

Memo

To: Alonzo Liñán, PE, PTOE, MPA
Director of Public Works
City of Keller

From: Norman Hogue, PE
Senior Traffic Engineer
Dunaway Associates, L.P

Date: July 12, 2017

Re: Proposed Andy's Frozen Custard Development, along Keller Parkway, east of Pate Orr Road



Dunaway #: B003734.001

07/12/2017

Introduction

This Trip Generation Memo was completed at the request of the City of Keller for a proposed Andy's Frozen Custard development located east of the intersection of Keller Parkway and Pate Orr Road in Keller, Texas (see **Attachment 1** for project location). The proposed development is to be located on the north side of Keller Parkway, approximately 280 feet east of the intersection with Pate Orr Road. Keller Parkway in the vicinity of the proposed development is a median divided, six-lane roadway, with a posted speed limit of 45 mph.

Proposed Site Plan

The proposed site plan (see **Attachment 2a & 2b**) includes one enclosed restaurant building with a covered patio for a total of 2,909 SF. The proposed site plan includes a connection to the existing shared access driveway on the north side of the site which provides access to Pate Orr Road and Rufe Snow Drive. The existing driveway is 24-ft. in width and includes one outbound lane and one inbound lane. The proposed site includes 34 parking spaces and a 24-ft. access easement which will connect to the existing development located to the east of the proposed development. The proposed site plan includes a 12-ft. wide drive thru with a queue storage length of (7) seven vehicles from the menu board and a total queue storage of (11) eleven vehicles from the drive-thru window. The drive thru lane warps around south side the building with vehicles entering and exiting into the north parking lot of the site. Existing traffic volumes were not collected for this Trip Generation Memo.

Trip Generation/Distribution

The Institute of Transportation Engineers (ITE) provides predicted trip generation rates and equations for several land uses as provided in **ITE Trip Generation, 9th Edition**. These rates are based on individual sites to compute driveway volumes for particular land uses. The land use most closely related to this development would be a Fast Food Restaurant with Drive-

Through Window. However, a Traffic Study was performed by KLOA, Inc. for a separate Andy's Frozen Custard location with four consecutive days of peak hour traffic counts which will be used for this memo. The Traffic Study review letter and memorandum are included as **Attachments**. Since Andy's Frozen Custard opens for business at 11:00 AM, the traffic counts were conducted from 11:30 A.M. to 1:30 P.M. and 5:00 P.M. to 10:00 P.M. from Thursday through Sunday. The peak hours for this type of establishments occurs during lunchtime and late evenings on the weekends.

ITE Trip Generation Handbook, 2nd Edition provides that significant pass-by trips are associated with particular land uses located adjacent to highly traveled roadways and states "The pass-by trip-making phenomenon, if estimated to be significant, should be recognized when examining the traffic impact of a development on the adjacent street system." The pass-by trips phenomenon was not considered for this memo, to provide a more conservative analysis. **Table 1** provides the summary of the generated trips for four typical study parameters utilized in the **ITE Trip Generation, 9th Edition**.

Table 1. Summary of Generated Trips

Peak of Generator	AM Peak Hour* Weekday		PM Peak Hour Weekday		AM Peak Hour* Weekend		PM Peak Hour Weekend	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Gross New Trips	10	11	108	84	6	7	98	97
TOTAL	21		192		13		195	
Peak hour of Adjacent Street Traffic	AM Peak Hour Weekday (7-9)		PM Peak Hour Weekday (4-6)		AM Peak Hour Weekend (7-9)		PM Peak Hour Weekend (4-6)	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Gross New Trips	N/A	N/A	28	29	N/A	N/A	58	57
TOTAL	N/A		57		N/A		115	

*AM Peak Hour 11:30 A.M. to 12:30 P.M.

Once the assumed trip generation for the proposed development was calculated, the next steps in the traditional three-phase planning process are the distribution and assignment to the proposed access driveway. For this project site, traffic will have access to the existing driveways located to the north and east of the property, and will be able to access all three surrounding roadways. Since traffic volumes are unknown at this time, and a directional distributed is not necessary to fill out the required Unified Development Code (UDC) worksheet, all driveways were combined in the reporting total. The attached UDC worksheet includes a summary of the total gross floor area, number of parking spaces, and the gross trips anticipated for the development.

Conclusions

The trip generation analysis for the proposed development indicates that a total of 57 PM peak hour vehicles are anticipated on weekdays; the proposed development will not be open during the weekday AM peak hour. On weekends, the proposed development is anticipated to generate 115 peak hour vehicles. Additionally, the weekday peak hours for this development will occur between the hours of 12:30 P.M. to 1:30 P.M. and 8:00 P.M. to 9:00 P.M. respectively.

The hours are generally considered off-peak hours for the adjacent roadways. Lastly, the collected traffic data incorporated a portion of the typical weekday peak hour (5:00 PM – 6:00 PM) with 57 trips, which is approximately 30 percent of the evening peak hour volume of the generator (192 trips). Consequently, it is anticipated that the proposed land use will minimally impact the roadways and traffic signal operations.

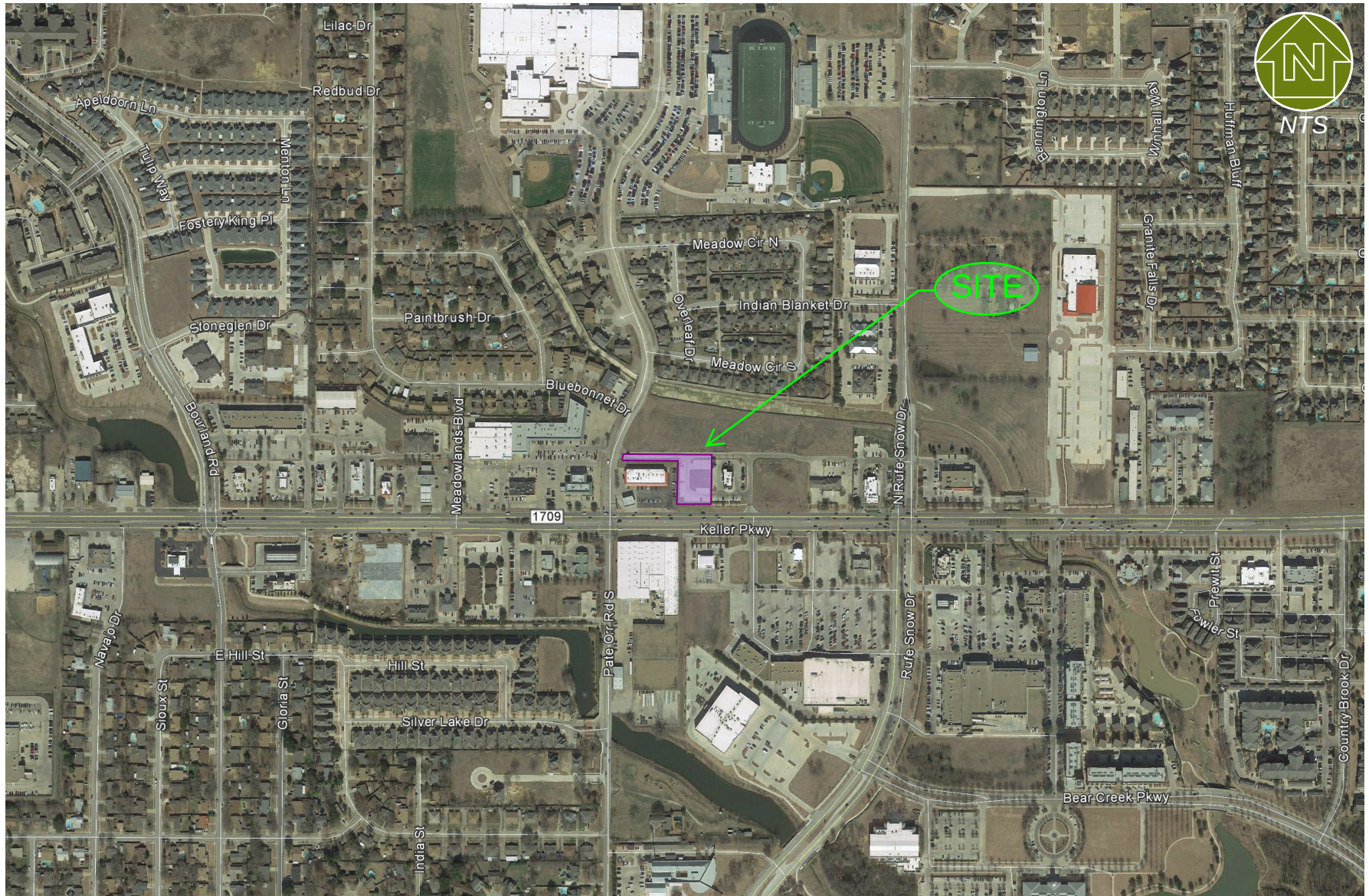
NLH/nlh

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Attachments:

- Project Location
- Proposed Site Plan
- Context Plan
- City of Keller Unified Development Code pages 5-94 and 5-95
- KOAL, Inc. Traffic Study Review Letter
- KOAL, Inc. Traffic Study Memorandum

cc: File



LOCATION MAP

Trip Generation Memo - Andy's Frozen Custard Development, Keller, Texas

TRASH
ENCLOSURE

7

9

9'-0"

24'-0"

12'-0"

26'-0"

12'-0"

Andy's
Frozen Custard
SINCE 1986

DRIVE
THRU
MENU

PATIO
MENU

7

24'-0"

7

4

MONUMENT
SIGN

SITE PLAN

1" = 10'-0"



0'

10'

20'

40'



PARKING

PARKING REQUIRED	11
PARKING PROVIDED	34
DRIVE THRU STACK	11

BUILDING

ENCLOSURE SQARE FOOTAGE	1,581.7
MECHANICAL ENCLOSURE	415.5
COVERED PATIO SQUARE FOOTAGE	902.5
TOTAL SQUARE FOOTAGE	2,909

DOCUMENTS FOR

ANDY'S FROZEN CUSTARD
961 KELLER PKWY
KELLER, TX

This document, and the ideas and designs incorporated herein, is the property of Andy's Frozen Custard, and is not to be used, in whole or in part, for any other project, without the written authorization of Andy's Frozen Custard.

Revisions:	No.	Date	Description

Store #:	
Drawn:	
Approved:	
Issue Date:	

Sheet Title:
SITE PLAN

Sheet No:

SP101



RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

A BETTER
CROSSFIT

JOE'S
PASTA

ALLIANCE
JEWELERS

STUDENT
MINISTRY

TACO
CASA

UNITY ONE
CREDIT UNION

PATE ORR RD N

QUICK
WAY

LITTLE
CAESARS

RAISING
CANE'S

AMERICAN NATION
BANK

961 Keller Pkwy

KELLER PKWY

ENTERPRISE
RENT-A-CAR

DRY CLEAN

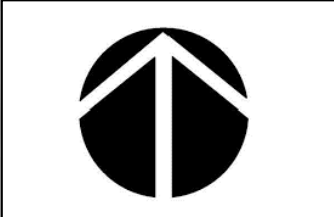
KWIK KAR

FOAM FABRICATORS

WELLS FARGO
BANK

STARBUCKS

SITE LOCATION
1" = 50'-0"



DOCUMENTS FOR:

ANDY'S FROZEN CUSTARD
961 KELLER PKWY
KELLER, TX

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Revisions:		
No.	Date	Description

Store #:
Drawn:
Approved:
Issue Date:

Sheet Title:
CONTEXT PLAN

Sheet No:
SP 100

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 1)

Land Use/Building Type: ¹ 934/Fast Food Restaurant with Drive-Through Window		ITE Land Use Code:	
Source: Traffic Study prepared by KLOA, Inc.		Source No. (ITE use only):	
Name of Development: Andy's Frozen Custard, along Keller Parkway, east of Pate Orr Road		Day of the Week: Thursday - Sunday	
City: Keller		Day: 9-12 Month: July Year: 2015	
State/Province: TX Zip/Postal Code: 76248		Metropolitan Area: Countryside, Illinois	
Country: USA			

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area: ☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural ☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural) ☐ (7) Not Given		Detailed Description of Development: ³	
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Independent Variable: (include data for as many as possible)²

	Actual	Estimated	Actual	Estimated
(1) Employees (#)				☒
(2) Persons (#)				
(3) Total Units (#) (indicate unit:)				
(4) Occupied Units (#) (indicate unit:)				
2,909 (5) Gross Floor Area (gross sq. ft.)				
(% of development occupied)				
(6) Net Rentable Area (sq. ft.)				
(7) Gross Leasable Area (sq. ft.)				
(% of development occupied)				
1.14 (8) Total Acres (% developed:)				
(9) Parking Spaces (% occupied: UNK)				
(10) Beds (% occupied:)				
(11) Seats (#)				
(12) Servicing Positions/Vehicle Fueling Positions				
(13) Shopping Center % Out-parcels/pads				
(14) A.M. Peak Hour Volume of Adjacent Street Traffic				
(15) P.M. Peak Hour Volume of Adjacent Street Traffic				
(16) Other				
(17) Other				

2. Definitions for several independent variables can be found in the Trip Generation, Second Edition, User's Guide Glossary.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data: Vehicle Occupancy (#): A.M. _____ P.M. _____ 24-hour % _____ Percent by Transit: A.M. % _____ P.M. % _____ 24-hour % _____ Percent by Carpool/Vanpool: A.M. % _____ P.M. % _____ 24-hour % _____ Employees by Shift: First Shift: Start Time _____ End Time _____ Employees (#) _____ Second Shift: Start Time _____ End Time _____ Employees (#) _____ Third Shift: Start Time _____ End Time _____ Employees (#) _____ Parking Cost on Site: Hourly _____ Daily _____		Transportation Demand Management (TDM) Information: At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway? ☒ No ☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary) ☐ (1) Transit Service ☐ (2) Carpool Programs ☐ (3) Vanpool Programs ☐ (4) Bicycle/Pedestrian Facilities and Site Improvements ☐ (5) Employer Support Measures ☐ (6) Preferential HOV Treatments ☐ (7) Transit and Ridesharing Incentives ☐ (8) Parking Supply and Pricing Management ☐ (9) Tolls and Congestion Pricing ☐ (10) Variable Work Hours/Compressed Work Weeks ☐ (11) Telecommuting ☐ (12) Other _____	
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Part A – Street System Improvements

FIGURE 4.01 – Trip Generation Data Form (Part 1)

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 2)

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

	Average Weekday (M-F)						Saturday						Sunday					
	Enter		Exit		Total		Enter		Exit		Total		Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks
24-Hour Volume																		
A.M.: Peak Hour of Adjacent ¹ Street Traffic (7 – 9) Time (ex.: 7:15 - 8:15):	N/A																	
P.M.: Peak Hour of Adjacent ¹ Street Traffic (4 – 6) Time: 5:00 - 6:00	28		29		57		31		28		59		58		57		115	
A.M.: Peak Hour Generator ² Time:	N/A		N/A		N/A													
P.M.: Peak Hour Generator ^{2a} Time: 8:00 - 9:00	108		84		192		81		76		157							
Peak Hour Generator ³ Time (Weekend): 7:00 - 8:00													98		97		195	

Note: Weekend Peak is Different on Sunday

4. Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.). Please specify the peak hour.

2. Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

3. Highest hourly volume during the entire day. Please specify the peak hour.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Hourly Driveway Volumes-Average Weekday (M-E)

Hourly Driveway Volumes- Average Weekday (M-F)

A.M. Period	Enter		Exit		Total		Mid-Day Period		Enter		Exit		Total		P.M. Period		Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks
6:00-7:00							11:00-12:00								3:00-4:00							
6:15-7:15							11:15-12:15								3:15-4:15							
6:30-7:30							11:30-12:30		10		11		21		3:30-4:30							
6:45-7:45							11:45-12:45								3:45-4:45							
7:00-8:00							12:00-1:00								4:00-5:00							
7:15-8:15							12:15-1:15								4:15-5:15							
7:30-8:30							12:30-1:30		20		17		37		4:30-5:30							
7:45-8:45							12:45-1:45								4:45-5:45							
8:00-9:00							1:00-2:00								5:00-6:00							
																	24		23			47

☒ Check if Part 3, 4 and/or additional information is attached.

Survey conducted by: Norman L. Hoque, PE

Please return to: Institute of Transportation Engineers

Technical Projects Division

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Fax: +1 202-785-0609
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ITE on the Web: www.ite.org

Survey conducted by: **Norman L. Hoque, PE**

Survey conducted by: NAME, _____
 Organization: **Dunaway Associates, L.P.**

Organization: **Dunaway Associates, L.P.**
550 Bailey Avenue Suite 400

Address: 550 Bailey Avenue, Suite 400

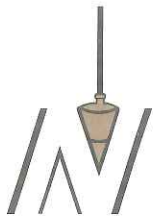
City/State/Zip: Fort Worth, Texas 76107

City, State, Zip: _____
 Telephone #: 817-335-1121
 E-mail: NHogue@dinaway-assoc.com

Telephone #: 817-333-1121
Fax #: _____
E-mail: NIHoyne@uullaway-assoc.com

Part A – Street System Improvements

FIGURE 4.02 – Trip Generation Data Form (Part 2)



Frank Novotny & Associates, Inc.

825 Midway Drive ♦ Willowbrook, IL ♦ 60527 ♦ Telephone: (630) 887-8640 ♦ Fax: (630) 887-0132

*Civil Engineers/
Municipal Consultants*

July 17, 2015

Hon. Mayor & City Council
City of Countryside
5550 East Avenue
Countryside, IL 60525

Re: **Andy's Frozen Custard**
Northeast Corner of 58th Street & LaGrange Road
Traffic Study

Gentlemen:

We are in receipt of a Traffic Study for the above-referenced site, prepared by KLOA, Inc., dated July 17, 2015. The study was prepared in order to evaluate the operations of Andy's Frozen Custard's on-site circulation and drive-thru facility to determine the cause and frequency of traffic queueing onto 58th Street and to determine if any site or operational improvements could be made at Andy's to improve efficiency and minimize street traffic congestion. In order to determine the current traffic conditions at Andy's, KLOA conducted observations during the establishment's normal hours of operation. Cameras were used to observe traffic on the following four consecutive days:

- Thursday, July 9th – 11:00 a.m. to 11:00 p.m.
- Friday, July 10th – 11:00 a.m. to 11:30 p.m.
- Saturday, July 11th – 11:00 a.m. to 11:30 p.m.
- Sunday, July 12th – 11:00 a.m. to 11:00 p.m.

This study was also required as a condition to the Planning Commission's recommendation for the Chipotle Development located on the southeast corner of 58th Street & LaGrange Road.

Based on the four days of observation, the report shows that the majority of the queueing of vehicles onto 58th Street occurred on weekends in the late evening hours (after 7:30 p.m.) and that no queueing occurred on the typical weekday. The queueing on 58th Street was also observed to be caused by vehicles attempting to park in spaces along the aisle that the drive-thru traffic queues in. The queueing is mostly due to operational inefficiencies of the Andy's drive-thru facility. The ordering, payment and pickup process all occur at the same drive-thru window, which is terribly inefficient. The following are potential alternatives itemized in the study to improve the operations of the drive-thru facility and mitigate the queueing of traffic on 58th Street:

- A third menu board should be placed near the pick-up window to allow vehicles to advance closer to the window and minimize the gaps occurring between queued vehicles in the drive-thru lane.

- Ordering stations should be considered at the menu boards so customers can order prior to the pick-up window when the employee taking orders is not available.
- A second employee should be used during peak periods to help with taking orders in the back of the queue.
- This employee can also direct drive-thru traffic to double stack in the drive aisle when long queues are occurring and also help regulate parked vehicles exiting spaces that may obstruct the flow of the drive-thru traffic.
- The two employees taking orders should also be able to accept payments to expedite the process at the pick-up window.
- The drive aisle should be striped to allow for two lanes. The easterly lane for drive-thru stacking and the westerly lane for traffic circulating the parking lot. This may require angling the parking spaces to create additional aisle width and to improve the maneuverability of vehicles in and out of the parking spaces.
- During times of peak activity, employees should direct vehicles waiting for their orders to be completed to advance to the south side of the building within the drive-thru lane. This will allow vehicles to advance and utilize the entire length of the drive-thru lane past the drive-thru window.

After reviewing the traffic study, it is my recommendation that City Staff work with the management of Andy's Frozen Custard in order to improve the efficiency of their on-site circulation and drive-thru facility. City Staff should also monitor traffic after any improvements have been made in order to determine if the traffic has been mitigated or if additional operational improvements are required.

If you have any questions or comments regarding any of this information, please feel free to contact me.

Sincerely,

FRANK NOVOTNY & ASSOCIATES, INC.



John E. Fitzgerald, P.E.

JEF/kes

cc: Ms. Gail Paul, Administrator
Ms. Sharon Peterson, Asst. Administrator
Ms. Kimberly Clarke, Zoning Administrator
Mr. Richard Fulmer, Chairman, PC/ZBA
Project File No. 15209

MEMORANDUM TO: John Fitzgerald
City of Countryside

FROM: Brendan May
Consultant

Luay Aboona, PE
Principal

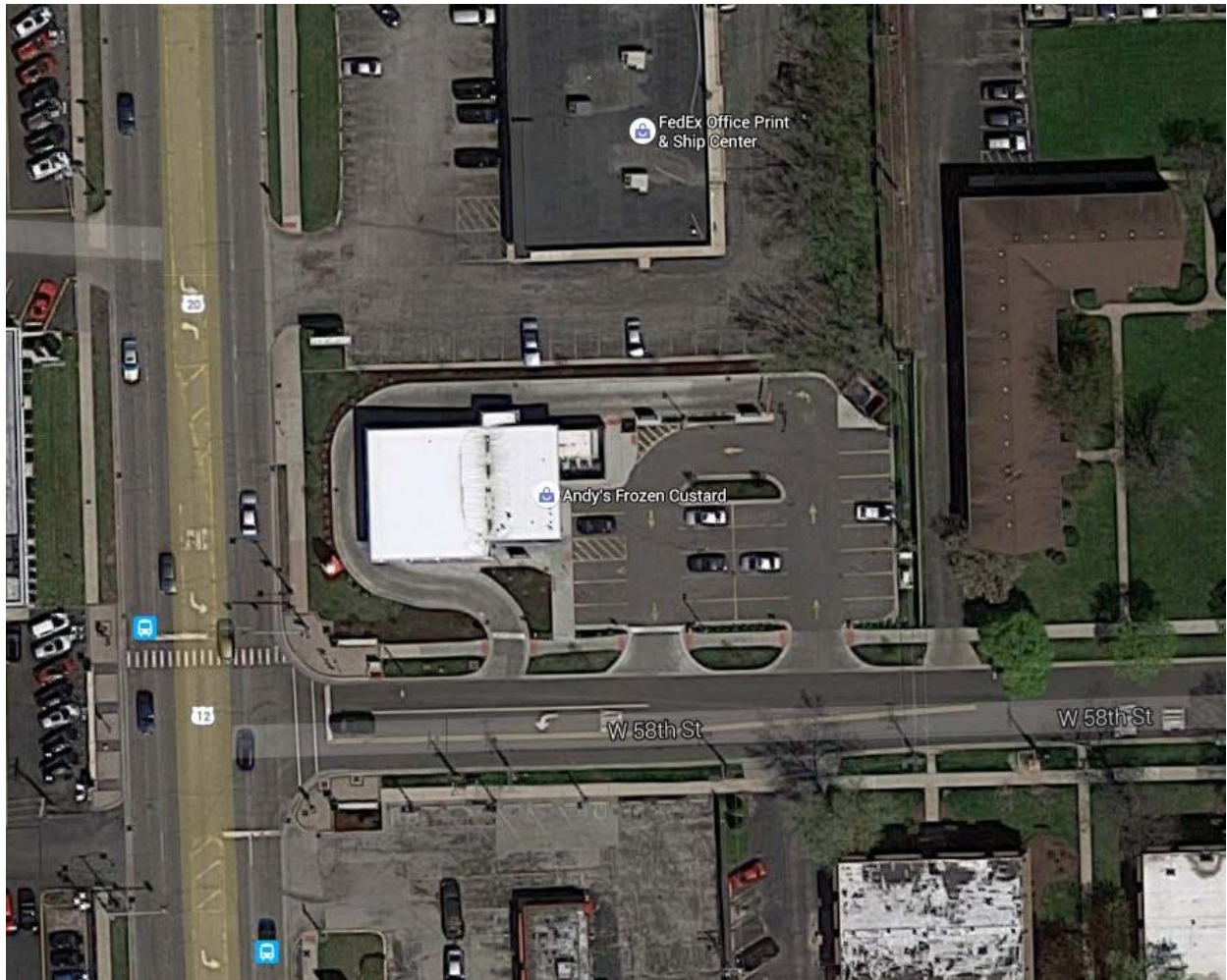
DATE: July 17, 2015

SUBJECT: Access Evaluation Study
Andy's Frozen Custard
Countryside, Illinois

This memorandum summarizes the results and findings of an access evaluation study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for the Andy's Frozen Custard (Andy's) located in the northeast quadrant of the intersection of La Grange Road (US Route 12/20/45) with 58th Street in Countryside, Illinois. Access to Andy's is currently provided on 58th Street via one inbound access drive and two outbound access drives. The inbound only access drive serves both the parking lot and the entrance to the drive through lane, the easterly outbound only access drive serves the parking lot and the westerly right out only access drive serves the drive through lane. The parking lot provides approximately 23 90-degree parking spaces and allows for one-way counterclockwise circulation via pavement markings and signage. **Figure 1** shows an aerial view of the Andy's.

The purpose of this study was to examine the operations of Andy's on-site circulation and drive-through during the peak hours of operation and determine the following:

- The number of trips generated by Andy's during the peak hours of operation.
- Frequency and the causes of drive through or site related queueing that results in the backup of site traffic onto 58th Street.
- Determine, if any, site or operational improvements are necessary to more efficiently accommodate the peak periods of onsite traffic.



Aerial of Andy's Frozen Custard

Figure 1

Andy's Trip Generation

The number of trips generated by Andy's during the midday and late evening peak periods was determined based on traffic counts conducted from 11:30 A.M. to 1:30 P.M. and 5:00 P.M. to 10:00 P.M. on Thursday through Sunday, July 9 to July 12, 2015. The number of inbound and outbound trips generated by Andy's are summarized in **Table 1**. The total number of trips generated by Andy's per hour is illustrated in **Figure 2**. As can be seen from the trip generation, Andy's generates its peak number of trips on the weekends between 7:00 P.M and 9:00 P.M. while the lunchtime and dinnertime peak hours generate, at a minimum, approximately 70 to 40 percent less trips than the late evening peak hour, respectively.

Table 1
ANDY'S TRIP GENERATION

Time Period	July 9		July 10		July 11		July 12	
	In	Out	In	Out	In	Out	In	Out
11:30 AM - 12:30 P.M.	10	11	6	7	4	5	6	7
12:30 - 1:30 P.M.	20	17	12	9	23	23	21	18
5:00 - 6:00 P.M.	24	23	28	29	31	28	58	57
6:00 - 7:00 P.M.	52	31	38	30	56	43	56	55
7:00 - 8:00 P.M.	58	68	55	50	80	68	98	97
8:00 - 9:00P.M.	74	65	108	84	81	76	89	85
9:00 - 10:00P.M.	57	61	81	75	40	39	69	79

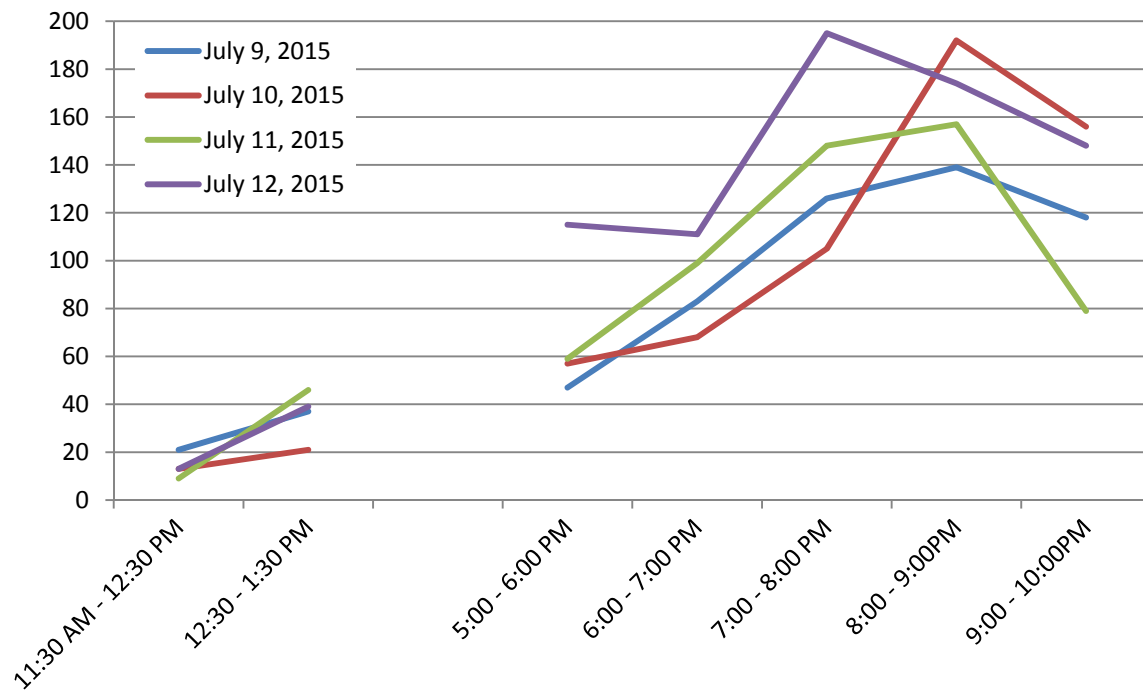


Figure 2: Total Generated Trips per Hour

Observations of the Andy's Operations

In order to determine the current traffic conditions at the Andy's, KLOA, Inc. conducted observations during the restaurant's hours of operation. The observations were conducted on the following four consecutive days:

- Thursday, July 9, 2015 – 11:00 A.M. to 11:00 P.M.
- Friday, June 10, 2015 – 11:00 A.M. to 11:30 P.M.
- Saturday, June 11, 2015 – 11:00 A.M. to 11:30 P.M.
- Sunday, June 12, 2015 – 11:00 A.M. to 11:00 P.M.

The following describes the events in which vehicles were queued along 58th Street waiting to turn into the Andy's parking lot and the number of times in which the drive through queue extended to the driveway apron (with no vehicles queued on 58th Street). Figures illustrating the number of vehicles that queued on 58th Street per minute during each observed day are included in the Appendix.

Thursday, July 9, 2015

- No vehicles were observed to be queued on 58th Street.
- Only one time at 10:22 P.M the drive through queue extended to the driveway apron.

Friday, June 10, 2015

- A total of six times between 9:01 and 9:54 P.M. vehicles were queued on 58th Street. The average number of cars queued on 58th Street was two vehicles with a maximum of three vehicles queued at any one time.
 - o At 9:01 P.M., three vehicles arrived and were queued on 58th Street. All three queued vehicles cleared the roadway by 9:02 P.M.
 - o At 9:03 P.M. one vehicle was queued on 58th Street, this vehicle cleared the roadway by 9:05 P.M.
 - o At 9:06 P.M. one vehicle was queued on 58th Street, this vehicle cleared the roadway by 9:07 P.M.
 - o At 9:08: P.M. one vehicle was queued on 58th Street, this vehicle cleared the roadway by 9:09 P.M.
 - o At 9:10 P.M. one vehicle was queued on 58th Street, this vehicle cleared the roadway by 9:11 P.M.

- o At 9:53 P.M. one vehicle was queued on 58th Street, a second vehicle queued behind the first vehicle at 9:54 P.M. The two queued vehicles cleared the roadway by 9:56 P.M.
- It was observed that at 8:55 P.M., 8:56 P.M., 9:01 P.M., 9:06 P.M., 9:11 P.M., 9:53 P.M., 10:11 P.M., and at 10:12 P.M. the drive through queue extended to the driveway apron with no vehicles queued onto the street.

Saturday, June 11, 2015

- A total of four times between 8:40 and 9:00 P.M. vehicles were queued on 58th Street attempting to turn into the Andy's parking lot. The average number of vehicles queued was one with a maximum queue of three vehicles.
 - o Starting at 8:41 P.M. one vehicle was queued on 58th Street per minute with all vehicles cleared of the roadway by 8:44 P.M.
 - o At 8:52 P.M. three vehicles were queued on 58th Street. All vehicles cleared the roadway by 8:53 P.M.
- It was observed that at 4:07 P.M., 8:40 P.M. and 8:53 P.M. the drive through queue extended to the driveway apron with no vehicles queued in the street.

Sunday, June 12, 2015

- A total of ten times between 7:30 and 9:00 P.M. vehicles were queued on 58th Street. The average number of vehicles in queue was three with a maximum queue of seven vehicles.
 - o One vehicle was observed to be queued on 58th Street at 7:32 P.M. and then at 7:43 P.M. These vehicles cleared the roadway within the minute.
 - o Starting at 7:50 P.M. a rolling queue of vehicles began on 58th Street ranging from one vehicle to a maximum of seven vehicles. At least one vehicle was queued on 58th Street until 8:24 P.M.
 - o A maximum two cars were queued on 58th Street from 8:26 to 8:27 P.M., 8:29 P.M., and 8:31 to 8:32 P.M.
 - o At 8:35 P.M. there was a maximum of five vehicles queued on 58th Street. These vehicles cleared the roadway by 8:41 P.M.
 - o One vehicle was queued on 58th Street at 8:49 P.M., 8:55 P.M., and 8:58 P.M. These vehicles cleared the roadway within one minute.

- It was observed that at 4:51 P.M., 4:54 P.M., 7:32 P.M., 7:42 P.M. and 7:49 P.M. the drive through queue extended to the driveway apron with no vehicles queued in the street.

General Observations

- There were several instances in which vehicles were stopped on 58th Street or on the driveway apron in order to allow for vehicles to park into or back out of the parking spaces closest to 58th Street. These situations were not included in the above observations.
- The traffic flow to the drive through was held up by vehicles entering or exiting the parking spaces along the drive isle. Many vehicles required multiple maneuvers to enter or exit the parking space.
- Gaps in the on-site drive through queue were created due to the spacing of vehicles at the ordering window and menu boards and vehicles waiting in the drive through lane backing up or not advancing in line to allow vehicles to exit parking spaces along the drive isle.
- Some of the queued traffic on 58th Street were vehicles wishing park only and not the drive through. This occurs since there is only one inbound access drive and the drive through traffic occupying the center of the drive isle.

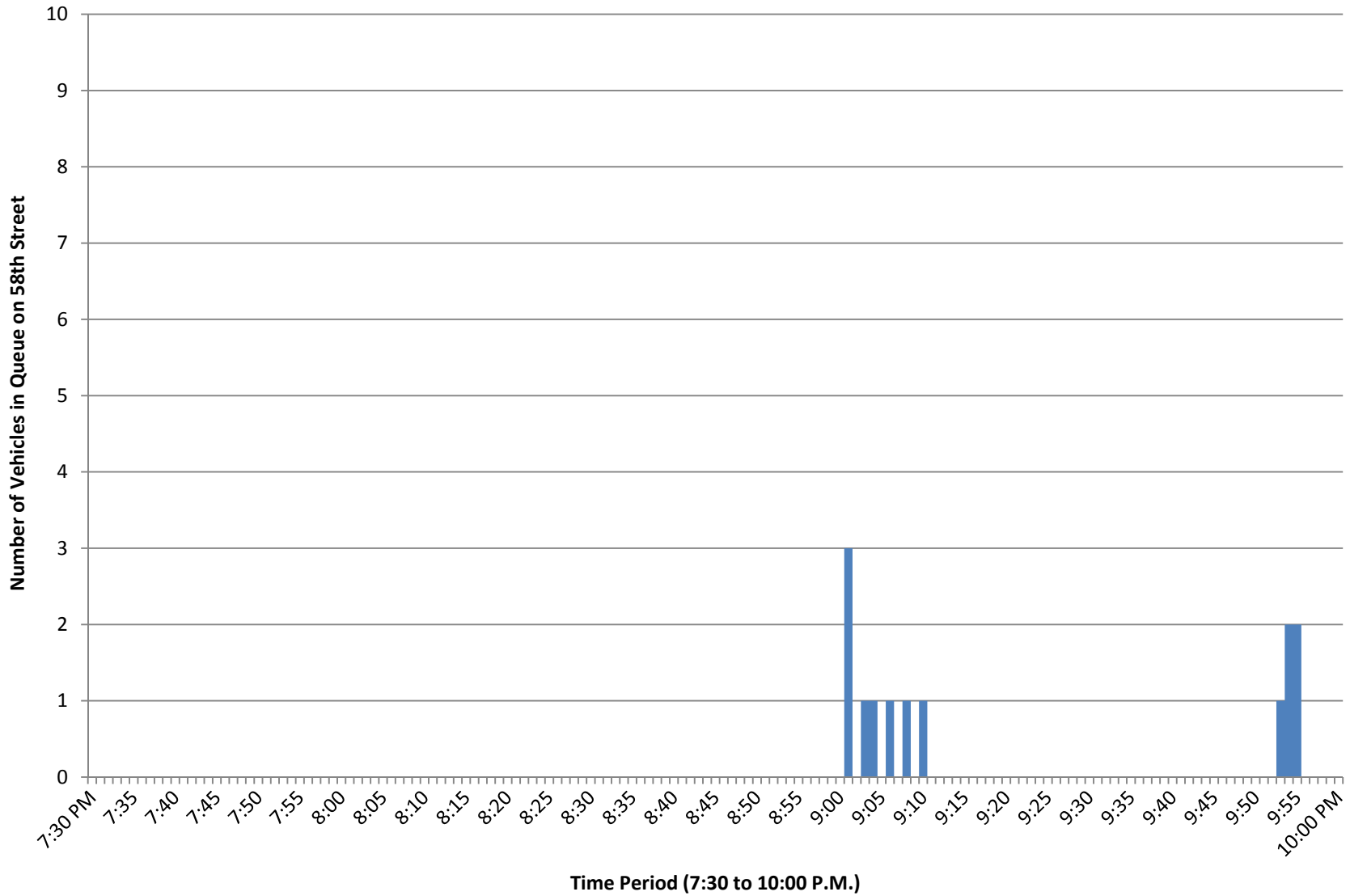
Based on the above observations, it can be seen that on a typical weekday queueing of vehicles on 58th Street does not occur and that the majority of the queuing occurs on weekends in the late evening hours. This queueing is mostly due to the operations of the drive through in which vehicles stop at the menu boards which cause gaps in the drive through line. Primarily, ordering, payment, and pick-up all occur at the pick-up window with an employee taking orders along the drive through queue during peak periods. While having the employee helps the progression of the queue, customers still stop at the menu boards to decide what to order. The queueing on 58th Street is also caused by vehicles attempting to park in the spaces along the drive isle and needing multiple maneuvers or vehicles exiting the parking space both of which interrupt the flow of the drive through traffic.

Recommendations

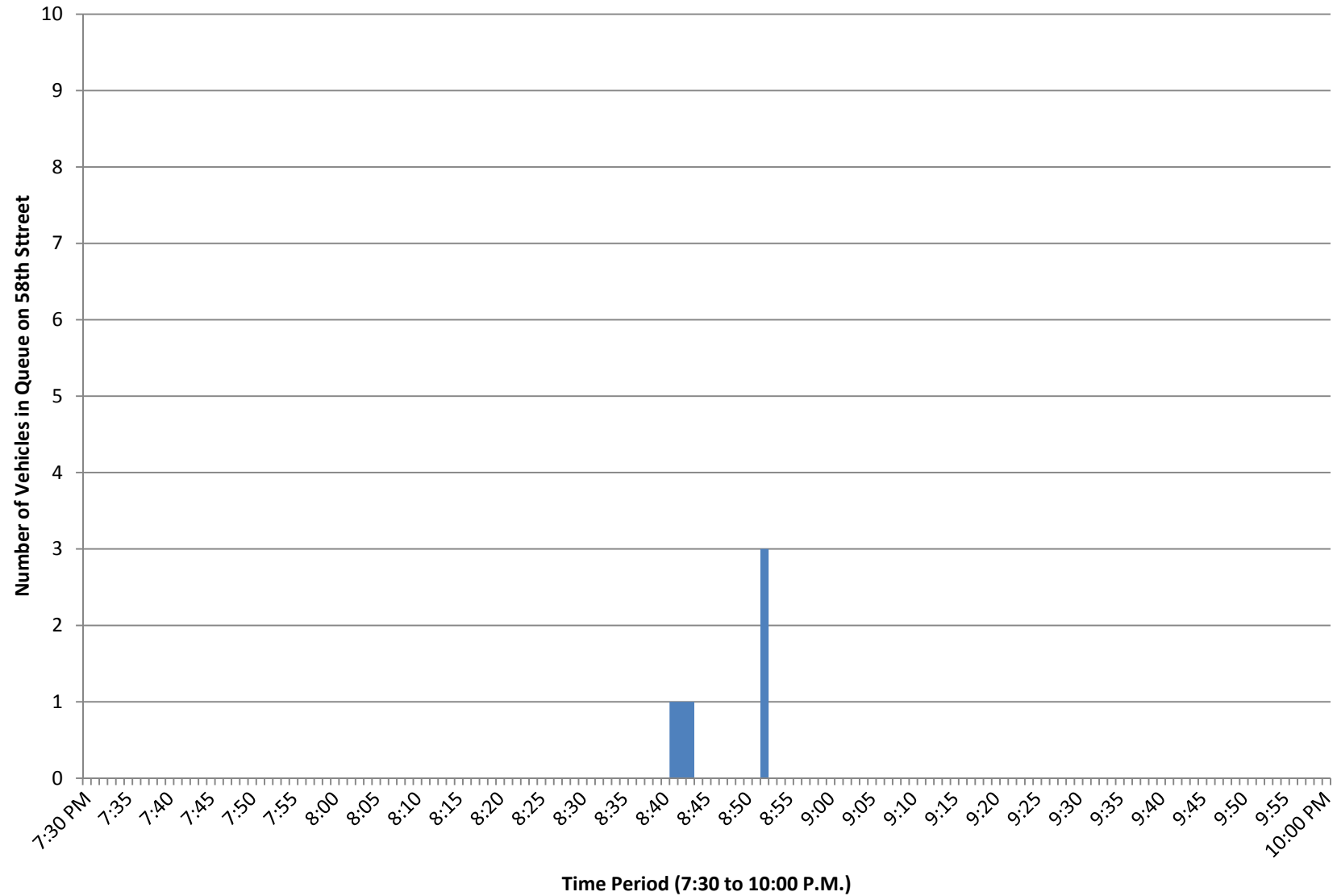
Based on the above, the following are potential alternatives to improve the operations of the drive-through and mitigate the queueing of traffic on 58th Street.

- A third menu board should be placed near the pick-up window to allow vehicles to advance closer to the window and minimize the gaps occurring between queued vehicles in the drive through lane.
- Ordering stations should be considered at the menu boards so customers can order prior to the pick-up window when the employee taking orders is not available.
- A second employee should be used during peak periods to help with taking orders in the back of the queue.
- This employee can also direct drive through traffic to double stack in the drive isle when long queues are occurring and also help regulate parked vehicles exiting spaces that may obstruct the flow of the drive through traffic.
- The two employees taking orders should also be able to accept payments to expedite the process at the pick-up window.
- The drive aisle should be striped to allow for two lanes. The easterly lane for drive-through stacking and the westerly lane for traffic circulating the parking lot. This may require angling the parking spaces to create additional aisle width and to improve the maneuverability of vehicles in and out of the parking spaces.
- During times of peak activity, employees should direct vehicles waiting for their orders to be completed to advance to the south side of the building within the drive through lane. This will allow vehicles to advance and utilize the entire length of the drive through lane past the drive through window.

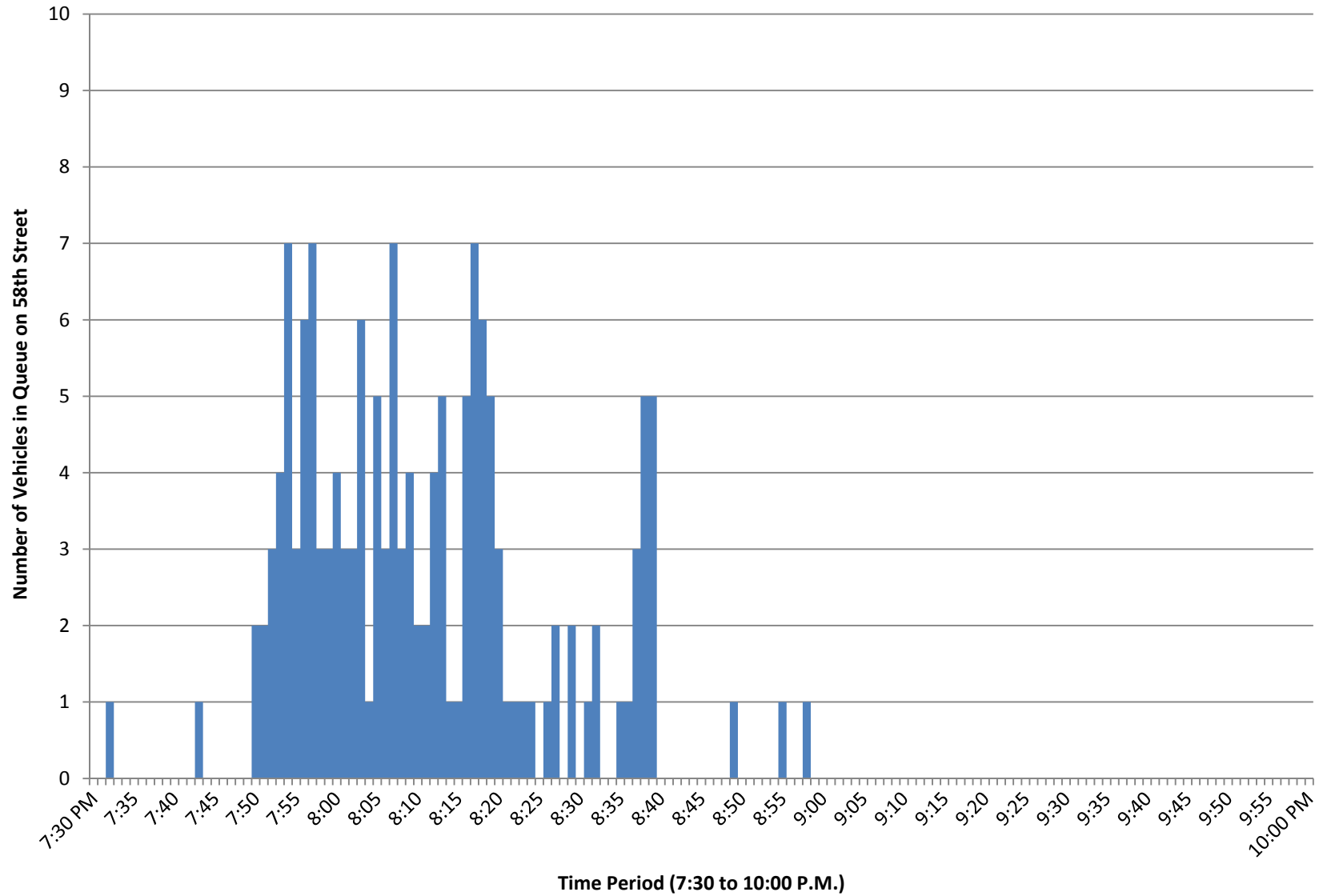
APPENDIX



**Figure A: Maximum Number of Vehicles in Queue on 58th Street
(Friday)**



**Figure B: Maximum Number of Vehicles in Queue on 58th Street per Minute
(Saturday)**



**Figure C: Maximum Number of Vehicles in Queue on 58th Street
(Sunday)**

Chris Biggers

From: Ali Momenzadeh <Ali.Momenzadeh@txdot.gov>
Sent: Wednesday, August 16, 2017 4:07 PM
To: Chris Biggers
Subject: RE: Proposed Andy's Frozen Custard - FM1709 @ Pate Orr Road - Keller

Hi Chris,
To whom may concern

TXDOT agreed the new business pad (Andy's Frozen Custard) will not generate traffic for need of deceleration lane for existing driveway. If you have any questions please let me know.

Thanks,
Ali Momenzadeh
817-399-4310

From: Chris Biggers [mailto:CBiggers@dunaway-assoc.com]
Sent: Wednesday, August 16, 2017 2:52 PM
To: Ali Momenzadeh
Subject: RE: Proposed Andy's Frozen Custard - FM1709 @ Pate Orr Road - Keller

Hi Ali. I just left a voicemail also on this. I wanted to check and see if you had been able to review the below information to provide something for the City of Keller, or if we need to discuss

Thanks,

Chris Biggers, PE
Principal / Director of Retail Services
T 817.335.1121 D 817.632.4709 C 817.287.8814

From: Chris Biggers
Sent: Friday, August 11, 2017 8:09 AM
To: 'Ali.Momenzadeh@txdot.gov' <Ali.Momenzadeh@txdot.gov>
Subject: Proposed Andy's Frozen Custard - FM1709 @ Pate Orr Road - Keller

Good afternoon Ali,

This is a follow-up to our discussion on the phone yesterday afternoon. We are assisting with a proposed project adjacent to 961 Keller Parkway/FM1709 (Our site is the pad just to the west of Cane's). The proposed use is an Andy's Frozen Custard, which is approximately 1,600 SF with a drive-thru. A site plan was recently submitted and the City Public Works department requested the below:

1. Please provide verification from TxDOT that deceleration/turn lane will not be required on FM 1709 due to additional traffic.

I have attached for reference a site plan, aerial plan, and Traffic Memo Don and his team prepared.

Can you review and provide something that we could provide back to the city per their request? They asked that we provide it as soon as possible, but no later than next Friday 8/18.
Please let me know if you need additional information to review.

Please see screenshot for location reference:



Thanks,

Chris Biggers, PE
Principal / Director of Retail Services



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