

March 1, 2022

PK# 3610-21.560

TRAFFIC IMPACT ANALYSIS

Project:

The Hill

In Dallas, Texas

Prepared for:

City of Dallas

On behalf of:

Asana Partners

Prepared by:

Steve E. Stoner

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EXECUTIVE SUMMARY

The services of **Pacheco Koch** were retained by **Asana Partners** to prepare a Traffic Impact Analysis (TIA) for new development at the existing mixed-use property known as *The Hill* (the "Project") located at 8041 Walnut Hill Lane and 9310 N Central Expressway in Dallas, Texas. The Project proposes to increase existing office use and add a new multifamily use to the existing site. For purposes of this study, buildout of the Project is estimated to occur by 2025. A TIA is required by the City of Dallas for review as part of the Owner's request for a zoning change of the subject properties.

The purpose of this report is to estimate the incremental impact on the background traffic operational conditions caused by the proposed development within a specific study area as determined by standardized engineering analyses. The study parameters used in this TIA are based upon the requirements of City and are consistent with the standard industry practices used in similar studies.

Based upon the analyses performed herein, Pacheco Koch developed the following findings and recommendations.

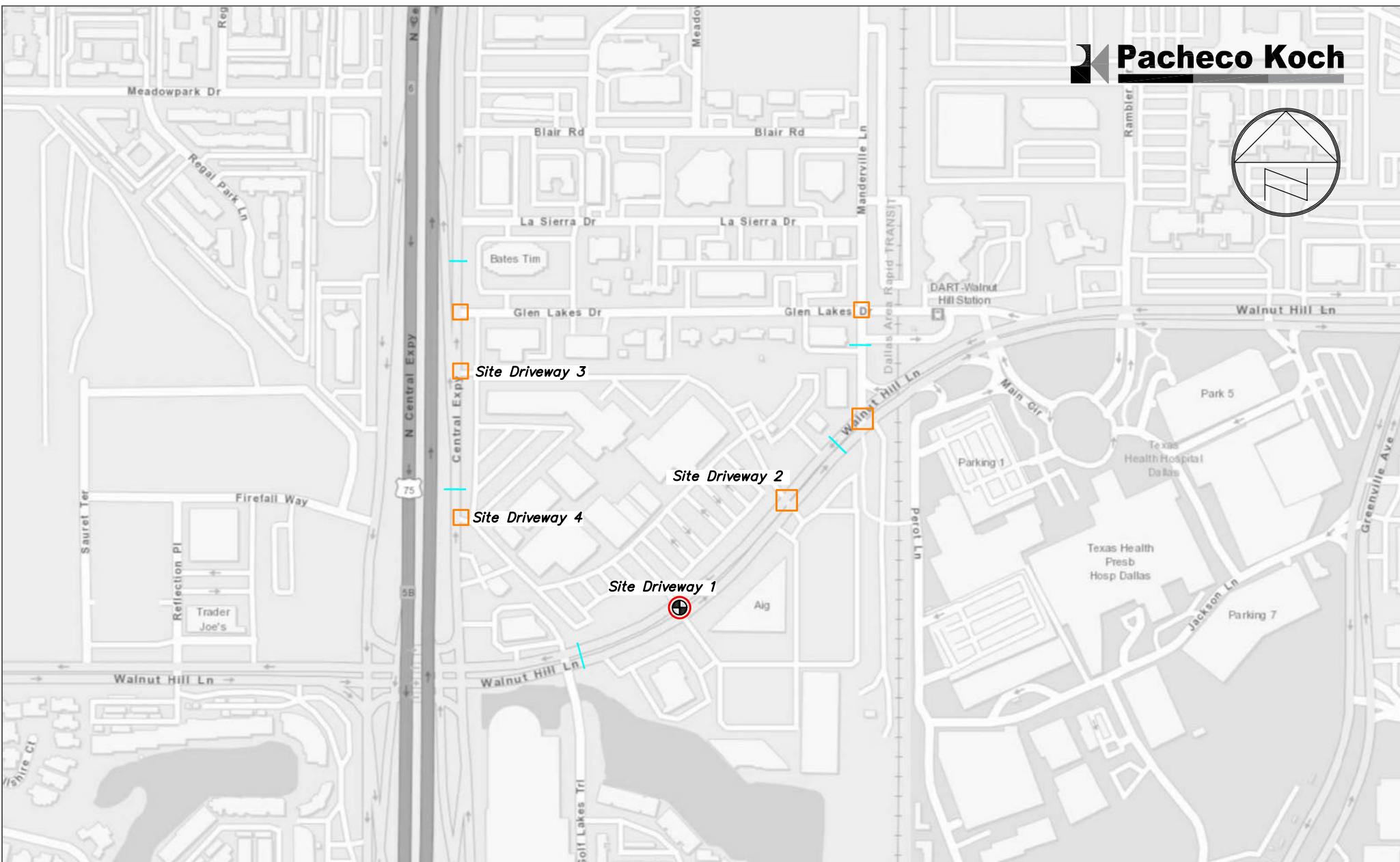
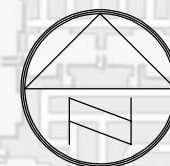
FINDING: The Hill is an existing mixed-use development containing office and commercial uses located adjacent to the DART Walnut Hill Light Rail Station. The proposed Project includes a significant expansion of the office component on site and addition of a multifamily component. The commercial component of the project will largely remain intact although total floor area will decrease very slightly. Overall traffic volume generated by the site will increase by approximately 4,500 vehicular trip ends per day and 450 trip ends during peak hours.

FINDING: The site provides multiple driveways on Walnut Hill Lane and on the North Central Expressway. The main driveway on Walnut Hill Lane is controlled by a traffic signal, which operates at good Levels of Service during peak hour periods. The analysis of the additional traffic generated by the development indicate that, while average delays will increase slightly, the Levels of Service at the traffic-signal-controlled intersection will remain the same. For the traffic operations at the unsignalized intersections, average delays will also increase as a result of increased volumes; however, the effects on traffic maneuvers within the public right-of-way are not significant.

- ❖ **RECOMMENDATION:** In order to encourage and facilitate use of existing transit services, improvements to the pedestrian environment along Manderville Lane are recommended. Such as:
 - a. Improve pedestrian corridors within the site and connections to the sidewalk.

- b. Replace all existing pavement markings on Manderville Lane at the intersections with Walnut Hill Lane and Glen Lakes Drive.

END

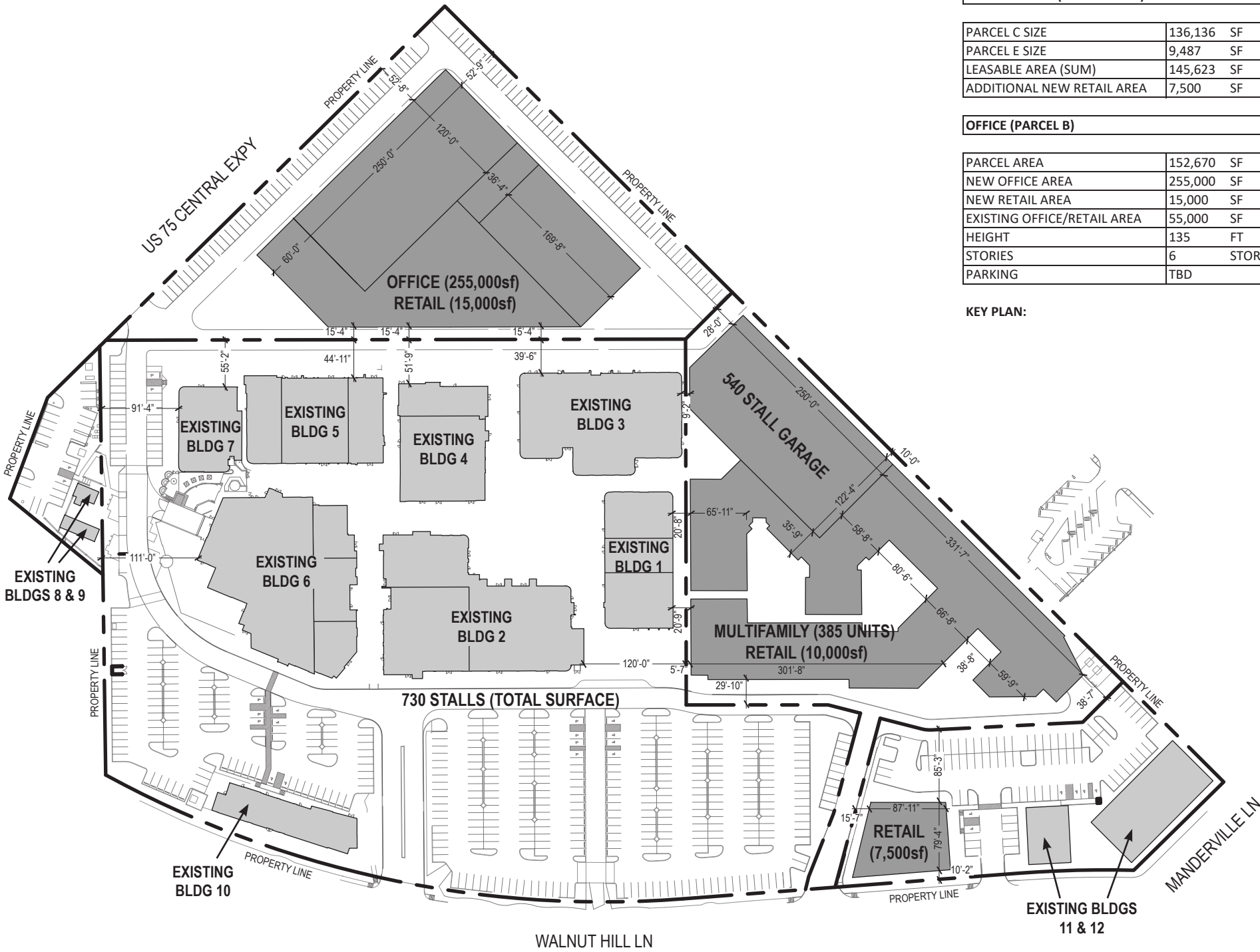


- - Study Area Intersection (Signalized)
- - Road-Tube Counts
- ⊕ - Traffic Signal
- - Study Area Intersection (Unsignalized)

Site Location Map

Dallas, Texas

PK #3610-21.560 (SMN: 11/01/21)



DEVELOPMENT PLAN DETAILS:

MULTIFAMILY PARCEL (PARCEL D)

PARCEL SIZE	3	AC	
UNIT DENSITY	385	UNITS	
NEW MULTIFAMILY AREA	458,000	SF	
NEW RETAIL AREA	10,000	SF	
HEIGHT	72	FT	
STORIES	7	STORIES	
PARKING	540	STALLS	1.42 STALLS/UNIT

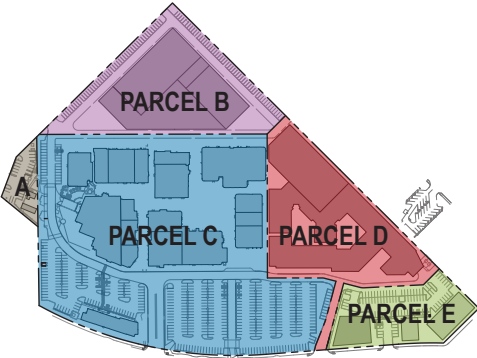
RETAIL PARCEL (PARCEL C & E)

PARCEL C SIZE	136,136	SF	
PARCEL E SIZE	9,487	SF	
LEASABLE AREA (SUM)	145,623	SF	EXCLUDING HOUNDSTOOTH COFFEE (PARCEL A)
ADDITIONAL NEW RETAIL AREA	7,500	SF	

OFFICE (PARCEL B)

PARCEL AREA	152,670	SF	
NEW OFFICE AREA	255,000	SF	
NEW RETAIL AREA	15,000	SF	
EXISTING OFFICE/RETAIL AREA	55,000	SF	
HEIGHT	135	FT	180 FT WITH RETAIL
STORIES	6	STORIES	
PARKING	TBD		

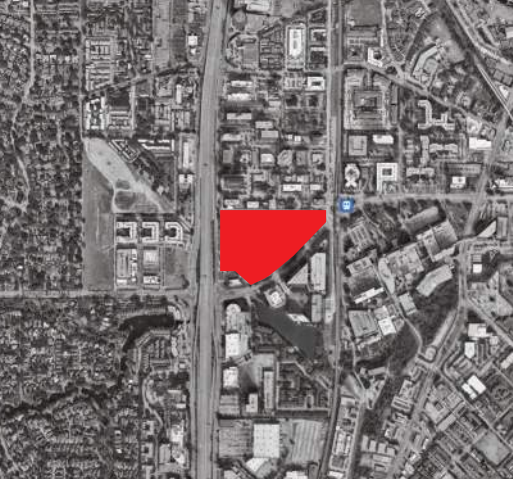
KEY PLAN:



Perkins&Will

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VICINITY MAP



THE HILL
DEVELOPMENT PLAN

February 21, 2022



TRAFFIC IMPACT ANALYSIS

The Hill

Dallas, Texas

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INTRODUCTION

The services of **Pacheco Koch** (PK) were retained by **Asana Partners** to prepare a Traffic Impact Analysis for proposed new development within the existing mixed-use property known as “The Hill” located at 8041 Walnut Hill Lane and 9310 N Central Expressway in Dallas, Texas. A preliminary site plan for the Project, provided by **Asana Partners**, and a site location map (**Exhibit 1**) are provided following the EXECUTIVE SUMMARY section of this report.

In order to facilitate development of the Project, Asana Partners (the “Applicant”) has made a request to the **City of Dallas** (the “Approving Agency”) for a zoning change of the subject properties. The Applicant is being represented by **Winstead** in the zoning process. As part of application process for this request, submittal of a TIA commissioned by the Applicant must be submitted to the Approving Agency for review.

This TIA was prepared by traffic engineers at Pacheco Koch (the “Engineer”) in accordance with industry and local standards. Pacheco Koch is a licensed engineering firm, based in Texas, that provides professional engineering and related services.

Purpose

A Traffic Impact Analysis (TIA) is an engineering study used to provide information on the projected off-site impacts produced by a specific Project on the traffic operations of public traffic facilities. In some instances, those Project impacts can be sufficiently accommodated by the existing roadway network; while in other cases, Project impacts may require mitigation. Determination of mitigation requirements is subject to the standards and expectations of the Approving Agency.

Commissioning a TIA may be required by an Approving Agency when an Applicant is seeking approvals or entitlements for the Project. Using standardized analysis methodologies, the findings of the TIA are used to gage the direct impacts on the transportation system that are attributable to the Project. Under certain circumstances and within legal parameters, the Approving Agency may require the Applicant to fund the improvement(s) needed to mitigate the impacts.

A TIA should be prepared by a licensed Engineer skilled in the principles of traffic and transportation engineering and planning. The general methodologies, processes, and guidelines used in a TIA are established by industry standards—which are maintained by organizations such as the Institute of Transportation Engineers (ITE) and others—although, the project-specific parameters of the study (e.g., study locations, analysis scenarios, analytical assumptions, etc.) may be established by local ordinances or technical staff of the Approving Agency.

Generally, existing and background conditions of the transportation system are assumed to be the responsibility of the respective governing agency(-ies).

Although the explicit purpose of a TIA is not to evaluate those conditions and identify deficiencies, this information may be evident from the study's findings. The Engineer may suggest or recommend modifications to the transportation system that, in the Engineer's opinion, could improve overall traffic operations, safety, site access, circulation, etc. However, such proposals may be unrelated to the traffic impacts of the Project and are not considered to be the responsibility of the Developer. Implementation of such modifications are subject to the discretion and approval of the respective agency. In general all proposals from the Engineer should not be considered mandatory and are not intended to assign or imply funding responsibility.

A TIA is not a detailed site plan review nor a substitute for local or regional transportation planning.

Project Description

The Hill is an existing mixed-use property developed in the 1980's. The Project contains office, retail, restaurant, and other commercial uses. Portions of the property were previously rezoned in anticipation of adding new medical office use, but the redevelopment did not happen.

Today, the Owners are seeking to expand the office portion of the Project and add a new multifamily component. Commercial uses (retail, restaurant, personal service, etc.) will have a slight net reduction in floor area. For purposes of this study, completion of the new development is estimated to occur by 2025. A summary of the proposed development program, by phase, is provided in **Table 1**.

Table 1. Development Program Summary

USE	EXISTING AMOUNT	FUTURE AMOUNT
Multifamily	-0-	415 DU
Office	70,776 SF	268,226 SF (197,450 SF net increase)
Commercial (includes, retail, restaurant, personal service, and similar uses)	168,382 SF	164,897 SF (3,485 SF net decrease)

NOTE: The development program provided above is based upon the most current and complete information available at the time of this study publication.

Existing property access is provided on Walnut Hill Lane and the Northbound Frontage Road of North Central Expressway. Existing access will remain.

The subject property is approximately 19.23 acres and is currently zoned a mix of Regional Retail (RR), Mixed Use (MU-1), and Planned Development District Number 804 (PD 804).

Study Parameters

The study parameters used in this TIA are based upon industry standard practices and requirements of the City of Dallas.

This TIA analyzed the day-to-day traffic operations on the public roadway system at time periods that have the greatest combined volume of the background traffic and site-related traffic. Due to the predominant influence of background traffic, the weekday AM and PM peak hours of adjacent street traffic are typically analyzed.

The analysis scenarios addressed in this study include the following:

- at existing conditions ("Existing" scenario)
- at site buildout year without site-generated traffic ("Background" scenario)
- at site buildout year with site-generated traffic ("Buildout" scenario)
- at five years after site buildout without site-generated traffic
- at five years after site buildout with site-generated traffic ("Horizon" scenario)

NOTE: Analyses of all future conditions scenarios utilize projected traffic volumes derived by Pacheco Koch using reasonable and customary assumptions that are based upon existing conditions where possible. ITE appropriately points out that, due to natural changes in traffic patterns that occur over time, the margin of error for projected traffic volumes increases as the length of time of the projection increases; and, any projection of hourly turning movement volumes beyond five years inherently contain significant assumptions.

Study Area

The study area for a TIA is typically defined to allow an assessment of the most relevant traffic impacts to the local area. The extent of the study area is discretionary but is generally commensurate with the scale of the proposed development. Special localized factors may also be considered. The specific locations included in the study area of this TIA are listed below and depicted in **Exhibit 1**.

Intersections:

- (a) US 75 Northbound (NB) Frontage Road (FR) and Glen Lakes Drive
- (b) US 75 Northbound (NB) Frontage Road (FR) and Site Driveways (2)
- (c) Manderville Lane and Glen Lakes Drive
- (d) Walnut Hill Lane and Manderville Lane
- (e) Walnut Hill Lane and Site Driveways (2—one signalized, one unsignalized)

Roadway Links:

- (A) Walnut Hill Lane east of US 75
 - ❑ Existing operation and cross-section: *six lanes, two-way operation, median-divided*
 - ❑ City of Dallas Thoroughfare Plan Designation: *Principal Arterial, M-6-D(A)*

- ❑ Current Daily Traffic Volume: 38,404 (Wednesday, November 3, 2021)
- ❑ Posted Speed Limit: 35 MPH

(B) Walnut Hill Lane east of US 75

- ❑ Existing operation and cross-section: *varies, one-way operation*
- ❑ City of Dallas Thoroughfare Plan Designation: *frontage road*
- ❑ Current Daily Traffic Volume: 29,482 (Wednesday, November 3, 2021)
- ❑ Posted Speed Limit: 40 MPH

TRAFFIC IMPACT ANALYSIS

The following is a description of the analyses performed as part of this Traffic Impact Analysis.

Approach

The TIA presented in this report analyzed the operational conditions of the study area intersections for the relevant peak hours using standardized analytical methodologies, where applicable. Actual traffic volumes (with adjustments described previously) represent background traffic conditions with no site-related traffic included. Then, traffic generated by the proposed development was calculated using the industry-standard four-step approach of trip generation, mode split, trip distribution, and traffic assignment. By adding the site-generated traffic to the background traffic, the resulting site-plus-background operational conditions were re-analyzed in order to measure the “impact” created by the Project. For any scenario, where appropriate, the Engineer considered and may recommend measures to mitigate undue operational conditions. Recommendations may be unrelated to impact of the Project. However, any recommendations provided by the Engineer are for the consideration of the Approving Agency who may or may not accept the recommendations. Recommendations provided by the Engineer are not intended to assign or imply a mandate nor financial responsibility as such decisions are for the Approving Agency and Applicant to resolve.

Background Traffic Volume Data

Existing Volumes

Current traffic volumes were collected during the analysis periods at the study area intersections on Wednesday, November 3, 2021. Traffic volumes are graphically summarized in APPENDIX A; detailed data sheets are provided in APPENDIX B.

Projected Background Traffic Volumes

Background traffic growth is defined as the normal growth of traffic that is not directly related to the subject development of this study. A review of historical traffic volume data can provide an indication of the local traffic growth patterns.

Table 2 provides a comparison of prior traffic volumes from institutional sources in the vicinity of the subject site, from which PK calculated an annual growth rate.

Table 2. Historical Daily Traffic Volume Data

ROADWAY SEGMENT	HISTORICAL DAILY VOLUME (DATE)	ANNUAL GROWTH RATE
Walnut Hill Lane, east of US 75	44,101 ('19) ^A 39,758 ('14) ^A	2.10%

Data Source: A = TxDOT Traffic Count Database System

According to these data, traffic volumes in the vicinity of the subject site are generally increasing. For purposes of this analysis, Pacheco Koch assumed a growth rate of two percent (2.0%) per year for purposes of this study in order to estimate future background traffic volumes.

By applying the assumed growth rate(s) described previously, future background traffic volumes at the Project buildout year were calculated for the study area intersections. These volumes are graphically summarized in APPENDIX A.

Site-Related Traffic

Trip Generation and Mode Split

Trip generation is calculated in terms of “trip ends” – a trip end is a one-way vehicular trip entering or exiting a site driveway (i.e., a single vehicle entering and exiting a site represents two trip ends). Trip generation for this Project was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation* manual (11th Edition). ITE *Trip Generation* is a compilation of actual, vehicular traffic volume generation data and statistics by land use as collected over several decades by creditable sources across the country. Using the ITE equations and rates is an accepted methodology to calculate the projected site-generated traffic volumes for many land uses (though engineering judgment is strongly advised).

The base trip generation data from ITE generally reflect average conditions for a standalone use on a typical day. However, in some cases, the Engineer may judge that other factors may be of sufficient significance to warrant adjusting the base ITE calculations in order to more accurately reflect Project-specific conditions. For this analysis no adjustments to the base ITE data were applied; however internal trip capture could be applied.

“Mode split” refers to the consideration of all modes of transportation. Typically, the majority of trips occur by passenger vehicles such as personal autos and ridesharing services. But, some alternative modes—such as travel by public transit, bicycle, and walking—do not generate additional vehicle trips. The default trip generation data from ITE is summarized in vehicular trip ends and incorporate “typical” mode split characteristics. However, when travel by alternative mode has the potential to be greater than normal, a reduction in the number of vehicular trip volume may be warranted. For this analysis a five percent (5%) reduction was applied to the base ITE data to account for transit mode split due to the close

proximity of and convenient access to the DART Walnut Hill Light Rail station (located across Manderville Lane from the subject site).

Table 3 provides a summary of the calculated net increase in trip ends generated by the project. Supplemental information used in the trip generation calculations is provided in APPENDIX C.

Table 3. Projected Trip Generation Summary (New Uses Only)

SCENARIO	DAILY TRIP ENDS (WEEKDAY)	AM PEAK HOUR TRIP ENDS (ADJACENT STREET PEAK)	PM PEAK HOUR TRIP ENDS (ADJACENT STREET PEAK)
		Total (In/Out)	Total (In/Out)
Multifamily (415 DU)	2,094	139 (36/103)	169 (103/66)
General Office (200,000 SF net increase)	2,630	313 (269/44)	311 (50/261)
Subtotal	4,724	452 (305/147)	480 (153/327)
Net Increase*	4,488	429 (290/139)	456 (145/311)

* After application of 5% transit reduction.

Trip Distribution and Assignment

The distribution and assignment of site-generated trip ends to the surrounding roadway system is determined by proportionally estimating the orientation of travel via various travel routes. This is a subjective exercise based upon professional judgment considering such factors as directional characteristics of existing local traffic, trip attributes (e.g., trip purpose, trip length, travel time, etc.), roadway features (e.g., capacity, operational conditions, character of environment), regional demographics, etc.

Traffic for the proposed redevelopment was distributed and assigned to the study area roadway network based upon consideration of the factors listed above. Separate traffic assignments were generated for residential and for office trips. Detailed trip distribution and traffic assignment calculations and results are summarized in APPENDIX C.

Site-Generated Traffic Volumes

Site-generated traffic is calculated by multiplying the trip generation value (from **Table 3**) by the corresponding traffic assignments (from APPENDIX C). The resulting cumulative (for all uses) peak period site-generated traffic volumes at buildout of the Project are graphically summarized in APPENDIX A.

Traffic Operational Analysis — Roadway Links

Description

A roadway link is a segment of roadway between two intersections. Roadway link capacity analysis is a comparison of actual or forecasted traffic volumes to the theoretically optimum roadway capacity. The capacity of the roadway link is

predominantly a function of the roadway's cross-section (i.e., number of lanes, lane widths, type of center divider, etc.). However, other more theoretical factors also apply, such as the character of environment and the functional classification of the roadway. Generally, roadway link capacity is less critical than intersection capacity; however, it can provide a gage of the utilization of given roadway.

A specific industry standard for roadway link capacity does not exist, but the typical concept is derived from a base saturation flow rate (i.e., the maximum theoretical rate of continuous flow under ideal, unobstructed conditions -- in the traffic engineering industry, this value is generally considered to range between 1,900-2,100 vehicles per lane per hour). A series of adjustment factors are then applied to the saturation flow rate to reflect the characteristics of a given location.

The North Central Texas Council of Governments (NCTCOG) – the metropolitan planning agency for the Dallas-Fort Worth region – has derived internal “hourly service volume” guidelines used for transportation modelling purposes. The NCTCOG values were based upon the principals presented in the *Highway Capacity Manual* with “regional calibration” factors applied. Though these per-lane capacities, or “Service Volumes” (summarized in the table below), are intended for modelling purposes, they do provide a reasonable gage of theoretical capacity.

Hourly Service Volumes By Roadway Function

Area Type	Activity Density Range (per acre)	Principal Arterial		Minor Arterial & Frontage Road		Collector & Local Street	
		Median-Divided or One-Way	Undivided Two-Way	Median-Divided or One-Way	Undivided Two-Way	Median-Divided or One-Way	Undivided Two-Way
CBD	>125	725	650	725	650	475	425
Outer Business	30-125	775	725	775	725	500	450
Urban Residential	7.5-30	850	775	825	750	525	475
Suburban Residential	1.8-7.5	900	875	900	825	575	525
Rural	<1.8	1,025	925	975	875	600	550

To determine the utilization of a roadway, the volume:capacity ratio can be calculated – a v/c ratio of less than 1.0 indicates that the roadway is operating under capacity. NCTCOG’s Level of Service denominations are as follows:

- Volume:Capacity Ratio $\leq 65\%$ is LOS A/B/C,
- Volume:Capacity Ratio $> 65\%$ and $\leq 100\%$ is LOS D/E,
- Volume:Capacity Ratio $\geq 100\%$ is LOS F

Summary of Results

For roadways adjacent to or in the vicinity of the subject site, the volume/capacity ratio was calculated for existing and site buildout conditions. A summary of the link capacity analysis is provided in **Table 4**. See specific recommendations in the *Recommendations* section of this report.

Table 4. Roadway Link Capacity Analysis Results Summary

ROADWAY/ SCENARIO	PEAK HOUR VOLUME	THEORETICAL HOURLY CAPACITY	V:C RATIO/ LEVEL OF SERVICE
<u>Walnut Hill Lane</u>			
Existing Conditions	3,267	5,100	0.64 – C
Buildout Year-Background Conditions	3,536	5,100	0.69 – D
Buildout Year-Buildout Conditions	3,751	5,100	0.74 – D
<u>North Central NB FR</u>			
Existing Conditions	2,599	2,475	1.05 – F
Buildout Year-Background Conditions	2,813	2,475	1.14 – F
Buildout Year-Buildout Conditions	2,922	2,475	1.18 – F

Traffic Operational Analysis — Roadway Intersections

Description

The level of performance of civil infrastructure can often be measured through an analysis of volume and capacity that considers various physical and operational characteristics of the system. For vehicular traffic an operational analysis of roadway intersection capacity over a 60-minute period is the most detailed type of analysis. An industry-standardized methodology for this type of analysis was developed by the Transportation Research Board and is presented in the Highway Capacity Manual (HCM). HCM uses the term “Level of Service” (or, LOS) to qualitatively describe the efficiency using a letter grade of A through F. Generally, LOS can be described as follows:

LOS A = free, unobstructed flow

LOS B = reasonably free flow

LOS C = stable flow

LOS D = approaching unstable flow

LOS E = unstable flow, operating at design capacity

LOS F = operating over design capacity

Traffic operational analysis is typically measured in one-hour periods during day-to-day peak conditions. In most urban settings, LOS C, or better, is desirable, although LOS D is considered to be acceptable in urban conditions; LOS E indicates a facility or maneuver is approaching capacity, while LOS F is theoretically an over-capacity

condition. On highly-utilized transportation facilities, brief periods of LOS E or F conditions are not uncommon for during peak periods. In some cases measures to increase capacity, either through operational changes and/or physical improvements, can be identified to improve efficiency and sometimes raise Level of Service.

For traffic-signal-controlled ("signalized") intersections and STOP-controlled ("unsignalized") intersections, LOS is determined based upon the calculated average seconds of delay per vehicle. For signalized intersections the average delay per vehicle can be effectively calculated for the entire intersection; however, for unsignalized intersections the average delay per vehicle is calculated only by approach or by individual traffic maneuvers that must stop or yield right-of-way.

NOTE: The HCM unsignalized intersection analysis methodology was developed and calibrated for low-to-moderate volume intersections. When applied to intersections with one or more high-volume or high-capacity approaches, the analyses often reflect poor results (i.e., low Level of Service). However, the actual delay/operational conditions are typical of similar locations and do not necessarily represent unique conditions. Low-performing, high-volume, unsignalized intersections cannot be analytically mitigated unless a traffic signal is installed. (Traffic signal installation is subject to a detailed analysis of established criteria AND approval of the responsible agency. Neither Level of Service nor vehicle delay is a warrant for traffic signal installation.)

The following table summarizes the LOS criteria for signalized and unsignalized intersections as defined in the latest edition of the *Highway Capacity Manual*.

	Signalized Intersection (Average Delay per Vehicle)	Unsignalized Intersection (Average Delay per Vehicle)
LOS A	≤ 10	≤ 10
LOS B	$> 10 - \leq 20$	$> 10 - \leq 15$
LOS C	$> 20 - \leq 35$	$> 15 - \leq 25$
LOS D	$> 35 - \leq 55$	$> 25 - \leq 35$
LOS E	$> 55 - \leq 80$	$> 35 - \leq 50$
LOS F	> 80	> 50

Analysis Traffic Volumes

Determination of the traffic impact associated with the Project is measured by comparing the incremental change in operational conditions during peak periods with and without site-related traffic. APPENDIX A provides exhibits summarizing the following:

- Existing traffic volumes during study peak hours
- Projected Background traffic volumes at the Site Buildout Year during study peak hours
- Projected Site-Generated traffic volumes during study peak hours
- Projected Background-plus-Site-Generated traffic volumes at the Site Buildout Year during study peak hours

- Projected five years after site buildout traffic volumes, including Site-Generated traffic during study peak hours

A summary of the existing intersection/roadway geometry and traffic control devices is also graphically summarized in APPENDIX A.

Summary of Results

Intersection capacity analyses presented in this study were performed using the *Synchro* software package. **Table 5** and **Table 6** provide a summary of the peak period intersection operational conditions under the analysis conditions presented previously. Detailed software output is provided in APPENDIX D.

SITE ACCESS EVALUATION

The City of Dallas *Street Design Manual* suggests various site access items should be evaluated for each project, where applicable. **Table 7** summarizes the findings and recommendations of these evaluations. Applicable supplemental information is provided in APPENDIX E.

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NOTE: Traffic signal operational parameters used in this analysis were based upon actual, existing traffic signal operational characteristics observed in the field at the time of traffic data collection.

Table 5. Peak Hour Intersection Capacity Analysis Results Summary (Signalized Intersections)

Table 6. Peak Hour Intersection Capacity Analysis Results Summary (Unsignalized Intersections)

See specific recommendations in the SUMMARY OF FINDINGS AND RECOMMENDATIONS section of this report.

Table 5. Peak Hour Intersection Capacity Analysis Results Summary
(Signalized Intersections)

INTERSECTION		EXISTING CONDITIONS						NO-BUILD CONDITIONS						BUILD CONDITIONS					
		AM			PM			AM			PM			AM			PM		
		LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue
Walnut Hill Lane @ Site Driveway 1	Overall	B	(17.4)		C	(30.5)		B	(17.4)		C	(32.1)		B	(17.6)		C	(32.5)	
	EB	B	(17.4)	319 ft	C	(28.7)	517 ft	B	(16.6)	357 ft	C	(30.3)	582 ft	B	(16.6)	286 ft	C	(30.3)	589 ft
	WB	B	(17.1)	296 ft	C	(30.4)	467 ft	B	(17.8)	331 ft	C	(31.8)	527 ft	B	(18.1)	350 ft	C	(33.5)	578 ft
	NB	C	(31.0)	43 ft	D	(51.6)	217 ft	C	(33.7)	48 ft	D	(54.7)	236 ft	C	(33.9)	48 ft	E	(55.6)	237 ft
	SB	B	(18.4)	40 ft	C	(20.8)	66 ft	C	(20.1)	44 ft	C	(21.3)	70 ft	B	(18.5)	63 ft	C	(22.3)	126 ft

NOTE: Traffic signal operational parameters used in this analysis were based upon actual traffic signal operational characteristics observed in the field at the time of data collection.

Table 6. Peak Hour Intersection Capacity Analysis Results Summary
(Unsignalized Intersections)

INTERSECTION	TRAFFIC MANEUVER	EXISTING CONDITIONS						NO-BUILD CONDITIONS						BUILD CONDITIONS					
		AM			PM			AM			PM			AM			PM		
		LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue	LOS	delay	queue
Walnut Hill Lane @ Manderville Lane	EBL	D	(27.5)	26 ft	D	(26.6)	28 ft	D	(33.8)	35 ft	D	(32.4)	38 ft	E	(37.4)	40 ft	D	(34.3)	40 ft
	SB	C	(20.2)	19 ft	D	(27.6)	63 ft	C	(22.6)	24 ft	D	(34.8)	85 ft	D	(25.5)	33 ft	E	(38.8)	94 ft
Manderville Lane @ Glen Lakes Drive	NBL	A	(7.4)	0 ft	A	(7.5)	0 ft	A	(7.4)	0 ft	A	(7.5)	0 ft	A	(7.4)	0 ft	A	(7.5)	0 ft
	EBLR	A	(8.9)	2 ft	A	(9.3)	2 ft	A	(8.9)	2 ft	A	(9.4)	2 ft	A	(9.0)	2 ft	A	(9.4)	2 ft
N Central Expressway NBFR @ Glen Lakes Drive	WBR	B	(11.7)	7 ft	B	(12.2)	9 ft	B	(12.1)	7 ft	B	(12.7)	12 ft	B	(12.2)	7 ft	B	(12.8)	12 ft
Walnut Hill Lane @ Site Driveway 2	EBL	C	(24.2)	7 ft	D	(26.2)	14 ft	D	(27.7)	9 ft	D	(30.8)	16 ft	D	(31.2)	12 ft	D	(35.0)	26 ft
	SBLR	D	(32.9)	5 ft	F	(53.2)	28 ft	E	(38.8)	7 ft	F	(76.7)	40 ft	F	(80.9)	56 ft	F	(>100)	148 ft
N Central Expressway NBFR @ Site Driveway 3	WBR	B	(11.4)	0 ft	B	(11.4)	2 ft	B	(11.7)	0 ft	B	(11.8)	2 ft	B	(12.4)	2 ft	B	(12.3)	5 ft
N Central Expressway NBFR @ Site Driveway 4	WBR	C	(17.8)	9 ft	D	(28.0)	21 ft	C	(19.4)	12 ft	D	(33.2)	28 ft	D	(26.4)	28 ft	F	(66.8)	101 ft

[Note: Bold font in the Unsignalized Intersection table refers to maneuvers within public right-of-way (others are within private property).]

KEY:

A, B, C, D, E, F = Level-of-Service
NB-, SB-, EB-, WB- = intersection approach
AM = AM Peak Hour of Adjacent Street

(# #.#) = Average Seconds of Delay Per Vehicle
-L, -T, -R = Left, Through, Right turning movement
PM = PM Peak Hour of Adjacent Street

Table 7. Site Access Evaluation

EVALUATION	FINDING																																
<u>Auxiliary (Deceleration) Lanes</u>	Construction of deceleration lanes not recommended due to urban, low-speed conditions.																																
<u>Signage and Pavement Markings on Public Rights-of-Way</u>	Existing pavement markins on Walnut Hill Lane are in average condition; existing pavement markings on N Central Expressway are in fair condition; pavement markings on Manderville Lane are in poor condition. All signage is in good condition.																																
<u>Historical Accident Analysis</u>	<p>According to the TxDOT CRIS database, the number of crashes fatality (Type K), serious injury (Type A), and Injustry (Type B) crashes during the past three years (2019-2021) near the site are summarized in the following table. (See summary data in Appendix E.)</p> <table><tr><td><u>Location</u></td><td><u>Type K</u></td><td><u>Type A</u></td><td><u>Type B</u></td></tr><tr><td>Manderville Lane at Glen Lakes Drive</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Walnut Hill Lane at Manderville Lane</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Walnut Hill Lane at Driveway 1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Walnut Hill Lane at Driveway 2</td><td>0</td><td>0</td><td>0</td></tr><tr><td>N Central Expy at Driveway 3</td><td>0</td><td>0</td><td>0</td></tr><tr><td>N Central Expy at Driveway 4</td><td>0</td><td>0</td><td>0</td></tr><tr><td>N Central Expy at Glen Lakes Drive</td><td>0</td><td>0</td><td>0</td></tr></table>	<u>Location</u>	<u>Type K</u>	<u>Type A</u>	<u>Type B</u>	Manderville Lane at Glen Lakes Drive	0	0	1	Walnut Hill Lane at Manderville Lane	0	0	0	Walnut Hill Lane at Driveway 1	0	0	1	Walnut Hill Lane at Driveway 2	0	0	0	N Central Expy at Driveway 3	0	0	0	N Central Expy at Driveway 4	0	0	0	N Central Expy at Glen Lakes Drive	0	0	0
<u>Location</u>	<u>Type K</u>	<u>Type A</u>	<u>Type B</u>																														
Manderville Lane at Glen Lakes Drive	0	0	1																														
Walnut Hill Lane at Manderville Lane	0	0	0																														
Walnut Hill Lane at Driveway 1	0	0	1																														
Walnut Hill Lane at Driveway 2	0	0	0																														
N Central Expy at Driveway 3	0	0	0																														
N Central Expy at Driveway 4	0	0	0																														
N Central Expy at Glen Lakes Drive	0	0	0																														
<u>Pedestrian Safety at Unsignalized Crossing(s)</u>	N/A																																
<u>Driveway Sight Distances</u>	All site driveways are existing and have no known history of sight distance conflicts.																																
<u>Number of Access Points and Driveway Spacing</u>	<p>The subject site has three points of vehicular access on Walnut Hill Lane (one is minor and not included in this analysis) and two points of vehicular access on N Central Expy. All access points are existing, and no new points of vehicular access are proposed.</p> <table><tr><td><u>Driveway</u></td><td><u>Upstream</u></td><td><u>Downstream</u></td><td rowspan="5">(Spacing is approximate and measured from nearest curbline.)</td></tr><tr><td>Driveway 1 (Walnut Hill)</td><td>170'</td><td>460'</td></tr><tr><td>Driveway 2 (Walnut Hill, traffic-signal controlled)</td><td>460'</td><td>355'</td></tr><tr><td>Driveway 3 (N Central Expy)</td><td>90'</td><td>450'</td></tr><tr><td>Driveway 4 (N Central Expy)</td><td>450'</td><td>190'</td></tr></table>	<u>Driveway</u>	<u>Upstream</u>	<u>Downstream</u>	(Spacing is approximate and measured from nearest curbline.)	Driveway 1 (Walnut Hill)	170'	460'	Driveway 2 (Walnut Hill, traffic-signal controlled)	460'	355'	Driveway 3 (N Central Expy)	90'	450'	Driveway 4 (N Central Expy)	450'	190'																
<u>Driveway</u>	<u>Upstream</u>	<u>Downstream</u>	(Spacing is approximate and measured from nearest curbline.)																														
Driveway 1 (Walnut Hill)	170'	460'																															
Driveway 2 (Walnut Hill, traffic-signal controlled)	460'	355'																															
Driveway 3 (N Central Expy)	90'	450'																															
Driveway 4 (N Central Expy)	450'	190'																															
<u>Corner Clearances</u>	Anticipated to comply with City standards.																																
<u>Median Openings</u>	Existing medians on Walnut Hill Lane at Driveways 1 and 2. No new median openings proposed.																																
<u>Shared Access</u>	None anticipated.																																
<u>Stopping Sight Distance</u>	N/A																																
<u>Traffic Signal or STOP Control Warrant Analysis</u>	N/A																																
<u>Driveway Improvements</u>	All proposed driveways are existing and are not intended to be modified.																																
<u>Curb Return Radius</u>	All proposed driveways are existing and are not intended to be modified.																																

SUMMARY OF FINDINGS AND RECOMMENDATIONS

NOTE: Recommendations presented in this report reflect the opinion of Pacheco Koch based solely upon technical analysis and professional judgment but are not intended to infer mandates or funding responsibility. Any proposed improvements in the public right-of-way are subject to approval of the responsible agency(-ies). Should the approving agency determine that any off-site improvements are required for approval of the Project, legal precedents apply with regard to jurisdiction and funding allocation.

The following findings and, if applicable, recommendations were based upon an analysis of the anticipated traffic impact generated by the proposed development scenario outlined in the **Project Description** section of this report.

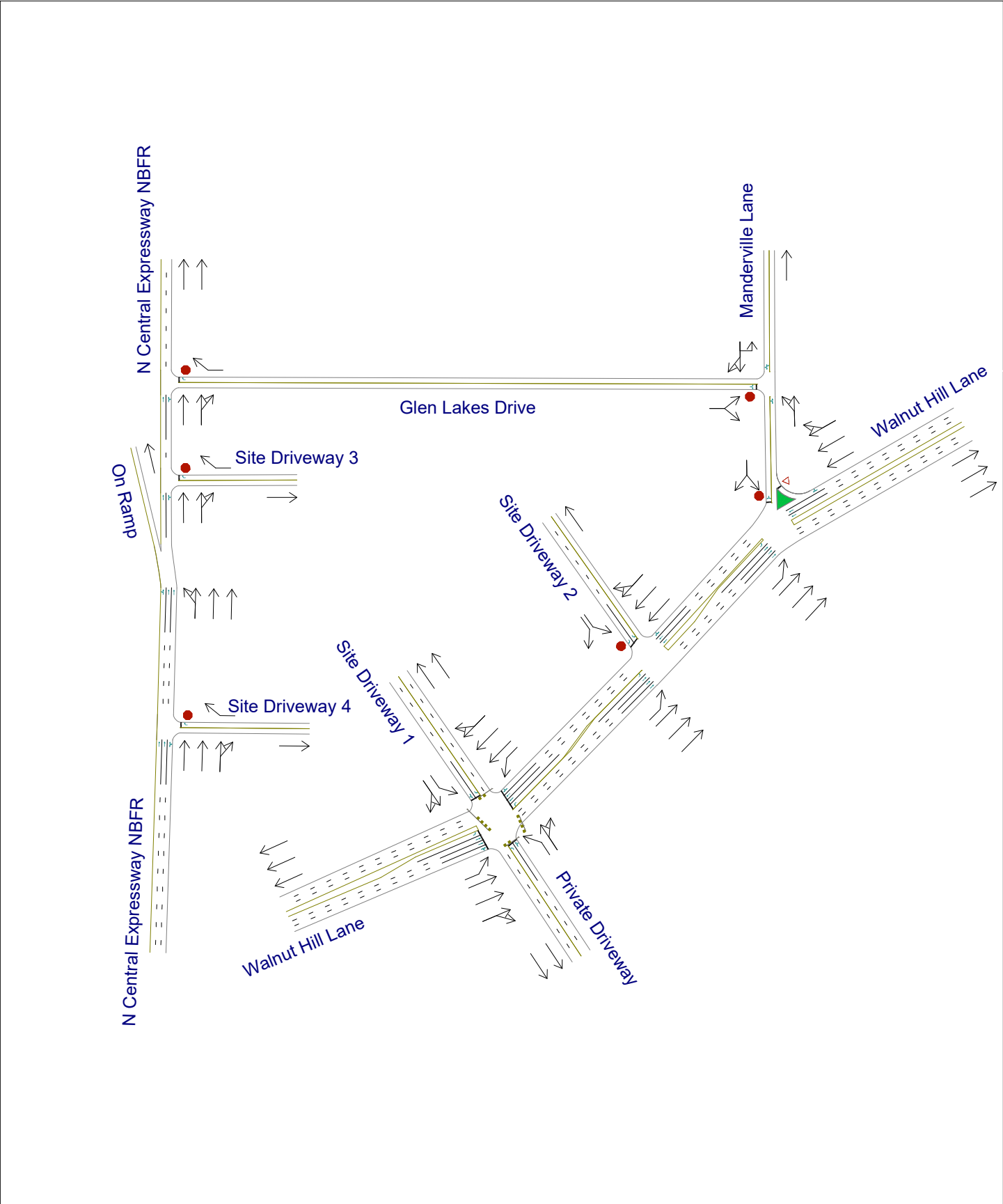
FINDING: The Hill is an existing mixed-use development containing office and commercial uses located adjacent to the DART Walnut Hill Light Rail Station. The proposed Project includes a significant expansion of the office component on site and addition of a multifamily component. The commercial component of the project will largely remain intact although total floor area will decrease very slightly. Overall traffic volume generated by the site will increase by approximately 4,500 vehicular trip ends per day and 450 trip ends during peak hours.

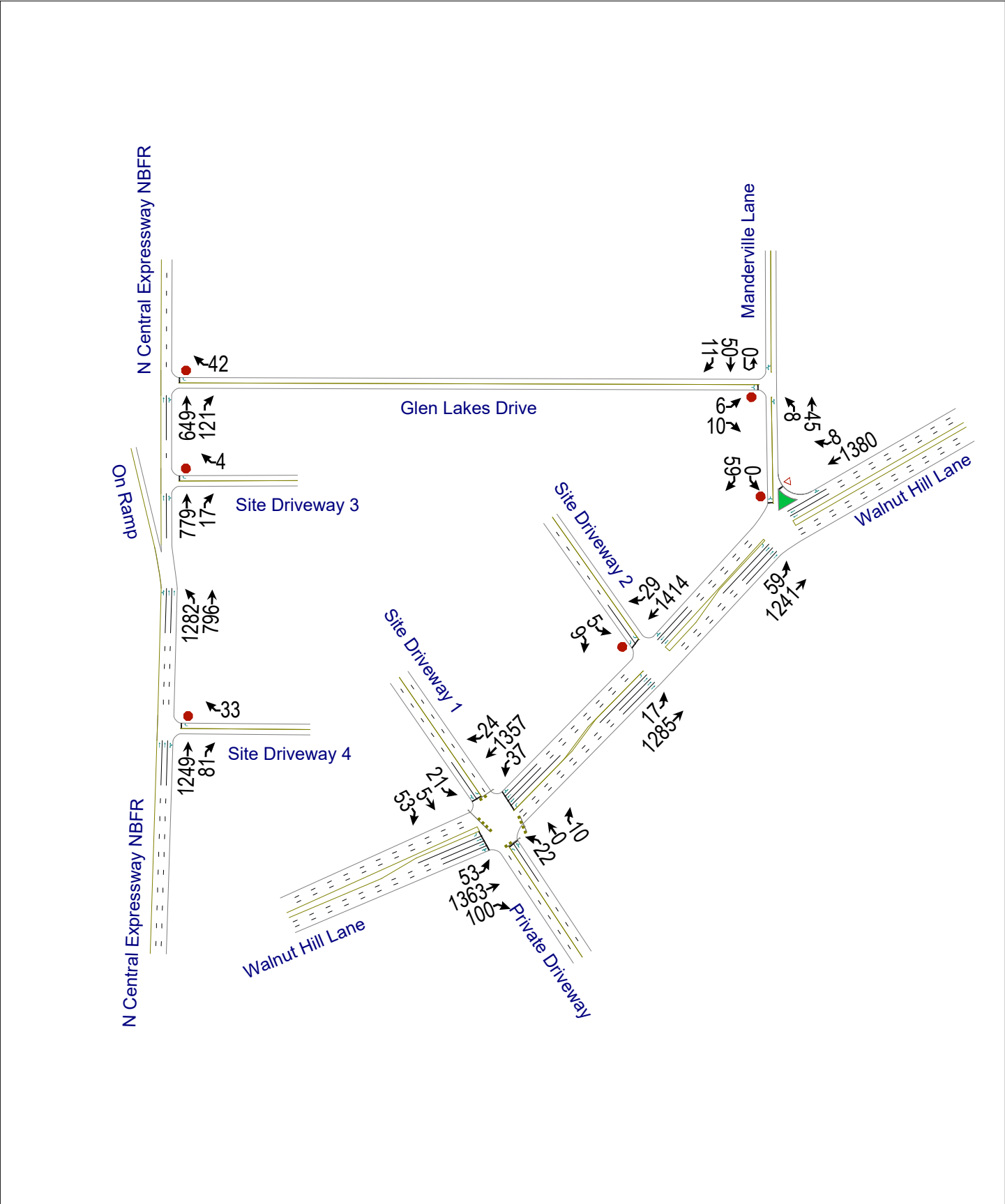
FINDING: The site provides multiple driveways on Walnut Hill Lane and on the North Central Expressway. The main driveway on Walnut Hill Lane is controlled by a traffic signal, which operates at good Levels of Service during peak hour periods. The analysis of the additional traffic generated by the development indicate that, while average delays will increase slightly, the Levels of Service at the traffic-signal-controlled intersection will remain the same. For the traffic operations at the unsignalized intersections, average delays will also increase as a result of increased volumes; however, the effects on traffic maneuvers within the public right-of-way are not significant.

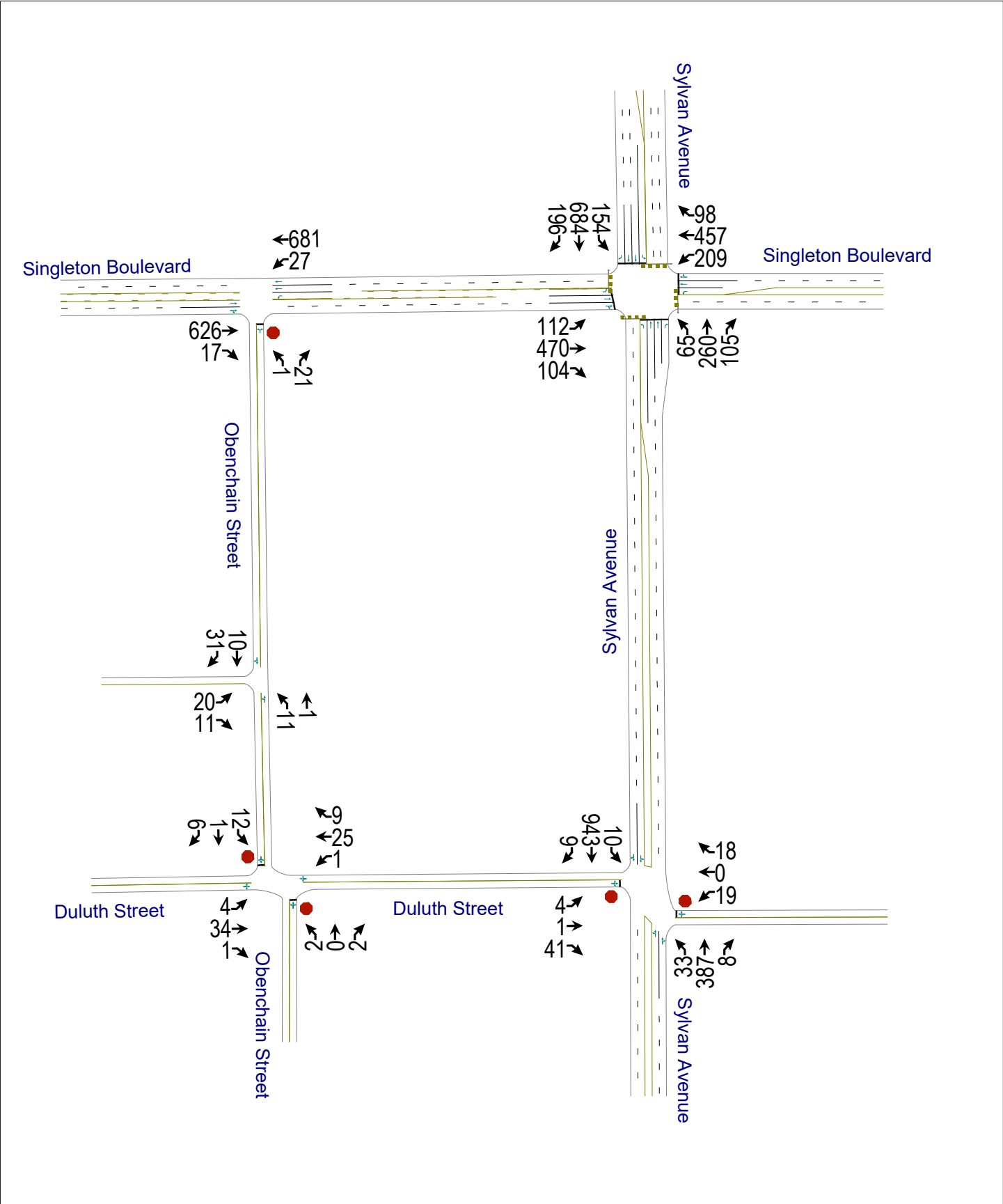
- ❖ **RECOMMENDATION:** In order to encourage and facilitate use of existing transit services, improvements to the pedestrian environment along Manderville Lane are recommended. Such as:
 - a. Improve pedestrian corridors within the site and connections to the sidewalk.
 - b. Replace all existing pavement markings on Manderville Lane at the intersections with Walnut Hill Lane and Glen Lakes Drive.

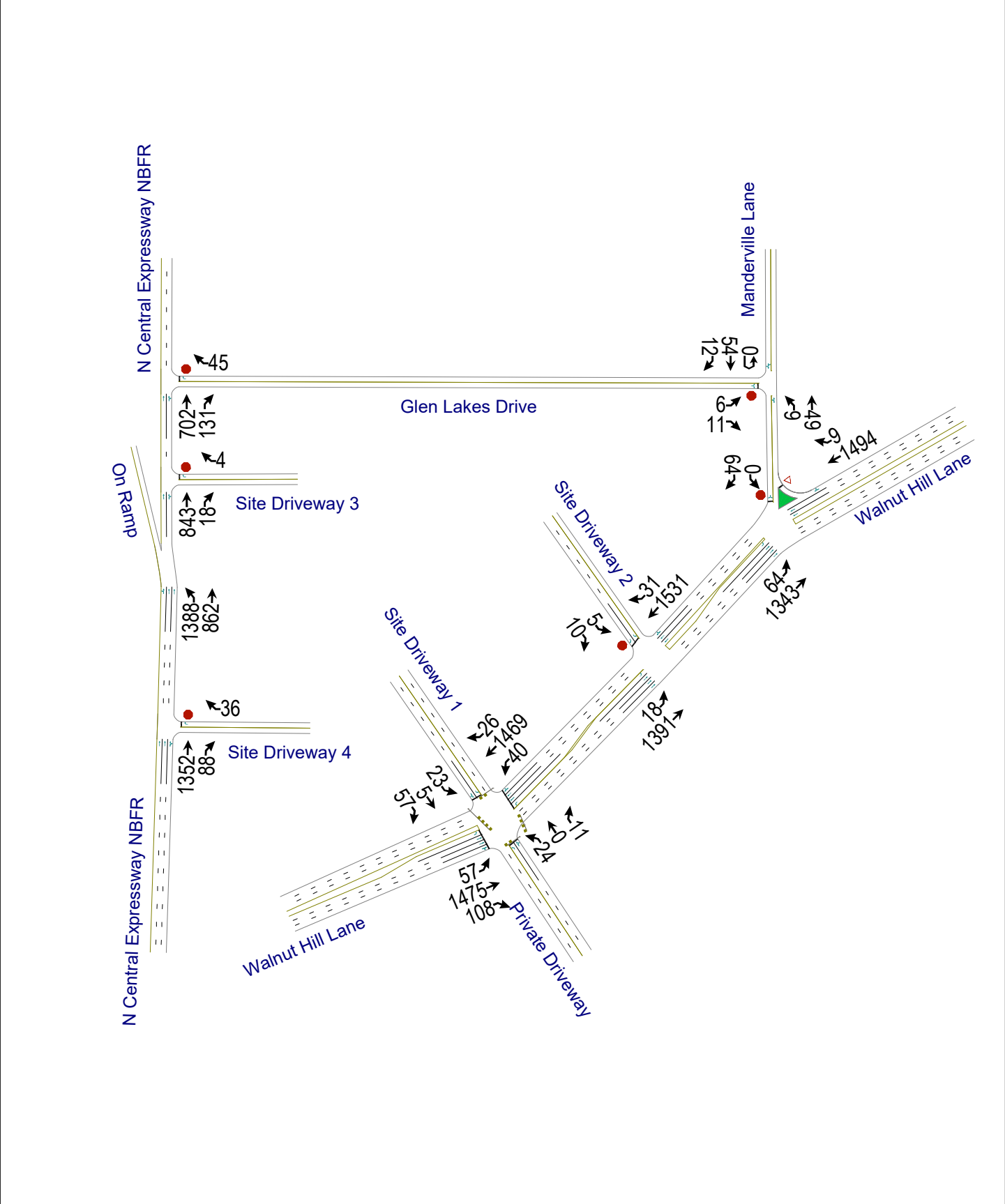
END OF MEMO

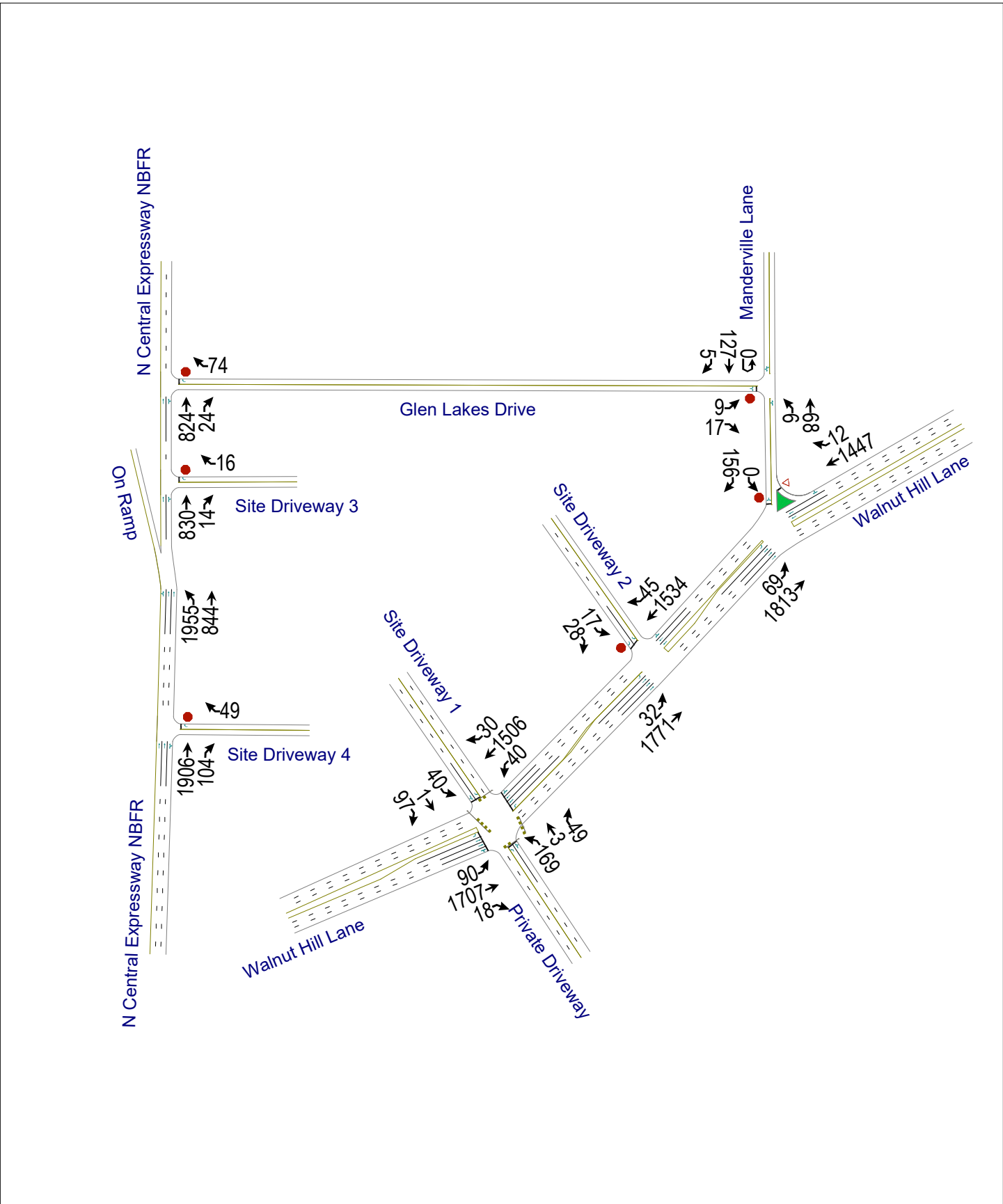
APPENDIX A. Traffic Volumes Exhibits

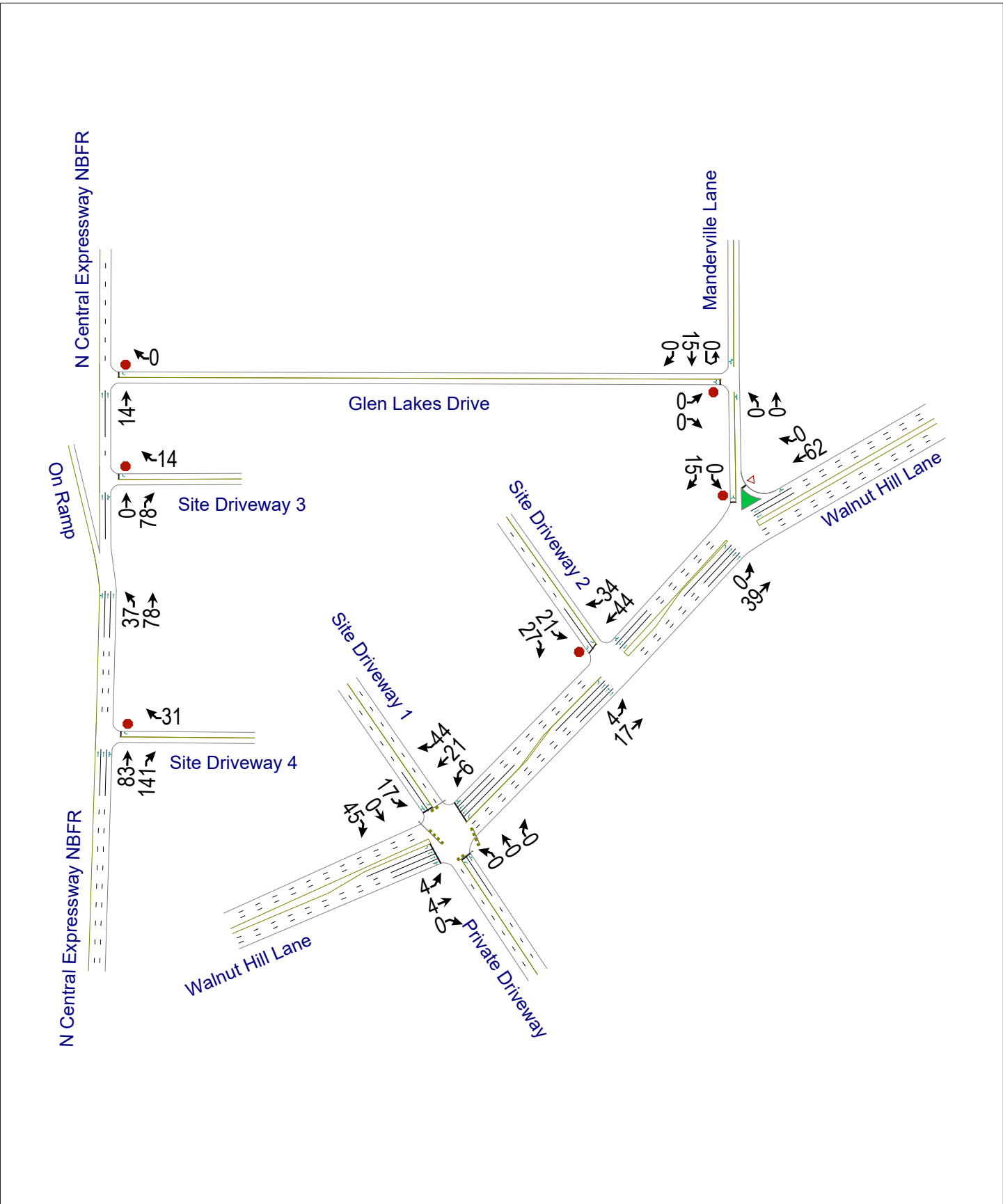






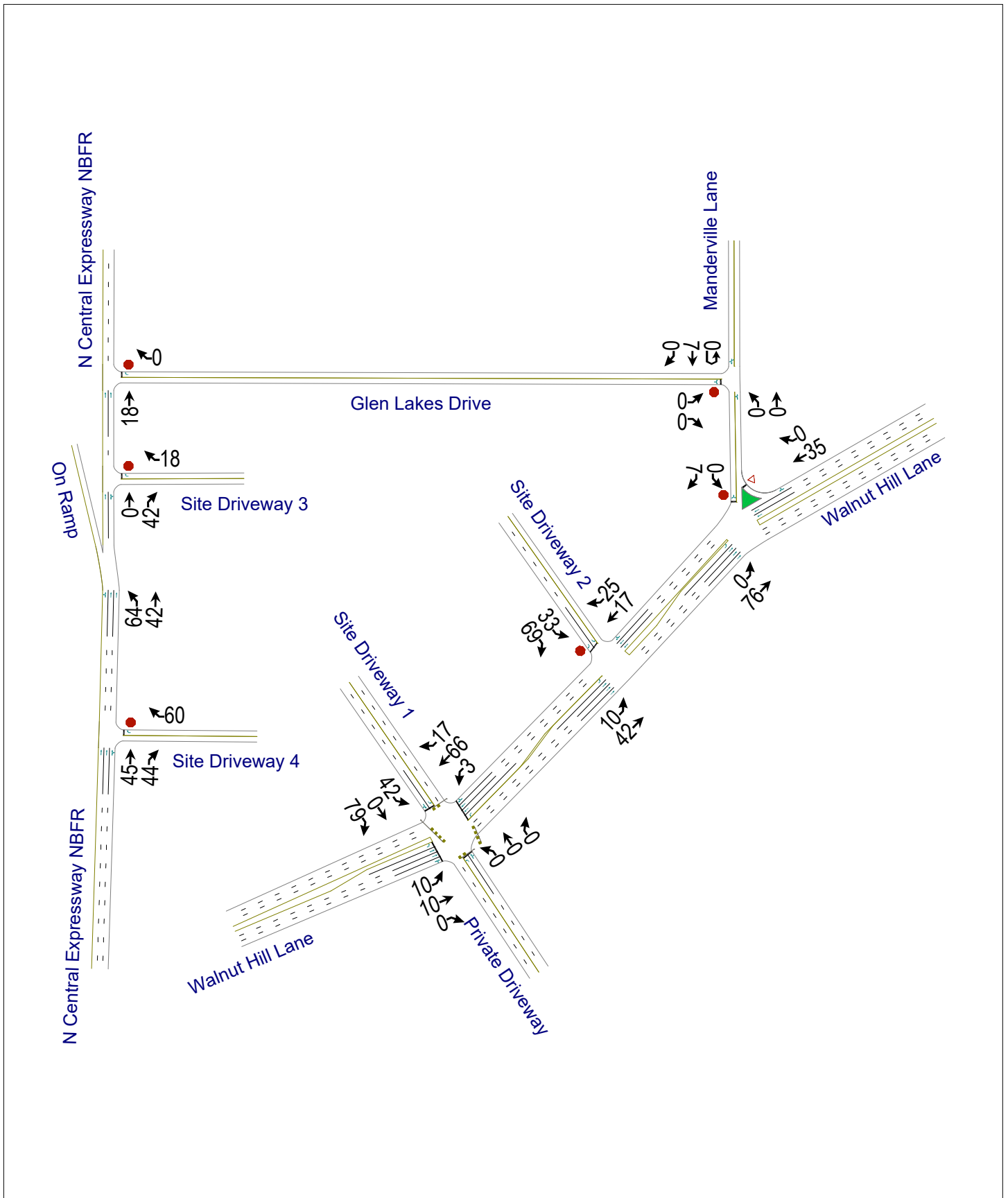






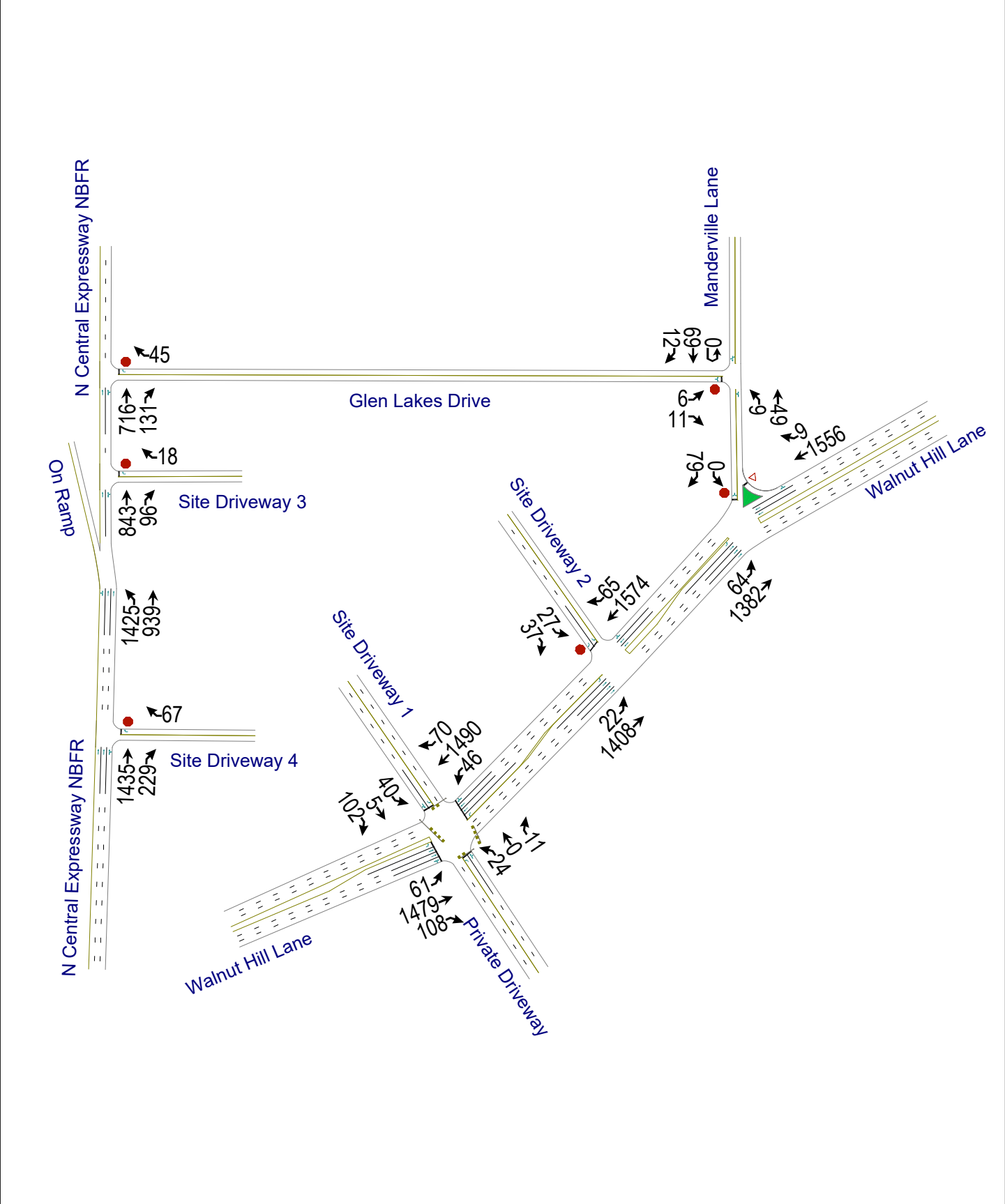
Appendix A7 - Site Generated PM

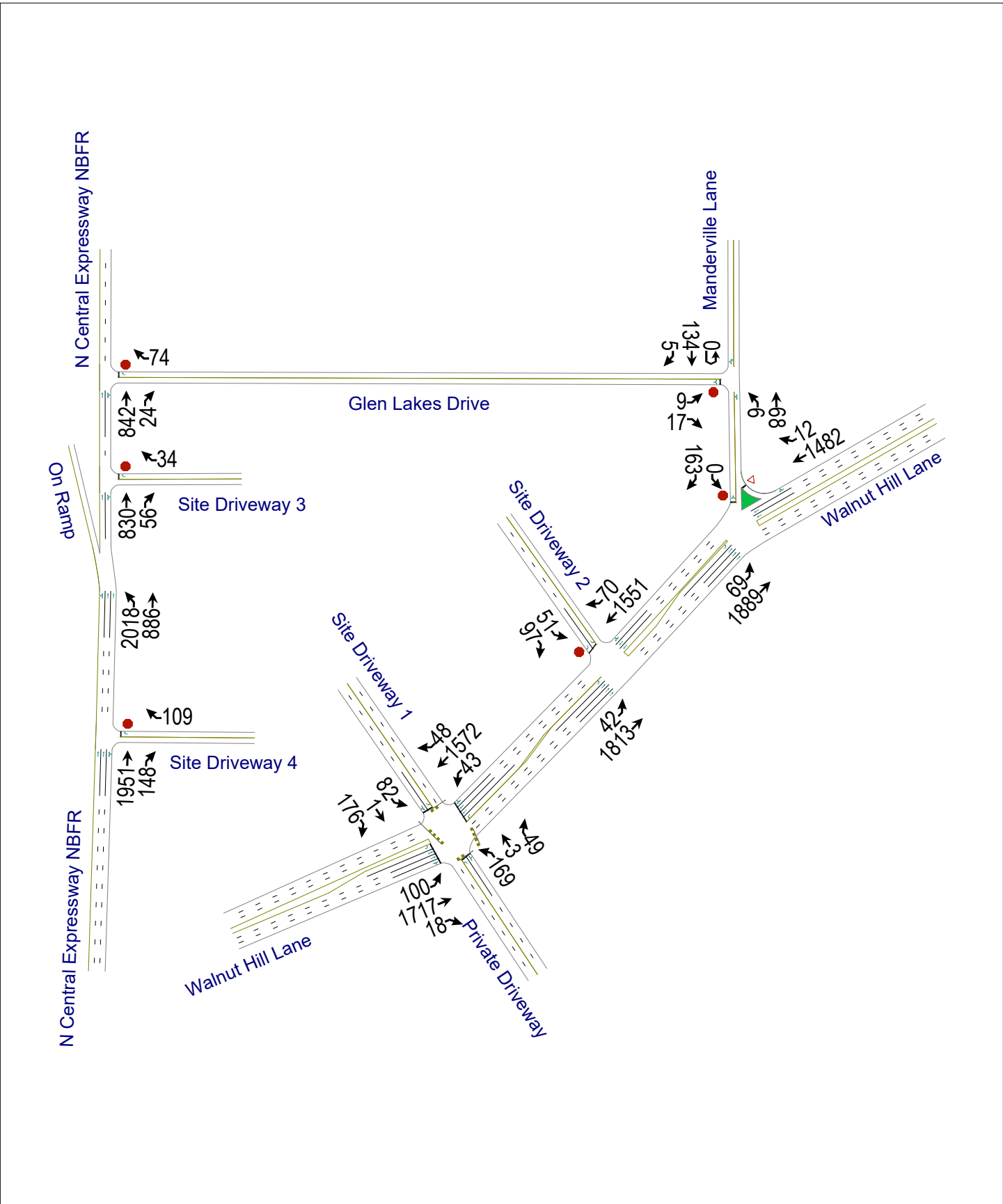
North ^
Not to Scale



3610 - 21.560
SMN

03/01/2022
Pacheco Koch





APPENDIX B. Detailed Traffic Volume Data

ROADWAY: N Central Expressway NBFR
 LOCATION: South of the On Ramp
 DAY: Wednesday
 DATE: 3-Nov
 YEAR: 2021
 SOURCE: CJ-Hensch

24-HOUR, BI-DIRECTIONAL VOLUME

29,482
 (WEEKDAY)

N Central Expressway NBFR

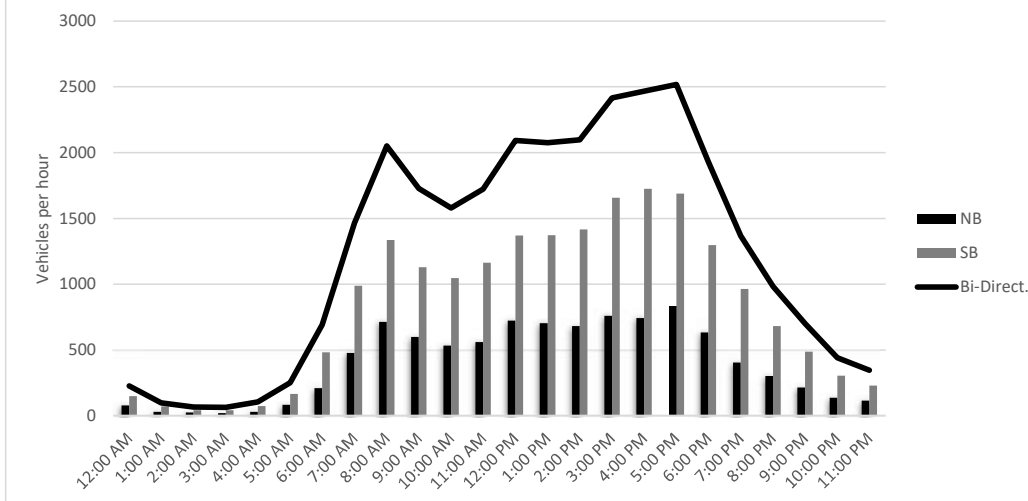
START TIME	Northbound				Southbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	NB	SB	Bi-Direct.
12:00 AM	16	23	22	18	33	49	34	32	79	148	227
1:00 AM	8	7	6	8	22	20	14	14	29	70	99
2:00 AM	10	6	3	5	12	11	8	11	24	42	66
3:00 AM	6	7	6	2	9	14	11	8	21	42	63
4:00 AM	4	7	6	13	12	16	14	32	30	74	104
5:00 AM	16	17	18	33	24	37	46	60	84	167	251
6:00 AM	34	44	57	75	84	99	124	174	210	481	691
7:00 AM	90	92	129	166	183	249	256	300	477	988	1465
8:00 AM	164	163	188	198	329	326	317	365	713	1337	2050
9:00 AM	168	148	138	145	302	288	254	284	599	1128	1727
10:00 AM	148	122	134	129	278	270	238	261	533	1047	1580
11:00 AM	130	130	133	166	288	290	290	296	559	1164	1723
12:00 PM	180	167	194	182	338	334	328	370	723	1370	2093
1:00 PM	180	179	170	174	333	375	321	344	703	1373	2076
2:00 PM	156	180	182	163	303	397	348	368	681	1416	2097
3:00 PM	182	212	166	199	432	448	368	410	759	1658	2417
4:00 PM	214	178	163	188	455	390	435	445	743	1725	2468
5:00 PM	214	203	210	203	487	441	411	349	830	1688	2518
6:00 PM	171	164	148	149	364	343	314	277	632	1298	1930
7:00 PM	104	122	93	85	252	288	235	188	404	963	1367
8:00 PM	81	80	80	60	195	172	168	146	301	681	982
9:00 PM	51	64	58	41	121	138	122	106	214	487	701
10:00 PM	40	35	29	33	88	90	62	65	137	305	442
11:00 PM	34	39	18	24	76	60	42	52	115	230	345

8:00 AM 9:00 AM
 4:45 PM 5:45 PM
 5:00 PM 6:00 PM
 4:30 PM 5:30 PM

24-Hour Total:
 (Bi-Direct.) AM Peak Hour Total:
 (Bi-Direct.) PM Peak Hour Total:
 Highest By Direction (NB):
 Highest By Direction (SB):

NB	SB	Bi-Direct.
9,600	19,882	29,482
713	1,337	2,050
815	1,784	2,599
830		
	1,808	

Graph



ROADWAY: Walnut Hill Lane
 LOCATION: East of Gold Lakes Trail
 DAY: Wednesday
 DATE: 3-Nov
 YEAR: 2021
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME

38,404
 (WEEKDAY)

Walnut Hill Lane

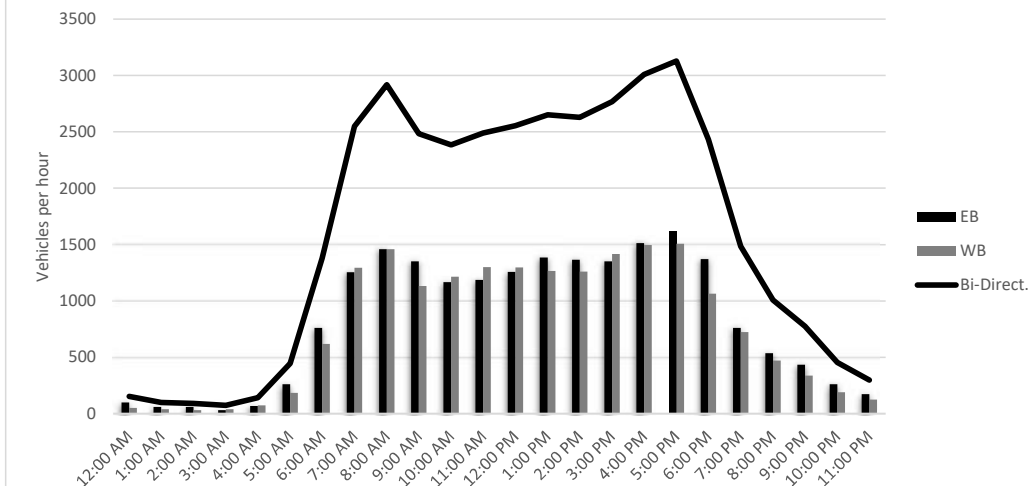
START TIME	Eastbound				Westbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	EB	WB	Bi-Direct.
12:00 AM	30	23	26	22	21	14	12	6	101	53	154
1:00 AM	23	14	9	14	16	11	6	6	60	39	99
2:00 AM	14	17	12	18	11	3	9	8	61	31	92
3:00 AM	11	5	8	9	7	11	11	12	33	41	74
4:00 AM	8	14	12	34	18	14	18	24	68	74	142
5:00 AM	30	40	70	121	30	38	58	60	261	186	447
6:00 AM	139	190	217	214	122	126	182	190	760	620	1380
7:00 AM	222	278	349	405	240	310	345	400	1254	1295	2549
8:00 AM	355	378	358	369	370	391	352	345	1460	1458	2918
9:00 AM	368	326	302	354	270	286	286	291	1350	1133	2483
10:00 AM	288	292	290	297	287	319	296	314	1167	1216	2383
11:00 AM	306	292	297	293	303	318	350	330	1188	1301	2489
12:00 PM	303	277	316	362	338	358	300	302	1258	1298	2556
1:00 PM	359	326	322	379	336	285	314	330	1386	1265	2651
2:00 PM	323	334	362	346	299	324	329	310	1365	1262	2627
3:00 PM	322	336	338	354	340	374	329	374	1350	1417	2767
4:00 PM	350	368	390	404	354	372	372	398	1512	1496	3008
5:00 PM	402	408	434	377	466	379	376	286	1621	1507	3128
6:00 PM	391	392	328	259	314	270	256	224	1370	1064	2434
7:00 PM	232	204	178	148	198	226	168	132	762	724	1486
8:00 PM	141	135	138	122	158	125	96	94	536	473	1009
9:00 PM	118	126	91	100	114	76	78	71	435	339	774
10:00 PM	70	72	65	56	52	50	44	46	263	192	455
11:00 PM	51	44	40	38	44	31	34	17	173	126	299

7:45 AM 8:45 AM
 4:45 PM 5:45 PM
 4:45 PM 5:45 PM
 4:45 PM 5:45 PM

24-Hour Total:
 (Bi-Direct.) AM Peak Hour Total:
 (Bi-Direct.) PM Peak Hour Total:
 Highest By Direction (EB):
 Highest By Direction (WB):

	EB	WB	Bi-Direct.
24-Hour Total:	19,794	18,610	38,404
(Bi-Direct.) AM Peak Hour Total:	1,496	1,513	3,009
(Bi-Direct.) PM Peak Hour Total:	1,648	1,619	3,267
Highest By Direction (EB):	1,648		
Highest By Direction (WB):		1,619	

Graph



Intersection Turning Movement Counts

				Southbound Approach on Site Driveway 1						Westbound Approach on Walnut Hill Lane						Northbound Approach on Site Driveway 1						Eastbound Approach on Walnut Hill Lane						
				Vehicles				Peds		Vehicles				Peds		Vehicles				Peds		Vehicles				Peds		
				U	L	T	R	CCW	CW	U	L	T	R	CCW	CW	U	L	T	R	CCW	CW	U	L	T	R	CCW	CW	
		START	END																									
City:	Dallas	7:00 AM	7:15 AM	3	0	7																						
State:	Texas	7:15 AM	7:30 AM	4	1	4																						
Day:	Wednesday	7:30 AM	7:45 AM	5	3	9																						
Date:	3-Nov	7:45 AM	8:00 AM	3	1	8																						
Year:	2022	8:00 AM	8:15 AM	6	2	16																						
Data Collector:	Camera	8:15 AM	8:30 AM	7	0	13																						
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	5	2	16																						
Traffic Control:	Traffic Signal	8:45 AM	9:00 AM	5	1	26																						
Observations:																												
				4:30 PM	4:45 PM	8	0	22																				
				4:45 PM	5:00 PM	10	1	24																				
				5:00 PM	5:15 PM	12	0	26																				
				5:15 PM	5:30 PM	7	0	20																				
				5:30 PM	5:45 PM	8	0	20																				
				5:45 PM	6:00 PM	14	2	15																				
				6:00 PM	6:15 PM	8	1	27																				
				6:15 PM	6:30 PM	12	0	28																				

Intersection Turning Movement Counts

				Southbound Approach on Manderville Lane						Westbound Approach on Walnut Hill Lane						Northbound Approach on Manderville Lane						Eastbound Approach on Walnut Hill Lane					
				Vehicles				Peds		Vehicles				Peds		Vehicles				Peds		Vehicles				Peds	
				U	L	T	R	CCW	CW	U	L	T	R	CCW	CW	U	L	T	R	CCW	CW	U	L	T	R	CCW	CW
City:	Dallas	7:00 AM	7:15 AM	0	0	16				0	184	1				0	0	0				13	188	0			
State:	Texas	7:15 AM	7:30 AM	0	0	20				0	291	3				0	0	0				7	248	0			
Day:	Wednesday	7:30 AM	7:45 AM	0	0	15				0	350	1				0	0	0				12	294	0			
Date:	3-Nov	7:45 AM	8:00 AM	0	0	15				0	353	1				0	0	0				11	355	1			
Year:	2022	8:00 AM	8:15 AM	0	0	13				0	362	1				0	0	0				16	262	0			
Data Collector:	Camera	8:15 AM	8:30 AM	0	0	15				0	357	1				0	0	0				17	316	0			
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	0	0	16				0	308	5				0	0	1				15	308	1			
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	0	0	19				0	358	4				0	0	0				16	310	0			
Observations:		4:30 PM	4:45 PM	0	0	48				0	315	0				0	0	0				15	402	0			
		4:45 PM	5:00 PM	0	0	39				0	343	3				0	0	0				12	406	0			
		5:00 PM	5:15 PM	0	0	41				0	359	3				0	0	0				18	423	0			
		5:15 PM	5:30 PM	0	0	33				0	341	2				0	0	0				14	413	0			
		5:30 PM	5:45 PM	0	0	31				0	294	3				0	0	0				20	433	0			
		5:45 PM	6:00 PM	0	0	24				0	246	1				0	0	0				13	380	0			
		6:00 PM	6:15 PM	0	0	22				0	268	3				0	0	0				14	371	0			
		6:15 PM	6:30 PM	0	0	23				0	242	1				0	0	1				21	383	1			

City:	<i>Dallas</i>
State:	<i>Texas</i>
Day:	<i>Wednesday</i>
Date:	<i>3-Nov</i>
Year:	<i>2022</i>
Data Collector:	<i>Camera</i>
Data Source:	<i>CJ Hensch & Associates, Inc.</i>
Traffic Control:	<i>Minor Approach Stop</i>
Observations:	

AM Peak Hour	Intersection PHF: 0.94
	Peak Hour 8:00 AM - 9:00 AM
	Study Area PHF: 0.94
	Peak Hour: 7:45 AM - 8:45 AM
PM Peak Hour	Intersection PHF: 0.96
	Peak Hour 5:00 PM - 6:00 PM
	Study Area PHF: 0.94
	Peak Hour: 4:45 PM - 5:45 PM

Intersection Turning Movement Counts

				NORTH LEG							EAST LEG							SOUTH LEG							WEST LEG						
				Southbound Approach on Manderville Lane							Westbound Approach on Glen Lakes Drive							Northbound Approach on Manderville Lane							Eastbound Approach on Glen Lakes Drive						
				Vehicles				Peds			Vehicles				Peds			Vehicles				Peds			Vehicles				Peds		
				U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW	
				START							END							START							END						
City:	Dallas	7:00 AM	7:15 AM	3	16	1					1	8	17					0	10	0					0	4	0				
State:	Texas	7:15 AM	7:30 AM	6	22	2					1	10	11					0	6	2					0	1	1				
Day:	Wednesday	7:30 AM	7:45 AM	6	14	4					0	13	12					0	11	0					2	3	3				
Date:	3-Nov	7:45 AM	8:00 AM	5	15	3					1	23	26					0	10	1					3	3	2				
Year:	2022	8:00 AM	8:15 AM	3	9	4					4	19	27					6	10	0					2	1	3				
Data Collector:	Camera	8:15 AM	8:30 AM	8	12	2					2	21	26					1	14	0					0	4	2				
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	10	14	2					2	15	37					1	11	4					1	3	3				
Traffic Control:	All-Way Stop	8:45 AM	9:00 AM	12	13	7					2	22	26					5	11	1					2	3	2				
Observations:		4:30 PM	4:45 PM	26	38	2					4	8	16					1	11	0					2	8	5				
		4:45 PM	5:00 PM	16	30	3					3	10	9					1	12	1					3	10	5				
		5:00 PM	5:15 PM	42	36	1					2	10	17					2	18	0					4	12	4				
		5:15 PM	5:30 PM	17	26	1					2	11	14					1	12	1					1	8	4				
		5:30 PM	5:45 PM	22	25	0					3	10	9					2	21	1					0	9	3				
		5:45 PM	6:00 PM	9	17	1					2	8	6					2	12	0					3	6	8				
		6:00 PM	6:15 PM	16	16	0					0	1	7					1	12	1					1	5	4				
		6:15 PM	6:30 PM	11	16	1					8	6	8					0	21	0					1	1	3				
AM Peak Hour	Intersection PHF:	0.92	Intersection PHV:	0	33	48	15				0	10	77	116				0	13	46	5				0	5	11	10			
	Peak Hour:	8:00 AM - 9:00 AM	PHF:	0.69	0.86	0.54					0.63	0.88	0.78					0.54	0.82	0.31					0.63	0.69	0.83				
	Study Area PHF:	0.91	Study Area PHV:	0	26	50	11				0	9	78	116				0	8	45	5				0	6	11	10			
	Peak Hour:	7:45 AM - 8:45 AM	PHF:	0.65	0.83	0.69					0.56	0.85	0.78					0.33	0.80	0.31					0.50	0.69	0.83				
PM Peak Hour	Intersection PHF:	0.79	Intersection PHV:	0	101	130	7				0	11	39	56				0	5	53	2				0	10	38	18			
	Peak Hour:	4:30 PM - 5:30 PM	PHF:	0.60	0.86	0.58					0.69	0.89	0.82					0.63	0.74	0.50					0.63	0.79	0.90				
	Study Area PHF:	0.77	Study Area PHV:	0	97	117	5				0	10	41	49				0	6	63	3				0	8	39	16			
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.58	0.81	0.42					0.83	0.93	0.72					0.75	0.75	0.75					0.50	0.81	0.80				

Intersection Turning Movement Counts

				NORTH LEG							EAST LEG							SOUTH LEG							WEST LEG						
				Southbound Approach on N Central Expressway NBFR							Westbound Approach on Site Driveway 3							Northbound Approach on N Central Expressway NBFR							Eastbound Approach on Site Driveway 3						
				Vehicles				Peds			Vehicles				Peds			Vehicles				Peds			Vehicles				Peds		
				U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW	
City:	Dallas	7:00 AM	7:15 AM	0	0	0					0	0	1					0	103	0					0	0	0				
State:	Texas	7:15 AM	7:30 AM	0	0	0					0	0	1					0	96	1					0	0	0				
Day:	Wednesday	7:30 AM	7:45 AM	0	0	0					0	0	0					0	144	2					0	0	0				
Date:	3-Nov	7:45 AM	8:00 AM	0	0	0					0	0	0					0	183	0					0	0	0				
Year:	2022	8:00 AM	8:15 AM	0	0	0					0	0	0					0	201	8					0	0	0				
Data Collector:	Camera	8:15 AM	8:30 AM	0	0	0					0	0	2					0	180	5					0	0	0				
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	0	0	0					0	0	2					0	215	4					0	0	0				
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	0	0	0					0	0	1					0	200	8					0	0	0				
Observations:		4:30 PM	4:45 PM	0	0	0					0	0	6					0	150	6					0	0	0				
		4:45 PM	5:00 PM	0	0	0					0	0	6					0	166	4					0	0	0				
		5:00 PM	5:15 PM	0	0	0					0	0	7					0	207	4					0	0	0				
		5:15 PM	5:30 PM	0	0	0					0	0	0					0	196	3					0	0	0				
		5:30 PM	5:45 PM	0	0	0					0	0	2					0	198	2					0	0	0				
		5:45 PM	6:00 PM	0	0	0					0	0	4					0	185	5					0	0	0				
		6:00 PM	6:15 PM	0	0	0					0	0	8					0	171	4					0	0	0				
		6:15 PM	6:30 PM	0	0	0					0	0	6					0	156	1					0	0	0				
AM Peak Hour	Intersection PHF:	0.93	Intersection PHV:	0	0	0	0				0	0	0	5				0	0	796	25				0	0	0	0			
	Peak Hour:	8:00 AM - 9:00 AM	PHF:	0.00	0.00	0.00					0.00	0.00	0.63					0.00	0.93	0.78					0.00	0.00	0.00				
	Study Area PHF:	0.90	Study Area PHV:	0	0	0	0				0	0	0	4				0	0	779	17				0	0	0	0			
	Peak Hour:	7:45 AM - 8:45 AM	PHF:	0.00	0.00	0.00	0.00				0.00	0.00	0.50					0.00	0.91	0.53					0.00	0.00	0.00	0.00			
PM Peak Hour	Intersection PHF:	0.93	Intersection PHV:	0	0	0	0				0	0	0	13				0	0	786	14				0	0	0	0			
	Peak Hour:	5:00 PM - 6:00 PM	PHF:	0.00	0.00	0.00					0.00	0.00	0.46					0.00	0.95	0.70					0.00	0.00	0.00				
	Study Area PHF:	0.91	Study Area PHV:	0	0	0	0				0	0	0	15				0	0	767	13				0	0	0	0			
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.00	0.00	0.00					0.00	0.00	0.54					0.00	0.93	0.81					0.00	0.00	0.00				

Intersection Turning Movement Counts

				NORTH LEG							EAST LEG							SOUTH LEG							WEST LEG						
				Southbound Approach on N Central Expressway NBFR							Westbound Approach on Site Driveway 4							Northbound Approach on N Central Expressway NBFR							Eastbound Approach on						
				Vehicles				Peds			Vehicles				Peds			Vehicles				Peds			Vehicles				Peds		
				U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW		U	L	T	R	CCW	CW	
City:	Dallas	7:00 AM	7:15 AM	0	0	0					0	0	7					0	179	14					0	0	0				
State:	Texas	7:15 AM	7:30 AM	0	0	0					0	0	1					0	244	12					0	0	0				
Day:	Wednesday	7:30 AM	7:45 AM	0	0	0					0	0	10					0	255	21					0	0	0				
Date:	3-Nov	7:45 AM	8:00 AM	0	0	0					0	0	5					0	294	16					0	0	0				
Year:	2022	8:00 AM	8:15 AM	0	0	0					0	0	6					0	329	19					0	0	0				
Data Collector:	Camera	8:15 AM	8:30 AM	0	0	0					0	0	13					0	316	26					0	0	0				
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	0	0	0					0	0	9					0	310	20					0	0	0				
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	0	0	0					0	0	15					0	352	25					0	0	0				
Observations:		4:30 PM	4:45 PM	0	0	0					0	0	14					0	426	18					0	0	0				
		4:45 PM	5:00 PM	0	0	0					0	0	17					0	433	24					0	0	0				
		5:00 PM	5:15 PM	0	0	0					0	0	9					0	486	27					0	0	0				
		5:15 PM	5:30 PM	0	0	0					0	0	6					0	441	23					0	0	0				
		5:30 PM	5:45 PM	0	0	0					0	0	13					0	401	22					0	0	0				
		5:45 PM	6:00 PM	0	0	0					0	0	13					0	344	23					0	0	0				
		6:00 PM	6:15 PM	0	0	0					0	0	16					0	351	15					0	0	0				
		6:15 PM	6:30 PM	0	0	0					0	0	23					0	323	23					0	0	0				
AM Peak Hour	Intersection PHF:	0.92	Intersection PHV:	0	0	0	0				0	0	0	43				0	0	1,307	90				0	0	0	0			
	Peak Hour:	8:00 AM - 9:00 AM	PHF:	0.00	0.00	0.00					0.00	0.00	0.72					0.00	0.93	0.87					0.00	0.00	0.00				
	Study Area PHF:	0.96	Study Area PHV:	0	0	0	0				0	0	0	33				0	0	1,249	81				0	0	0	0			
	Peak Hour:	7:45 AM - 8:45 AM	PHF:	0.00	0.00	0.00	0.00				0.00	0.00	0.63					0.00	0.95	0.78					0.00	0.00	0.00	0.00			
PM Peak Hour	Intersection PHF:	0.92	Intersection PHV:	0	0	0	0				0	0	0	46				0	0	1,786	92				0	0	0	0			
	Peak Hour:	4:30 PM - 5:30 PM	PHF:	0.00	0.00	0.00					0.00	0.00	0.68					0.00	0.92	0.85					0.00	0.00	0.00				
	Study Area PHF:	0.91	Study Area PHV:	0	0	0	0				0	0	0	45				0	0	1,761	96				0	0	0	0			
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.00	0.00	0.00					0.00	0.00	0.66					0.00	0.91	0.89					0.00	0.00	0.00				

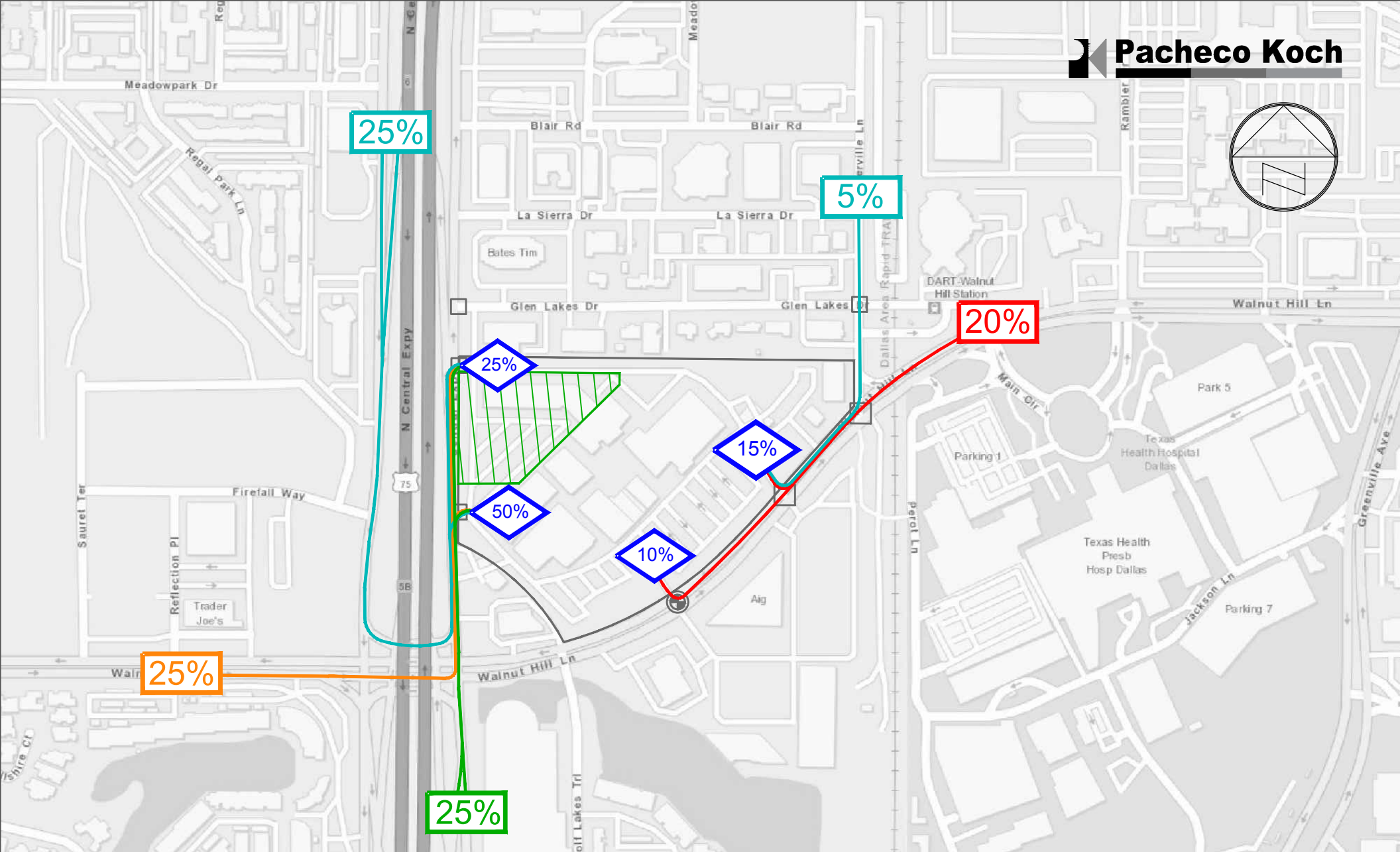
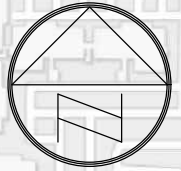
Intersection Turning Movement Counts



			START	END	U				L	T	R	CCW	CW	U				L	T	R	CCW	CW	U				L	T	R	CCW	CW
City:	Dallas	7:00 AM	7:15 AM	3	0	9					1	193	4				1	0	2				3	198	15						
State:	Texas	7:15 AM	7:30 AM	1	0	1					3	310	3				1	0	0				4	240	11						
Day:	Wednesday	7:30 AM	7:45 AM	1	0	1					10	337	5				1	0	0				3	315	12						
Date:	3-Nov	7:45 AM	8:00 AM	0	0	0					10	365	5				0	0	2				5	353	23						
Year:	2022	8:00 AM	8:15 AM	1	0	3					14	367	7				1	0	0				7	288	27						
Data Collector:	Camera	8:15 AM	8:30 AM	3	0	4					10	360	11				0	0	1				4	322	25						
Data Source:	CJ Hensch & Associates, Inc.	8:30 AM	8:45 AM	1	0	2					22	322	6				5	0	10				1	322	21						
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	1	1	7					8	371	12				5	0	8				1	313	25						
Observations:		4:30 PM	4:45 PM	4	0	4					4	354	8				6	0	18				6	400	1						
		4:45 PM	5:00 PM	3	0	3					2	364	10				5	0	13				12	393	2						
		5:00 PM	5:15 PM	3	0	7					2	385	6				3	0	20				7	416	1						
		5:15 PM	5:30 PM	2	0	10					5	360	16				2	0	12				5	409	1						
		5:30 PM	5:45 PM	8	0	6					4	308	10				2	0	11				6	418	1						
		5:45 PM	6:00 PM	1	0	5					1	259	7				1	0	5				4	383	1						
		6:00 PM	6:15 PM	5	0	7					5	266	9				1	0	5				6	378	0						
		6:15 PM	6:30 PM	4	0	17					3	244	13				1	0	1				6	394	0						
AM Peak Hour	Intersection PHF:	0.96	Intersection PHV:	0	5	0	9				0	56	1,414	29			0	6	0	13			0	17	1,285	96					
	Peak Hour	7:45 AM - 8:45 AM	PHF:	0.42	0.00	0.56					0.64	0.96	0.66				0.30	0.00	0.33				0.61	0.91	0.89						
	Study Area PHF:	0.96	Study Area PHV:	0	5	0	9				0	56	1,414	29			0	6	0	13			0	17	1,285	96					
	Peak Hour:	7:45 AM - 8:45 AM	PHF:	0.42	0.00	0.56					0.64	0.96	0.66				0.30	0.00	0.33				0.61	0.91	0.89						
PM Peak Hour	Intersection PHF:	0.97	Intersection PHV:	0	12	0	24				0	13	1,463	40			0	16	0	63			0	30	1,618	5					
	Peak Hour	4:30 PM - 5:30 PM	PHF:	0.75	0.00	0.60					0.65	0.95	0.63				0.67	0.00	0.79				0.63	0.97	0.63						
	Study Area PHF:	0.96	Study Area PHV:	0	16	0	26				0	13	1,417	42			0	12	0	56			0	30	1,636	5					
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.50	0.00	0.65					0.65	0.92	0.66				0.60	0.00	0.70				0.63	0.98	0.63						

APPENDIX C. Site-Generated Traffic Supplement

PROJECTED TRIP GENERATION

	Development Program			Weekday Trip Ends						
	Land Use	Quantity	Units	Weekday Daily	AM Peak - Adjacent Street			PM Peak - Adjacent Street		
					In	Out	Total	In	Out	Total
Use "A" ITE LUC 710	Office	200,000 SF		2168	268	36	304	49	239	288
Use "B" ITE LUC 221	Multifamily (Mid-Rise)	415 DU		1884	35	119	154	99	63	162
Subtotal (no adjustments)				4052	303	155	458	148	302	450
Ped/Trans Reductions				203	15	8	23	7	15	23
Internal Capture										
Subtotal				3849	288	147	435	141	287	427
Pass-by										
Net Driveway Vols				3849	288	147	435	141	287	427

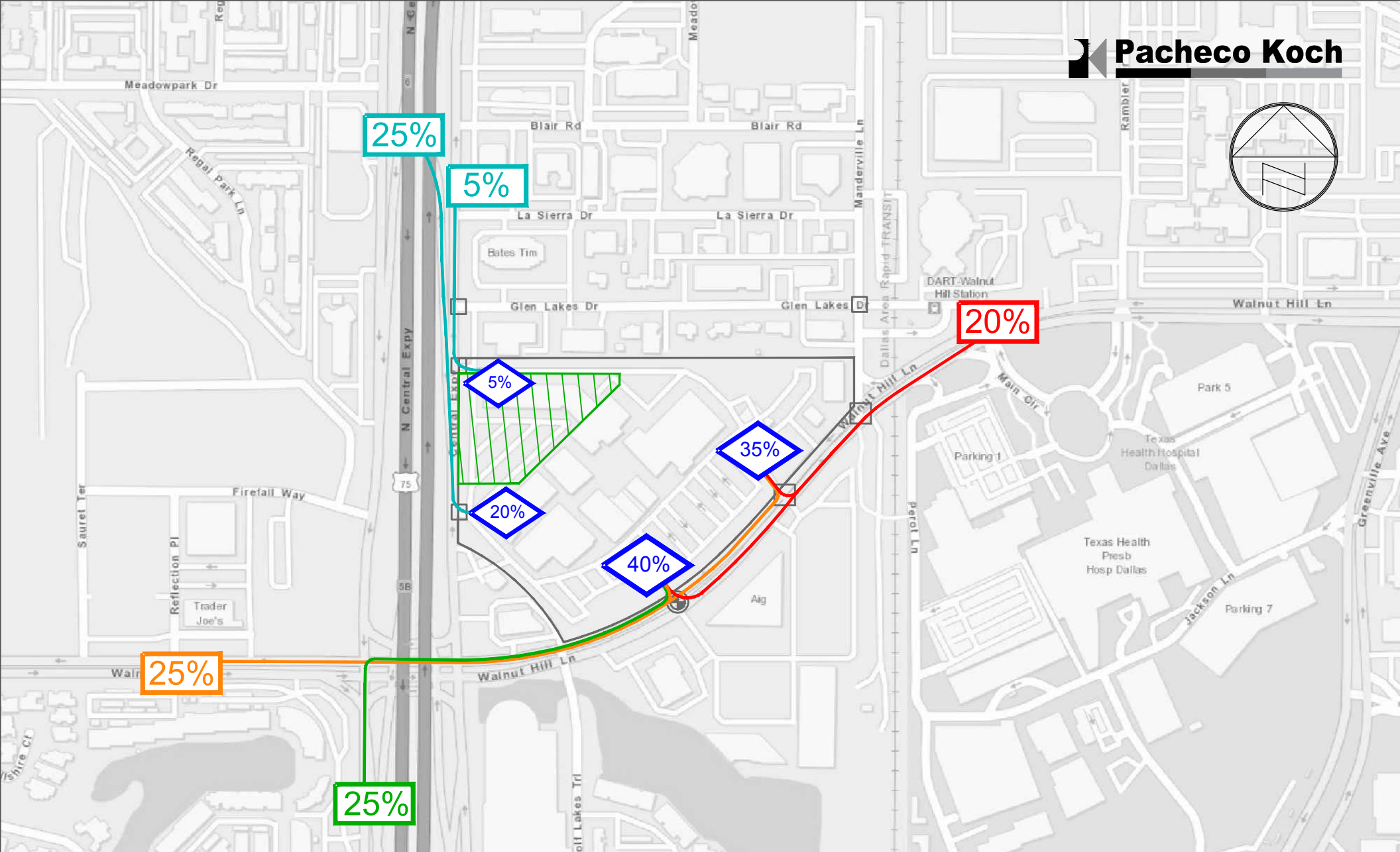
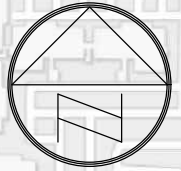


-  - Project Location
-  - Traffic Assignment

Site Generated Trip Distribution - Office - Inbound

The Hill, Dallas, Texas

PK #3610-21.560 (SMN: 01/20/22)

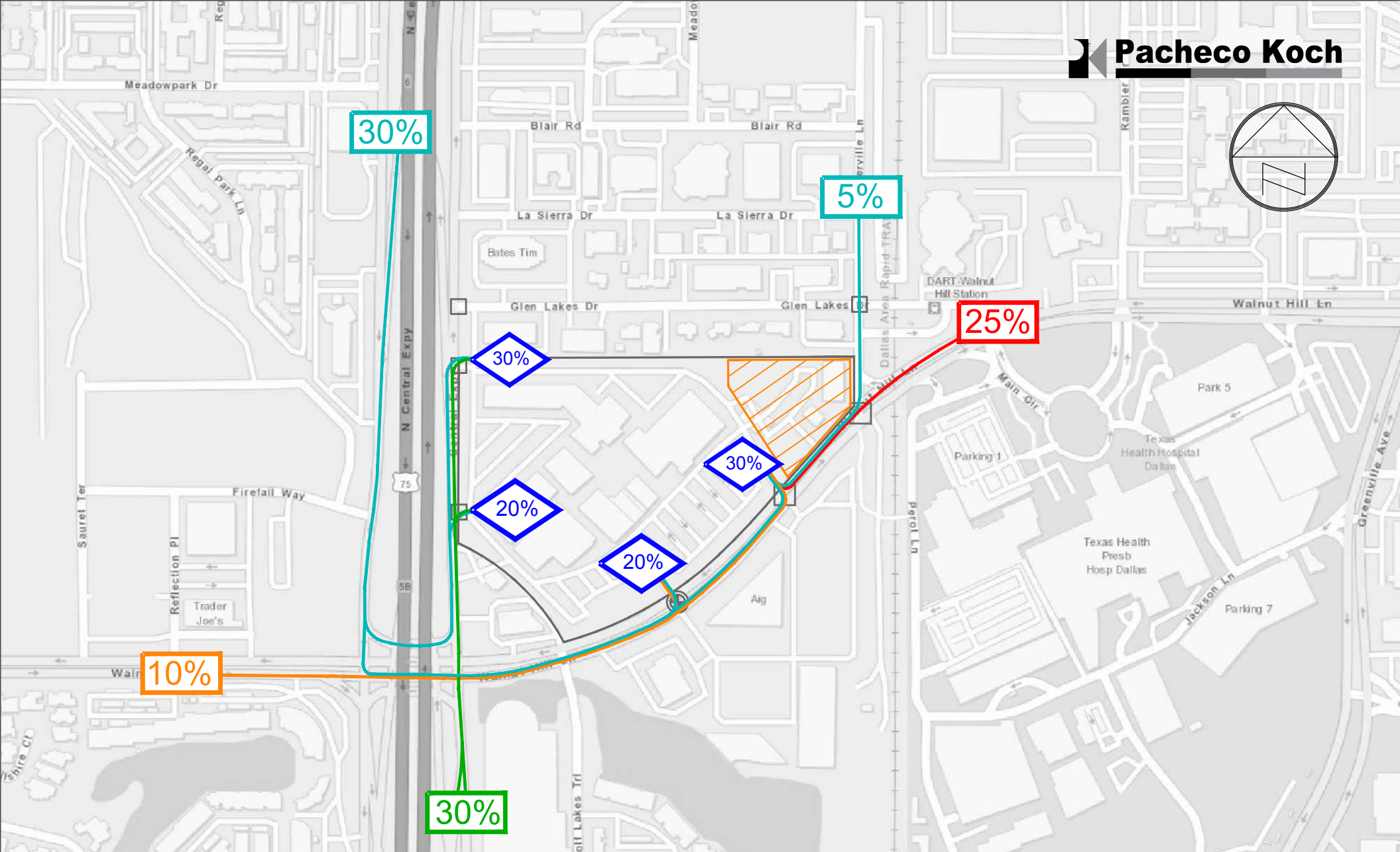
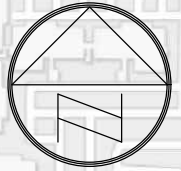




- Project Location
- Traffic Assignment

Site Generated Trip Distribution - Office - Outbound

The Hill, Dallas, Texas

PK #3610-21.560 (SMN: 01/20/22)

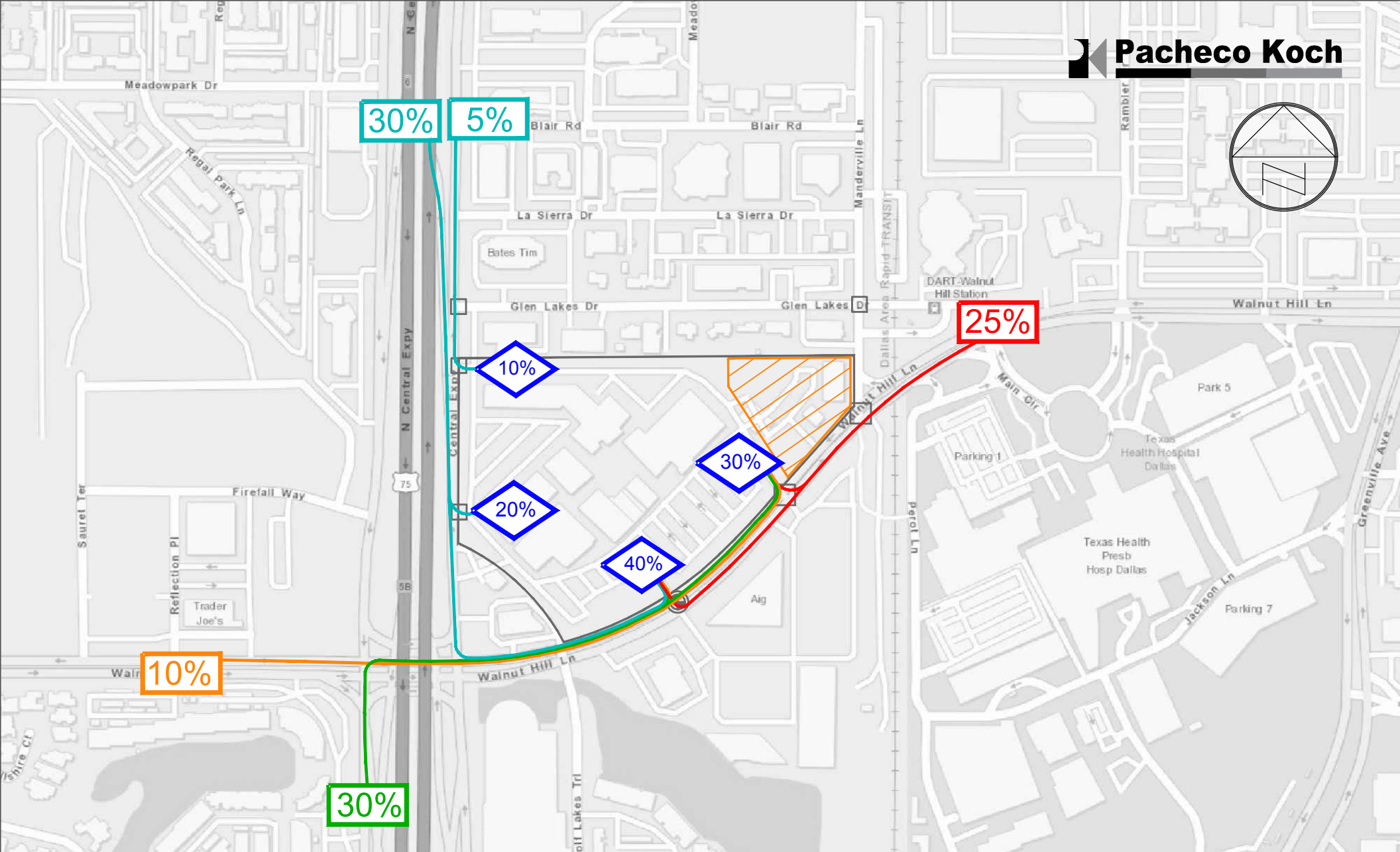
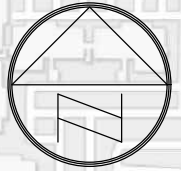




-  - Project Location
-  - Traffic Assignment

Site Generated Trip Distribution - Multifamily - Inbound

The Hill, Dallas, Texas

PK #3610-21.560 (SMN: 01/31/22)



-  - Project Location
-  - Traffic Assignment

Site Generated Trip Distribution - Multifamily - Outbound

The Hill, Dallas, Texas

PK #3610-21.560 (SMN: 01/20/22)

APPENDIX D. Detailed Intersection Capacity Analysis Results

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

Existing
Timing Plan: AM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	53	1363	100	37	1357	24	22	0	10	21	5	53
Future Volume (vph)	53	1363	100	37	1357	24	22	0	10	21	5	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	1482	109	40	1475	26	24	0	11	23	5	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	1591	0	40	1501	0	24	11	0	23	63	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	72.0		12.0	72.0		18.0	18.0		18.0	18.0	
Total Split (%)	10.0%	60.0%		10.0%	60.0%		15.0%	15.0%		15.0%	15.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	41.9	38.4		41.6	38.2		7.2	7.2		19.8	19.8	
Actuated g/C Ratio	0.53	0.48		0.52	0.48		0.09	0.09		0.25	0.25	
v/c Ratio	0.24	0.65		0.17	0.62		0.15	0.03		0.05	0.14	
Control Delay	10.5	17.6		9.7	17.3		45.1	0.2		34.4	12.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.5	17.6		9.7	17.3		45.1	0.2		34.4	12.6	
LOS	B	B		A	B		D	A		C	B	
Approach Delay		17.4			17.1			31.0			18.4	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	13	251		9	235		13	0		11	2	
Queue Length 95th (ft)	30	319		23	296		43	0		37	40	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	265	4116		265	4143		329	493		440	442	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.22	0.39		0.15	0.36		0.07	0.02		0.05	0.14	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 79.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 17.4

Intersection LOS: B

01/19/2022
SMN

Synchro 10 Report
Page 1

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

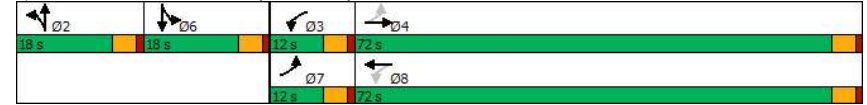
Existing
Timing Plan: AM

Intersection Capacity Utilization 51.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



01/19/2022
SMN

Synchro 10 Report
Page 2

2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙		↖ ↗ ↘	↗ ↘ ↙
Traffic Vol, veh/h	17	1285	1414	29	5	9
Future Vol, veh/h	17	1285	1414	29	5	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	1397	1537	32	5	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1569	0	-	0	2148 785
Stage 1	-	-	-	-	1553 -
Stage 2	-	-	-	-	595 -
Critical Hdwy	5.34	-	-	-	5.74 7.14
Critical Hdwy Stg 1	-	-	-	-	6.64 -
Critical Hdwy Stg 2	-	-	-	-	6.04 -
Follow-up Hdwy	3.12	-	-	-	3.82 3.92
Pot Cap-1 Maneuver	206	-	-	-	78 288
Stage 1	-	-	-	-	110 -
Stage 2	-	-	-	-	468 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	206	-	-	-	71 288
Mov Cap-2 Maneuver	-	-	-	-	71 -
Stage 1	-	-	-	-	100 -
Stage 2	-	-	-	-	468 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	32.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	206	-	-	-	71	288
HCM Lane V/C Ratio	0.09	-	-	-	0.077	0.034
HCM Control Delay (s)	24.2	-	-	-	59.9	17.9
HCM Lane LOS	C	-	-	-	F	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2	0.1

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙		↖ ↗ ↘	↗ ↘ ↙
Traffic Vol, veh/h	59	1241	1380	8	0	59
Future Vol, veh/h	59	1241	1380	8	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	1349	1500	9	0	64

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1500	0	-	0	2173 755
Stage 1	-	-	-	-	1505 -
Stage 2	-	-	-	-	668 -
Critical Hdwy	5.34	-	-	-	5.74 7.14
Critical Hdwy Stg 1	-	-	-	-	6.64 -
Critical Hdwy Stg 2	-	-	-	-	6.04 -
Follow-up Hdwy	3.12	-	-	-	3.82 3.92
Pot Cap-1 Maneuver	223	-	-	-	76 301
Stage 1	-	-	-	-	118 -
Stage 2	-	-	-	-	429 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	223	-	-	-	54 301
Mov Cap-2 Maneuver	-	-	-	-	54 -
Stage 1	-	-	-	-	84 -
Stage 2	-	-	-	-	429 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	223	-	-	-	301
HCM Lane V/C Ratio	0.288	-	-	-	0.213
HCM Control Delay (s)	27.5	-	-	-	20.2
HCM Lane LOS	D	-	-	-	C
HCM 95th %tile Q(veh)	1.1	-	-	-	0.8

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	6	10	8	45	50	11
Future Vol, veh/h	6	10	8	45	50	11
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	11	9	49	54	12

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	127	60	66	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	868	1005	1536	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	863	1005	1536	-	-	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1536	-	947	-	-
HCM Lane V/C Ratio	0.006	-	0.018	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	42	649	121	0	0
Future Vol, veh/h	0	42	649	121	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	46	705	132	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	419	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	583	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	583	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.7	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	583
HCM Lane V/C Ratio	-	0.078
HCM Control Delay (s)	-	11.7
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.3

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑ ↑			
Traffic Vol, veh/h	0	4	779	17	0	0
Future Vol, veh/h	0	4	779	17	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	847	18	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	433	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	571	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	571	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 571
HCM Lane V/C Ratio	-	- 0.008
HCM Control Delay (s)	-	- 11.4
HCM Lane LOS	-	- B
HCM 95th %tile Q(veh)	-	- 0

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑ ↑ ↑			
Traffic Vol, veh/h	0	33	1249	81	0	0
Future Vol, veh/h	0	33	1249	81	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	36	1358	88	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	723	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.14	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.92	-	-
Pot Cap-1 Maneuver	0	316	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	316	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	17.8	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 316
HCM Lane V/C Ratio	-	- 0.114
HCM Control Delay (s)	-	- 17.8
HCM Lane LOS	-	- C
HCM 95th %tile Q(veh)	-	- 0.4

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

Existing
Timing Plan: PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	83	1577	17	37	1391	28	156	3	45	37	1	90
Future Volume (vph)	83	1577	17	37	1391	28	156	3	45	37	1	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	1714	18	40	1512	30	170	3	49	40	1	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1732	0	40	1542	0	170	52	0	40	99	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	63.0		20.0	63.0		29.2	29.2		27.8	27.8	
Total Split (%)	14.3%	45.0%		14.3%	45.0%		20.9%	20.9%		19.9%	19.9%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	61.1	53.8		55.9	49.1		16.8	16.8		23.8	23.8	
Actuated g/C Ratio	0.52	0.46		0.48	0.42		0.14	0.14		0.20	0.20	
v/c Ratio	0.46	0.74		0.24	0.72		0.67	0.19		0.11	0.25	
Control Delay	22.7	29.0		17.3	30.8		62.6	15.7		45.0	11.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.7	29.0		17.3	30.8		62.6	15.7		45.0	11.0	
LOS	C	C		B	C		E	B		D	B	
Approach Delay		28.7			30.4			51.6			20.8	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	31	394		14	343		127	2		26	1	
Queue Length 95th (ft)	72	517		34	467		217	41		66	53	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	294	2620		298	2586		380	383		359	400	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.31	0.66		0.13	0.60		0.45	0.14		0.11	0.25	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 117

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 30.5

Intersection LOS: C

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

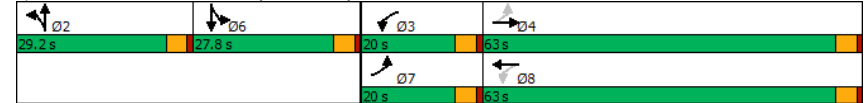
Existing
Timing Plan: PM

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	30	1636	1417	42	16	26
Future Vol, veh/h	30	1636	1417	42	16	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	1778	1540	46	17	28

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1586	0	-	0	2340
Stage 1	-	-	-	-	1563
Stage 2	-	-	-	-	777
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	202	-	-	-	61
Stage 1	-	-	-	-	108
Stage 2	-	-	-	-	376
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	202	-	-	-	51
Mov Cap-2 Maneuver	-	-	-	-	51
Stage 1	-	-	-	-	90
Stage 2	-	-	-	-	376

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	53.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	202	-	-	-	51	284
HCM Lane V/C Ratio	0.161	-	-	-	0.341	0.1
HCM Control Delay (s)	26.2	-	-	-	108.5	19.1
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	0.6	-	-	-	1.2	0.3

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	64	1675	1337	11	0	144
Future Vol, veh/h	64	1675	1337	11	0	144
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	1821	1453	12	0	157

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1453	0	-	0	2327
Stage 1	-	-	-	-	1459
Stage 2	-	-	-	-	868
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	235	-	-	-	62
Stage 1	-	-	-	-	126
Stage 2	-	-	-	-	336
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	235	-	-	-	44
Mov Cap-2 Maneuver	-	-	-	-	44
Stage 1	-	-	-	-	88
Stage 2	-	-	-	-	336

Approach	EB	WB	SB
HCM Control Delay, s	1	0	27.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	235	-	-	-	312
HCM Lane V/C Ratio	0.296	-	-	-	0.502
HCM Control Delay (s)	26.6	-	-	-	27.6
HCM Lane LOS	D	-	-	-	D
HCM 95th %tile Q(veh)	1.2	-	-	-	2.7

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	8	16	6	63	117	5
Future Vol, veh/h	8	16	6	63	117	5
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	17	7	68	127	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	212	130	132	0	-	0
Stage 1	130	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	776	920	1453	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	772	920	1453	-	-	-
Mov Cap-2 Maneuver	772	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1453	-	865	-	-
HCM Lane V/C Ratio	0.004	-	0.03	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	68	761	22	0	0
Future Vol, veh/h	0	68	761	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	74	827	24	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	426	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	577	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	577	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.2	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	577
HCM Lane V/C Ratio	-	0.128
HCM Control Delay (s)	-	12.2
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.4

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	15	767	13	0	0
Future Vol, veh/h	0	15	767	13	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	834	14	0	0

Major/Minor	Minor1	Major1	
Conflicting Flow All	-	424	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	579	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	579	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	579
HCM Lane V/C Ratio	-	0.028
HCM Control Delay (s)	-	11.4
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.1

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	45	1761	96	0	0
Future Vol, veh/h	0	45	1761	96	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	1914	104	0	0

Major/Minor	Minor1	Major1	
Conflicting Flow All	-	1009	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	205	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	205	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB
HCM Control Delay, s	28	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	205
HCM Lane V/C Ratio	-	0.239
HCM Control Delay (s)	-	28
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	0.9

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane

3610 - 21.560

No Build

Timing Plan: AM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩↩↩	↩	↩	↩↩↩	↩	↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	57	1475	108	40	1469	26	24	0	11	23	5	57
Future Volume (vph)	57	1475	108	40	1469	26	24	0	11	23	5	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	1603	117	43	1597	28	26	0	12	25	5	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	1720	0	43	1625	0	26	12	0	25	67	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	72.0		12.0	72.0		18.0	18.0		18.0	18.0	
Total Split (%)	10.0%	60.0%		10.0%	60.0%		15.0%	15.0%		15.0%	15.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	50.2	46.5		48.5	43.6		7.3	7.3		19.5	19.5	
Actuated g/C Ratio	0.57	0.53		0.55	0.50		0.08	0.08		0.22	0.22	
v/c Ratio	0.28	0.64		0.20	0.65		0.18	0.03		0.06	0.17	
Control Delay	10.8	16.8		9.8	18.0		49.2	0.2		38.2	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.8	16.8		9.8	18.0		49.2	0.2		38.2	13.3	
LOS	B	B		A	B		D	A		D	B	
Approach Delay		16.6			17.8			33.7			20.1	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	14	283		10	265		15	0		13	2	
Queue Length 95th (ft)	32	357		24	331		48	0		43	44	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	240	3926		241	3952		295	459		393	404	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.26	0.44		0.18	0.41		0.09	0.03		0.06	0.17	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 87.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 17.4

Intersection LOS: B

01/19/2022

SMN

Synchro 10 Report

Page 1

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane

3610 - 21.560

No Build

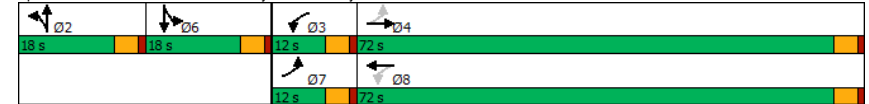
Timing Plan: AM

Intersection Capacity Utilization 54.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



01/19/2022

SMN

Synchro 10 Report

Page 2

2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	18	1391	1531	31	5	10
Future Vol, veh/h	18	1391	1531	31	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	1512	1664	34	5	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1698	0	-	0	2326
Stage 1	-	-	-	-	1681
Stage 2	-	-	-	-	645
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	178	-	-	-	62
Stage 1	-	-	-	-	91
Stage 2	-	-	-	-	441
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	178	-	-	-	55
Mov Cap-2 Maneuver	-	-	-	-	55
Stage 1	-	-	-	-	81
Stage 2	-	-	-	-	441

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	38.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	178	-	-	-	55	261
HCM Lane V/C Ratio	0.11	-	-	-	0.099	0.042
HCM Control Delay (s)	27.7	-	-	-	77.5	19.4
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.3	0.1

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	64	1343	1494	9	0	64
Future Vol, veh/h	64	1343	1494	9	0	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	1460	1624	10	0	70

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1624	0	-	0	2353
Stage 1	-	-	-	-	1629
Stage 2	-	-	-	-	724
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	193	-	-	-	60
Stage 1	-	-	-	-	98
Stage 2	-	-	-	-	401
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	193	-	-	-	38
Mov Cap-2 Maneuver	-	-	-	-	38
Stage 1	-	-	-	-	62
Stage 2	-	-	-	-	401

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	22.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	193	-	-	-	274
HCM Lane V/C Ratio	0.36	-	-	-	0.254
HCM Control Delay (s)	33.8	-	-	-	22.6
HCM Lane LOS	D	-	-	-	C
HCM 95th %tile Q(veh)	1.5	-	-	-	1

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	6	11	9	49	54	12
Future Vol, veh/h	6	11	9	49	54	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	12	10	53	59	13

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	139	66	72	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	854	998	1528	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	848	998	1528	-	-	-
Mov Cap-2 Maneuver	848	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	950	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	939	-	-
HCM Lane V/C Ratio	0.006	-	0.02	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	45	702	131	0	0
Future Vol, veh/h	0	45	702	131	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	763	142	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	453	0	0
Stage 1	-	-	-	
Stage 2	-	-	-	
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	554	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	554	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.1	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	554
HCM Lane V/C Ratio	-	0.088
HCM Control Delay (s)	-	12.1
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.3

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	843	18	0	0
Future Vol, veh/h	0	4	843	18	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	916	20	0	0

Major/Minor	Minor1	Major1
Conflicting Flow All	- 468	0 0
Stage 1	- -	- -
Stage 2	- -	- -
Critical Hdwy	- 6.94	- -
Critical Hdwy Stg 1	- -	- -
Critical Hdwy Stg 2	- -	- -
Follow-up Hdwy	- 3.32	- -
Pot Cap-1 Maneuver	0 542	- -
Stage 1	0 -	- -
Stage 2	0 -	- -
Platoon blocked, %	-	- -
Mov Cap-1 Maneuver	- 542	- -
Mov Cap-2 Maneuver	- -	- -
Stage 1	- -	- -
Stage 2	- -	- -

Approach	WB	NB
HCM Control Delay, s	11.7	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	- -	542
HCM Lane V/C Ratio	- -	0.008
HCM Control Delay (s)	- -	11.7
HCM Lane LOS	- -	B
HCM 95th %tile Q(veh)	- -	0

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

No Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	1352	88	0	0
Future Vol, veh/h	0	36	1352	88	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	39	1470	96	0	0

Major/Minor	Minor1	Major1
Conflicting Flow All	- 783	0 0
Stage 1	- -	- -
Stage 2	- -	- -
Critical Hdwy	- 7.14	- -
Critical Hdwy Stg 1	- -	- -
Critical Hdwy Stg 2	- -	- -
Follow-up Hdwy	- 3.92	- -
Pot Cap-1 Maneuver	0 289	- -
Stage 1	0 -	- -
Stage 2	0 -	- -
Platoon blocked, %	-	- -
Mov Cap-1 Maneuver	- 289	- -
Mov Cap-2 Maneuver	- -	- -
Stage 1	- -	- -
Stage 2	- -	- -

Approach	WB	NB
HCM Control Delay, s	19.4	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	- -	289
HCM Lane V/C Ratio	- -	0.135
HCM Control Delay (s)	- -	19.4
HCM Lane LOS	- -	C
HCM 95th %tile Q(veh)	- -	0.5

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

No Build
Timing Plan: PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	90	1707	18	40	1506	30	169	3	49	40	1	97
Future Volume (vph)	90	1707	18	40	1506	30	169	3	49	40	1	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1855	20	43	1637	33	184	3	53	43	1	105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	1875	0	43	1670	0	184	56	0	43	106	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	63.0		20.0	63.0		29.2	29.2		27.8	27.8	
Total Split (%)	14.3%	45.0%		14.3%	45.0%		20.9%	20.9%		19.9%	19.9%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	65.3	57.7		59.7	52.8		17.8	17.8		23.7	23.7	
Actuated g/C Ratio	0.54	0.47		0.49	0.43		0.15	0.15		0.19	0.19	
v/c Ratio	0.51	0.78		0.27	0.76		0.71	0.20		0.13	0.27	
Control Delay	26.2	30.5		18.0	32.2		66.6	15.4		46.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.2	30.5		18.0	32.2		66.6	15.4		46.9	10.9	
LOS	C	C		B	C		E	B		D	B	
Approach Delay		30.3			31.8			54.7			21.3	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	35	456		15	394		143	2		29	1	
Queue Length 95th (ft)	86	582		36	527		236	42		70	54	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	282	2532		285	2472		364	370		343	392	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.35	0.74		0.15	0.68		0.51	0.15		0.13	0.27	
Intersection Summary												
Cycle Length: 140												
Actuated Cycle Length: 121.9												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.78												
Intersection Signal Delay: 32.1												
Intersection LOS: C												

02/28/2022
SMN

Synchro 10 Report
Page 1

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

No Build
Timing Plan: PM

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



02/28/2022
SMN

Synchro 10 Report
Page 2

2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙	↖ ↗ ↘ ↙	↖ ↗ ↘ ↙
Traffic Vol, veh/h	32	1771	1534	45	17	28
Future Vol, veh/h	32	1771	1534	45	17	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	1925	1667	49	18	30

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1716	0	-	0	2532
Stage 1	-	-	-	-	1692
Stage 2	-	-	-	-	840
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	174	-	-	-	48
Stage 1	-	-	-	-	90
Stage 2	-	-	-	-	348
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	174	-	-	-	38
Mov Cap-2 Maneuver	-	-	-	-	38
Stage 1	-	-	-	-	72
Stage 2	-	-	-	-	348

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	76.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	174	-	-	-	38	258
HCM Lane V/C Ratio	0.2	-	-	-	0.486	0.118
HCM Control Delay (s)	30.8	-	-	-	168.8	20.8
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	0.7	-	-	-	1.7	0.4

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙	↗ ↘ ↙	↖ ↗ ↘ ↙	↖ ↗ ↘ ↙
Traffic Vol, veh/h	69	1813	1447	12	0	156
Future Vol, veh/h	69	1813	1447	12	0	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	1971	1573	13	0	170

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1573	0	-	0	2518
Stage 1	-	-	-	-	1580
Stage 2	-	-	-	-	938
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	205	-	-	-	49
Stage 1	-	-	-	-	105
Stage 2	-	-	-	-	308
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	205	-	-	-	31
Mov Cap-2 Maneuver	-	-	-	-	31
Stage 1	-	-	-	-	67
Stage 2	-	-	-	-	308

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	34.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	205	-	-	-	284
HCM Lane V/C Ratio	0.366	-	-	-	0.597
HCM Control Delay (s)	32.4	-	-	-	34.8
HCM Lane LOS	D	-	-	-	D
HCM 95th %tile Q(veh)	1.6	-	-	-	3.6

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	9	17	6	68	127	5
Future Vol, veh/h	9	17	6	68	127	5
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	18	7	74	138	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	229	141	143	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	759	907	1440	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	755	907	1440	-	-	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1440	-	848	-	-
HCM Lane V/C Ratio	0.005	-	0.033	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	74	824	24	0	0
Future Vol, veh/h	0	74	824	24	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	80	896	26	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	461	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	547	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	547	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.7	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	547
HCM Lane V/C Ratio	-	0.147
HCM Control Delay (s)	-	12.7
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.5

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	16	830	14	0	0
Future Vol, veh/h	0	16	830	14	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	17	902	15	0	0

Major/Minor	Minor1	Major1	
Conflicting Flow All	-	459	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	549	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	549	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.8	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 549
HCM Lane V/C Ratio	-	- 0.032
HCM Control Delay (s)	-	- 11.8
HCM Lane LOS	-	- B
HCM 95th %tile Q(veh)	-	- 0.1

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

No Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	49	1906	104	0	0
Future Vol, veh/h	0	49	1906	104	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	53	2072	113	0	0

Major/Minor	Minor1	Major1	
Conflicting Flow All	-	1093	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	180	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	180	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB
HCM Control Delay, s	33.2	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 180
HCM Lane V/C Ratio	-	- 0.296
HCM Control Delay (s)	-	- 33.2
HCM Lane LOS	-	- D
HCM 95th %tile Q(veh)	-	- 1.2

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

Build
Timing Plan: AM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	61	1479	108	46	1490	70	24	0	11	40	5	102
Future Volume (vph)	61	1479	108	46	1490	70	24	0	11	40	5	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	1608	117	50	1620	76	26	0	12	43	5	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	1725	0	50	1696	0	26	12	0	43	116	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	72.0		12.0	72.0		18.0	18.0		18.0	18.0	
Total Split (%)	10.0%	60.0%		10.0%	60.0%		15.0%	15.0%		15.0%	15.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	50.9	47.2		49.4	44.4		7.3	7.3		19.5	19.5	
Actuated g/C Ratio	0.57	0.53		0.56	0.50		0.08	0.08		0.22	0.22	
v/c Ratio	0.30	0.64		0.23	0.67		0.18	0.04		0.11	0.27	
Control Delay	11.1	16.8		10.2	18.4		49.4	0.2		38.2	11.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.1	16.8		10.2	18.4		49.4	0.2		38.2	11.1	
LOS	B	B		B	B		D	A		D	B	
Approach Delay		16.6			18.1			33.9			18.5	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	15	286		12	282		15	0		22	3	
Queue Length 95th (ft)	33	358		27	350		48	0		63	56	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	238	3887		239	3899		292	438		390	437	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.28	0.44		0.21	0.43		0.09	0.03		0.11	0.27	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 88.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 17.6

Intersection LOS: B

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

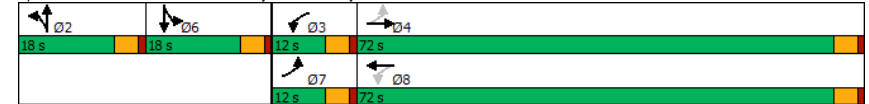
Build
Timing Plan: AM

Intersection Capacity Utilization 55.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	22	1408	1574	65	27	37
Future Vol, veh/h	22	1408	1574	65	27	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	1530	1711	71	29	40

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1782	0	-	0	2407 891
Stage 1	-	-	-	-	1747 -
Stage 2	-	-	-	-	660 -
Critical Hdwy	5.34	-	-	-	5.74 7.14
Critical Hdwy Stg 1	-	-	-	-	6.64 -
Critical Hdwy Stg 2	-	-	-	-	6.04 -
Follow-up Hdwy	3.12	-	-	-	3.82 3.92
Pot Cap-1 Maneuver	161	-	-	-	56 245
Stage 1	-	-	-	-	83 -
Stage 2	-	-	-	-	433 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	161	-	-	-	48 245
Mov Cap-2 Maneuver	-	-	-	-	48 -
Stage 1	-	-	-	-	71 -
Stage 2	-	-	-	-	433 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	80.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	161	-	-	-	48	245
HCM Lane V/C Ratio	0.149	-	-	-	0.611	0.164
HCM Control Delay (s)	31.2	-	-	-	160.7	22.6
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	0.5	-	-	-	2.4	0.6

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗ ↗ ↗	↗ ↗ ↗ ↗	↗ ↗ ↗ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	64	1382	1556	9	0	79
Future Vol, veh/h	64	1382	1556	9	0	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	1502	1691	10	0	86

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1691	0	-	0	2437 851
Stage 1	-	-	-	-	1696 -
Stage 2	-	-	-	-	741 -
Critical Hdwy	5.34	-	-	-	5.74 7.14
Critical Hdwy Stg 1	-	-	-	-	6.64 -
Critical Hdwy Stg 2	-	-	-	-	6.04 -
Follow-up Hdwy	3.12	-	-	-	3.82 3.92
Pot Cap-1 Maneuver	179	-	-	-	54 260
Stage 1	-	-	-	-	89 -
Stage 2	-	-	-	-	393 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	179	-	-	-	33 260
Mov Cap-2 Maneuver	-	-	-	-	33 -
Stage 1	-	-	-	-	54 -
Stage 2	-	-	-	-	393 -

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	25.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	179	-	-	-	260
HCM Lane V/C Ratio	0.389	-	-	-	0.33
HCM Control Delay (s)	37.4	-	-	-	25.5
HCM Lane LOS	E	-	-	-	D
HCM 95th %tile Q(veh)	1.7	-	-	-	1.4

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	6	11	9	49	69	12
Future Vol, veh/h	6	11	9	49	69	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	12	10	53	75	13

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	155	82	88	0	-	0
Stage 1	82	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	836	978	1508	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	830	978	1508	-	-	-
Mov Cap-2 Maneuver	830	-	-	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	950	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1508	-	920	-	-
HCM Lane V/C Ratio	0.006	-	0.02	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	45	716	131	0	0
Future Vol, veh/h	0	45	716	131	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	778	142	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	460	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	548	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	548	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.2	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	548
HCM Lane V/C Ratio	-	0.089
HCM Control Delay (s)	-	12.2
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.3

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	18	843	96	0	0
Future Vol, veh/h	0	18	843	96	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	20	916	104	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	510	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	509	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	509	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 509
HCM Lane V/C Ratio	-	- 0.038
HCM Control Delay (s)	-	- 12.4
HCM Lane LOS	-	- B
HCM 95th %tile Q(veh)	-	- 0.1

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

Build
Timing Plan: AM

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			
Traffic Vol, veh/h	0	67	1435	229	0	0
Future Vol, veh/h	0	67	1435	229	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	73	1560	249	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	905	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.14	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.92	-	-
Pot Cap-1 Maneuver	0	240	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	240	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	26.4	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	- 240
HCM Lane V/C Ratio	-	- 0.303
HCM Control Delay (s)	-	- 26.4
HCM Lane LOS	-	- D
HCM 95th %tile Q(veh)	-	- 1.2

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

Build
Timing Plan: PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	100	1717	18	43	1572	48	169	3	49	82	1	176
Future Volume (vph)	100	1717	18	43	1572	48	169	3	49	82	1	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1866	20	47	1709	52	184	3	53	89	1	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	1886	0	47	1761	0	184	56	0	89	192	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8								
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	63.0		20.0	63.0		29.2	29.2		27.8	27.8	
Total Split (%)	14.3%	45.0%		14.3%	45.0%		20.9%	20.9%		19.9%	19.9%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		None	None		Max	Max	
Act Effct Green (s)	67.4	59.4		61.0	54.0		18.0	18.0		23.6	23.6	
Actuated g/C Ratio	0.54	0.48		0.49	0.44		0.15	0.15		0.19	0.19	
v/c Ratio	0.55	0.77		0.30	0.80		0.72	0.20		0.26	0.42	
Control Delay	29.7	30.3		18.7	33.9		67.8	15.5		49.2	9.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.7	30.3		18.7	33.9		67.8	15.5		49.2	9.8	
LOS	C	C		B	C		E	B		D	A	
Approach Delay		30.3			33.5			55.6			22.3	
Approach LOS		C			C			E			C	
Queue Length 50th (ft)	40	463		17	431		147	2		64	1	
Queue Length 95th (ft)	100	589		38	578		237	42		126	70	
Internal Link Dist (ft)		431			420			314			314	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	277	2520		281	2427		357	365		337	456	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.39	0.75		0.17	0.73		0.52	0.15		0.26	0.42	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 123.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 32.5

Intersection LOS: C

03/01/2022
SMN

Synchro 10 Report
Page 1

1: Private Driveway/Site Driveway 1 & Walnut Hill Lane
3610 - 21.560

Build
Timing Plan: PM

Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Site Driveway 1 & Walnut Hill Lane



03/01/2022
SMN

Synchro 10 Report
Page 2

2: Walnut Hill Lane & Site Driveway 2
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	9.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰ ↱ ↱ ↱ ↱ ↱				↰ ↱	↰ ↱
Traffic Vol, veh/h	42	1813	1551	70	51	97
Future Vol, veh/h	42	1813	1551	70	51	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	1971	1686	76	55	105

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1762	0	-	0	2604
Stage 1	-	-	-	-	1724
Stage 2	-	-	-	-	880
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	165	-	-	-	44
Stage 1	-	-	-	-	85
Stage 2	-	-	-	-	331
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	165	-	-	-	32
Mov Cap-2 Maneuver	-	-	-	-	32
Stage 1	-	-	-	-	61
Stage 2	-	-	-	-	331

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	233.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	165	-	-	-	32	249
HCM Lane V/C Ratio	0.277	-	-	-	1.732	0.423
HCM Control Delay (s)	35	-	-	-	\$ 621.2	29.7
HCM Lane LOS	D	-	-	-	F	D
HCM 95th %tile Q(veh)	1.1	-	-	-	6.3	2

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

3: Walnut Hill Lane & Manderville Lane
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰ ↱ ↱ ↱ ↱ ↱				↰ ↱	↰ ↱
Traffic Vol, veh/h	69	1889	1482	12	0	163
Future Vol, veh/h	69	1889	1482	12	0	163
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	2053	1611	13	0	177

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1611	0	-	0	2589
Stage 1	-	-	-	-	1618
Stage 2	-	-	-	-	971
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	196	-	-	-	45
Stage 1	-	-	-	-	100
Stage 2	-	-	-	-	296
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	196	-	-	-	28
Mov Cap-2 Maneuver	-	-	-	-	28
Stage 1	-	-	-	-	62
Stage 2	-	-	-	-	296

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	38.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	196	-	-	-	276
HCM Lane V/C Ratio	0.383	-	-	-	0.642
HCM Control Delay (s)	34.3	-	-	-	38.8
HCM Lane LOS	D	-	-	-	E
HCM 95th %tile Q(veh)	1.7	-	-	-	4

4: Manderville Lane & Glen Lakes Drive
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	9	17	6	68	134	5
Future Vol, veh/h	9	17	6	68	134	5
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	18	7	74	146	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	237	149	151	0	-	0
Stage 1	149	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	751	898	1430	-	-	-
Stage 1	879	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	747	898	1430	-	-	-
Mov Cap-2 Maneuver	747	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1430	-	839	-	-
HCM Lane V/C Ratio	0.005	-	0.034	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: N Central Expressway NBFR & Glen Lakes Drive
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔	↔			
Traffic Vol, veh/h	0	74	842	24	0	0
Future Vol, veh/h	0	74	842	24	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	80	915	26	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	471	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	539	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	539	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.8	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	539
HCM Lane V/C Ratio	-	0.149
HCM Control Delay (s)	-	12.8
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.5

6: N Central Expressway NBFR & Site Driveway 3
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			
Traffic Vol, veh/h	0	34	830	56	0	0
Future Vol, veh/h	0	34	830	56	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	37	902	61	0	0

Major/Minor	Minor1	Major1		
Conflicting Flow All	-	482	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	530	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	530	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	12.3	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	530
HCM Lane V/C Ratio	-	0.07
HCM Control Delay (s)	-	12.3
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.2

7: N Central Expressway NBFR & Site Driveway 4
3610 - 21.560

Build
Timing Plan: PM

Intersection						
Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑↑			
Traffic Vol, veh/h	0	109	1951	148	0	0
Future Vol, veh/h	0	109	1951	148	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	118	2121	161	0	0

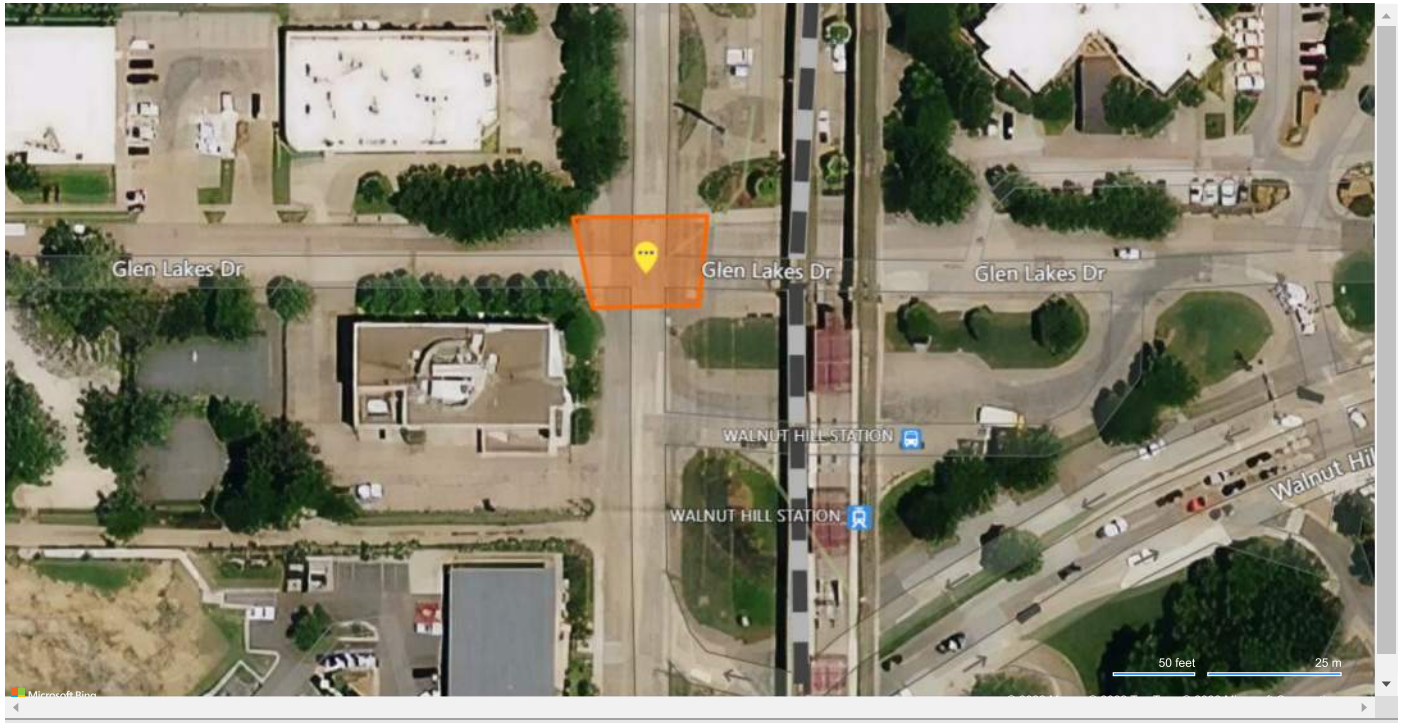
Major/Minor	Minor1	Major1		
Conflicting Flow All	-	1141	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.14	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.92	-	-
Pot Cap-1 Maneuver	0	167	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	167	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	66.8	0
HCM LOS	F	



Minor Lane/Major Mvmt	NBT	NBRWBLn1
Capacity (veh/h)	-	167
HCM Lane V/C Ratio	-	0.709
HCM Control Delay (s)	-	66.8
HCM Lane LOS	-	F
HCM 95th %tile Q(veh)	-	4.3

APPENDIX E. Site Access Evaluation Supplement

All crash data available using this tool represents reportable data collected from Texas Peace Officer's Crash Reports (CR-3) received and processed by the Texas Department of Transportation (Department) as of 03/01/2022. The Department makes no warranty, representation or guaranty as to the content, accuracy, timeliness or completeness of any of the information provided as a result of your query. Any opinions and conclusions resulting from analysis performed on the crash data must be represented as your own and not those of the State of Texas or the Department.



Legend

-  2019 and Not Injured
-  2020 and Possible Injury

Query Builder

Build your query using the steps below. You can View Results when all conditions shown below are satisfied.

Select Query Type

What type of Query would you like to build?

- ☒ I want to find all Crashes that meet a certain set of criteria
- ☐ I want to find Units (ex. Vehicles, Bicycles) that were involved in crashes that meet a certain set of criteria
- ☐ I want to find Persons that were involved in crashes that meet a certain set of criteria

Select Crash Date and Time

When did the crashes occur that you would like to find?

- ☐ Select crashes from a specific year
- ☒ Select Crashes from a range of years
- ☐ Select Crashes from a specific date and time range

Begin Year

2019

x

End Year

2020

x

Select Crash Location

When did the crash occur that you would like to find?

- ☐ Define search by entering **one or more** of the most common location fields
- ☐ Define more complex search area using Filter Builder
- ☒ Define search area using interactive map
- ☐ Search All of Texas

Currently Selected Search Area

[Edit Search Area](#)



Microsoft Bing

© 2022 TomTom, © 2022 Microsoft Corporation, © OpenStreetMap

Defined Search Coordinates
Latitude: 32.882, Longitude -96.765
Latitude: 32.883, Longitude -96.765
Latitude: 32.882, Longitude -96.765
Latitude: 32.882, Longitude -96.765
Latitude: 32.882, Longitude -96.765

Create Additional Filters

Filters can be defined using the various attributes associated with a crash, the units involved in the crash, and the persons involved in the crash. Any crash that meets all of the conditions of your filters will be returned in your Query.

Current Filters

[Add Filter](#)

You haven't created any Filters yet.

Choose From TxDOT-Authored Filters

TxDOT has authored a set of Filters that you can use to narrow down the results of your Query. Check the box below to apply the Filter to your Query alongside the Filters that you have created.

Filters Authored by TxDOT	
<input type="checkbox"/> Intersection Related Crashes	More Information
<input type="checkbox"/> Work Zone Crashes	More Information
<input type="checkbox"/> Alcohol Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Crashes	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol	More Information
<input type="checkbox"/> Motorcycle Related Crashes	More Information
<input type="checkbox"/> Speed Related Crashes	More Information
<input type="checkbox"/> Cell Phone Use Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Vehicles	More Information
<input type="checkbox"/> Counts of Motorcycles	More Information
<input type="checkbox"/> Motorcyclists	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol or Drugs	More Information
<input type="checkbox"/> Driving Under the Influence of Drugs	More Information
<input type="checkbox"/> Driving While Intoxicated	More Information
<input type="checkbox"/> Drug Involved Crashes	More Information

[Switch To Wizard View](#)

View Results

Save

Start Over

Results can be viewed when:

- Date and Time has been specified
- Crash Location has been specified
- Match Count is between 1 and 50,000 Crashes

0 Crashes

Match your Query

All crash data available using this tool represents reportable data collected from Texas Peace Officer's Crash Reports (CR-3) received and processed by the Texas Department of Transportation (Department) as of 03/01/2022. The Department makes no warranty, representation or guaranty as to the content, accuracy, timeliness or completeness of any of the information provided as a result of your query. Any opinions and conclusions resulting from analysis performed on the crash data must be represented as your own and not those of the State of Texas or the Department.



Legend

- 2019 and Possible Injury
- 2019 and Not Injured

Query Builder

Build your query using the steps below. You can View Results when all conditions shown below are satisfied.

Select Query Type

What type of Query would you like to build?

- ☒ I want to find all Crashes that meet a certain set of criteria
- ☐ I want to find Units (ex. Vehicles, Bicycles) that were involved in crashes that meet a certain set of criteria
- ☐ I want to find Persons that were involved in crashes that meet a certain set of criteria

Select Crash Date and Time

When did the crashes occur that you would like to find?

- ☐ Select crashes from a specific year
- ☒ Select Crashes from a range of years
- ☐ Select Crashes from a specific date and time range

Begin Year

2019

x

End Year

2020


x

Select Crash Location

When did the crash occur that you would like to find?

- ☐ Define search by entering **one or more** of the most common location fields
- ☐ Define more complex search area using Filter Builder
- ☒ Define search area using interactive map
- ☐ Search All of Texas

Currently Selected Search Area[Edit Search Area](#)



Defined Search Coordinates
Latitude: 32.881, Longitude -96.768
Latitude: 32.881, Longitude -96.767
Latitude: 32.881, Longitude -96.767
Latitude: 32.880, Longitude -96.767
Latitude: 32.881, Longitude -96.767

Create Additional Filters

Filters can be defined using the various attributes associated with a crash, the units involved in the crash, and the persons involved in the crash. Any crash that meets all of the conditions of your filters will be returned in your Query.

Current Filters[Add Filter](#)

You haven't created any Filters yet.

Choose From TxDOT-Authored Filters

TxDOT has authored a set of Filters that you can use to narrow down the results of your Query. Check the box below to apply the Filter to your Query alongside the Filters that you have created.

Filters Authored by TxDOT	
<input type="checkbox"/> Intersection Related Crashes	More Information
<input type="checkbox"/> Work Zone Crashes	More Information
<input type="checkbox"/> Alcohol Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Crashes	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol	More Information
<input type="checkbox"/> Motorcycle Related Crashes	More Information
<input type="checkbox"/> Speed Related Crashes	More Information
<input type="checkbox"/> Cell Phone Use Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Vehicles	More Information
<input type="checkbox"/> Counts of Motorcycles	More Information
<input type="checkbox"/> Motorcyclists	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol or Drugs	More Information
<input type="checkbox"/> Driving Under the Influence of Drugs	More Information
<input type="checkbox"/> Driving While Intoxicated	More Information
<input type="checkbox"/> Drug Involved Crashes	More Information




[Switch To Wizard View](#)

View Results

Save

Start Over

Results can be viewed when:

- Date and Time has been specified 
- Crash Location has been specified 
- Match Count is between 1 and 50,000 Crashes 

0 Crashes

Match your Query

Query Builder

Build your query using the steps below. You can View Results when all conditions shown below are satisfied.

Select Query Type

What type of Query would you like to build?

- ☒ I want to find all Crashes that meet a certain set of criteria
- ☐ I want to find Units (ex. Vehicles, Bicycles) that were involved in crashes that meet a certain set of criteria
- ☐ I want to find Persons that were involved in crashes that meet a certain set of criteria

Select Crash Date and Time

When did the crashes occur that you would like to find?

- ☐ Select crashes from a specific year
- ☒ Select Crashes from a range of years
- ☐ Select Crashes from a specific date and time range

Begin Year

2019

x

End Year

2020

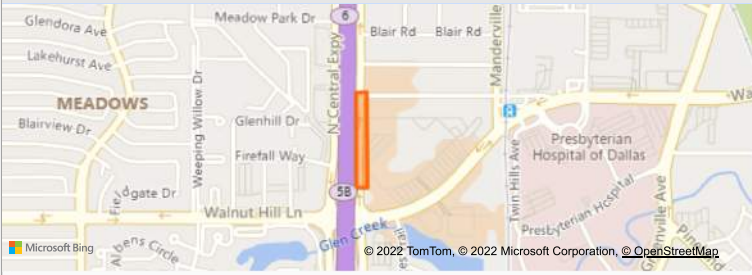
x

Select Crash Location

When did the crash occur that you would like to find?

- ☐ Define search by entering **one or more** of the most common location fields
- ☐ Define more complex search area using Filter Builder
- ☒ Define search area using interactive map
- ☐ Search All of Texas

Currently Selected Search Area[Edit Search Area](#)



Defined Search Coordinates
Latitude: 32.883, Longitude -96.770
Latitude: 32.883, Longitude -96.770
Latitude: 32.881, Longitude -96.770
Latitude: 32.881, Longitude -96.769

Create Additional Filters

Filters can be defined using the various attributes associated with a crash, the units involved in the crash, and the persons involved in the crash. Any crash that meets all of the conditions of your filters will be returned in your Query.

Current Filters[Add Filter](#)

You haven't created any Filters yet.

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TxDOT has authored a set of Filters that you can use to narrow down the results of your Query. Check the box below to apply the Filter to your Query alongside the Filters that you have created.

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<input type="checkbox"/> Work Zone Crashes	More Information
<input type="checkbox"/> Alcohol Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Crashes	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol	More Information
<input type="checkbox"/> Motorcycle Related Crashes	More Information
<input type="checkbox"/> Speed Related Crashes	More Information
<input type="checkbox"/> Cell Phone Use Involved Crashes	More Information
<input type="checkbox"/> Distracted Driving Vehicles	More Information
<input type="checkbox"/> Counts of Motorcycles	More Information
<input type="checkbox"/> Motorcyclists	More Information
<input type="checkbox"/> Driving Under the Influence of Alcohol or Drugs	More Information
<input type="checkbox"/> Driving Under the Influence of Drugs	More Information
<input type="checkbox"/> Driving While Intoxicated	More Information
<input type="checkbox"/> Drug Involved Crashes	More Information




[Switch To Wizard View](#)

View Results

Save

Start Over

Results can be viewed when:

- Date and Time has been specified 
- Crash Location has been specified 
- Match Count is between 1 and 50,000 Crashes 

0 Crashes

Match your Query