TRAFFIC ANALYSIS REPORT

FOR
PROPOSED CHICK-FIL-A

HIGHLAND AVENUE, CINCINNATI, OHIO

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Table of Content

Figures

Tables

List of Appendices

1. Introduction

The purpose of this Traffic Analysis Report (TAR) is to:

- *Describe and measure the impact of traffic generated by the proposed Chick-fil-A on the adjacent existing public street system; and*
- *Provide a list of conclusions and recommendations related to traffic operations and analysis of the proposed access drives on Highland Avenue and East McMillan Street.*

The new Chick-fil-A is proposed at the northwest quadrant of the intersection of Highland Avenue and East McMillan Street in Cincinnati, Ohio. Chick-fil-A store with 5,020 SF is proposed with two access locations. The first access is proposed on Highland Avenue at the north end of the development. The second access drive is proposed on East McMillan Street near the west end of the development. Access Drive (Drive A in Figure 1) on Highland Avenue is proposed with all movements allowed. East McMillan is one-way serving eastbound traffic. Therefore, access on McMillan Street is proposed with left turn in and left turn out only. The location of the site and access locations are shown in Figure 1, and the preliminary site plan is included in Appendix A.

Figure 1 – Site Location

2. Scope of Services

SHA Engineering prepared a Memorandum of Understanding (MOU) and submitted it to City of Cincinnati on October 15, 2024. A copy of the MOU is attached in Appendix B.

3. Existing Conditions

East McMillan Street in the vicinity of the site is one way eastbound only with three lanes. Roadside parking is allowed on East McMillan Street, west of the location of Drive B. It is posted at 35 mph.

Highland Avenue is carrying two-way traffic in northbound and southbound directions. It is posted at 30 mph. In the vicinity of the proposed access drive, Highland Avenue operates with 4 narrow lanes (about 9' wide).

The turning movement counts were completed at the intersection of Highland Avenue and East McMillan Street. The counts were completed October 22, 2024. The counts were used to calculate through volumes on East McMillan Street and Highland Avenue in the vicinity of the proposed access drives. Based on the recorded traffic counts, the Midday Peak Hour was recorded from 12:30 PM to 1:30 PM and the PM Peak Hour was recorded from 3:30 PM to 4:30 PM.

The observed 2024 Midday and PM Peak Hour traffic counts are shown in Figure 2.

The traffic data is included in Appendix C.

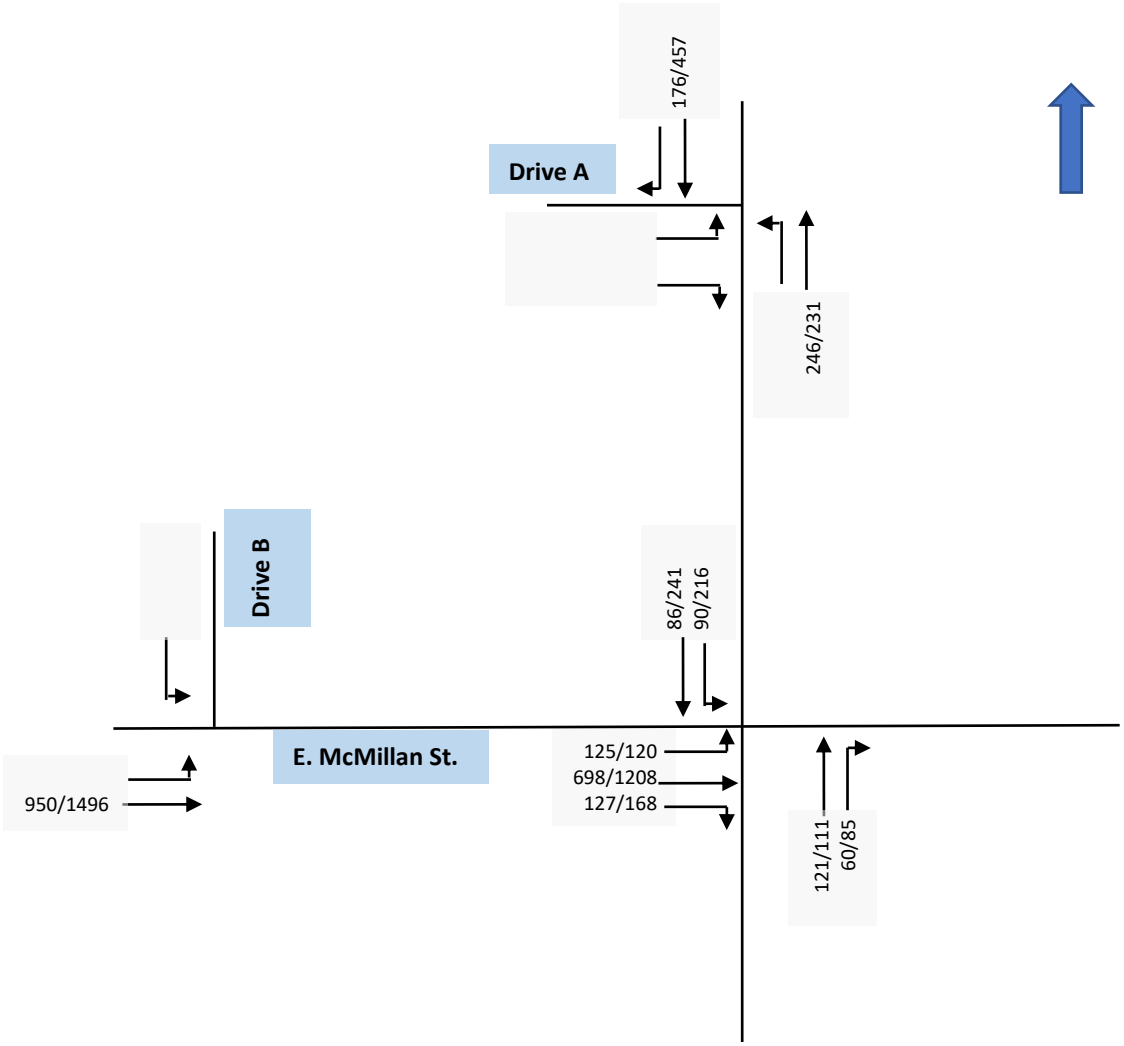


Figure 2 – 2024 Recorded /2025 No Build Traffic –

Midday/PM xxx/xxx/

4. Proposed Development

The new Chick-fil-A is proposed at the northwest quadrant of the intersection of Highland Avenue and East McMillan Street. in the city of Cincinnati, Ohio. Chick-fil-A store with 5,020 SF is proposed with two access locations. The first access is proposed on Highland Avenue at the north end of the development. The second access drive is proposed on East McMillan Street near the west end of the development. Access Drive (Drive A in Figure 1) is proposed Highland Avenue will allow all movements. East McMillan is operating eastbound one-way. Therefore, access on McMillan Street is proposed with left turn in and left turn out only.

The site plan is attached in Appendix A.

5. Trip Generation and Distribution

SHA Engineering completed trip generation calculations for the proposed Chick-fil-A site using the rates identified in Palmer Study referenced in the MOU. The summary of estimated trips is included in Table 1.

Table 1 – Summary of Estimated Trips

Land Use	*Unit*	*Size*	**Midday Peak**			**PM Peak**		
			Enter	***Exit***	***Total***	***Enter***	***Exit***	***Total***
Chick-fil-A	SF	5,020	205	197	402	154	147	301
	Pass-by		101	101	202	75	75	150
	Primary		104	96	200	79	72	151

The existing traffic counts were used for estimating the trip distribution of the new trips. The trip distribution for the new development is based on the following assumptions. The directional counts on Stewart Road were used for trip distribution. Table 2 shows trip distribution used in the study.

Table 1 - Directional Assignment of Estimated Vehicular Trips

	Midday/PM Peak
	From/To
North	30%
South	20%
West	30%
East	20%

5

Figure 5 shows the new trip distribution percentage, and the estimated new trips are shown in Figure 6. The years 2025 and 2035 Build traffic volumes are shown in Figures 7 and 8.

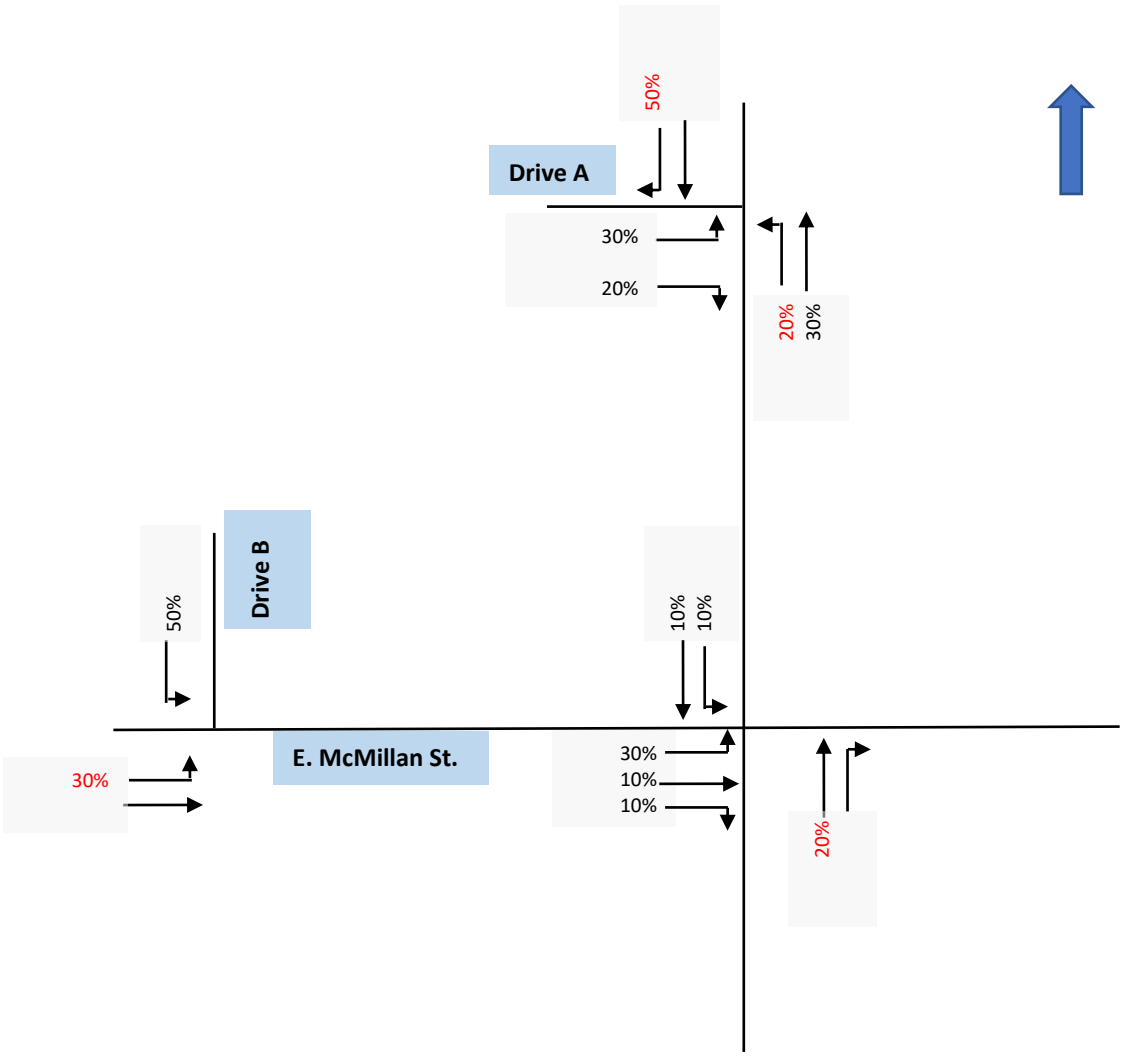
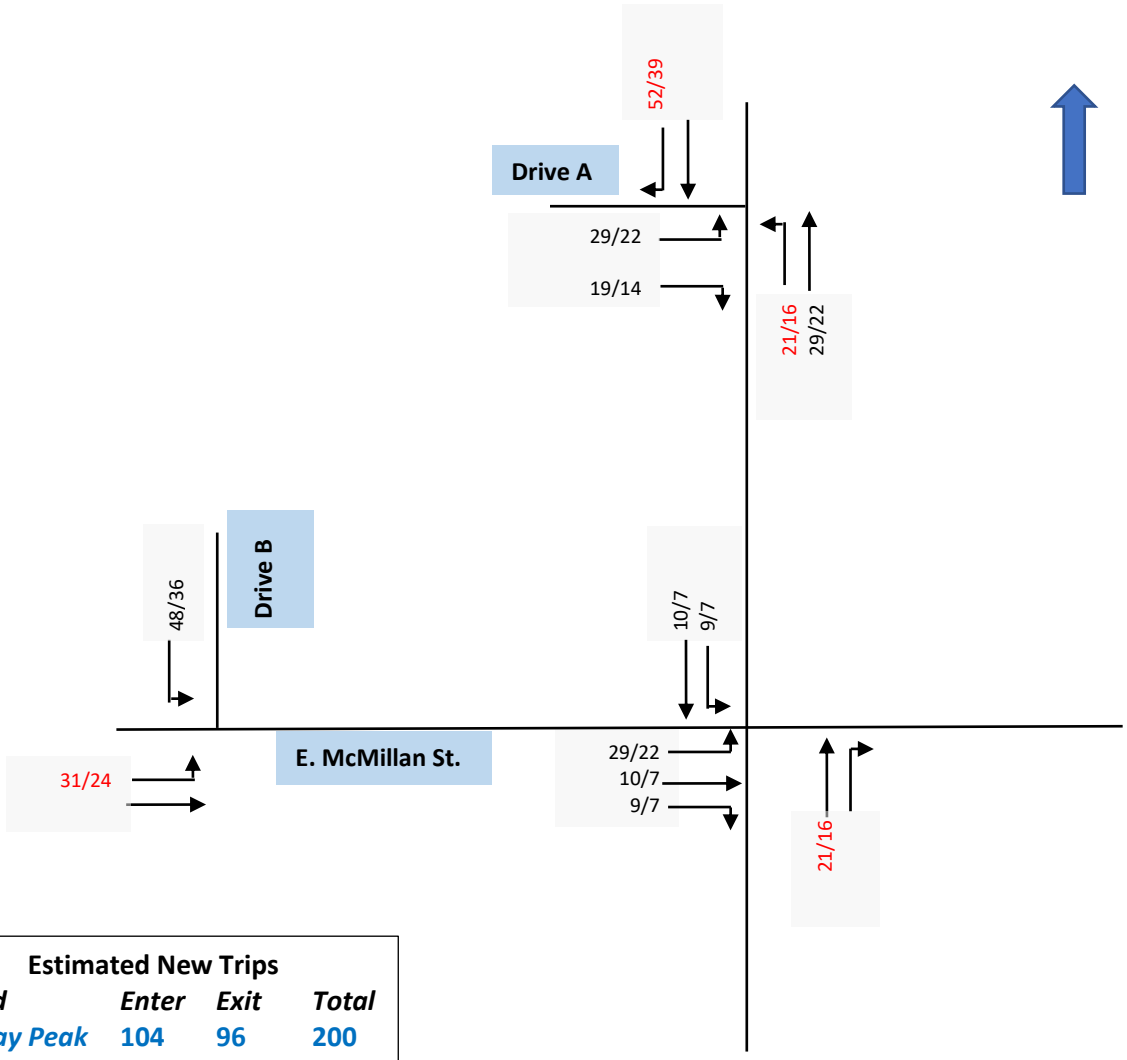


Figure 3 – Trip Distribution (Percentages)

Midday/PM xxx/xxx/



Estimated New Trips			
Period	*Enter*	*Exit*	*Total*
Midday Peak	104	96	200
PM Peak	79	72	151

Figure 4 – Estimated New Trips

Midday/PM xxx/xxx/

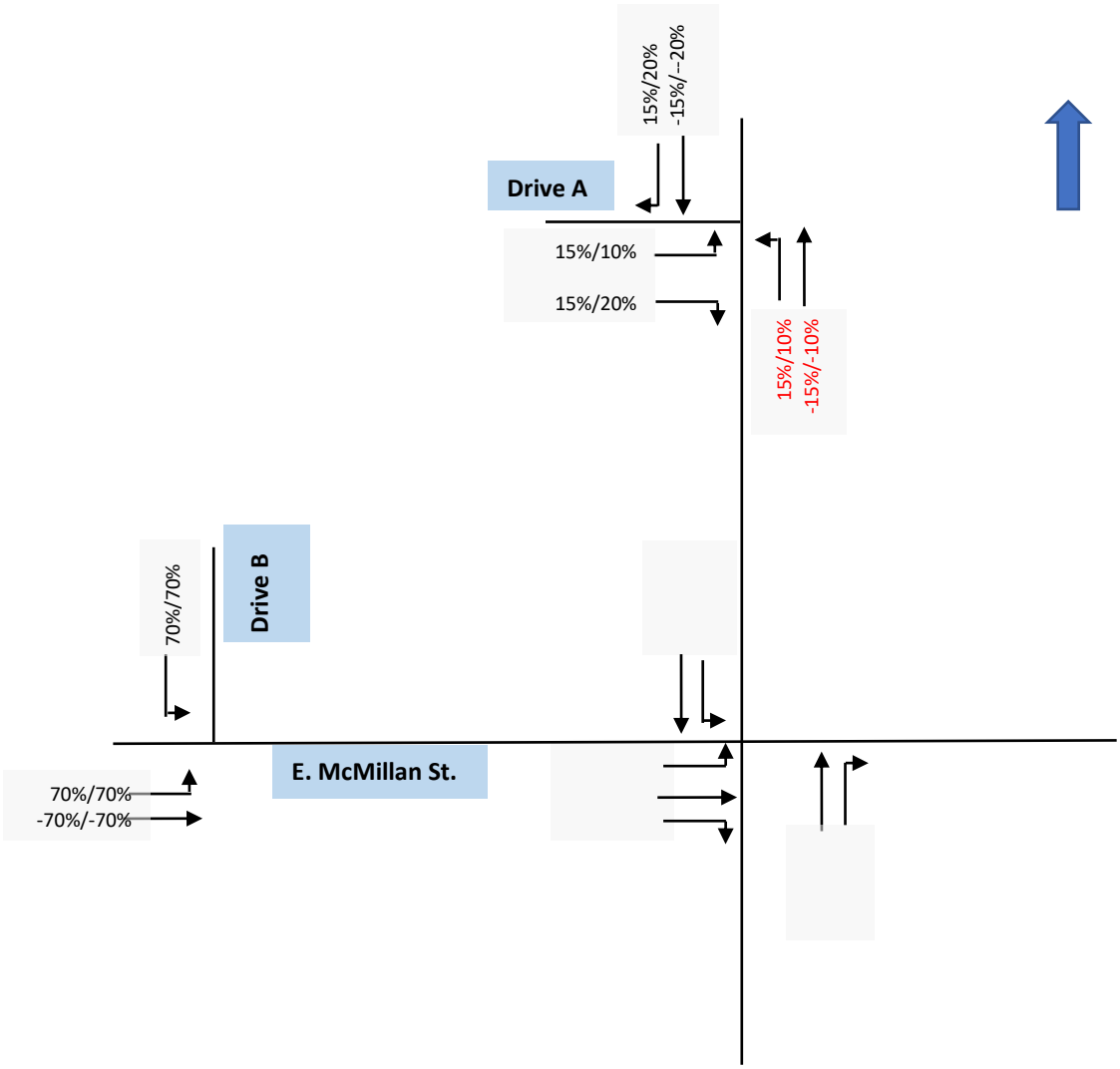
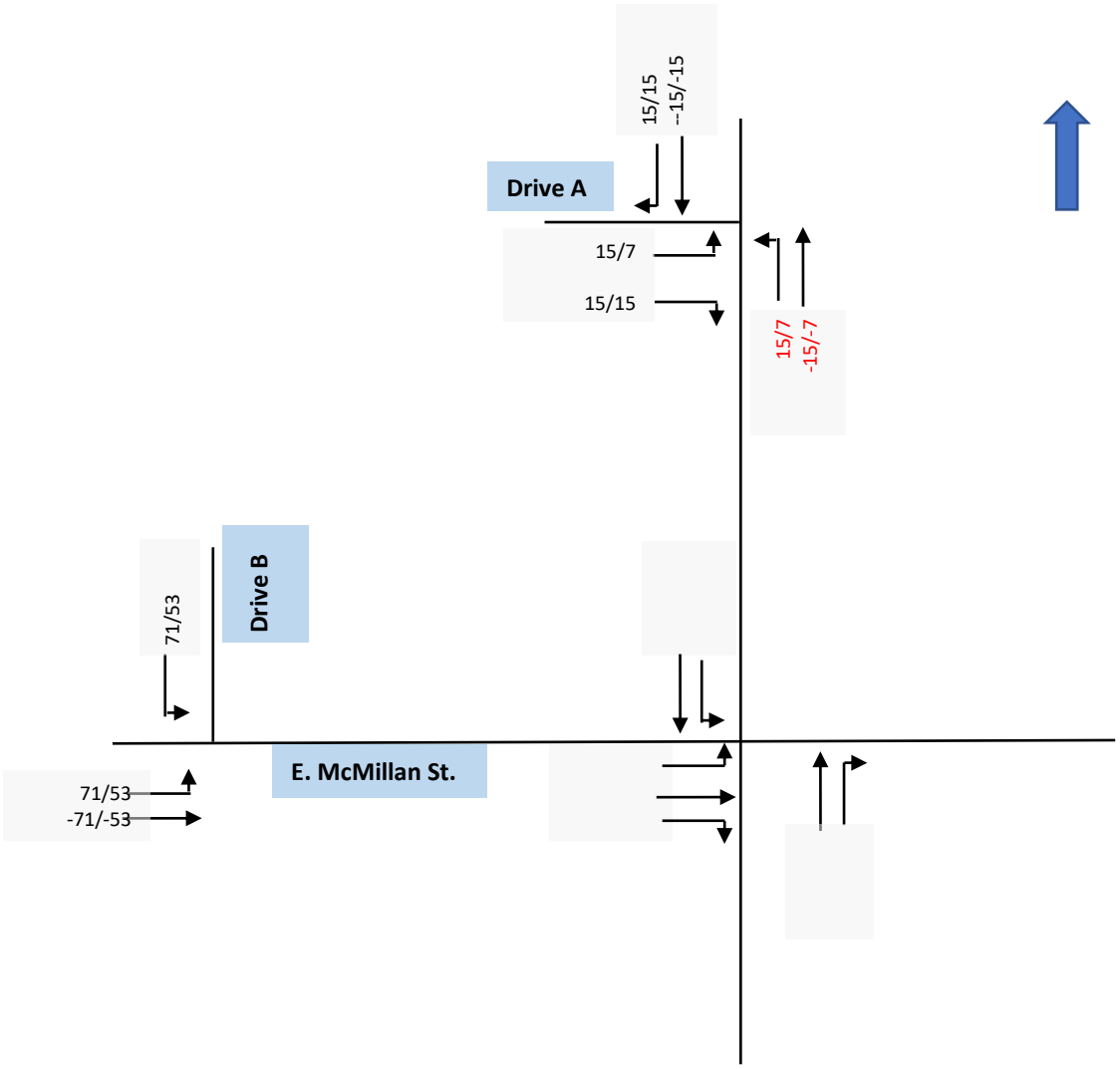


Figure 5 – Pass-by Trips (Percentages)

Midday/PM xxx/xxx/



Estimated Pass-by Trips			
Period	*Enter*	*Exit*	*Total*
Midday Peak	101	101	202
PM Peak	75	75	150

Figure 6 – Estimated Pass-by Trips

Midday/PM xxx/xxx/

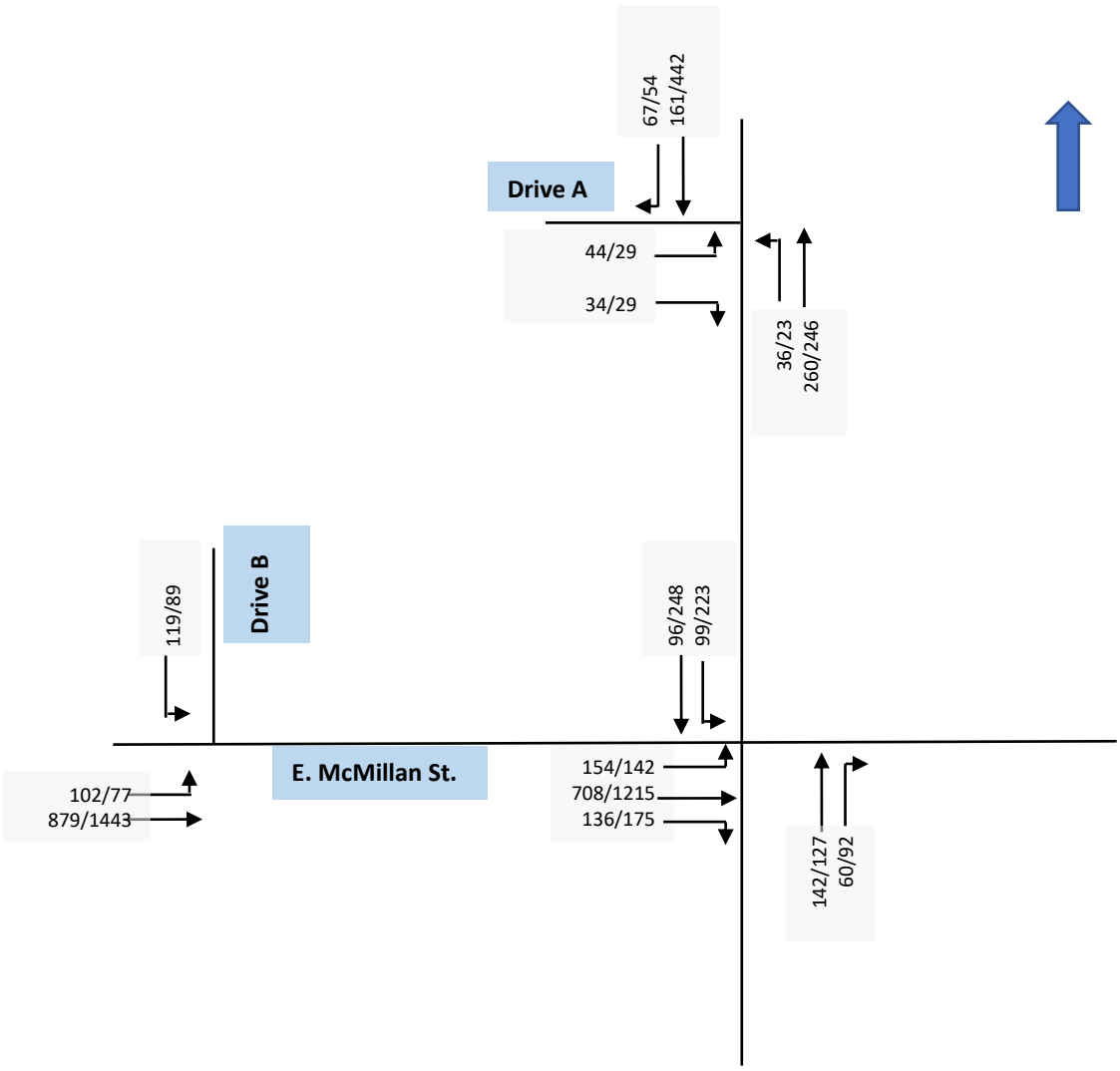


Figure 7 – 2025 Build Traffic

Midday/PM xxx/xxx/

6. Analysis

Turn Lane Warrants

The turn lane warrants were completed using the procedure identified in ODOT Location and Design Manual, Volume 1. The turn lane warrants were analyzed at Drive A on Highland Avenue. The results of the turn lane warrants are summarized below, and detailed warrants are included in Appendix E.

Highland Avenue at Drive A

- The northbound left turn lane from Highland Avenue to westbound on Drive A ***is warranted***.
- The southbound right turn lane from Highland Avenue to westbound on Drive A ***is not warranted***.

East McMillan Street at Drive B

East McMillan Street operates with 3 lanes for the eastbound traffic at Drive B. An exclusive lane for the eastbound left turn lane, with no opposing traffic, is not required.

Capacity Analysis

Capacity analyses were performed for the two access locations for the Chick-fil-A. All the analyses were completed for the Build traffic using Highway Capacity Software (HCS). Capacity of an intersection is quantified by the Level of Service (LOS) which is based upon the amount of delay a vehicle experience while at an intersection. The criterion for both signalized and unsignalized intersections (including roundabouts) are listed below as defined in Chapter 19, 20 and 22 of the Highway Capacity Manual (6th edition) Volume 3.

Table 2 – Signalized/Unsignalized Intersection LOS Criteria (Exhibits 19-8, 20-2, 22-8 HCM)

Level of Service	Control Delay - Signalized Intersections (seconds/vehicle)	*Control Delay – Unsignalized Intersections (seconds/vehicles)
A	*0-10*	*< 10*
B	*>10 – 20*	*>10 – 15*
C	*>20 – 35*	*>15 – 25*
D	*>35 – 55*	*>25 – 35*
E	*>55 – 80*	*>35 – 50*
F	*>80*	*>50*

*If v/c ratio exceeds 1, LOS F

The following is a list of code definitions that are used in the capacity analysis results:

EB/WB/NB/SB – Eastbound/Westbound/Northbound/Southbound
L – Left Turn Movement (exclusive left-turn lane or lanes)
T – Through Movement (exclusive through lane or lanes)
R – Right Turn Movement (exclusive right turn lane or lanes)

LT– Shared left turn and through movement lane
LTR – This provides movements in all directions.
TR – Shared through and right turn movement lane.

The summary of the capacity analysis completed for the intersections in the study area are included below and the results of the capacity analysis are included in Appendix F.

Highland Avenue at Drive A

The intersection will operate with stop control on the eastbound approach on Drive A. The results of capacity analysis are summarized in Table 3.

The analysis completed shows LOS B for the eastbound approach on Drive A. The northbound left turns show LOS A.

Table 3 – Capacity Analysis – Midday/PM Peak – 2025 Build – Highland Avenue at Drive A

	2025 Midday Peak Build (Un-Signalized)					2025 PM Peak Build (Un-Signalized)				
	LOS	Delay (Sec/veh)	v/c	QSR	95th %ile queue	LOS	Delay (Sec/veh)	v/c	QSR	95th %ile queue
NBL	A	7.8	.03		3	A	8.6	.02		3
EBLR	B	11.4	.13		10	B	13.5	.09		8
EB Approach	***B***	***11.4***				***B***	***13.5***			
Intersection	**N/A**					**N/A**				

East McMillan Street at Drive A

The intersection operates with eastbound one-way traffic on McMillan Road and left turn out only movement allowed at Drive B. The intersection will operate with 3 lanes on East McMillan Street. The southbound left turns from Drive B will yield to the eastbound through movement on East McMillan Street. With three lanes on East McMillan Street, the southbound right turn will operate without significant delay. The summary of capacity analysis is included in Table 4 below.

Table 4 – Capacity Analysis – Midday/PM Peak – 2025 Build – East McMillan Street at Drive B

	2025 Midday Peak Build (Un-Signalized)					2025 PM Peak Build (Un-Signalized)				
	LOS	Delay (Sec/veh)	v/c	QSR	95th %ile queue	LOS	Delay (Sec/veh)	v/c	QSR	95th %ile queue
SBL	C	17.0	.30		33	C	19.1	.28		28
SB Approach	***C***	***17.0***				***C***	***19.1***			
Intersection	**N/A**					**N/A**				

7. Findings

The preceding analysis and recommendations listed below are based on the typical procedure used for evaluating the impact of the proposed development on the adjacent roadway infrastructure and usual customary traffic engineering standards.

The results of the analysis completed at each intersection in the study area are summarized below.

Highland Avenue at Drive A

The capacity analysis completed for the intersection shows LOS B for the eastbound approach on Drive A. The turn lane warrants completed for the intersection show the northbound left turn lane from Highland Avenue to westbound on Drive A is warranted. However, the existing conditions will make it challenging to construct the turn lane on Highland Avenue. The northbound and southbound approaches on Highland Avene are operating with two lanes in each direction. The through traffic on Highland Avenue is less than 500 vehicles per hour for all scenarios. The turn lanes from the shared lane will have no significant impact on the northbound and southbound traffic on Highland Avenue.

The southbound approach at the intersection of Highland Avenue and East McMillan Street was examined to check the estimated 95th percentile queues. The summary of estimated 95th percentile queues for the southbound approach are shown in Table 5. Drive A is located about 200 feet north of the intersection with East McMillan Street. The estimated queues shown in Table 3 indicate the queues for the southbound approach at the intersection of Highland Avenue and East McMillan Street will not block Drive A.

Table 5 - Estimated Queues – Highland Avenue at East McMillan Street

	95th Percentile Queue (Ft.)	
	Midday Peak	***PM Peak***
Southbound Left	25	83
Southbound Through	21	86

East McMillan Street at Drive B

East McMillan Street in the vicinity of Drive B is one way carrying traffic in the eastbound direction. The left turns from East McMillan Street to northbound on Drive B can be made with no opposing traffic. Similarly, the southbound left turns from Drive B will only yield to the eastbound traffic on East McMillan Street with 3 lanes available for the movement. The left turns from Drive B can be made with minimal delays. Access Drive B will serve the exiting traffic from the site efficiently and safely.

Recommendations

All improvements to be made as per the recommendations in this study shall be completed following Standards published by Ohio Department of Transportation and supplements to these standards followed by City of Cincinnati.

Highland Avenue at Drive A

- Drive A shall be constructed with a single inbound and single outbound lane.
- A stop sign shall be installed on the eastbound approach on Drive.

East McMillan Street at Drive B

- Drive B shall be constructed with a single inbound and single outbound lane.
- Stop Sign shall be installed on the southbound approach on Drive B.