

April 5, 2019

Mr. Chuck Edwards, PE
NCDOT District Engineer
115 East Crescent Square Drive
Graham, North Carolina 27253
Phone: 336.570.6833
E-mail: cnedwards@ncdot.gov

Subject: Drive-Through Vehicle Stacking Assessment
Dunkin' Donuts – 1509 E. Franklin Street, Chapel Hill, North Carolina

Dear Mr. Edwards:

This letter presents the findings of a vehicle stacking assessment performed by Ramey Kemp & Associates, Inc. (RKA) for the existing Dunkin' Donuts site located at 1509 E. Franklin Street in Chapel Hill. A site location map is attached for reference. This store does not currently have a drive-through. It is proposed that a drive-through be constructed and that internal site circulation be modified to accommodate the drive-through. Refer to the attached site plan showing the proposed drive-through lane and internal site circulation plan.

This assessment was prepared to request a reduction in the vehicle stacking (storage) capacity requirements as set forth by NCDOT in the Policy on Street and Driveway Access to North Carolina Highways. Per NCDOT policy, fast-food restaurants with drive-through window service must provide storage within the site to accommodate a minimum of eight vehicles per service lane from the menu board. The policy assumes that each vehicle is 25 feet in length; therefore, 200 feet of stacking is required per NCDOT policy.

It should be noted that numerous municipalities within the state, including Raleigh, Durham, Charlotte, and Greensboro, each use 20 feet as the minimum length of stacking spaces, while the Town of Cary typically assumes a length of 18 feet, which is the length of a standard parking space. Pertinent information on stacking space lengths from these municipalities is attached.

Due to the size and layout of the existing Dunkin' Donuts site, the proposed drive-through lane is limited in length and cannot accommodate 200 feet of stacking from the menu board as required based on a vehicle length of 25 feet. As shown on the attached site plan, the proposed drive-through lane could accommodate six vehicles at 20 feet each, for a total of 120 feet of stacking capacity within the site. In addition, while not technically on-site, there is capacity for a seventh vehicle to stack within the right-of-way and out of the travel lanes on E. Franklin Street. Refer to the attached site plan.

It should also be noted that the proposed drive-thru layout can accommodate an additional four vehicles (approximately 100 feet of stacking) between the menu board and the pick-up window. In total, the drive-thru can

stack ten 20-foot vehicles from the pick-up window. Although the menu board could be moved forward 80 feet to meet the 200-foot stacking requirement, this would impede on the efficiency of processing orders.

Based on discussions with NCDOT, a reduction in stacked vehicle length could be supported for this site if sufficient data can be found or collected to justify it. It was determined that the site's stacking issues could be addressed by collecting and analyzing data at similar Dunkin' Donuts locations in the area to determine actual stacking conditions during peak store times.

Data Collection

RKA collected drive-through data at the following three existing Dunkin' Donuts locations:

Site #1: 13600 Falls of Neuse Road, Raleigh

Site #2: 2608 Erwin Road, Durham

Site #3: 8201 Creedmoor Road, Raleigh

Each of the selected Dunkin' Donuts locations has one drive-through lane. Counts were conducted at the above locations on a typical weekday AM (6:00 – 9:00 AM) and Saturday AM (8:00 – 11:00 AM), since those are the peak times for the stores. The maximum number of queued vehicles (counted from the menu board) in the drive-through was recorded for each five-minute interval during the count period. The collected data is summarized in the attached tables.

Based on the data, there was a maximum of seven vehicles queued at any one time beyond the menu board at any of the locations counted. It should be noted, however, that the maximum queue length of seven vehicles occurred only once during the count periods and at only one of the sites (Site #2). Therefore, a queue length of less than seven vehicles was observed for over 99.5% of the peak periods counted. The 95th percentile queue lengths at each of the sites were five vehicles or fewer, and average queue lengths were less than 2.5 vehicles.

Internal Site Circulation

Changes to the internal site circulation will be needed to accommodate the construction of a drive-through on the existing Dunkin' Donuts site. As shown on the attached site plan, the existing site driveway will be converted from two-way (enter/exit) to one-way (entrance only) with two ingress lanes. This will allow the drive-through lane to extend along what is now the driveway egress lane and for the second ingress lane to provide access to parking and allow for one-way counter-clockwise site circulation.

There is a Sherwin Williams store located next to the Dunkin' Donuts site that receives deliveries via box truck during business hours. The loading dock for the Sherwin Williams store is located on the north side of the store and can be seen on the attached site plan as an approximately 40-foot x 15-foot hatched area. Since the business hours of the Sherwin Williams store coincide with those of the Dunkin' Donuts store, deliveries will need to be made while the Dunkin' Donuts store is open. Since both stores are under the same ownership, deliveries to Sherwin Williams can be coordinated to occur at non-peak times for the Dunkin' Donuts store to reduce interaction with circulating vehicles.

Conclusions

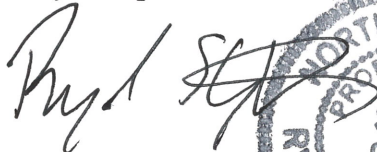
Based on the findings of this assessment, the drive-through stacking lengths shown on the attached Dunkin' Donuts site plan are expected to be adequate to accommodate the stacking needs of the site. Based on the data collected for this assessment, it is unlikely that queue lengths will exceed six vehicles during peak periods; at non-peak times, queue lengths would be much shorter. Numerous municipalities in North Carolina already assume a stacked vehicle length of 20 feet or less. Using a stacked vehicle length of 20 feet, the existing Dunkin' Donuts site would be able to accommodate six stacked vehicles on-site and, therefore, the standard queues observed at similar Dunkin' Donuts locations.

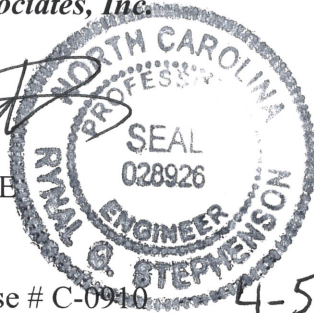
Additionally, since the adjacent Sherwin Williams store is under the same ownership as the Dunkin' Donuts store, deliveries to Sherwin Williams can be scheduled to occur at non-peak times for Dunkin' Donuts, minimizing any potential impacts to site circulation.

If you should have any questions or comments relative to this assessment, please feel free to contact me at 919-872-5115.

Sincerely,

Ramey Kemp & Associates, Inc.

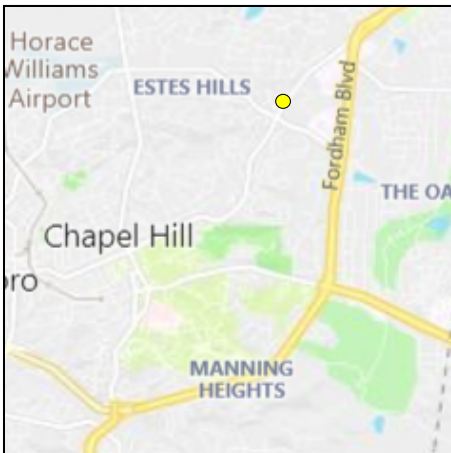
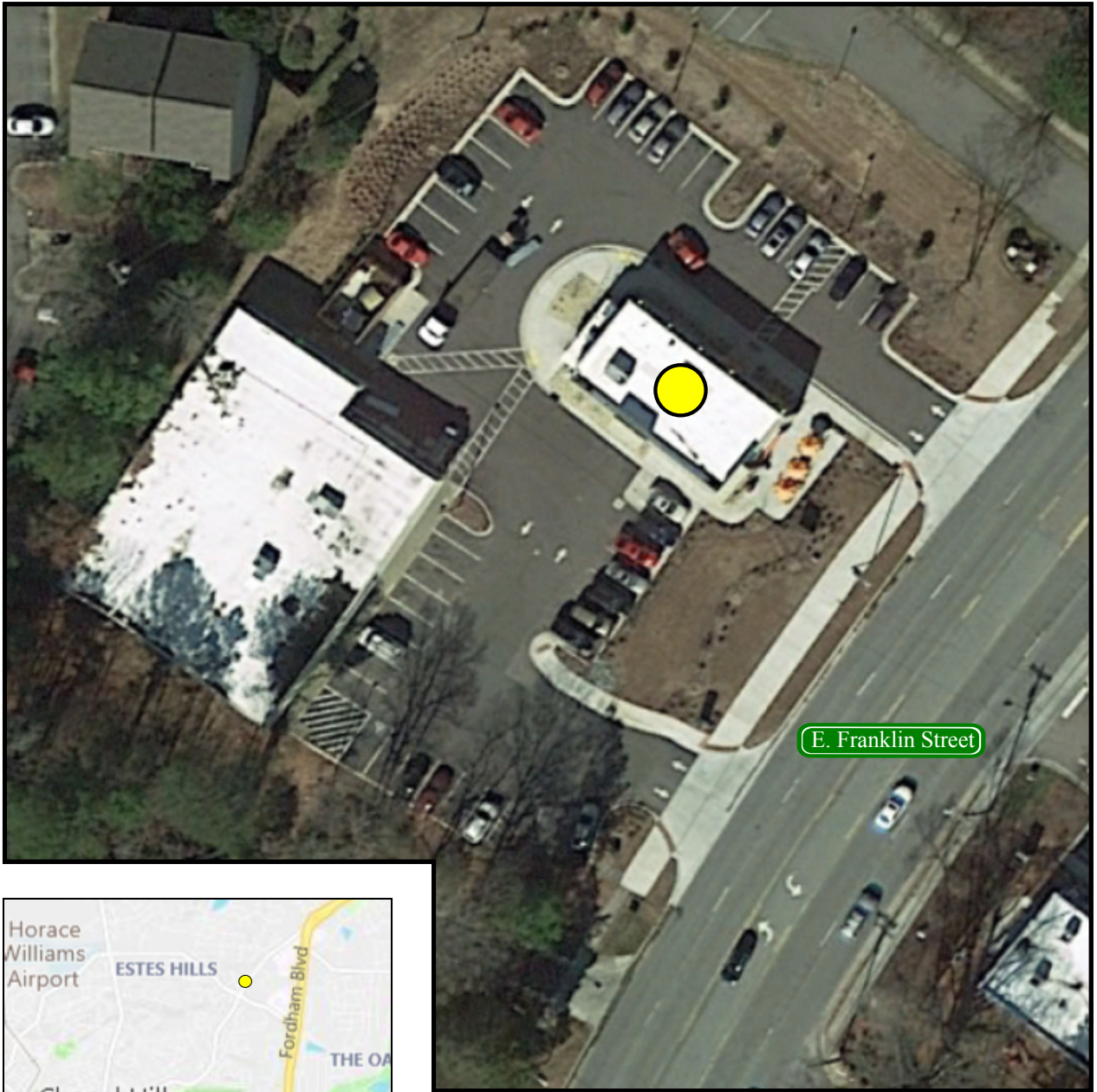

Rynal Stephenson, PE
Regional Manager



NC Corporate License # C-0910

Attachments: Site Location Map
Site Plan
Stacking Data from other Municipalities
Site Data Tables

cc: Kumar Nepalli, Town of Chapel Hill



LEGEND

● Site Location

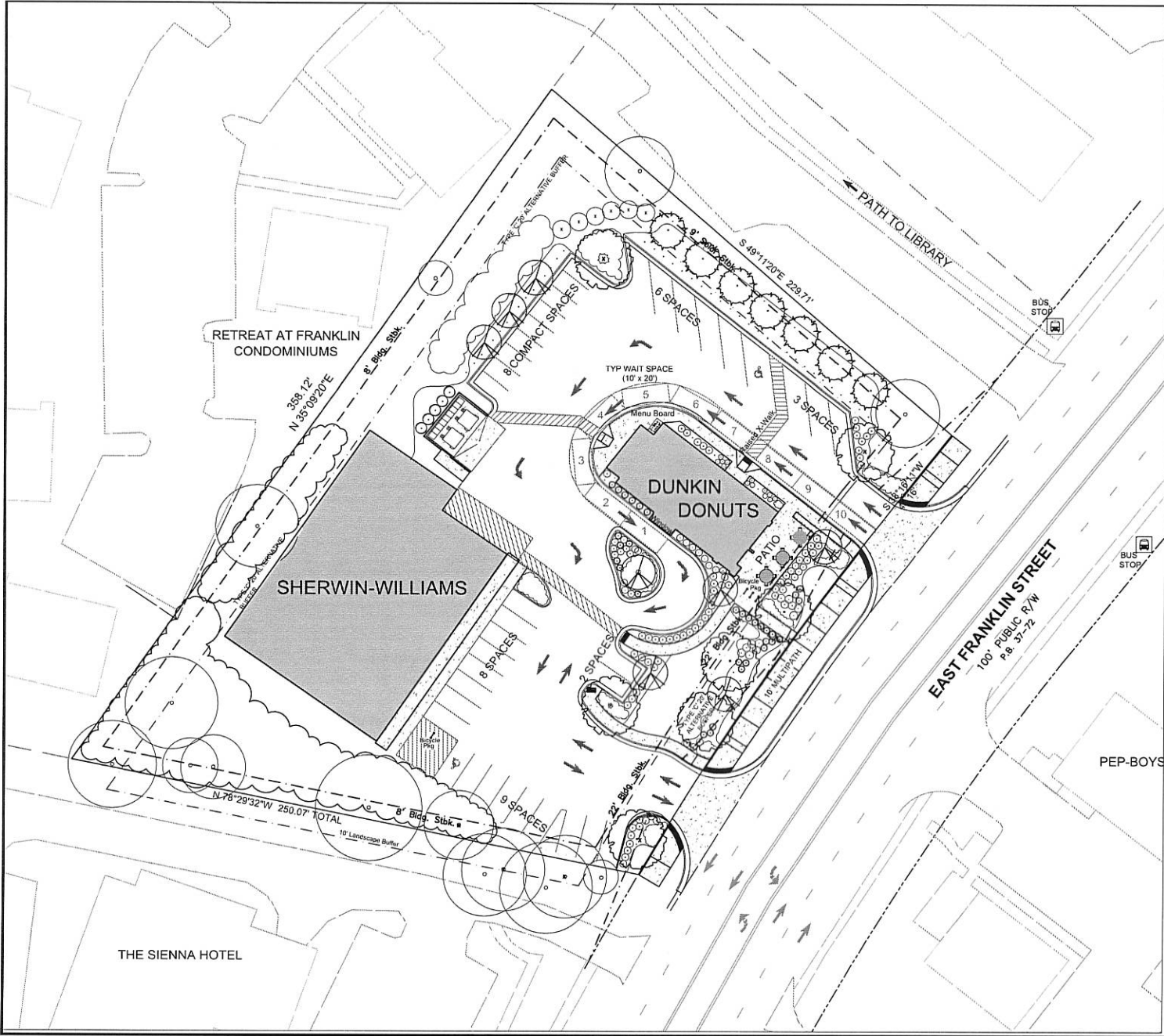


Dunkin' Donuts
Chapel Hill, NC

Site Location Map

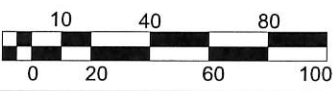
Scale: Not to Scale

Figure 1



Project Data
 Dunkin Donuts Drive Thru
 1509 E. Franklin Street, Chapel Hill, NC 27514
 Applicant: The Design Response
 PO Box 3585
 Cary, NC 27519
 919-469-2080
 jsmyre@thedesignresponse.com

Site Data
 Pin Number: 9789-93-9745
 Street Address: 1507 & 1509 E. Franklin Street
 Owner / Developer: Taylor Family Properties, LLC
 1645 Westbrook Plaza Drive
 Winston Salem, NC 27103
 Net Acreage: 1.53 AC, 67,160 SF
 Gross Land Area: 1.69 AC, 73,825 SF
 Zoning: CC - Community Commercial
 SUP: PD-SC Planned Development-Shopping Center



Taylor Family Property - Restaurant
 Chapel Hill, North Carolina
Proposed Drive Thru Site Plan

DATE	REVISION
10-7-2017	
11-20F	
JLS	
075-001	

SHEET NO. **C - 4**
 OF 4 SHEETS

Use	Minimum Number of Stacking Spaces Required
Bank/financial institution	4 spaces per teller window or automatic teller machine
Car wash Self-service Full-service	3 spaces per approach lane, plus 2 drying spaces per bay 10 spaces per approach lane or 30 total, whichever is greater, plus 3 spaces per bay for manual drying
Truck wash	3 spaces per bay
Gasoline pump	2 spaces per pump per side
Restaurant Single drive-through lane Multiple drive-through lanes	11 total spaces, with at least 5 spaces at or before order station 8 total spaces per lane with at least 5 spaces at or before order station
Other	3 spaces per bay, window, lane, ordering station or machine

c. **Pass-by Lane**

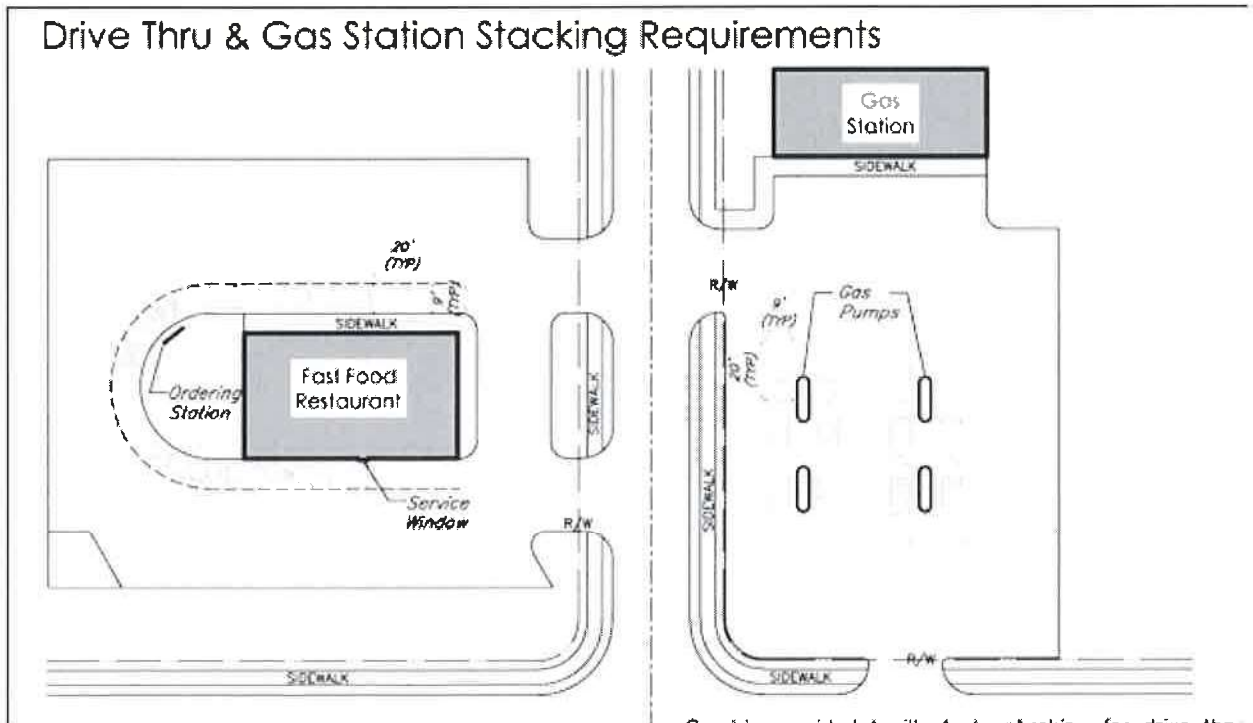
Pass-by lanes must be installed in accordance with the *Driveway Manual*.

d. **Stacking Lane Dimensions, Design and Layout**

Stacking lanes must be designed so that they do not interfere with park vehicle circulation. Stacking spaces must be 9 feet wide by 20 feet long.

e. **Stacking Lanes Identified**

All stacking lanes must be clearly identified, through such means as landscaping, pavement design, curbing and/or signs.



10.5.2 Design and Layout of Stacking Spaces

Required stacking spaces shall be subject to the following design and layout standards:

A. Size

Stacking spaces shall be a minimum of eight feet in width by 20 feet in length.

B. Location

Stacking spaces shall not impede on- or off-site traffic movements or movements into or out of off-street parking spaces.

C. Design

Stacking spaces shall be separated from other internal driveways by raised medians if deemed necessary by the City Transportation Director or NCDOT, or appropriate designers, for traffic movement and safety.

The Durham Unified Development Ordinance is current through legislation effective:

Durham County: February 1, 2019

City of Durham: February 1, 2019

Disclaimer: The [Durham City-County Planning Department](#) office has the official version of the Durham Unified Development Ordinance. Users should contact the Planning Department for amendments subsequent to the amendment cited here.

[City Website: durhamnc.gov](http://durhamnc.gov)

[Code Publishing Company](#)

Molly Mathewson

From: Jones, Ron <jrjones@ci.charlotte.nc.us>
Sent: Tuesday, November 19, 2013 10:59 AM
To: Molly Mathewson
Subject: RE: Drive-Through Stacking

Hi Molly,

It's 20'.

Regards,
Ron
704-336-5059

From: Molly Mathewson [<mailto:mmathewson@rameykemp.com>]
Sent: Tuesday, November 19, 2013 10:56 AM
To: Jones, Ron
Subject: Drive-Through Stacking

Ron

Could you please tell me what minimum vehicle length must be used in Charlotte when laying out the stacking for a drive-thru lane? Is it 20' or 25'?

Thanks!

Molly C. Mathewson, PE
Transportation Engineer



5808 Faringdon Place, Suite 100
Raleigh, NC 27609
Ph: 919-872-5115 Fax: 919-878-5416

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(5) **Bicycle Related Signage**

Signs restricting bicycle travel in vehicular areas at retail sites will be prohibited.

(E) **Stacking Spaces for Drive-Through Uses**

- (1) In addition to meeting the off-street parking requirements of this section, drive-through facilities specified in Table 7.8-3 shall comply with the following minimum stacking space standards:

TABLE 7.8-3: SCHEDULE OF STACKING SPACES		
Type of Use	Minimum Stacking Spaces	Measured From
Bank, teller lane	4	Teller window
Bank, ATM	3	Teller machine
Restaurant, with drive through	8	Order box*
Car Wash, automatic	6	Bay entrance
Car Wash, self-service	3	Bay entrance
Car Wash, full service	4	Bay entrance
Auto Service Station, gas pump island	30 feet from each end of island	
Unlisted	**	

*A minimum 4-vehicle queue shall be provided from the order box to the pick-up window.

**Requirements for uses not specifically listed may be determined by the Planning Director based upon the requirements for comparable uses and upon the particular characteristics of the use. Alternately, the applicant may submit a parking demand study per 7.8.2 (C)(9).

(F) **Handicapped Parking Requirements**

(1) **Residential Uses**

Handicapped-accessible parking for residential uses shall be provided at the rate of one space per each dwelling unit that is designed for occupancy by the handicapped.

* per Dan Matthys @ TOC, no specific vehicle length. most folks assume 18', which is length req. for parking space.

Site #1 - 13600 Falls of Neuse Road, Raleigh

<u>Weekday</u>	<u>Veh. in Q</u>	<u>Saturday</u>	<u>Veh. in Q</u>
6:00 AM	2	8:00 AM	2
6:05 AM	1	8:05 AM	2
6:10 AM	1	8:10 AM	3
6:15 AM	2	8:15 AM	1
6:20 AM	3	8:20 AM	2
6:25 AM	1	8:25 AM	3
6:30 AM	1	8:30 AM	2
6:35 AM	2	8:35 AM	2
6:40 AM	2	8:40 AM	2
6:45 AM	1	8:45 AM	1
6:50 AM	2	8:50 AM	1
6:55 AM	3	8:55 AM	1
7:00 AM	2	9:00 AM	4
7:05 AM	3	9:05 AM	1
7:10 AM	5	9:10 AM	1
7:15 AM	4	9:15 AM	2
7:20 AM	2	9:20 AM	0
7:25 AM	2	9:25 AM	2
7:30 AM	1	9:30 AM	2
7:35 AM	4	9:35 AM	1
7:40 AM	4	9:40 AM	2
7:45 AM	3	9:45 AM	2
7:50 AM	1	9:50 AM	6
7:55 AM	1	9:55 AM	2
8:00 AM	1	10:00 AM	3
8:05 AM	3	10:05 AM	2
8:10 AM	4	10:10 AM	1
8:15 AM	4	10:15 AM	1
8:20 AM	3	10:20 AM	2
8:25 AM	3	10:25 AM	3
8:30 AM	5	10:30 AM	0
8:35 AM	3	10:35 AM	2
8:40 AM	2	10:40 AM	2
8:45 AM	1	10:45 AM	2
8:50 AM	3	10:50 AM	2
8:55 AM	4	10:55 AM	1
avg.	2.47	avg.	1.89
max.	5	max.	6
95th %	4.25	95th %	3.25

Site #2 - 2608 Erwin Road, Durham

<u>Weekday</u>	<u>Veh. in Q</u>	<u>Saturday</u>	<u>Veh. in Q</u>
6:00 AM	0	8:00 AM	1
6:05 AM	1	8:05 AM	0
6:10 AM	3	8:10 AM	1
6:15 AM	3	8:15 AM	1
6:20 AM	1	8:20 AM	2
6:25 AM	1	8:25 AM	1
6:30 AM	2	8:30 AM	1
6:35 AM	1	8:35 AM	3
6:40 AM	2	8:40 AM	1
6:45 AM	2	8:45 AM	1
6:50 AM	3	8:50 AM	1
6:55 AM	1	8:55 AM	2
7:00 AM	3	9:00 AM	0
7:05 AM	1	9:05 AM	2
7:10 AM	2	9:10 AM	1
7:15 AM	1	9:15 AM	0
7:20 AM	2	9:20 AM	0
7:25 AM	1	9:25 AM	1
7:30 AM	7	9:30 AM	2
7:35 AM	5	9:35 AM	1
7:40 AM	4	9:40 AM	2
7:45 AM	3	9:45 AM	2
7:50 AM	2	9:50 AM	1
7:55 AM	1	9:55 AM	1
8:00 AM	2	10:00 AM	1
8:05 AM	2	10:05 AM	1
8:10 AM	4	10:10 AM	3
8:15 AM	3	10:15 AM	0
8:20 AM	5	10:20 AM	1
8:25 AM	4	10:25 AM	1
8:30 AM	4	10:30 AM	2
8:35 AM	1	10:35 AM	2
8:40 AM	3	10:40 AM	2
8:45 AM	2	10:45 AM	1
8:50 AM	1	10:50 AM	1
8:55 AM	1	10:55 AM	2
avg.	2.33	avg.	1.25
max.	7	max.	3
95th %	5	95th %	2.25

Site #3 - 8201 Creedmoor Road, Raleigh

<u>Weekday</u>	<u>Veh. in Q</u>	<u>Saturday</u>	<u>Veh. in Q</u>
6:00 AM	0	8:00 AM	1
6:05 AM	0	8:05 AM	2
6:10 AM	0	8:10 AM	1
6:15 AM	1	8:15 AM	1
6:20 AM	0	8:20 AM	0
6:25 AM	0	8:25 AM	2
6:30 AM	1	8:30 AM	0
6:35 AM	0	8:35 AM	1
6:40 AM	0	8:40 AM	2
6:45 AM	1	8:45 AM	4
6:50 AM	2	8:50 AM	4
6:55 AM	5	8:55 AM	2
7:00 AM	4	9:00 AM	0
7:05 AM	4	9:05 AM	2
7:10 AM	4	9:10 AM	1
7:15 AM	5	9:15 AM	1
7:20 AM	3	9:20 AM	5
7:25 AM	1	9:25 AM	1
7:30 AM	3	9:30 AM	3
7:35 AM	3	9:35 AM	3
7:40 AM	1	9:40 AM	4
7:45 AM	0	9:45 AM	5
7:50 AM	2	9:50 AM	3
7:55 AM	4	9:55 AM	0
8:00 AM	2	10:00 AM	4
8:05 AM	3	10:05 AM	5
8:10 AM	3	10:10 AM	2
8:15 AM	3	10:15 AM	1
8:20 AM	2	10:20 AM	2
8:25 AM	1	10:25 AM	1
8:30 AM	4	10:30 AM	3
8:35 AM	3	10:35 AM	3
8:40 AM	1	10:40 AM	3
8:45 AM	1	10:45 AM	4
8:50 AM	0	10:50 AM	2
8:55 AM	1	10:55 AM	0
avg.	1.89	avg.	2.17
max.	5	max.	5
95th %	4.25	95th %	5