Traffic Impact Study **Proposed Dunkin Drive Through**

Albuquerque, New Mexico



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I. Executive Summary

This report summarizes the results of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for a proposed Dunkin Drive Through (Dunkin) to be located at 1600 Eubank Boulevard NE in Albuquerque, New Mexico. The objectives of the traffic study are as follows:

- Determine the existing vehicular conditions in the study area to establish a base condition.
- Assess the impact that the proposed development will have on traffic conditions in the area.
- Determine any roadway or access modifications and/or improvements that will be necessary to effectively accommodate and mitigate future conditions.

Vehicle, pedestrian, and bicycle counts were conducted during the weekday morning and weekday evening peak periods at the intersections of Eubank Boulevard NE with Hannett Avenue NE and the two existing site access drives to determine the peak hour of traffic activity during these time periods.

As proposed, the Dunkin will be approximately 1,500 square feet in size and will provide a drive through that will accommodate 16 vehicles. A total of 13 parking spaces will serve the site. Access to the site will continue to be provided via the two existing curb cuts serving the site which consist of a southerly full movement access drive and a northerly right-in/right-out access drive.

Based on the proceeding analyses and recommendations, the following conclusions have been made:

- The proposed Dunkin will be located at 1600 Eubank Boulevard NE and will be a 1,500 square foot building providing a drive-through that will accommodate 16 vehicles and a parking lot with 13 parking spaces.
- Access to the site will continue to be provided via the two existing curb cuts serving the site which consist of a southerly full movement access drive and a northerly right-in/right-out access drive.
- The volume of traffic estimated to be generated by the site will be reduced due to the high percentage of pass-by trips anticipated to be diverted from the existing traffic on Eubank Road NE.
- The traffic generated by Dunkin will have a limited impact on the intersection of Eubank Boulevard NE with Hannett Avenue NE and no roadway or traffic control improvements will be required.
- The access drives are projected to be adequate in accommodating the traffic estimated to be generated by Dunkin and will provide flexible and efficient access to the site as well as the adjacent sites that have cross access to the access drives.



- As part of the proposed development, stop signs should be provided for outbound traffic from the access drives onto Eubank Boulevard NE
- The drive-through stacking of 16 vehicles will be adequate in accommodating the peak drivethrough activity for the coffee shop.



1. Introduction

This report summarizes the results of a traffic study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for a proposed Dunkin to be located at 1600 Eubank Boulevard NE in Albuquerque, New Mexico. The site, which is currently occupied by a single-story building with a canopy, is located on the east side of Eubank Boulevard NE at Hannett Avenue NE. The scoping document for this traffic impact study can be found in the Appendix.

As proposed, the proposed Dunkin will be approximately 1,500 square feet in size and will provide a drive through that will accommodate 16 vehicles. A total of 13 parking spaces will serve the site. Access to the site will continue to be provided via the two existing curb cuts serving the site which consist of a southerly full movement access drive and a northerly right-in/right-out access drive.

Figure 1 shows the location of the site in relation to the area roadway network. Figure 2 shows an aerial view of the site.

The sections of this report present the following:

- Existing roadway conditions
- A description of the proposed site
- Directional distribution of the site traffic
- Vehicle trip generation for the site
- Future traffic conditions, including access to the site.
- Traffic analyses for the weekday morning and weekday evening peak hours
- Accident analyzes for the intersection of Eubank Boulevard NE with Hannett Avenue NE
- Recommendations with respect to the adequacy of site access and adjacent roadway system

Traffic capacity analyses were conducted for the weekday morning and weekday evening peak hours for the following conditions:

- 1. Existing Conditions Analyzes the capacity of the existing roadway system using existing peak hour traffic volumes in the surrounding area.
- 2. Year 2024 No-Build Conditions Analyzes the capacity of the existing roadway system using the ambient area growth, not attributable to any particular development.
- 3. Year 2024 Total Projected Conditions Analyzes the capacity of the future roadway system using the projected traffic volumes that include the existing traffic volumes, ambient area growth, and traffic estimated to be generated by the proposed development.





Site Location Figure 1 – Site Location

Figure 1



Proposed Dunkin Drive Through Albuquerque, New Mexico



Aerial View of Site Figure 2 – Aerial View of Site

Figure 2



Proposed Dunkin Drive Through Albuquerque, New Mexico

2. Existing Conditions

The following provides a detailed description of the physical characteristics of the adjacent roadways, including geometry and traffic control, adjacent land uses, and peak hour traffic flows.

Site Location

The site of the proposed is located on the east side of Eubank Boulevard NE at Hannett Avenue NE and is currently occupied by a one-story building with an overhead canopy. The building has been occupied by various commercial uses but is currently vacant. The site shares cross access with Contact Wireless to the east and Pizza 9 Eubank to the north. Land uses within the vicinity of the site are primarily commercial along the Eubank Boulevard NE corridor and include Advance Service Company, Eubank Animal Clinic, and Ming Dynasty to the west, and Sandra's School of Dance to the south. Land-uses to the east and west of the commercial corridor consists primarily of residential homes.

Existing Roadway Characteristics

Some of the key characteristics of the existing roadways within the study area are described below and illustrated in **Figure 3**. The existing site access drives serving the site will be described in the following chapter of the traffic impact study.

Eubank Boulevard NE is a north south roadway that provides three travel lanes in each direction, separated by a raised median. The roadway is classified as a principal arterial roadway by the Mid-Region Council of Governments (MRCOG). At its unsignalized intersection with Hannett Avenue NE/southerly site access drive, Eubank Boulevard NE provides an exclusive left-turn lane, two exclusive through lanes, and a shared through/right-turn lane on the northbound and southbound approaches. At its unsignalized intersection with the northerly site access drive, Eubank Boulevard NE provides two exclusive through lanes and a shared through/right-turn lane on the northbound approach. Eubank Boulevard NE is under the jurisdiction of the City of Albuquerque, carries an AADT volume of 31,748 vehicles (NMDOT 2022) and has a posted speed limit of 40 miles per hour. It should be noted that ABQ RIDE Route 2 (Eubank) traverses the roadway along the site frontage and this bus route provides weekday, Saturday and Sunday service.

Hannett Avenue NE is an east-west local roadway that provides one travel lane in each direction. At its unsignalized intersection with Eubank Boulevard NE, Hannett Avenue NE, provides a shared left/right-turn lane that is under stop-sign control. Hannett Avenue NE is under the jurisdiction of the City of Albuquerque and has a posted speed limit of 25 miles per hour.





Existing Traffic Volumes

In order to determine current vehicle, pedestrian, and bicycle conditions within the study area, peak period traffic, pedestrian, and bicycle counts were conducted during the weekday morning (7:00 A.M. to 9:00 A.M.) and evening (4:00 P.M. to 6:00 P.M.) peak periods on Tuesday, May 23, 2023 at the following intersections:

- Eubank Boulevard NE with Hannett Avenue NE/Site Access Drive
- Eubank Boulevard NE with Northerly Right-In/Right-Out Access Drive

The results of the traffic counts show that the peak hours generally occur from 7:30 A.M. to 8:30 A.M. during the weekday morning peak hour and 4:45 P.M. and 5:45 P.M. during the weekday evening peak hour. **Figure 4** illustrates the existing peak hour vehicle traffic volumes. Summaries of the traffic counts are included in the Appendix.

Crash Data

KLOA, Inc. obtained crash data from the New Mexico Department of Transportation (NMDOT) for the most recent available past five years (2017 to 2021) for the intersection of Eubank Boulevard NE with Hannett Avenue NE. The crash data for the intersection including severity and crash type by year is summarized in **Tables 1**. As can be seen from Table 1 and based on a review of the crash data, the following was determined:

- During the review period a total of 10 crashes were reported.
- Eight of the ten crashes occurred during clear weather.
- Eight of the ten crashes occurred during daylight.
- Six of the ten crashes involved property damage only while the other four resulted in injury crashes of Class B or C severity.
- No fatal crashes were reported during the review period.
- No crashes involved a pedestrian or bicyclist.
- The only repetitive crash type was From Same Direction/Both Going Straight.
- Due to the limited number of crashes occurring at the intersection, there was no commonality concluded regarding the cause.



Table 1

EUBANK BOULEVARD NE WITH HANNET AVENUE NE – CRASH SUMMARY

N.			Type of	Crash	Frequer	ıcy	
Y ear	2017	2018	2019	2020	2021	Total	Average
Property Damage Only	1	3	1	0	1	6	1.2
Class A Severity	0	0	0	0	0	0	0
Class B Severity	1	0	1	0	0	2	< 1
Class C severity	0	2	0	0	0	2	< 1
Fatalities	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	<u>2</u>	<u>5</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>10</u>	<u>2</u>
From Same Direction/ All Others	1	0	0	0	0	1	< 1
Both Going Straight/ Entering at Angle	1	0	0	0	0	1	< 1
From Same Driection/ Both Going Straight	0	2	0	0	0	2	< 1
From Same Direction/ Vehicle Backing	0	1	0	0	0	1	<1
From Same Direciotn/ One Right Turn	0	1	0	0	0	1	< 1
Left Blank	0	1	0	0	1	2	< 1
From Opposite Direction/ Both Going Straight	0	0	1	0	0	1	< 1
From Same Direction/ Read End Collision	0	0	1	0	0	1	< 1





3. Traffic Characteristics of the Proposed Development

In order to properly evaluate future traffic conditions in the surrounding area, it was necessary to determine the traffic characteristics of the proposed development including the directional distribution and volumes of traffic that it will generate.

Proposed Site and Use Plan

As proposed, Dunkin will be approximately 1,500 square feet in size and will provide a drive-through with stacking for 16 vehicles. A total of 13 parking spaces will serve Dunkin. Eight of the parking spaces are located to the south of the proposed building and the remaining five parking spaces will be located in the northeast corner of the site. Access will be provided via the two existing access drives that serve the site which consist of the following:

- The full movement access drive off Eubank Boulevard NE, that is aligned opposite Hannett Avenue NE. This access drive provides one inbound lane and one outbound lane.
- The existing access drive off Eubank Boulevard NE, which is located approximately 80 feet north of Hannett Avenue NE. This access drive provides one inbound lane and one outbound lane with turning movements restricted to right-turns only via the raised concrete median along Eubank Boulevard NE.

It should be noted that these access drives also provide inbound access to Contact Wireless located to the east of the site and inbound and outbound access for the Pizza 9 Eubank located to the north of the site via cross access.

A copy of the proposed site plan is included in the Appendix.

Directional Distribution of Site Traffic

The directional distribution of how traffic will approach and depart the site was estimated based on the general travel patterns through the study area derived from the peak hour traffic volumes, which indicated that approximately 50 percent of the traffic traverses the site to/from the north and 50 percent of the traffic traverses the site to/from the south. **Figure 5** shows the established directional distribution for the proposed Dunkin and illustrates the distance in feet between the two access drives.





Proposed Site Traffic Generation

The estimate of vehicle traffic to be generated by the proposed Dunkin is based upon the proposed land use types and sizes. The vehicle trip generation was calculated using data published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition. Land-Use Code 937 (Coffee/Donut Shop with Drive-Through Window) was utilized. The ITE trip generation sheets are included in the Appendix.

It is important to note that surveys conducted by ITE have shown that a percentage of trips made to coffee/donut shops with drive-through lanes are diverted from the existing traffic on the roadway system. This is particularly true during the weekday morning and weekday evening peak hours when traffic is diverted from work-to-lunch and work-to-home trips. Such diverted trips are referred to as "pass-by" trips. Based on information published by ITE for coffee/donut shops, approximately 85 to 95 percent of trips are pass-by trips. However, in order to provide a conservative analysis, only a 70 percent pass-by reduction was applied to the trips estimated to be generated by Dunkin.

Table 2 shows the estimated vehicle trip generation for the weekday morning peak hour, weekday evening peak hour, and daily trips.

ITE Land Use	Type/Size	Weel P	xday M Peak Ho	orning our	Wee I	kday E Peak H	vening our	Daily Two-Way Trips			
Code		In	Out	Total	In	Out	Total	In	Out	Total	
937	Coffee/Donut Shop with Drive-Through (1,500 s.f.)	66	63	129	29	29	58	400	400	800	
70%	<u>-45</u>	<u>-45</u>	<u>-90</u>	<u>-20</u>	<u>-20</u>	<u>-40</u>	<u>-280</u>	<u>-280</u>	<u>-560</u>		
	21	18	39	9	9	18	120	120	240		

Table 2ESTIMATED PEAK HOUR VEHICLE TRIP GENERATION



4. Projected Traffic Conditions

The total projected traffic volumes include the base traffic volumes, increase in background traffic due to growth, and the traffic estimated to be generated by the proposed development.

Development Traffic Assignment

The estimated weekday morning and weekday evening peak hour traffic volumes that will be generated by the proposed Dunkin were assigned to the roadway system in accordance with the previously described directional distribution (Figure 5). **Figure 6** illustrated the traffic assignment of the new passenger vehicle trips and **Figure 7** illustrates the traffic assignment of the pass-by vehicles trips.

Ambient Traffic Growth

The existing traffic volumes were increased by an ambient growth factor of 0.5 percent per year for one year (project completion year) to represent Year 2024 no-build conditions. **Figure 8** shows the Year 2024 no-build traffic volumes.

Year 2024 Total Projected Traffic Volumes

The new and pass-by development-generated traffic (Figures 6 and 7) was added to the no-build traffic volumes (Figure 8) to determine the Year 2024 total projected traffic volumes. These volumes are illustrated in **Figure 9**.











5. Traffic Analysis and Recommendations

The following provides an evaluation conducted for the weekday morning and weekday evening peak hours. The analysis includes conducting capacity analyses to determine how well the roadway system and access drives are projected to operate and whether any roadway improvements or modifications are required.

Traffic Analyses

Intersection analyses were performed for the weekday morning and weekday evening peak hours for the existing, no-build, and total projected (Year 2024) traffic volumes.

The traffic analyses were performed using the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM)*, 6th Edition and analyzed using Synchro/SimTraffic 11 software.

The analyses for the unsignalized intersections determine the average control delay to vehicles at an intersection. Control delay is the elapsed time from a vehicle joining the queue at a stop sign (includes the time required to decelerate to a stop) until its departure from the stop sign and resumption of free flow speed. The methodology analyzes each intersection approach controlled by a stop sign and considers traffic volumes on all approaches and lane characteristics.

The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter from A to F based on the average control delay experienced by vehicles passing through the intersection. The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized intersections and unsignalized intersections are included in the Appendix of this report.

Summaries of the traffic analysis results showing the level of service, overall intersection delay (measured in seconds), volume-to-capacity ratios, and 95th percentile queues for the existing, nobuild and Year 2024 total projected conditions are presented in **Tables 3** through **8**. A discussion of the intersections follows. Summary sheets for the capacity analyses are included in the Appendix.



Table 3 CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS

	Intersection	Weekda Peak	y Morning K Hour	Weekday Evening Peak Hour		
		LOS	Delay	LOS	Delay	
Eu	bank Boulevard NE with Hannett Avenue	e NE ¹				
•	Eastbound Approach	D	26.8	С	23.8	
•	Westbound Approach			E	47.9	
•	Northbound Left Turn	С	24.3	С	21.2	
•	Southbound Left Turn	С	19.6	С	24.4	
Eu	bank Boulevard with Right-In/Right-Out	Access Dr	ive ¹			
•	Westbound Approach	С	21.5	С	21.3	
LO Del	S = Level of Service $1 -$ Two-way stop contains is measured in seconds.	rol				

Table 4

CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS

	Interpretion	Weekday Peak	y Morning Hour	Weekday Evening Peak Hour		
	Intersection	V/C Datio	95 th	V/C Datio	95 th	
Eı	ıbank Boulevard NE with Hannett Avenue	NE ¹	Queues	Katio	Queues	
•	Eastbound Approach	0.124	0.4	0.140	0.5	
•	Westbound Approach			0.025	0.1	
•	Northbound Left Turn	0.101	0.3	0.116	0.4	
•	Southbound Left Turn	0.028	0.1	0.034	0.1	
Eı	ıbank Boulevard with Right-In/Right-Out	Access Dr	ive ¹			
•	Westbound Approach	0.005	0.0	0.014	0.0	
No	te: Queues measured in vehicles					



Table 5 CAPACITY ANALYSIS RESULTS – NO-BUILD CONDITIONS

Intersection	Weekda Peal	y Morning « Hour	Weekday Evening Peak Hour		
	LOS	Delay	LOS	Delay	
Eubank Boulevard NE with Hannett Avenue	e NE ¹				
• Eastbound Approach	D	27.4	С	23.8	
• Westbound Approach			E	49.0	
Northbound Left Turn	С	24.5	С	21.4	
• Southbound Left Turn	С	19.8	С	24.6	
Eubank Boulevard with Right-In/Right-Out	Access Dr	rive ¹			
• Westbound Approach	С	21.6	С	21.5	
LOS = Level of Service 1 – Two-way stop cont Delay is measured in seconds.	rol				

Table 6

CAPACITY ANALYSIS RESULTS – NO-BUILD CONDITIONS

Intersection	Weekday Peak	y Morning Hour	Weekday Evening Peak Hour		
Intersection	V/C	95 th	V/C	95 th	
	Ratio	Queues	Ratio	Queues	
Eubank Boulevard NE with Hannett Avenue	NE ¹				
Eastbound Approach	0.126	0.4	0.140	0.5	
Westbound Approach			0.026	0.1	
Northbound Left Turn	0.102	0.3	0.117	0.4	
• Southbound Left Turn	0.028	0.1	0.034	0.1	
Eubank Boulevard with Right-In/Right-Out	Access Dr	ive ¹			
Westbound Approach	0.005	0.0	0.015	0.0	
Note: Queues measured in vehicles					



Table 7CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS

Intersection	Weekda Peak	y Morning K Hour	Weekday Evening Peak Hour		
	LOS	Delay	LOS	Delay	
Eubank Boulevard NE with Hannett Avenue	e NE ¹				
Eastbound Approach	D	28.1	С	24.0	
Westbound Approach	F	74.6	F	102.4	
Northbound Left Turn	С	23.8	С	21.1	
Southbound Left Turn	С	23.0	D	26.6	
Eubank Boulevard with Right-In/Right-Out	Access Dr	ive ¹			
Westbound Approach	С	16.0	С	19.7	
LOS = Level of Service 1 – Two-way stop cont Delay is measured in seconds.	trol				

Table 8

CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS

Testowastice	Weekday Peak	y Morning K Hour	Weekday Evening Peak Hour		
Intersection	V/C Datio	95 th	V/C Potio	95 th	
Eubank Boulevard NE with Hannett Avenue	NE ¹	Queues	Katio	Queues	
• Eastbound Approach	0.130	0.4	0.142	0.5	
Westbound Approach	0.468	2.0	0.365	1.3	
Northbound Left Turn	0.099	0.3	0.115	0.4	
Southbound Left Turn	0.197	0.7	0.119	0.4	
Eubank Boulevard with Right-In/Right-Out	Access Dr	ive ¹			
• Westbound Approach	0.088	0.3	0.062	0.2	
Note: Queues measured in vehicles					



Discussion and Recommendations

The following summarizes how the intersections are projected to operate and identifies any roadway and traffic control improvements necessary to accommodate the generated traffic.

Eubank Boulevard NE with Hannett Avenue NE

The results of the capacity analysis indicate that the eastbound (Hannett Avenue NE) approach currently operates at level of service (LOS) D during the weekday morning peak hour and at LOS C during the weekday evening peak hour. Under Year 2024 no build conditions, the eastbound approach is projected to continue operating at LOS D during the weekday morning peak hour and at LOS C during the weekday evening peak hour with increases in delay of less than one second. Under Year 2024 total projected conditions, the eastbound approach is projected to continue operating at existing levels of service with increase in delay of approximately one second or less over existing conditions. Northbound left-turn movements are projected to continue operating at LOS C during no-build and total projected conditions with 95th percentile queues of onto vehicle which can be accommodated within the 70 feet of left-turn lane storage provided.

Outbound movements from the existing southerly access drive currently operate at LOS E during the weekday evening peak hour and will continue to operate at LOS E under no-build conditions with increases in delay of approximately one second over existing conditions. It should be noted that no traffic was observed to exit this access drive during the weekday morning peak hour and that the traffic generated at this access drive encompasses the existing traffic generated by Pizza 9 Eubank and Contact Wireless.

Under Year 2024 total projected conditions, outbound movements from the access drive are projected to operate at LOS F during both peak hours. However, this level of service is expected for access driveways that have unsignalized intersections with major arterial roadways such as Eubank Boulevard NE. Furthermore, the volume-to-capacity ratios indicate for the approach will be less than one, indicating the approach has sufficient capacity to accommodate the traffic estimated to be generated by the proposed development and the analyses do not take into consideration the gaps in the Eubank Boulevard NE traffic stream that are created by the signalized intersections of the roadway with Indian School Road NE to the north and Constitution Avenue NE to the south. The 95th percentile queues for outbound movements are projected to be one to two vehicles which will not impact the on-site circulation of vehicles. Overall, the operations of this access drive will not impact the operations of the site due to the following:

- The majority of traffic generated by coffee/donut shops are drive-through trips, given the orientation of the site and drive-through lane vehicles will access the drive-through on the south end of the site and exit the drive-through on the north end of the site.
- The majority of traffic utilizing this driveway are left-turn vehicles. Due to the orientation of the drive-through lane and provision of a northerly right-in/right-out access drive. Outbound vehicles turning right onto Eubank Boulevard are likely to utilize the northerly access drive and not interact with the outbound left-turn vehicles.



- Internal queueing of vehicles waiting to turn left onto Eubank Boulevard NE, which is projected to be one to two vehicles, will not block inbound access to the drive-through lane or to the parking lot and will not impede outbound movements from the drive-through.
- Given that the majority of outbound traffic will originate from the drive-through exit, these vehicles will be able to queue along the north-south drive aisle on the west side of the building and not block on-site circulation.

Southbound left-turn movements from Eubank Boulevard NE onto the access drive are projected to operate at C during the weekday morning peak hour and at LOS D during the weekday evening peak hour with 95th percentile queues of one vehicle, which can be accommodated by the existing 95 feet of storage provided.

As can be seen from the above, the traffic estimated to be generated by the proposed Dunkin will not impact the operations of the Hannett Avenue NE approach to Eubank Boulevard NE, the existing southbound left-turn lane will be adequate in accommodating the traffic generated by the proposed development, and the operations of outbound traffic from the site onto Eubank Boulevard NE will not impact the on-site circulation.

Overall, no roadway improvements will be required to accommodate the traffic estimated to be generated by the proposed Dunkin except for the addition of a stop sign that should be provided for outbound vehicles from the site onto Eubank Boulevard NE.

Eubank Boulevard NE with Northerly Site Access Drives

The results of the capacity analysis indicate that outbound movements from the northerly access drive onto Eubank Boulevard NE currently operates at LOS C during the weekday morning and weekday evening peak hours and is projected to continue operating at LOS C under Year 2024 nobuild conditions. As previously indicated, this access drive is currently restricted to right-turn movements only via the raised concrete median along Eubank Boulevard NE and the traffic counts conducted at this access drive includes the existing traffic generated by the cross access provided to Pizza 9 Eubank and Contact Wireless.

Under Year 2024 projected conditions, outbound movements from the access drive are projected to continue operating at LOS C during the peak hours with 95th percentile queues of one vehicle. As such, this access drive will be adequate in accommodating the traffic estimated to be generated by the proposed development and the traffic currently generated by the adjacent land-uses. As part of the proposed Dunkin, a stop-sign should be provided for outbound movements from the access drive onto Eubank Boulevard NE.



On-Site Circulation and Drive-Through Stacking

Based on a review of the site plan, vehicles entering the drive-through facility for the coffee shop will enter at the southwest corner of the building facing east. Vehicles will proceed to the dual order boards, place their order, and then proceed to the pick-up window located on the north side of the building. Vehicles will then exit the drive-through and will be able to proceed west to the existing right-in/right-out access drive or south to the existing full movement access drive.

A stop sign should be provided for outbound movements from the drive-through onto the main circulation drive aisles and a "Do Not Enter" sign should be provided at the drive-through exit facing west. A barrier median will be provided separating the drive-through lane from the parking lot serving the proposed building, the cross-access connection to Contact Wireless, and from traffic utilizing the cross-access area to Pizza 9 Eubank.

Based on the site plan, the drive-through facility will provide stacking for approximately two vehicles from the pick-up window, five vehicles from the pay window, and nine vehicles from the dual order boards to the drive-through entrance for a total of 16 stacked vehicles.

Observations conducted by KLOA. Inc at existing coffee shops in the Chicagoland area indicated the following:

- During the weekday morning peak period (6:30 A.M. to 9:00 A.M.), an average queue of seven vehicles and a maximum queue of 12 vehicles were observed.
- During the weekday evening peak period (4:00 P.M. to 6:30 P.M.), an average queue of one vehicle and a maximum queue of two vehicles were observed.

As such, the proposed stacking for 16 vehicles will be adequate in accommodating the average and peak drive-through stacking anticipated for the coffee shop.



6. Conclusion

Based on the proceeding analyses and recommendations, the following conclusions have been made:

- The proposed Dunkin will be located at 1600 Eubank Boulevard NE and will be a 1,500 square foot building providing a drive-through that will accommodate 16 vehicles and a parking lot with 13 parking spaces.
- Access to the site will continue to be provided via the two existing curb cuts serving the site which consist of a southerly full movement access drive and a northerly right-in/right-out access drive.
- The volume of traffic estimated to be generated by Dunkin will be reduced due to the high percentage of pass-by trips anticipated to be diverted from the existing traffic on Eubank Boulevard NE.
- The traffic generated by Dunkin will have a limited impact on the intersection of Eubank Boulevard NE with Hannett Avenue NE and no roadway or traffic control improvements will be required.
- The access drives are projected to be adequate in accommodating the traffic estimated to be generated by Dunkin and will provide flexible and efficient access to the site as well as the adjacent sites that have cross access to the access drives.
- As part of the proposed development, stop signs should be provided for outbound traffic from the access drives onto Eubank Boulevard NE
- The drive-through stacking of 16 vehicles will be adequate in accommodating the peak drive-through activity for the coffee shop.



Appendix

Scope of Traffic Impact Study Traffic Count Summary Sheets Site Plan ITE Trip Generation Summary Sheets Level of Service Criteria Capacity Analysis Summary Sheets

Scope of Traffic Impact Study

SCOPE OF TRAFFIC IMPACT STUDY (TIS)

TO: Brendan May, PE, PTOE KLOA, Inc. 9575 W. Higgins Road, Suite 400 Rosemont, Illinois 60018

MEETING DATE: Wednesday, April 26, 2023 – Was a virtual meeting held

ATTENDEES: Matthew Grush, P.E. (City of Albuquerque), Brendan May, PE, PTOE (KLOA, Inc.), Luay Aboona, PE, PTOE (KLOA, Inc.), Jeff Wooten, PE, LEED AP (Wooten Engineering, LLC)

PROJECT: Dunkin Donuts 1600 Eubank Blvd NE (Eubank Boulevard/Hannett Avenue)

REQUESTED CITY ACTION: Zone Change X Site Development Plan

____ Subdivision ____ Building Permit ____ Sector Plan ____ Sector Plan Amendment

____ Curb Cut Permit ____ Conditional Use ____ Annexation ____ Site Plan Amendment

ASSOCIATED APPLICATION: Coffee Shop with Drive-Through Window (1,500 s.f.)

SCOPE OF REPORT:

The Traffic Impact Study should follow the standard report format, which is outlined in the DPM. The following supplemental information is provided for the preparation of this specific study.

- 1. Trip Generation Use Trip Generation Manual, 11th Edition.
- 2. Appropriate study area: Signalized Intersections; N/A

Unsignalized Intersections;

- a. Eubank Boulevard with Hannett Avenue
- b. Eubank Boulevard with northerly site access drive

Driveway Intersections: all site drives.- confirmed

3. Intersection turning movement counts

Study Time – 7-9 a.m. peak hour, 4-6 p.m. peak hour Consultant to provide for all intersections listed above.

- 4. Type of intersection progression and factors to be used. Information to be determined from the results of the traffic counts
- 5. Boundaries of area to be used for trip distribution. 2 mile radius – commercial;

6. Basis for trip distribution.

Commercial - Use relationship based upon population. Use population data from 2040 Socioeconomic Forecasts, MRCOG – See MRCOG website for most current data. Commercial -

Ts = (Tt) (Sp) / (Sp) Ts = Development to Individual Subarea Trips Tt = Total Trips Sp = Subarea Population

- 7. Traffic Assignment. Logical routing on the major street system.
- 8. Proposed developments which have been approved but not constructed that are to be Included in the analyses. Projects in the area include: N/A
- Method of intersection capacity analysis planning or operational (see "2016 Highway Capacity Manual" or equivalent [i.e. HCS, Synchro, Teapac, etc.] as approved by staff). Must use latest version of design software and/or current edition of design manual. Implementation Year: 2024
- 10. Traffic conditions for analysis:
 - a. Existing analysis <u>X</u> yes ____ no year (2023);
 - b. Phase implementation year(s) without proposed development N/A
 - c. Phase implementation year(s) with proposed development N/A
 - d. Project completion year without proposed development 2025
 - e. Project completion year with proposed development 2025
 - f. Other -
- 11. Background traffic growth.

Method: use 10-year historical growth based on standard data from the MRCOG Traffic Flow Maps. Minimum growth rate to be used is 1/2%.

- Planned (programmed) traffic improvements. List planned CIP improvements in study area and projected project implementation year:
 a. N/A
- 13. Items to be included in the study:
 - a. Intersection analysis. Yes
 - b. Signal progression An analysis is required if the driveway analysis indicates a traffic signal is possibly warranted. Analysis Method: N/A
 - c. Arterial LOS analysis; No
 - d. Recommended street, intersection and signal improvements. Yes
 - e. Site design features such as turning lanes, median cuts, queuing requirements and site circulation, including driveway signalization and visibility. Yes
 - f. Transportation system impacts.
 - g. Other mitigating measures. Yes
 - h. Accident analyses X yes ____ no; Location(s): Eubank/Hannett (5 years)
 - i. Weaving analyses ____yes <u>X</u> no; Location(s): N/A
- 14. Other: N/A

SUBMITTAL REQUIREMENTS:

- 1. Number of copies of report required
 - a. 1 paper copy
 - b. 1 digital copy
- 2. Submittal Fee \$1300 for up to 3 reviews plus technology fee

The Traffic Impact Study for this development proposal, project name, shall be performed in accordance with the above criteria. If there are any questions regarding the above items, please contact me at 505-924-3362.

MPMP.E.

6/9/2023

Date

Matt Grush, P.E. Senior Engineer City of Albuquerque, Planning Transportation Development Section

via: email

C: TIS Task Force Attendees, file

Traffic Count Summary Sheets

LOCATION: E	ATION: Eubank Blvd NE Hannett Ave NE/South Gas Station (/STATE: Albuquergue, NM														QC DATE:	C <mark>JOB</mark>	#: 162(Лау 23	04801 2023	
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Peak 15-Min Flowrates	Left	North Thru	bound Right	U	Left	South Thru	bound Right	U	Left	Eastb Thru	ound Right	U	Left	Westl Thru	oound Right	U	To	tal	
All Vehicles Heavy Trucks Buses Pedestrians Bicycles Scooters	20 0 0	14 <u>40</u> 32 0 0	0 0 0	0	0 0 0	14 <u>16</u> 20 0 0	8 0 0	8	0 0 0	0 0 0 0	16 0 0	0	0 0 0	0 0 0 0	0 0 0	0	29 5 (08 2	
Comments:																			

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Flowrates	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	То	tal
All Vehicles	20	1696	4	0	4	1336	8	12	8	0	40	0	0	0	0	0	31	28
Heavy Trucks Buses Pedestrians Bicycles	0	4 0 0	0		0	28 0 0	0		0	0 0 0	0		0	0 0 0	0		3 ((2
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8:30 AM	2	206	0	0	1	266	6	2	0	0	6	0	0	0	0	0	489	2392
8:45 AM	2	208	0	0	0	257	1	1	0	0	4	0	0	0	0	0	473	2140
Peak 15-Min Flowrates	Left	Thru	Right	U	left	Thru	Right	U	left	Thru	Right	U	Left	Thru	Right	U	To	al
All Vehicles	20	1416	0	0	0	1420	20	4	0	0	20	0	0	0	0	0	29	00
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5:00 PIVI 5:15 PM	2	429	0	0	3	329	5	0	1	1	8 8	0	0	0	1	0	786	2786
5:30 PM	8	385	0	0	0	317	7	0	3	0	4	0	0	0	1	0	725	2921
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Flowrates	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Tot	al
All Vehicles	8	1716	0	0	12	1344	20	0	4	4	32	0	0	0	4	0	31	44
Heavy Trucks Buses	0	8	0		0	4	0		0	0	0		0	0	0		1	2
Pedestrians Bicycles Scooters	0	0 0	0		0	0 0	0		0	0 0	0		0	0 0	0		C C	
Comments:																		

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Site Plan





VICINITY MAP LEGAL DESCRIPTION: Lot 2, in Tract "S-1" of Unit 2, Atrisco Business Park, Albuquerque, NM.

.\ARIA STUDIO CONSULTANTS Logo-01.tif

100 Gold Ave. SW, Suite 205, Albuquerque, NM 87102 Daniel@ariascinc.com (505) 506-2314

Dunkin Donuts

Restaurant w/ Drive-Thru 1600 Eubank Blvd. NE Albuquerque, NM 87112

markdatedescriptionrevisionsCONCEPTUALproject no2022056

February 27, 2023

drawn by checked by date

SITE PLAN

N N PO Rid Pho S

Wooten Engineering PO Box 15814 Rio Rancho, NM 87174 Phone: (505) 980-3560

C100

ITE Trip Generation Summary Sheets

Coffee/Donut Shop with Drive-Through Window (937)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 6

Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
533.57	309.41 - 869.00	243.65

Data Plot and Equation





Coffee/Donut Shop with Drive-Through Window (937)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 78

Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
85.88	18.51 - 282.05	44.92

Data Plot and Equation



Coffee/Donut Shop with Drive-Through Window (937)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 36

Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
38.99	13.78 - 92.31	17.79

Data Plot and Equation





Level of Service Criteria

LEVEL OF SERVICE CRITERIA

	Signalized Int	tersections	
Level of			Average Control Delay
Service	Interpretation	1	(seconds per vehicle)
A	Favorable progression. Most veh green indication and travel through stopping.	icles arrive during the the intersection without	≤10
В	Good progression, with more vehi Level of Service A.	icles stopping than for	>10 - 20
С	Individual cycle failures (i.e., one o are not able to depart as a result o during the cycle) may begin to appe stopping is significant, although m through the intersection without sto	r more queued vehicles of insufficient capacity ar. Number of vehicles hany vehicles still pass pping.	>20 - 35
D	The volume-to-capacity ratio is high is ineffective or the cycle length is to stop and individual cycle failures an	n and either progression po long. Many vehicles re noticeable.	>35 - 55
E	Progression is unfavorable. The veri is high and the cycle length is le failures are frequent.	olume-to-capacity ratio ong. Individual cycle	>55 - 80
F	The volume-to-capacity ratio is ve very poor, and the cycle length is lo clear the queue.	ry high, progression is ong. Most cycles fail to	>80.0
	Unsignalized In	ntersections	
	Level of Service	Average Total Del	ay (SEC/VEH)
	А	0 -	10
	В	> 10 -	15
	С	> 15 -	25
	D	> 25 -	35
	Ε	> 35 -	50
	F	> 50)
Source: Highwa	<i>ty Capacity Manual</i> , 6 th Edition.		

Capacity Analysis Summary Sheets Existing Weekday Morning Peak Hour

Intersection

Int Delay, s/veh

0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		۲.	朴朴。		۲.	**	
Traffic Vol, veh/h	3	0	17	0	0	0	18	1094	0	6	1354	7
Future Vol, veh/h	3	0	17	0	0	0	18	1094	0	6	1354	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	17	2	0
Mvmt Flow	3	0	20	0	0	0	21	1272	0	7	1574	8

Major/Minor	Minor2		Ν	Ainor1		Ν	Najor1		Ν	/lajor2			
Conflicting Flow All	2143	2906	791	1958	2910	636	1582	0	0	1272	0	0	
Stage 1	1592	1592	-	1314	1314	-	-	-	-	-	-	-	
Stage 2	551	1314	-	644	1596	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.64	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.27	-	-	
Pot Cap-1 Maneuver	53	16	289	69	16	364	207	-	-	253	-	-	
Stage 1	78	169	-	122	230	-	-	-	-	-	-	-	
Stage 2	448	230	-	394	168	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	· 48	14	289	58	14	364	207	-	-	253	-	-	
Mov Cap-2 Maneuver	· 63	89	-	93	83	-	-	-	-	-	-	-	
Stage 1	70	164	-	110	207	-	-	-	-	-	-	-	
Stage 2	403	207	-	357	163	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	26.8	0	0.4	0.1	
HCM LOS	D	А			

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1W	/BLn1	SBL	SBT	SBR	
Capacity (veh/h)	207	-	-	188	-	253	-	-	
HCM Lane V/C Ratio	0.101	-	-	0.124	-	0.028	-	-	
HCM Control Delay (s)	24.3	-	-	26.8	0	19.6	-	-	
HCM Lane LOS	С	-	-	D	А	С	-	-	
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-	0.1	-	-	

Intersection

Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		1	朴朴			*††
Traffic Vol, veh/h	0	1	1096	1	0	1367
Future Vol, veh/h	0	1	1096	1	0	1367
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage	,# 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	100	3	0	0	2
Mvmt Flow	0	1	1274	1	0	1590

Major/Minor	Minor1	Μ	lajor1	Ma	jor2		
Conflicting Flow All	-	638	0	0	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	
Critical Hdwy	-	9.1	-	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	
Follow-up Hdwy	-	4.9	-	-	-	-	
Pot Cap-1 Maneuver	0	219	-	-	0	-	
Stage 1	0	-	-	-	0	-	
Stage 2	0	-	-	-	0	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	· -	219	-	-	-	-	
Mov Cap-2 Maneuver	· _	-	-	-	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	21.5	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 219	-
HCM Lane V/C Ratio	-	- 0.005	-
HCM Control Delay (s)	-	- 21.5	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0	-

Capacity Analysis Summary Sheets Existing Weekday Evening Peak Hour

Intersection

Int Delay, s/veh

0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			÷		5	朴朴。		ľ	***	
Traffic Vol, veh/h	4	0	25	1	0	1	27	1533	2	6	1299	14
Future Vol, veh/h	4	0	25	1	0	1	27	1533	2	6	1299	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	0	0	1	0	0	1	0
Mvmt Flow	4	0	27	1	0	1	29	1648	2	6	1397	15

Major/Minor	Minor2		Ν	Ainor1		N	Major1		Ν	/lajor2			
Conflicting Flow All	2134	3125	706	2278	3131	825	1412	0	0	1650	0	0	
Stage 1	1417	1417	-	1707	1707	-	-	-	-	-	-	-	
Stage 2	717	1708	-	571	1424	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.18	6.4	6.5	7.1	5.3	-	-	5.3	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.94	3.8	4	3.9	3.1	-	-	3.1	-	-	
Pot Cap-1 Maneuver	54	11	321	44	11	274	251	-	-	192	-	-	
Stage 1	103	205	-	64	148	-	-	-	-	-	-	-	
Stage 2	356	148	-	436	204	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	r 48	9	321	36	9	274	251	-	-	192	-	-	
Mov Cap-2 Maneuver	r 77	74	-	51	71	-	-	-	-	-	-	-	
Stage 1	91	199	-	57	131	-	-	-	-	-	-	-	
Stage 2	314	131	-	387	198	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	23.8	47.9	0.4	0.1	
HCM LOS	С	E			

Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1	VBLn1	SBL	SBT	SBR	
Capacity (veh/h)	251	-	-	223	86	192	-	-	
HCM Lane V/C Ratio	0.116	-	-	0.14	0.025	0.034	-	-	
HCM Control Delay (s)	21.2	-	-	23.8	47.9	24.4	-	-	
HCM Lane LOS	С	-	-	С	Ε	С	-	-	
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.1	0.1	-	-	

Intersection

Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		1	朴朴			^
Traffic Vol, veh/h	0	3	1538	0	0	1319
Future Vol, veh/h	0	3	1538	0	0	1319
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage	, # 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	33	1	0	0	1
Mvmt Flow	0	3	1654	0	0	1418

Major/Minor	Minor1	N	lajor1	Ma	ijor2					
Conflicting Flow All	-	827	0	0	-	-				
Stage 1	-	-	-	-	-	-				
Stage 2	-	-	-	-	-	-				
Critical Hdwy	-	7.76	-	-	-	-				
Critical Hdwy Stg 1	-	-	-	-	-	-				
Critical Hdwy Stg 2	-	-	-	-	-	-				
Follow-up Hdwy	-	4.23	-	-	-	-				
Pot Cap-1 Maneuver	0	224	-	-	0	-				
Stage 1	0	-	-	-	0	-				
Stage 2	0	-	-	-	0	-				
Platoon blocked, %			-	-		-				
Mov Cap-1 Maneuver	r -	224	-	-	-	-				
Mov Cap-2 Maneuver	r -	-	-	-	-	-				
Stage 1	-	-	-	-	-	-				
Stage 2	-	-	-	-	-	-				

Approach	WB	NB	SB
HCM Control Delay, s	21.3	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 224	-
HCM Lane V/C Ratio	-	- 0.014	-
HCM Control Delay (s)	-	- 21.3	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0	-

Capacity Analysis Summary Sheets Year 2024 No-Build Weekday Morning Peak Hour

Intersection

Int Delay, s/veh

0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			÷		5	朴朴		5	***	
Traffic Vol, veh/h	3	0	17	0	0	0	18	1099	0	6	1361	7
Future Vol, veh/h	3	0	17	0	0	0	18	1099	0	6	1361	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	17	2	0
Mvmt Flow	3	0	20	0	0	0	21	1278	0	7	1583	8

Major/Minor	Minor2		Ν	Ainor1		ſ	Major1		Ν	/lajor2			
Conflicting Flow All	2154	2921	796	1967	2925	639	1591	0	0	1278	0	0	
Stage 1	1601	1601	-	1320	1320	-	-	-	-	-	-	-	
Stage 2	553	1320	-	647	1605	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.64	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.27	-	-	
Pot Cap-1 Maneuver	52	16	287	68	15	363	205	-	-	251	-	-	
Stage 1	76	167	-	121	228	-	-	-	-	-	-	-	
Stage 2	447	228	-	392	166	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	• 47	14	287	57	13	363	205	-	-	251	-	-	
Mov Cap-2 Maneuver	· 61	88	-	92	82	-	-	-	-	-	-	-	
Stage 1	68	162	-	109	205	-	-	-	-	-	-	-	
Stage 2	401	205	-	355	161	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	27.4	0	0.4	0.1	
HCM LOS	D	Α			

Minor Lane/Major Mvmt	NBL	NBT	NBR E	EBLn1W	/BLn1	SBL	SBT	SBR
Capacity (veh/h)	205	-	-	184	-	251	-	-
HCM Lane V/C Ratio	0.102	-	-	0.126	-	0.028	-	-
HCM Control Delay (s)	24.5	-	-	27.4	0	19.8	-	-
HCM Lane LOS	С	-	-	D	А	С	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-	0.1	-	-

Intersection

0					
WBL	WBR	NBT	NBR	SBL	SBT
	1	朴朴			^
0	1	1101	1	0	1374
0	1	1101	1	0	1374
0	0	0	0	0	0
Stop	Stop	Free	Free	Free	Free
-	None	-	None	-	None
-	0	-	-	-	-
,# 0	-	0	-	-	0
0	-	0	-	-	0
86	86	86	86	86	86
0	100	3	0	0	2
0	1	1280	1	0	1598
	0 WBL 0 0 Stop - , # 0 0 86 0 0	0 WBL WBR 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 10 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	0 WBR NBT WBL WBR NBT 0 1101 0 1101 0 1101 0 0 Stop Stop Stop Stop . None . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 100 . 3 . 1280	0 NBR NBR WBL WBR NBT NBR WBL MBR 1101 11 0 1101 1101 1 0 1101 1101 1 0 0 0 0 Stop Stop Free Free . None . None . 0 . . . 0 . . . 0 . . . 0 0 0 	WBL WBR NBT NBR SBL WBL 101 NBR SBL 0 1 1101 1 0 0 1 1101 1 0 0 1 1101 1 0 0 0 0 0 0 0 0 0 0 0 Stop Stop Free Free Free None - None - - 0 0 0 0 - - 4 0 - None - - 4 0 - None - - 4 0 - None - - 5 0 - 0 - - 6 86 86 86 86 0 - 7 1280 11 1280 11 0

Major/Minor	Minor1	Μ	lajor1	Ma	ajor2		
Conflicting Flow All	-	641	0	0	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	
Critical Hdwy	-	9.1	-	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	
Follow-up Hdwy	-	4.9	-	-	-	-	
Pot Cap-1 Maneuver	0	218	-	-	0	-	
Stage 1	0	-	-	-	0	-	
Stage 2	0	-	-	-	0	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	r -	218	-	-	-	-	
Mov Cap-2 Maneuver	r -	-	-	-	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn	1 SBT
Capacity (veh/h)	-	- 21	8 -
HCM Lane V/C Ratio	-	- 0.00	5 -
HCM Control Delay (s)	-	- 21.	6 -
HCM Lane LOS	-	-	- 2
HCM 95th %tile Q(veh)	-	-	- C

Capacity Analysis Summary Sheets Year 2024 No-Build Weekday Evening Peak Hour

Intersection

Int Delay, s/veh

0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			÷		5	朴朴。		5	**	
Traffic Vol, veh/h	4	0	25	1	0	1	27	1541	2	6	1305	14
Future Vol, veh/h	4	0	25	1	0	1	27	1541	2	6	1305	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	0	0	1	0	0	1	0
Mvmt Flow	4	0	27	1	0	1	29	1657	2	6	1403	15

Major/Minor	Minor2		N	Minor1		ſ	Major1		Ν	Najor2			
Conflicting Flow All	2144	3140	709	2289	3146	830	1418	0	0	1659	0	0	
Stage 1	1423	1423	-	1716	1716	-	-	-	-	-	-	-	
Stage 2	721	1717	-	573	1430	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.18	6.4	6.5	7.1	5.3	-	-	5.3	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.94	3.8	4	3.9	3.1	-	-	3.1	-	-	
Pot Cap-1 Maneuver	53	11	319	43	11	272	249	-	-	190	-	-	
Stage 1	102	204	-	63	146	-	-	-	-	-	-	-	
Stage 2	354	146	-	435	202	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	r 47	9	319	35	9	272	249	-	-	190	-	-	
Mov Cap-2 Maneuver	r 77	73	-	50	70	-	-	-	-	-	-	-	
Stage 1	90	197	-	56	129	-	-	-	-	-	-	-	
Stage 2	312	129	-	386	196	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	23.8	49	0.4	0.1	
HCM LOS	С	E			

Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1V	VBLn1	SBL	SBT	SBR
Capacity (veh/h)	249	-	-	223	84	190	-	-
HCM Lane V/C Ratio	0.117	-	-	0.14	0.026	0.034	-	-
HCM Control Delay (s)	21.4	-	-	23.8	49	24.6	-	-
HCM Lane LOS	С	-	-	С	Ε	С	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.1	0.1	-	-

Intersection

Int Delay, s/veh	0							
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations		1	朴朴			^		
Traffic Vol, veh/h	0	3	1546	0	0	1325		
Future Vol, veh/h	0	3	1546	0	0	1325		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	-	0	-	-	-	-		
Veh in Median Storage	, # 0	-	0	-	-	0		
Grade, %	0	-	0	-	-	0		
Peak Hour Factor	93	93	93	93	93	93		
Heavy Vehicles, %	0	33	1	0	0	1		
Mvmt Flow	0	3	1662	0	0	1425		

Major/Minor	Minor1	N	lajor1	Ma	ajor2				
Conflicting Flow All	-	831	0	0	-	-			
Stage 1	-	-	-	-	-	-			
Stage 2	-	-	-	-	-	-			
Critical Hdwy	-	7.76	-	-	-	-			
Critical Hdwy Stg 1	-	-	-	-	-	-			
Critical Hdwy Stg 2	-	-	-	-	-	-			
Follow-up Hdwy	-	4.23	-	-	-	-			
Pot Cap-1 Maneuver	0	222	-	-	0	-			
Stage 1	0	-	-	-	0	-			
Stage 2	0	-	-	-	0	-			
Platoon blocked, %			-	-		-			
Mov Cap-1 Maneuve	r -	222	-	-	-	-			
Mov Cap-2 Maneuve	r -	-	-	-	-	-			
Stage 1	-	-	-	-	-	-			
Stage 2	-	-	-	-	-	-			

Approach	WB	NB	SB
HCM Control Delay, s	21.5	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn	SBT
Capacity (veh/h)	-	- 222	-
HCM Lane V/C Ratio	-	- 0.01	, –
HCM Control Delay (s)	-	- 21.	, -
HCM Lane LOS	-	- (-
HCM 95th %tile Q(veh)	-	- () -

Capacity Analysis Summary Sheets Year 2024 Total Projected Weekday Morning Peak Hour

Intersection

Int Delay, s/veh

1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		÷			¢		1	<u>₩</u>		1	朴朴。	
Traffic Vol, veh/h	3	0	17	34	0	3	18	1082	27	42	1336	7
Future Vol, veh/h	3	0	17	34	0	3	18	1082	27	42	1336	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	17	2	0
Mvmt Flow	3	0	20	40	0	3	21	1258	31	49	1553	8

Major/Minor	Minor2		N	Ainor1		ſ	Major1		Ν	/lajor2			
Conflicting Flow All	2200	2986	781	2035	2975	645	1561	0	0	1289	0	0	
Stage 1	1655	1655	-	1316	1316	-	-	-	-	-	-	-	
Stage 2	545	1331	-	719	1659	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.64	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.27	-	-	
Pot Cap-1 Maneuver	49	14	293	62	14	360	212	-	-	248	-	-	
Stage 1	70	157	-	122	229	-	-	-	-	-	-	-	
Stage 2	452	226	-	355	156	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	- 38	10	293	45	10	360	212	-	-	248	-	-	
Mov Cap-2 Maneuver	· 56	68	-	86	67	-	-	-	-	-	-	-	
Stage 1	63	126	-	110	206	-	-	-	-	-	-	-	
Stage 2	403	204	-	266	125	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	28.1	74.6	0.4	0.7	
HCM LOS	D	F			

Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1V	VBLn1	SBL	SBT	SBR
Capacity (veh/h)	212	-	-	179	92	248	-	-
HCM Lane V/C Ratio	0.099	-	-	0.13	0.468	0.197	-	-
HCM Control Delay (s)	23.8	-	-	28.1	74.6	23	-	-
HCM Lane LOS	С	-	-	D	F	С	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	2	0.7	-	-

0.2

Intersection

Int Delay, s/veh

WBL	WBR	NBT	NBR	SBL	SBT
	1	朴朴			† ††
0	27	1084	4	0	1385
0	27	1084	4	0	1385
0	0	0	0	0	0
Stop	Stop	Free	Free	Free	Free
-	None	-	None	-	None
-	0	-	-	-	-
# 0	-	0	-	-	0
0	-	0	-	-	0
86	86	86	86	86	86
0	4	3	0	0	2
0	31	1260	5	0	1610
	WBL 0 0 Stop - 4 0 0 86 0 0	WBL WBR 0 27 0 27 0 27 0 500 Stop Stop - None - 0 # 0 86 86 0 4 0 31	WBL WBR NBT Image: I	WBL WBR NBT NBR Image: I	WBL WBR NBT NBR SBL Image: Image of the system Image of the system Image of the system Image of the system 0 27 1084 4 0 0 27 1084 4 0 0 27 1084 4 0 0 27 1084 4 0 0 27 1084 4 0 0 27 1084 4 0 0 0 0 0 0 0 Stop Stop Free Free Free Free None - None - - - 0 - 0 -

Major/Minor	Minor1	N	lajor1	Ma	jor2		
Conflicting Flow All	-	633	0	0	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	
Critical Hdwy	-	7.18	-	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	
Follow-up Hdwy	-	3.94	-	-	-	-	
Pot Cap-1 Maneuver	0	358	-	-	0	-	
Stage 1	0	-	-	-	0	-	
Stage 2	0	-	-	-	0	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver		358	-	-	-	-	
Mov Cap-2 Maneuver		-	-	-	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 358	-
HCM Lane V/C Ratio	-	- 0.088	-
HCM Control Delay (s)	-	- 16	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0.3	-

<u>Capacity Analysis Summary Sheets</u> Year 2024 Total Projected Weekday Evening Peak Hour

Intersection

Int Delay, s/veh

1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		۲	朴朴		ኘ	朴朴	
Traffic Vol, veh/h	4	0	25	16	0	3	27	1534	14	21	1294	14
Future Vol, veh/h	4	0	25	16	0	3	27	1534	14	21	1294	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	70	-	-	95	-	-
Veh in Median Storage,	,# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	0	0	1	0	0	1	0
Mvmt Flow	4	0	27	17	0	3	29	1649	15	23	1391	15

Major/Minor	Minor2		ľ	Minor1		Ν	Major1		Ν	/lajor2			
Conflicting Flow All	2163	3167	703	2317	3167	832	1406	0	0	1664	0	0	
Stage 1	1445	1445	-	1715	1715	-	-	-	-	-	-	-	
Stage 2	718	1722	-	602	1452	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	7.18	6.4	6.5	7.1	5.3	-	-	5.3	-	-	
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.8	4	3.94	3.8	4	3.9	3.1	-	-	3.1	-	-	
Pot Cap-1 Maneuver	51	11	322	41	11	271	253	-	-	189	-	-	
Stage 1	99	199	-	63	147	-	-	-	-	-	-	-	
Stage 2	355	145	-	417	197	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	· 42	9	322	31	9	271	253	-	-	189	-	-	
Mov Cap-2 Maneuver	· 74	64	-	49	66	-	-	-	-	-	-	-	
Stage 1	88	175	-	56	130	-	-	-	-	-	-	-	
Stage 2	311	128	-	336	173	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB	
HCM Control Delay, s	24	102.4	0.4	0.4	
HCM LOS	С	F			

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1\	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	253	-	-	220	56	189	-	-
HCM Lane V/C Ratio	0.115	-	-	0.142	0.365	0.119	-	-
HCM Control Delay (s)	21.1	-	-	24	102.4	26.6	-	-
HCM Lane LOS	С	-	-	С	F	D	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	1.3	0.4	-	-

Intersection

Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations		1	朴朴			† ††	
Traffic Vol, veh/h	0	15	1539	2	0	1329	
Future Vol, veh/h	0	15	1539	2	0	1329	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	0	-	-	-	-	
Veh in Median Storage	,# 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	93	93	93	93	93	93	
Heavy Vehicles, %	0	7	1	0	0	1	
Mvmt Flow	0	16	1655	2	0	1429	

Major/Minor	Minor1	N	lajor1	Ma	jor2		
Conflicting Flow All	-	829	0	0	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	
Critical Hdwy	-	7.24	-	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	
Follow-up Hdwy	-	3.97	-	-	-	-	
Pot Cap-1 Maneuver	0	261	-	-	0	-	
Stage 1	0	-	-	-	0	-	
Stage 2	0	-	-	-	0	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	r -	261	-	-	-	-	
Mov Cap-2 Maneuver	r -	-	-	-	-	-	
Stage 1	-	-	-	-	-	-	
Stage 2	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	19.7	0	0
HCM LOS	С		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 261	-
HCM Lane V/C Ratio	-	- 0.062	-
HCM Control Delay (s)	-	- 19.7	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0.2	-