0	0
195	999	0	0	0

Appendix C
Trip-End Generation Analysis

Fast Food Trip Generation Data

Site	Brand	Maximum Pk Hr Trip-Ends	AADT	SF
2	Chick-Fil-A	393	44,000	3,600
3	Chick-Fil-A	482	56,700	4,300
5	Chick-Fil-A	410	41,000	5,400
6	Chick-Fil-A	416	59,000	3,800
34	Chick-Fil-A	470	41,500	4,100
35	Chick-Fil-A	320	40,500	3,700
36	Chick-Fil-A	423	48,000	4,200
37	Chick-Fil-A	527	54,500	4,200
38	McDonald's	366	33,000	3,900
18	McDonald's	187	41,500	4,500
15	McDonald's	138	23,000	7,600
49	McDonald's	328	41,500	5,800
50	McDonald's	161	34,000	3,800
79	McDonald's	263	38,000	5,400
80	McDonald's	302	57,000	6,100
82	McDonald's	125	20,100	3,700
8	Whataburger	105	36,500	3,300
10	Whataburger	77	62,000	3,100
40	Whataburger	133	16,500	4,800
41	Whataburger	134	36,000	4,400

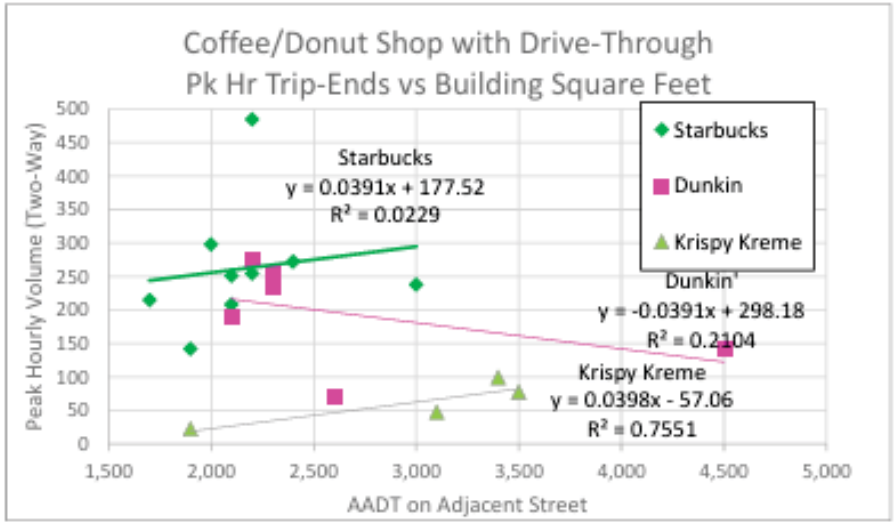


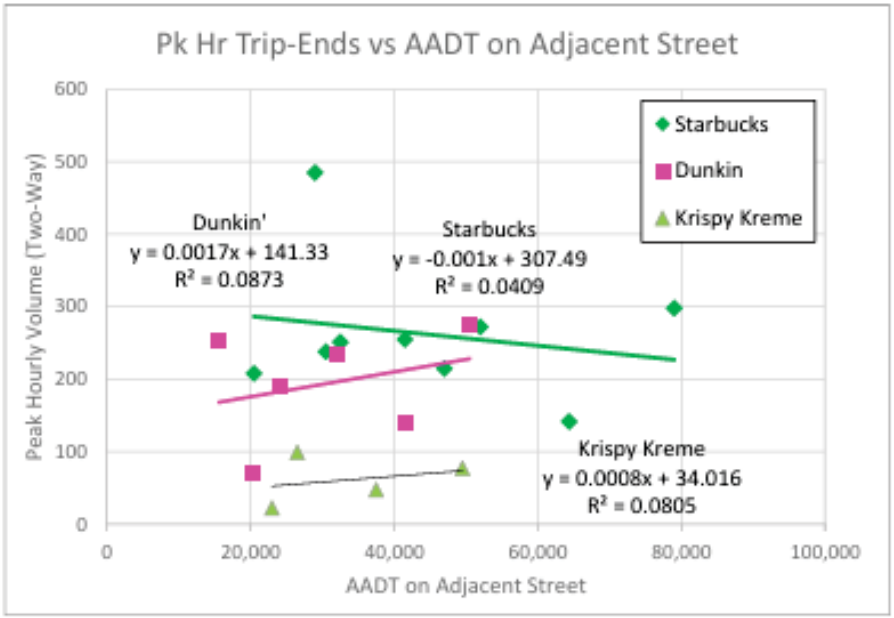


C:\WEO-PE\Projects\138.04 ARE-FDOT Trip Generation\3. Analysis\Site Database 20240415.xlsxFF Graphs

Coffee/Donut Shop with Drive-Through Trip Generation Data

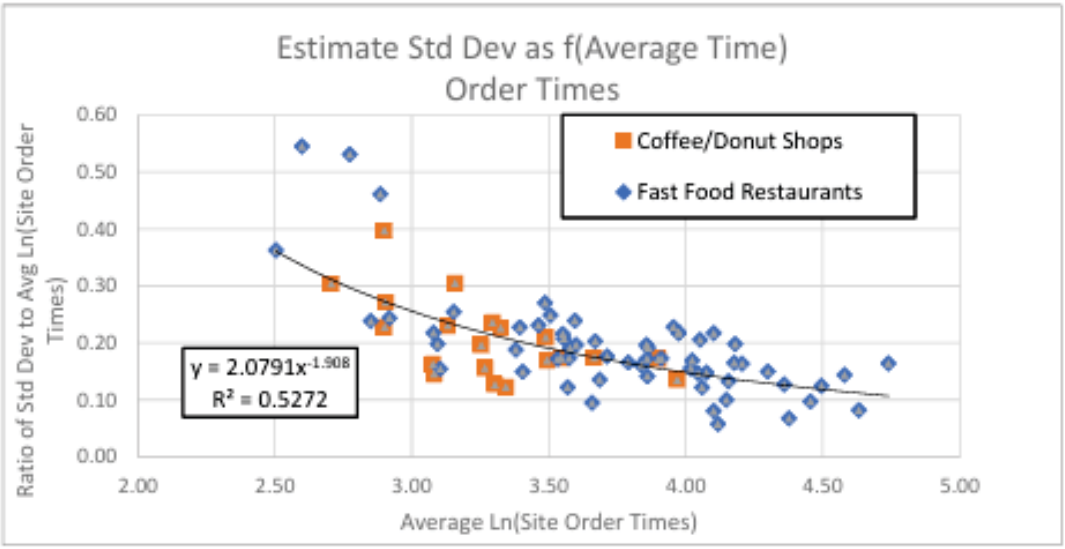
Site	Brand	Maximum Pk Hr Trip-Ends	AADT	Ln(AADT)	SF
21	Starbucks	215	47,000	10.76	1,700
19	Starbucks	142	64,390	11.07	1,900
24	Starbucks	485	29,000	10.28	2,200
51	Starbucks	255	41,500	10.63	2,200
52	Starbucks	272	52,000	10.86	2,400
83	Starbucks	251	32,500	10.39	2,100
84	Starbucks	238	30,500	10.33	3,000
85	Starbucks	208	20,500	9.93	2,100
87	Starbucks	298	79,000	11.28	2,000
30	Dunkin Do	276	50,500	10.83	2,200
31	Dunkin Do	189	24,000	10.09	2,100
62	Dunkin Do	140	41,500	10.63	4,500
63	Dunkin Do	70	20,100	9.91	2,600
94	Dunkin Do	254	15,600	9.66	2,300
95	Dunkin Do	235	32,000	10.37	2,300
28	Krispy Kre	77	49,500	10.81	3,500
57	Krispy Kre	99	26,500	10.18	3,400
59	Krispy Kre	22	23,000	10.04	1,900
26	Krispy Kre	47	37,500	10.53	3,100

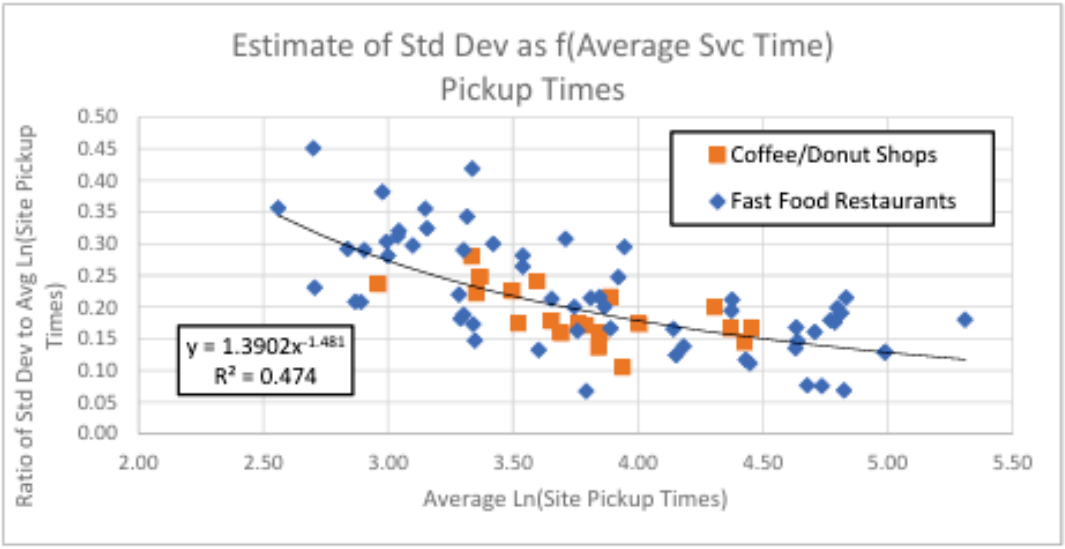




Appendix D
Service Times Analysis

Relationship of Natural Logarithms of Standard Deviation to Natural Logarithms of Average Times for Orders and Pickups (needed to compute service time distributions)





Log-Normal Service Times for Microsimulation (seconds)

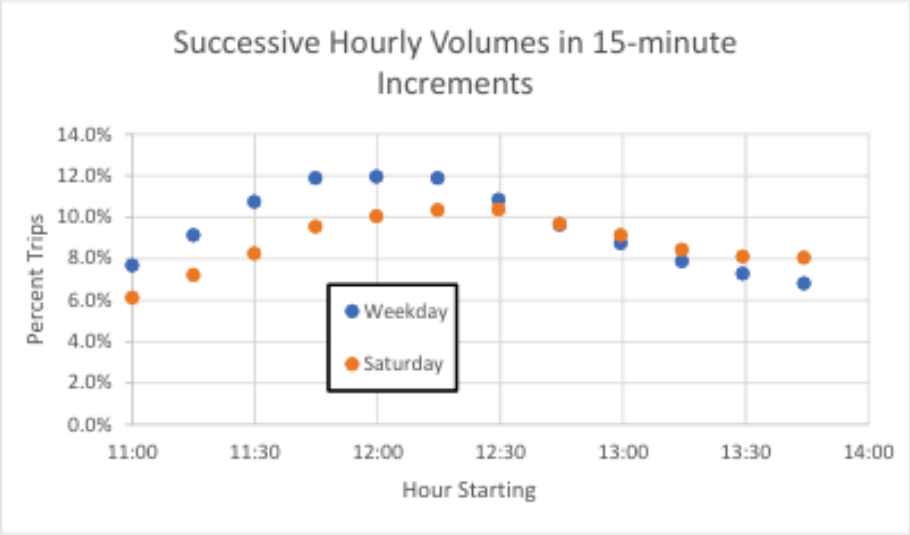
Avg Svc Time (sec):		17.1	18.0	18.9	20.0	21.2	22.5	24.0	25.7	27.7	30.0	32.7	36.0	40.0	45.0	51.4	60.0	72.0	90.0	120.0	180.0
Avg(Ln (Svc Time)):		2.474	2.530	2.589	2.650	2.716	2.784	2.856	2.933	3.016	3.104	3.199	3.304	3.418	3.546	3.689	3.854	4.049	4.285	4.588	5.017
Ratio StDev to Avg:		0.363	0.352	0.340	0.328	0.317	0.305	0.294	0.282	0.271	0.260	0.248	0.237	0.225	0.213	0.201	0.188	0.175	0.161	0.146	0.128
StDev(Ln(Svc Time)):		0.899	0.890	0.880	0.870	0.860	0.850	0.839	0.828	0.818	0.806	0.795	0.782	0.770	0.756	0.742	0.727	0.710	0.690	0.668	0.640
Max Svc Time (sec):		74	77	80	84	87	92	97	102	108	115	124	133	145	159	177	200	231	276	347	478
		Service Lane Capacity (vph)																			
Median %-ile	% to which applicable	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20
0.02	3.5%	1.9	2.0	2.2	2.4	2.6	2.8	3.1	3.4	3.8	4.3	4.8	5.5	6.3	7.3	8.7	10.6	13.3	17.6	24.9	40.5
0.05	4.0%	2.7	2.9	3.1	3.4	3.7	4.0	4.4	4.8	5.3	5.9	6.6	7.5	8.6	10.0	11.8	14.3	17.8	23.3	32.8	52.7
0.1	4.5%	3.7	4.0	4.3	4.6	5.0	5.4	5.9	6.5	7.2	7.9	8.9	10.0	11.4	13.1	15.5	18.6	23.1	30.0	41.7	66.5
0.14	5.5%	4.5	4.8	5.1	5.5	6.0	6.5	7.0	7.7	8.4	9.3	10.4	11.7	13.3	15.3	18.0	21.5	26.6	34.4	47.8	75.6
0.21	5.5%	5.7	6.1	6.6	7.0	7.6	8.2	8.8	9.6	10.6	11.6	12.9	14.5	16.4	18.8	22.0	26.3	32.3	41.6	57.3	90.1
0.25	6.0%	6.5	6.9	7.4	7.9	8.5	9.1	9.9	10.7	11.8	12.9	14.3	16.1	18.2	20.8	24.3	28.9	35.5	45.6	62.6	98.0
0.33	6.5%	8.0	8.5	9.0	9.7	10.4	11.1	12.0	13.0	14.2	15.6	17.3	19.3	21.7	24.8	28.9	34.3	41.9	53.6	73.3	113.9
0.38	5.5%	9.0	9.6	10.2	10.9	11.6	12.5	13.5	14.6	15.9	17.4	19.2	21.4	24.1	27.5	31.9	37.8	46.1	58.8	80.1	124.1
0.44	6.0%	10.4	11.0	11.7	12.4	13.3	14.2	15.3	16.6	18.0	19.7	21.7	24.2	27.2	30.9	35.8	42.3	51.5	65.4	88.9	137.0
0.5	6.0%	11.9	12.6	13.3	14.2	15.1	16.2	17.4	18.8	20.4	22.3	24.5	27.2	30.5	34.7	40.0	47.2	57.3	72.6	98.3	150.9
0.56	6.0%	13.6	14.4	15.2	16.1	17.2	18.4	19.7	21.3	23.1	25.2	27.6	30.6	34.3	38.9	44.8	52.7	63.8	80.6	108.7	166.2
0.62	5.5%	15.6	16.5	17.4	18.5	19.7	21.0	22.5	24.2	26.2	28.5	31.2	34.6	38.6	43.7	50.2	58.9	71.2	89.6	120.5	183.5
0.67	5.5%	17.6	18.6	19.6	20.8	22.1	23.5	25.2	27.0	29.2	31.8	34.8	38.4	42.8	48.3	55.5	65.0	78.3	98.4	131.9	200.0
0.73	5.5%	20.6	21.7	22.8	24.1	25.6	27.2	29.1	31.2	33.7	36.5	39.9	44.0	48.9	55.1	63.0	73.7	88.5	110.8	148.0	223.4
0.78	5.0%	23.8	25.0	26.3	27.7	29.4	31.2	33.2	35.6	38.4	41.5	45.3	49.8	55.3	62.1	71.0	82.7	99.1	123.7	164.6	247.4
0.83	5.0%	28.0	29.3	30.8	32.5	34.3	36.4	38.7	41.4	44.5	48.1	52.3	57.4	63.6	71.3	81.2	94.4	112.8	140.3	185.9	277.9
0.88	5.0%	34.1	35.7	37.4	39.3	41.5	43.9	46.6	49.7	53.3	57.5	62.3	68.2	75.4	84.3	95.7	110.8	131.9	163.4	215.5	320.1
0.93	4.5%	44.7	46.7	48.8	51.1	53.8	56.7	60.0	63.8	68.2	73.2	79.2	86.3	95.0	105.8	119.6	137.9	163.3	201.1	263.4	388.1
0.97	3.0%	64.4	66.9	69.7	72.7	76.2	80.0	84.3	89.2	94.9	101.5	109.2	118.5	129.8	143.7	161.5	185.1	217.7	266.0	345.3	478.0
0.99	2.0%	74.0	77.0	80.0	84.0	87.0	92.0	97.0	102.0	108.0	115.0	124.0	133.0	145.0	159.0	177.0	200.0	231.0	276.0	347.0	478.0
Longest Service Time (min):		1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.4	2.7	3.0	3.3	3.9	4.6	5.8	8.0

Excel Equation: =MIN(LOGNORM.INV(Median %-ile,Avg(Ln(Svc Time)),StDev(Ln(Svc Time)),Max Svc Time))

Appendix E

Peak Hour Traffic Arrival Pattern for Micro-Simulation

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use Source: ITE *Trip Generation Manual* , 11th Edition				
Land Use Code	934			
Land Use	Fast-Food Restaurant with Drive-Through Window			
Setting	General Urban/Suburban			
Time Period	Weekday			
# Data Sites	53			
% of 24-Hour Vehicle Trips				
Time	Total	Entering	Constructed	Check
10:45 - 11:45 AM	6.9%	7.7%	1.1%	7.7%
11:00 - 12:00 PM	8.4%	9.1%	1.7%	9.1%
11:15 - 12:15 PM	10.0%	10.8%	2.5%	10.8%
11:30 - 12:30 PM	11.3%	11.9%	2.4%	11.9%
11:45 - 12:45 PM	11.8%	12.0%	2.5%	12.0%
12:00 - 1:00 PM	11.9%	11.9%	3.4%	11.9%
12:15 - 1:15 PM	11.3%	10.9%	3.6%	10.9%
12:30 - 1:30 PM	10.2%	9.6%	2.5%	9.6%
12:45 - 1:45 PM	9.2%	8.8%	2.4%	8.8%
1:00 - 2:00 PM	8.3%	7.9%	2.4%	7.9%
1:15 - 2:15 PM	7.7%	7.3%	2.3%	7.3%
1:30 - 2:30 PM	7.1%	6.8%	1.7%	6.8%
1:45 - 2:45 PM	6.7%	6.3%	1.5%	6.3%
2:00 - 3:00 PM	6.2%	5.9%	1.8%	5.9%
2:15 - 3:15 PM	5.8%	5.7%	1.8%	
2:30 - 3:30 PM	5.6%	5.4%	1.2%	
2:45 - 3:45 PM	5.5%	5.4%	1.1%	

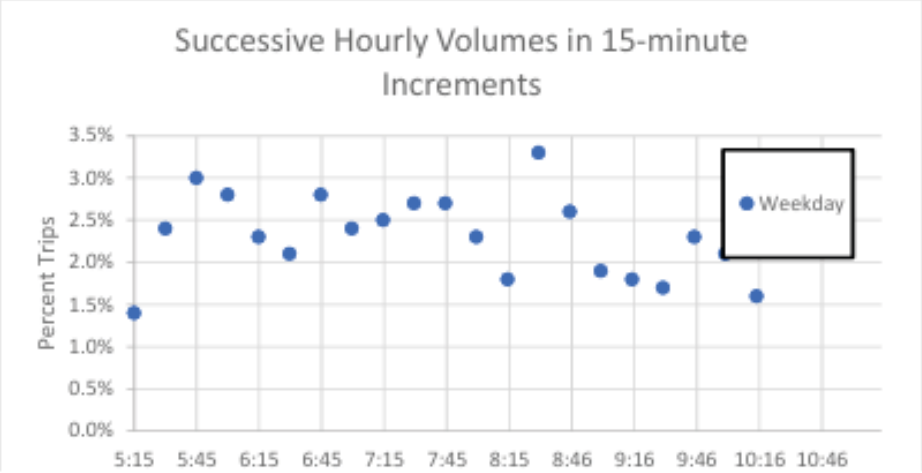


https://weope-my.sharepoint.com/personal/bill_weo-pe_com/Documents/Tools/TripGen/Vehicle Time of Day Distribution for ITETripGen Appendices.xlsx

15-Minute Volumes for Fast-Food Restaurants

Period Beginning	Pk Hr Vol Allocation	Peak Hour Volume																
		40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11:00	9.2%	4	5	6	6	7	8	9	10	11	12	13	14	15	16	17	17	18
11:15	14.2%	6	7	9	10	11	13	14	16	17	18	20	21	23	24	26	27	28
11:30	20.8%	8	10	13	15	17	19	21	23	25	27	29	31	33	35	38	40	42
11:45	20.0%	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
12:00	20.8%	8	10	13	15	17	19	21	23	25	27	29	31	33	35	38	40	42
12:15	28.3%	11	14	17	20	23	26	28	31	34	37	40	43	45	48	51	54	57
12:30	30.0%	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
12:45	20.8%	8	10	13	15	17	19	21	23	25	27	29	31	33	35	38	40	42
13:00	20.0%	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
13:15	20.0%	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
13:30	19.2%	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	36	38
13:45	14.2%	6	7	9	10	11	13	14	16	17	18	20	21	23	24	26	27	28
14:00	12.5%	5	6	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
14:15	15.0%	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30
14:30	15.0%	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30
14:45	10.0%	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
15:00	9.2%	4	5	6	6	7	8	9	10	11	12	13	14	15	16	17	17	18

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use			
Source: ITE *Trip Generation Manual* , 11th Edition			
Land Use Code	937		
Land Use	Coffee/Donut Shop with Drive-Through Window		
Setting	General Urban/Suburban		
Time Period	Weekday		
# Data Sites	1		
	% of 24-Hour Vehicle Trips		
Time	Hourly Entering	15-minute Estimate	Check-Hourly
5:15 - 6:15 AM	9.6%	1.4%	9.6%
5:30 - 6:30 AM	10.5%	2.4%	10.5%
5:45 - 6:45 AM	10.2%	3.0%	10.2%
6:00 - 7:00 AM	10.0%	2.8%	10.0%
6:15 - 7:15 AM	9.6%	2.3%	9.6%
6:30 - 7:30 AM	9.8%	2.1%	9.8%
6:45 - 7:45 AM	10.4%	2.8%	10.4%
7:00 - 8:00 AM	10.3%	2.4%	10.3%
7:15 - 8:15 AM	10.2%	2.5%	10.2%
7:30 - 8:30 AM	9.5%	2.7%	9.5%
7:45 - 8:45 AM	10.1%	2.7%	10.1%
8:00 - 9:00 AM	10.0%	2.3%	10.0%
8:15 - 9:15 AM	9.6%	1.8%	9.6%
8:30 - 9:30 AM	9.6%	3.3%	9.6%
8:45 - 9:45 AM	8.0%	2.6%	8.0%
9:00 - 10:00 AM	7.7%	1.9%	7.7%
9:15 - 10:15 AM	7.9%	1.8%	7.9%
9:30 - 10:30 AM	7.7%	1.7%	7.7%
9:45 - 10:45 AM	7.6%	2.3%	
10:00 - 11:00 AM	7.2%	2.1%	
10:15 - 11:15 AM	6.5%	1.6%	



C:\WEO-PE\Projects\138.04 ARE-FDOT Trip Generation\3. Analysis\Volumes.xlsx937-Coffee-Donut Shop w Dr Thr

15-Minute Volumes for Coffee/Donut Shops

Period Beginning	Pk Hr Vol Allocation	Peak Hour Volume							
		20	40	60	80	100	120	140	160
6:00	9.2%	2	4	6	7	9	11	13	15
6:15	14.2%	3	6	9	11	14	17	20	23
6:30	20.8%	4	8	13	17	21	25	29	33
6:45	20.0%	4	8	12	16	20	24	28	32
7:00	20.8%	4	8	13	17	21	25	29	33
7:15	28.3%	6	11	17	23	28	34	40	45
7:30	30.0%	6	12	18	24	30	36	42	48
7:45	20.8%	4	8	13	17	21	25	29	33
8:00	20.0%	4	8	12	16	20	24	28	32
8:15	20.0%	4	8	12	16	20	24	28	32
8:30	19.2%	4	8	12	15	19	23	27	31
8:45	14.2%	3	6	9	11	14	17	20	23
9:00	12.5%	3	5	8	10	13	15	18	20
9:15	15.0%	3	6	9	12	15	18	21	24
9:30	15.0%	3	6	9	12	15	18	21	24
9:45	10.0%	2	4	6	8	10	12	14	16
10:00	9.2%	2	4	6	7	9	11	13	15