

May 7, 2018

PK# 3859-17.399

Z178-271

TRAFFIC IMPACT ANALYSIS

Project:

Villages at Soho Square

In Dallas, Texas

Prepared for:

City of Dallas

On behalf of:

Lenart Development Company, LLC

Prepared by:

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TX. REG. SURVEYING FIRM LS-100080-00

EXECUTIVE SUMMARY

The services of **Pacheco Koch** were retained by **Lenart Development Company, LLC** to prepare a Traffic Impact Analysis (TIA) for the proposed residential development known as *Villages at Soho Square* (the "Project"). The subject site is located on the south side of Singleton Boulevard, east of Vilbig Road, in Dallas, Texas. For purposes of this analysis, buildout of the Project is estimated to occur by 2023. A TIA is required for review by the City of Dallas as part of the Owner's request for rezoning of the subject property.

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: Under typical-day peak traffic periods, the traffic operations at the signalized and unsignalized intersections within the study area generally operate efficiently and achieve acceptable Levels of Service.

FINDING: With the addition of estimated background traffic growth and the net increase in site-generated traffic from the proposed development, some individual traffic movements will experience a slight increase in average delay. However, the increases are not sufficient to result in any significant change in the existing traffic operational conditions. Therefore, no mitigation measures are considered to be warranted by the proposed development.

FINDING: At the intersection of W Commerce Street and Vilbig Road, the northbound shared through-right maneuver (not the entire intersection) achieves a Level of Service "E" in the background conditions and remains Level of Service "E" with the addition of site traffic. The southbound shared left-through-right maneuver (not the entire intersection) achieves a Level of Service "D" in the background condition and lowers to a Level of Service "E" with the addition of site traffic. However, the cross-sections of both W Commerce Street and Vilbig Road are not constructed to the current City of Dallas Thoroughfare Plan designations.

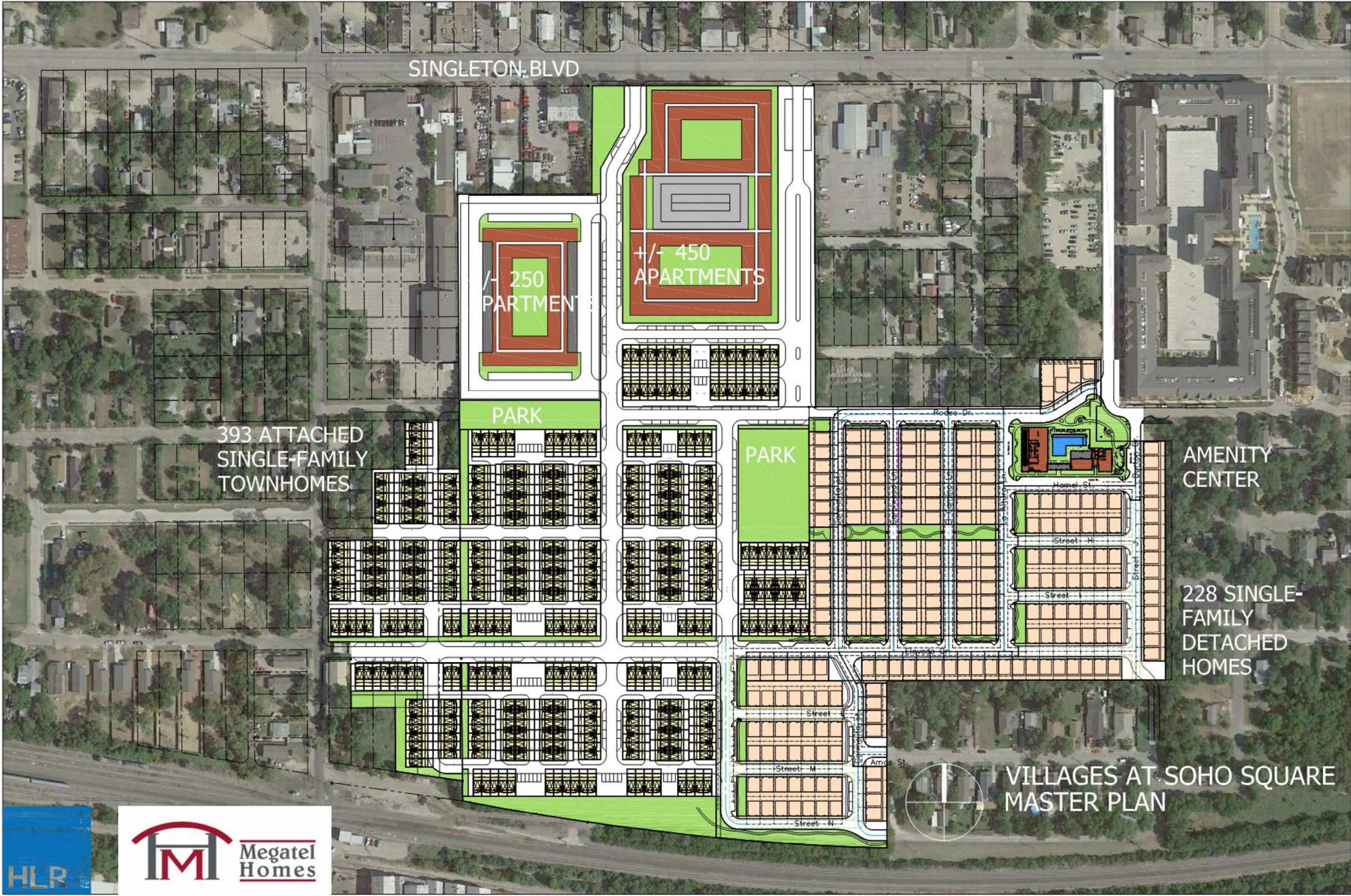
RECOMMENDATION: For mitigation of the intersection of W Commerce Street and Vilbig Road, the option of converting the intersection to All-way STOP-Controlled should be considered for the interim period until the roadways are improved.

END

Exhibit 1. Site Location and Study Area Map

Villages at Soho Square, Dallas, TX
Traffic Impact Analysis





SINGLETON BLVD

+/- 250 PARTMENTS

+/- 450 APARTMENTS

PARK

PARK

393 ATTACHED SINGLE-FAMILY TOWNHOMES

AMENITY CENTER

228 SINGLE-FAMILY DETACHED HOMES

VILLAGES AT SOHO SQUARE MASTER PLAN



TRAFFIC IMPACT ANALYSIS

Villages at Soho Square

Dallas, Texas

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INTRODUCTION

The services of **Pacheco Koch** (PK) were retained by **Lenart Development Company, LLC** to prepare a Traffic Impact Analysis (TIA) for a proposed residential development referred to herein as Villages at Soho Square. The subject site is located on the south side of Singleton Boulevard, east of Vilbig Road, in Dallas, Texas. A preliminary site plan for the Project, prepared by HLR Architects, 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, **Lenart Development Company, LLC** (the "Applicant") has made a request to the City of Dallas (the "Approving Agency") for rezoning of the subject property. As part of application process for this request, submittal of a TIA by the Applicant to the Approving Agency is required.

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 Dallas, Texas, that provides professional engineering and related services.

Purpose

The Approving Agency may require the Applicant to commission and submit a TIA to assist the technical staff of that agency in the review of certain aspects of the Applicant's request (for rezoning, site plan approval, etc.). A TIA is an engineering study prepared for a specific project under the supervision of a licensed engineer skilled in the principles of traffic and transportation engineering and planning. The study is an objective presentation of analytical findings based upon an investigation of existing and future traffic operations in the immediate vicinity of a Project. Typically, TIAs are specifically designed to measure the traffic operational impact of a Project during critical periods on a typical day. The TIA results are then used to identify occasions where the project may have undue impact on local traffic operations.¹ Under certain circumstances, the Applicant may, within established legal parameters, be required to mitigate such undue impacts. While a TIA may also identify pre-existing or anticipated problem areas that are unrelated to the project, the Applicant is not responsible for mitigation of such instances.

Where appropriate and feasible, the Engineer may recommend measures that are specifically intended to mitigate project-related impacts. The Engineer may also make general recommendations, either related or unrelated to the Project, to improve overall traffic operations, safety, site access, circulation, etc. All

¹ Undue impact is a subjective interpretation but is generally characterized when traffic operations degrade from conditions that are generally considered "acceptable" to conditions that are generally considered "unacceptable". Typically, in urban areas, "acceptable" conditions are categorized as Level of Service D, or better; while in rural areas, "acceptable" conditions may be categorized as Level of Service C, or better.

recommendations are the opinion of the Engineer and are subject to the acceptance and customary review/approval processes of the respective agency.

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

Project Description

The Project will consist of townhouse and apartment units, multiple park areas, and an internal street grid. For purposes of this analysis, buildout of the Project is estimated to occur by 2023. A summary of the proposed development program is provided in **Table 1**.

Table 1. Development Program Summary

USE	FUTURE AMOUNT (APPROXIMATE)
Apartments	700 DU
Townhomes	393 DU

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

Vehicular access to the development will occur via three primary access points:

- “Site Driveway 1” is on Vilbig Road and aligns with Muncie Avenue
- “Site Driveway 2” is on Singleton Boulevard and aligns with Chihuahua Avenue
- “Site Driveway 3” is on Singleton Boulevard and forms a T-intersection

The proposed area of rezoning consists of 30.173 acres that is currently zoned for industrial uses (IM-Industrial Manufacturing and IR-Industrial Research). The property is proposed to be incorporated into Planned Development District 944 (PD #944). PD #944 (15.342 acres) was established in June 2015 and consists of approximately 240 townhome units that are now under construction. The original site plan for the existing PD #944 site has been adjusted to integrate with the proposed additional land area.

Study Parameters

The study parameters used in this TIA are based upon the requirements of the City of Dallas and are consistent with the standard industry practices used in similar studies. Specific study parameters were reviewed with City staff at the outset of the study.

This TIA analyzed the day-to-day traffic operations at time periods that were considered representative of the overall most critical conditions on the public roadway system with some effect from the proposed Project. Based upon the prevailing background traffic conditions and the trip generation characteristics of the proposed development, the following periods were analyzed:

- traditional weekday AM and PM peak hours of adjacent street traffic

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

NOTE: Analyses of all future conditions scenarios utilize projected traffic volume data derived by Pacheco Koch using reasonable and customary assumptions that are based upon existing conditions where available. Industry publications appropriately point out that the margin of error for projecting traffic volumes is directly related to the length of time of the projection, and projections beyond five years from current conditions should take into consideration that natural changes in traffic characteristics will occur that cannot be anticipated.

The following technical assumptions were also made in this analysis.

- Traffic generated by several approved developments in the immediate vicinity of the subject site were added to the "Background" traffic volumes:
 - o A 240-unit single-family development by Megatel Homes located immediately east of the subject site (PD #944);
 - o A 1,224-unit multifamily development located immediately northeast of the aforementioned single-family development (PD #933);
 - o A 230-unit residential development located on Singleton Blvd. approximately 2.8 miles west of the subject site.

*(Traffic volumes for these developments were obtained from the respective Traffic Impact Analyses prepared by DeShazo Group and Traffic Impact Group. Excerpts from those studies are provided in **Appendix C.**)*

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) Singleton Boulevard and Vilbig Road: *traffic-signal-controlled*
- (b) Singleton Boulevard and Chihuahua Avenue/"Site Driveway 2": *STOP-controlled on Chihuahua Avenue and "Site Driveway 2"*
- (c) Singleton Boulevard and "Site Driveway 3": *STOP-controlled on "Site Driveway 3"*
- (d) Vilbig Road and Muncie Avenue/"Site Driveway 1": *STOP-controlled on Muncie Avenue and "Site Driveway 1"*
- (e) W Commerce Street and Vilbig Road: *STOP-controlled on Vilbig Road*

Roadway Links:

- (A) Singleton Boulevard adjacent to site
 - ❑ Existing operation and cross-section: *five lanes, with continuous-two-way-center-left-turn lane; two-way operation*
 - ❑ City of Dallas Thoroughfare Plan Designation: *Principal Arterial/M-6-D(A)*
 - ❑ City of Dallas Bike Plan Designation: *"On-Street" Route*
 - ❑ Current Daily Traffic Volume: 17,663 (Thursday, February 8th, 2018)

- (B) Vilbig Road adjacent to site
 - ❑ Existing operation and cross-section: *two lanes, two-way operation, rural cross-section (no sidewalk or curb-and-gutter) divided*
 - ❑ City of Dallas Thoroughfare Plan Designation: *Collector/M-4-U*
 - ❑ City of Dallas Bike Plan Designation: *"On-Street" Route*
 - ❑ Current Daily Traffic Volume: 2,368 (Thursday, February 8th, 2018)

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 for the peak hours and study area as defined above using standardized analytical methodologies where applicable. Current (or recent) traffic volume data were collected on a typical day throughout the study area to represent existing traffic conditions. Where applicable, growth factors were applied to the existing volumes to project future background traffic at the site buildout year conditions. Then, traffic generated by the proposed development was projected using the standard three-step approach: Trip Generation, Trip Distribution, and Traffic Assignment. By adding the site-generated traffic to the background traffic, the resulting site-plus-background traffic impact to operational conditions may be assessed from which approach mitigation measures may be recommended, if needed.

Background Traffic Volume Data

Existing Volumes

Current traffic volumes were collected during the analysis periods at the study area intersections on Thursday, February 8th, 2018. 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 recent traffic volumes with prior traffic volumes 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
Singleton Boulevard, west of N Hampton Road	15,847 ('09) ^A	-0.88%
	16,560 ('04) ^A	
Vilbig Road, between Singleton Boulevard and Commerce Street	1,005 ('09) ^A	-1.65%
	1,092 ('04) ^A	

Data Source: A = (TxDOT)

According to these data, traffic volumes in the vicinity of the subject site appear to be decreasing slightly. Although no positive growth is evident, Pacheco Koch assumed a growth rate of 1.0 percent per year 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

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 (10th 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 credible 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.

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

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)
Proposed Uses	6,743	405 (100/305)	487 (301/186)

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. 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 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 - ≤ 20	> 10 - ≤ 15
LOS C	> 20 - ≤ 35	> 15 - ≤ 25
LOS D	> 35 - ≤ 55	> 25 - ≤ 35
LOS E	> 55 - ≤ 80	> 35 - ≤ 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 Horizon 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 4** and **Table 5** provide a summary of the peak period intersection operational conditions under the analysis conditions presented previously. Detailed software output is provided in **Appendix D**.

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.

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.

Table 4. Peak Hour Intersection Capacity Analysis Results Summary
(Signalized Intersections)

INTERSECTION	EXISTING CONDITIONS		BACKGROUND CONDITIONS		BUILDOUT CONDITIONS		HORIZON CONDITIONS	
	AM	PM	AM	PM	AM	PM	AM	PM
Singleton Boulevard @ Vilbig Road	B (17.8)	B (13.2)	C (24.1)	B (16.8)	C (34.8)	B (19.5)	D (39.1)	C (21.4)

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

INTERSECTION	TRAFFIC MANEUVER	EXISTING CONDITIONS		BACKGROUND CONDITIONS		BUILDOUT CONDITIONS	
		AM	PM	AM	PM	AM	PM
Vilbig Road @ Muncie Avenue /Site Driveway 1	NBL	A (7.3)	A (8.0)	A (7.4)	A (8.0)	A (7.4)	A (8.0)
	EB	B (11.6)	B (10.8)	B (13.1)	B (11.7)	B (14.8)	B (13.2)
	WB	--	--	--	--	B (13.8)	B (11.7)
	SBL	--	--	--	--	A (8.3)	A (7.5)
W Commerce Street @ Vilbig Road	NB	D (32.0)	B (13.6)	E (39.4)	B (14.3)	E (44.4)	C (15.5)
	EBL	A (8.0)	A (7.4)	A (8.0)	A (7.4)	A (8.1)	A (7.4)
	WBL	A (7.5)	A (7.7)	A (7.6)	A (7.7)	A (7.6)	A (7.7)
	SB	C (18.2)	C (23.1)	C (19.8)	D (26.1)	D (32.6)	E (35.9)
w/ Improvement ¹	NB	--	--	--	--	B (14.6)	A (9.5)
	EB	--	--	--	--	B (14.6)	B (11.6)
	WB	--	--	--	--	B (12.8)	B (10.2)
	SB	--	--	--	--	B (11.4)	C (16.3)
Singleton Boulevard @ Chihuahua Avenue /Site Driveway 2	NB	--	--	--	--	C (18.1)	D (27.7)
	EBL	A (8.2)	B (10.1)	A (9.0)	B (11.2)	A (9.2)	B (11.3)
	WBL	--	--	--	--	A (8.9)	A (8.7)
	SB	A (9.9)	B (12.9)	B (11.3)	C (16.4)	B (13.1)	C (20.7)
Singleton Boulevard @ Site Driveway 3	NB	--	--	--	--	B (14.5)	B (14.5)
	WBL	--	--	--	--	A (9.1)	A (8.8)

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

Area Type	Hourly Service Volumes By Roadway Function					
	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	725	650	725	650	475	425
Urban/Commercial	850	775	825	750	525	475
Residential	925	875	900	825	575	525
Rural	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 25% is LOS A,
- Volume:Capacity Ratio $>$ 25% and \leq 45% is LOS B,
- Volume:Capacity Ratio $>$ 45% and \leq 65% is LOS C,
- Volume:Capacity Ratio $>$ 65% and \leq 80% is LOS D,
- Volume:Capacity Ratio $>$ 80% and \leq 100% is LOS 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 6**. See specific recommendations in the *Recommendations* section of this report.

Table 6. Roadway Link Capacity Analysis Results Summary

ROADWAY/ SCENARIO	DAILY VOLUME	THEORETICAL DAILY CAPACITY	V:C RATIO/ LEVEL OF SERVICE
<u>Singleton Boulevard</u> Existing Conditions	17,663	30,000	0.59 – C
Background Conditions	18,564	30,000	0.62 – C
Background-Plus-Site Traffic Condition	21,935	30,000	0.73 – D
<u>Vilbig Road</u> Existing Conditions	2,368	10,500	0.23 – A
Background Conditions	2,440	10,500	0.23 – A
Background-Plus-Site Traffic Condition	3,451	10,500	0.33 – B

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 recommendations are based upon buildout of the subject property in accordance with the hypothetical development scenario outlined in the **Project Description** section of this report.

FINDING: Under typical-day peak traffic periods, the traffic operations at the signalized and unsignalized intersections within the study area generally operate efficiently and achieve acceptable Levels of Service.

FINDING: With the addition of estimated background traffic growth and the net increase in site-generated traffic from the proposed development, some individual traffic movements will experience a slight increase in average delay. However, the increases are not sufficient to result in any significant change in the existing traffic operational conditions. Therefore, no mitigation measures are considered to be warranted by the proposed development.

FINDING: At the intersection of W Commerce Street and Vilbig Road, the northbound shared through-right maneuver (not the entire intersection) achieves a Level of Service “E” in the background conditions and remains

Level of Service "E" with the addition of site traffic. The southbound shared left-through-right maneuver (not the entire intersection) achieves a Level of Service "D" in the background condition and lowers to a Level of Service "E" with the addition of site traffic. However, the cross-sections of both W Commerce Street and Vilbig Road are not constructed to the current City of Dallas Thoroughfare Plan designations.

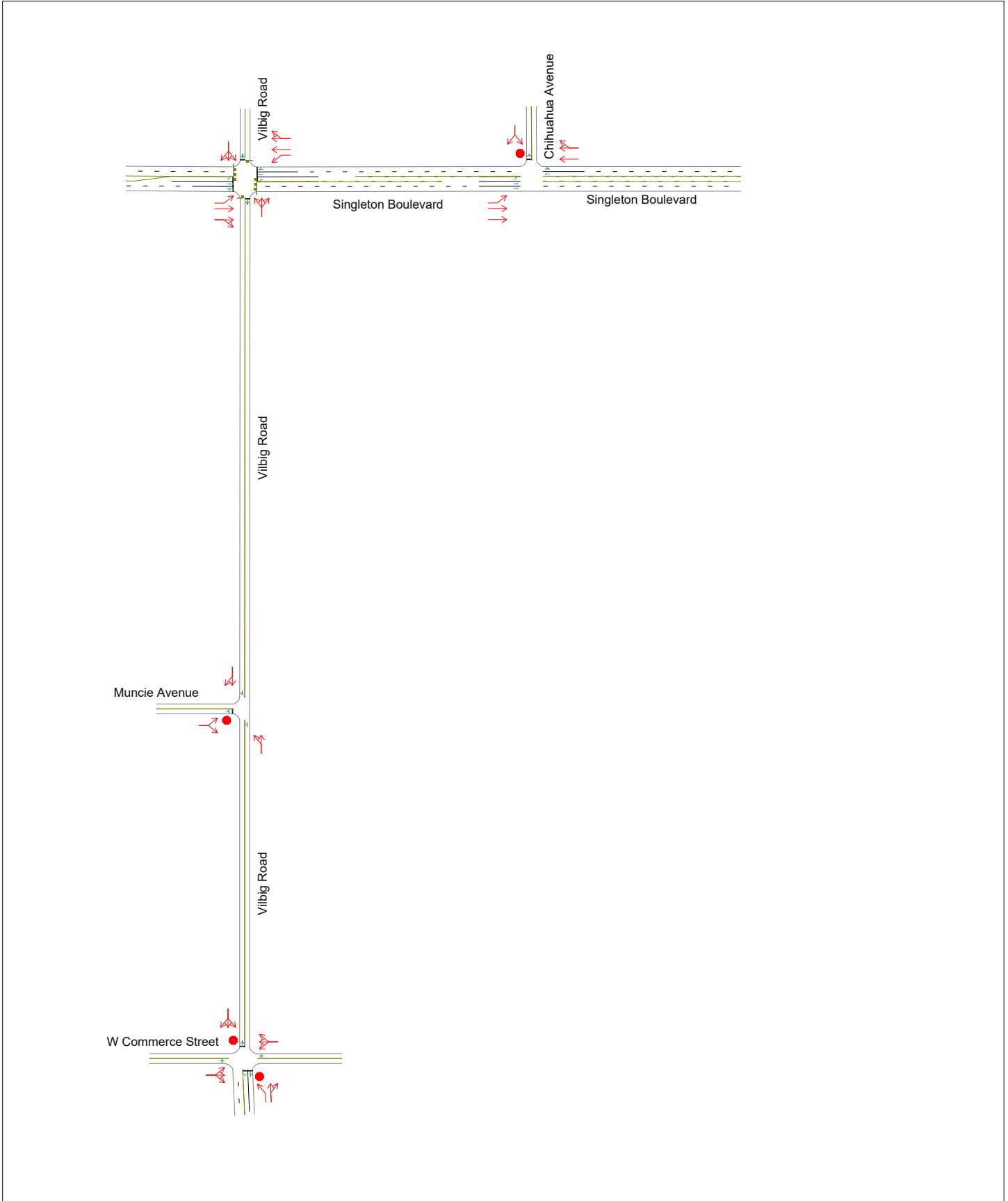
RECOMMENDATION: For mitigation of the intersection of W Commerce Street and Vilbig Road, the option of converting the intersection to All-way STOP-Controlled should be considered for the interim period until the roadways are improved.

END OF MEMO

Appendix A. Traffic Volume Exhibits

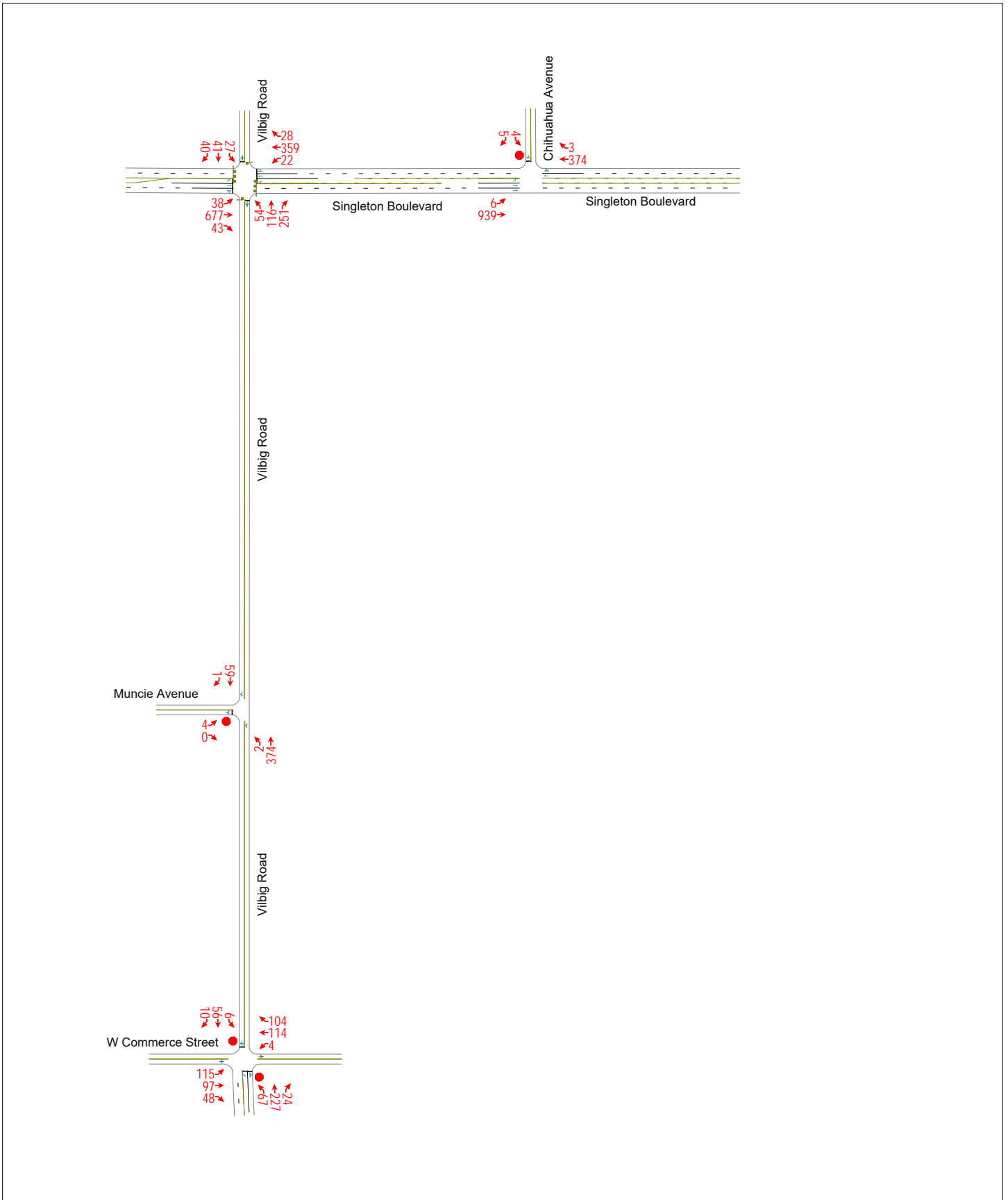
Appendix A1 - Roadway Geometry

North ^
Not to Scale



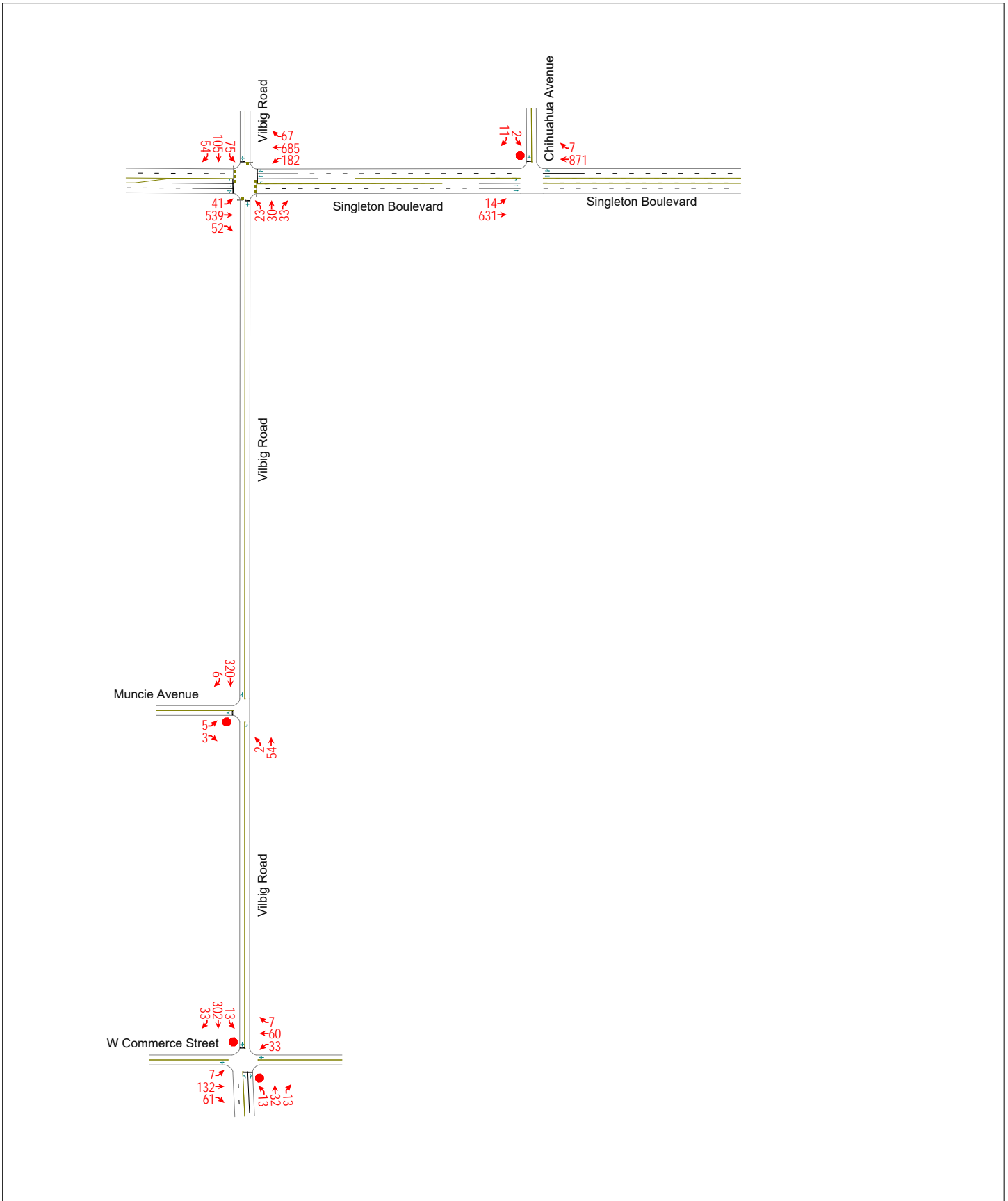
Appendix A2 - Existing AM Peak Hour Traffic Volumes

North ^
Not to Scale



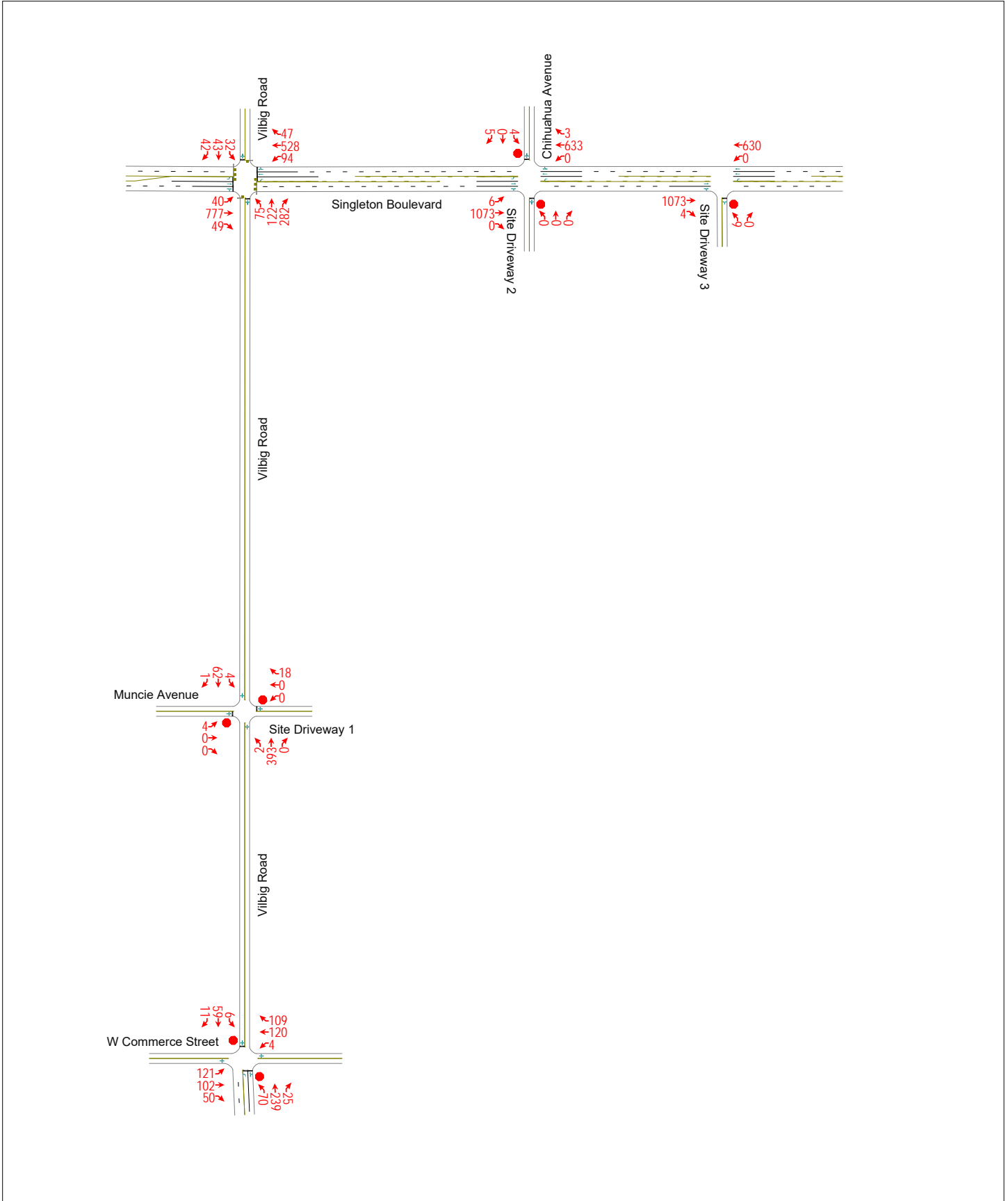
Appendix A3 - Existing PM Peak Hour Traffic Volumes

North ^
Not to Scale



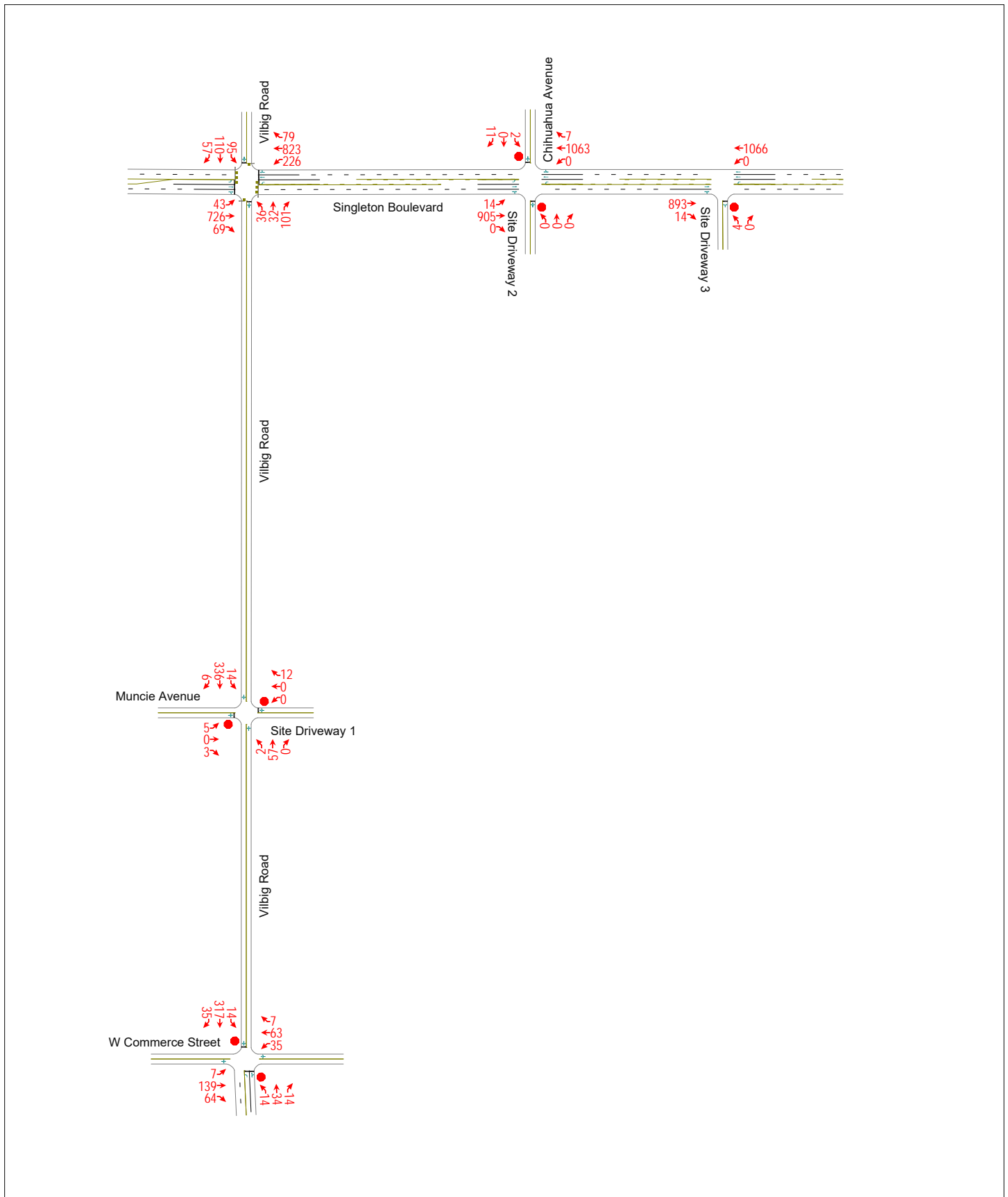
Appendix A4 - Background AM Peak Hour Traffic Volumes

North ^
Not to Scale



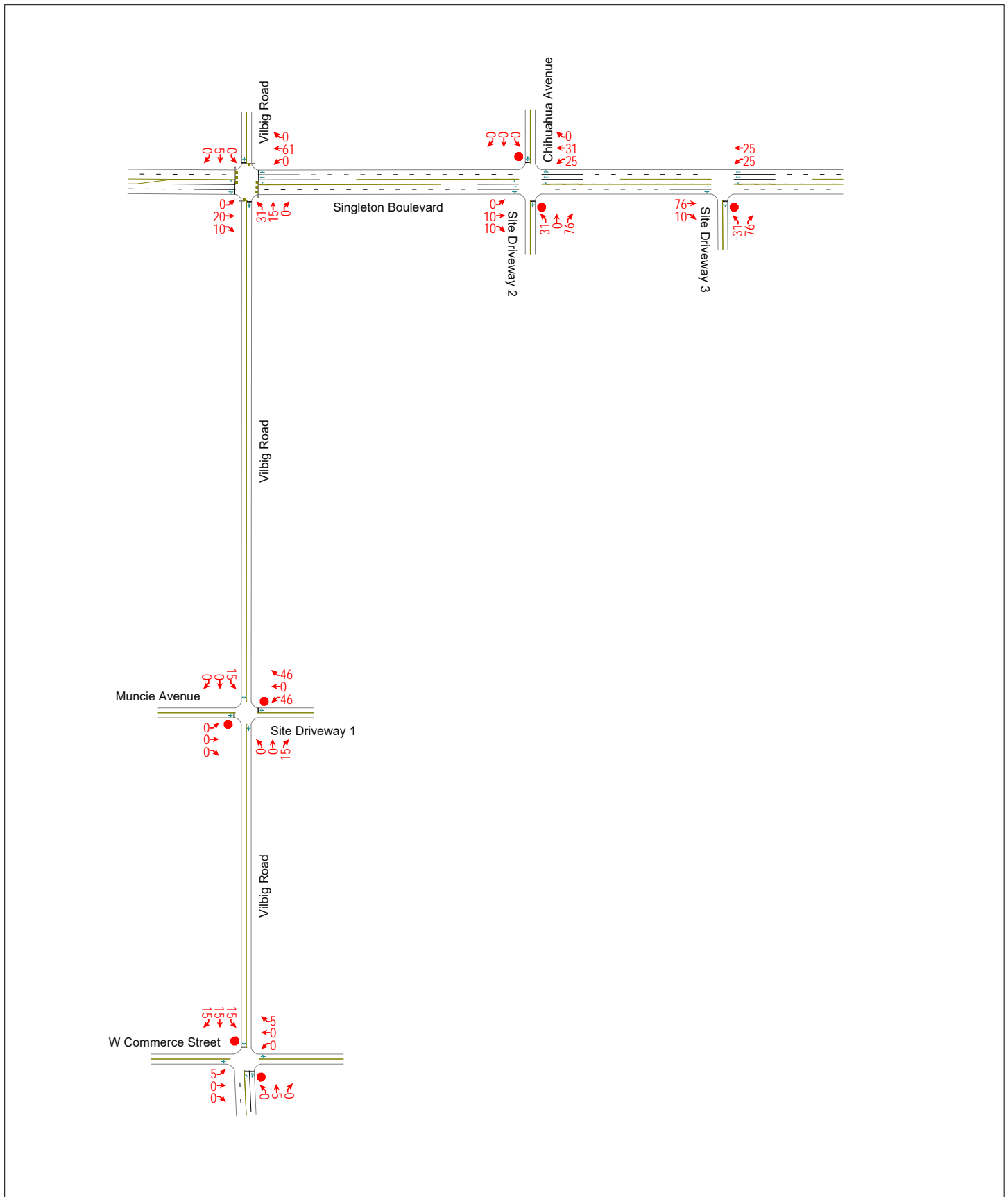
Appendix A5 - Background PM Peak Hour Traffic Volumes

North ^
Not to Scale



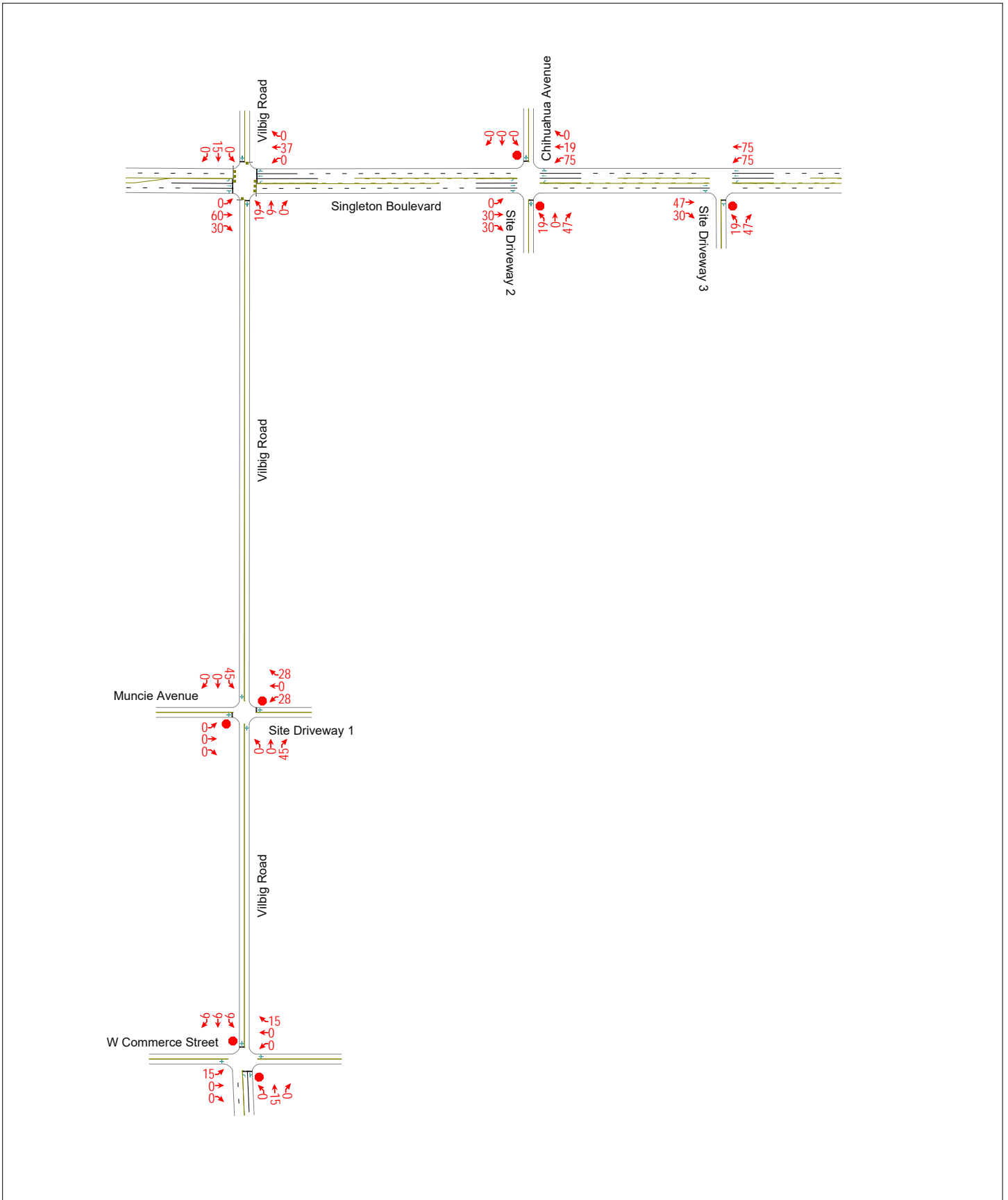
Appendix A6 - Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale



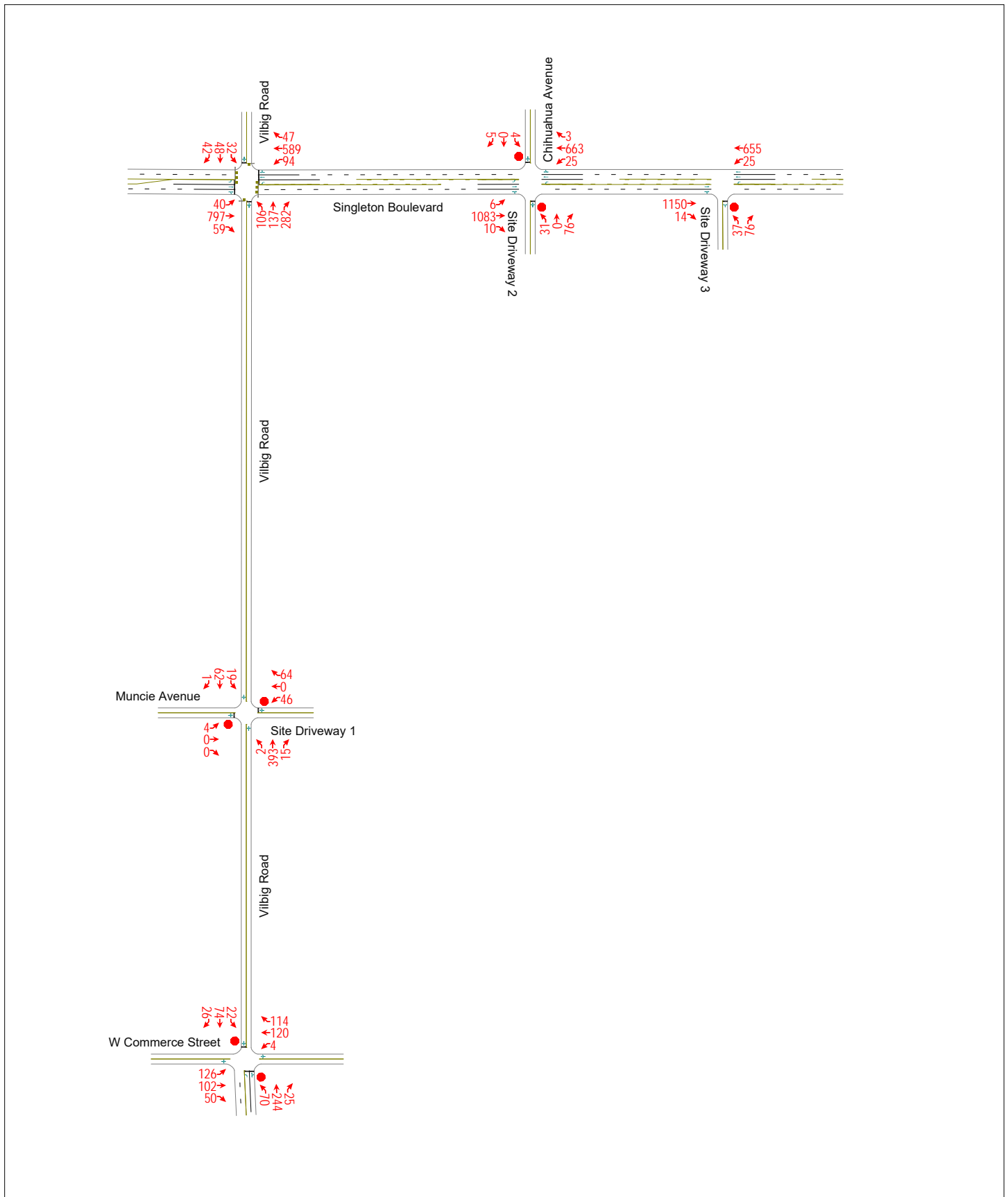
Appendix A7 - Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale



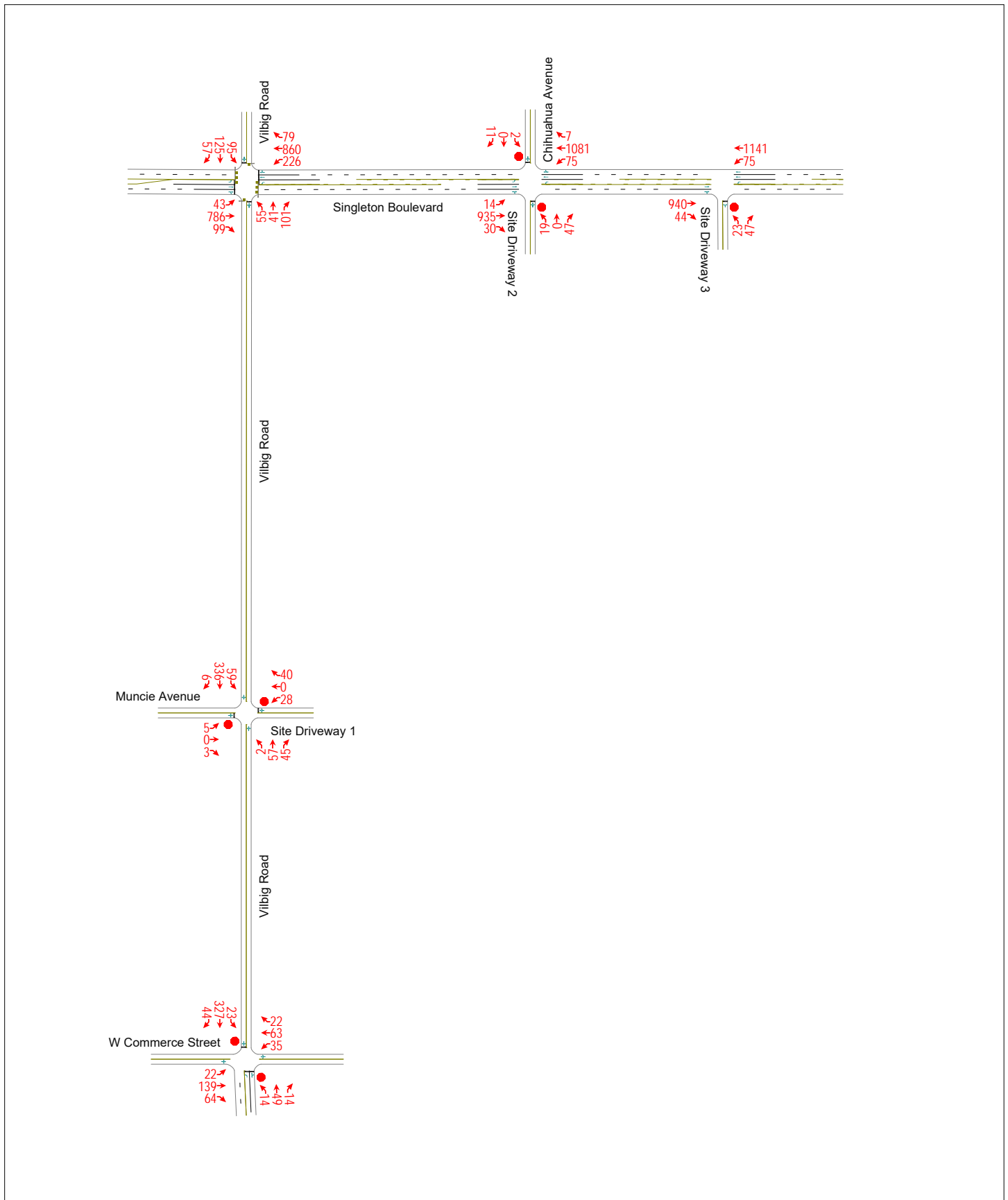
Appendix A8 - Background Plus Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale



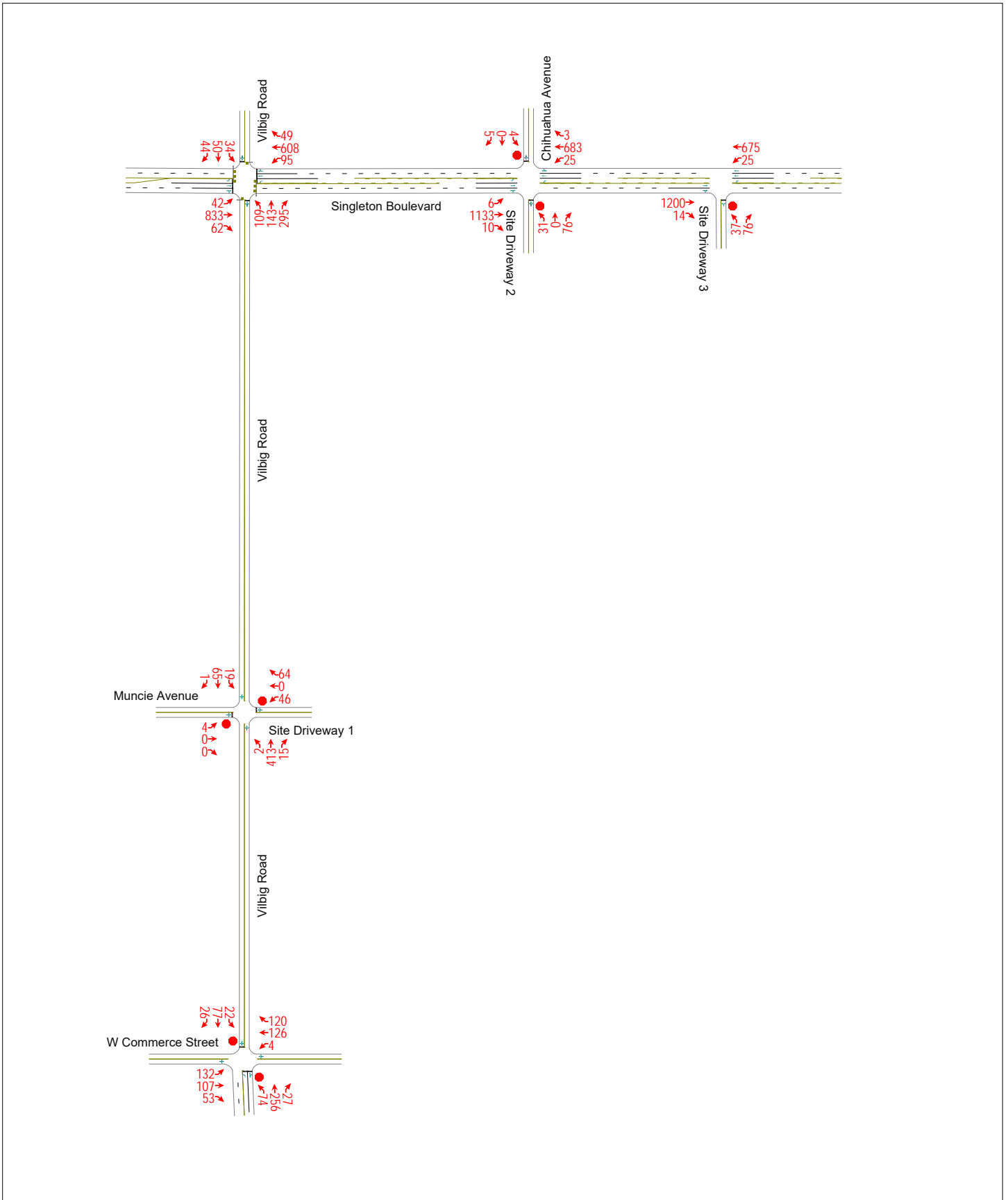
Appendix A9 - Background Plus Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale



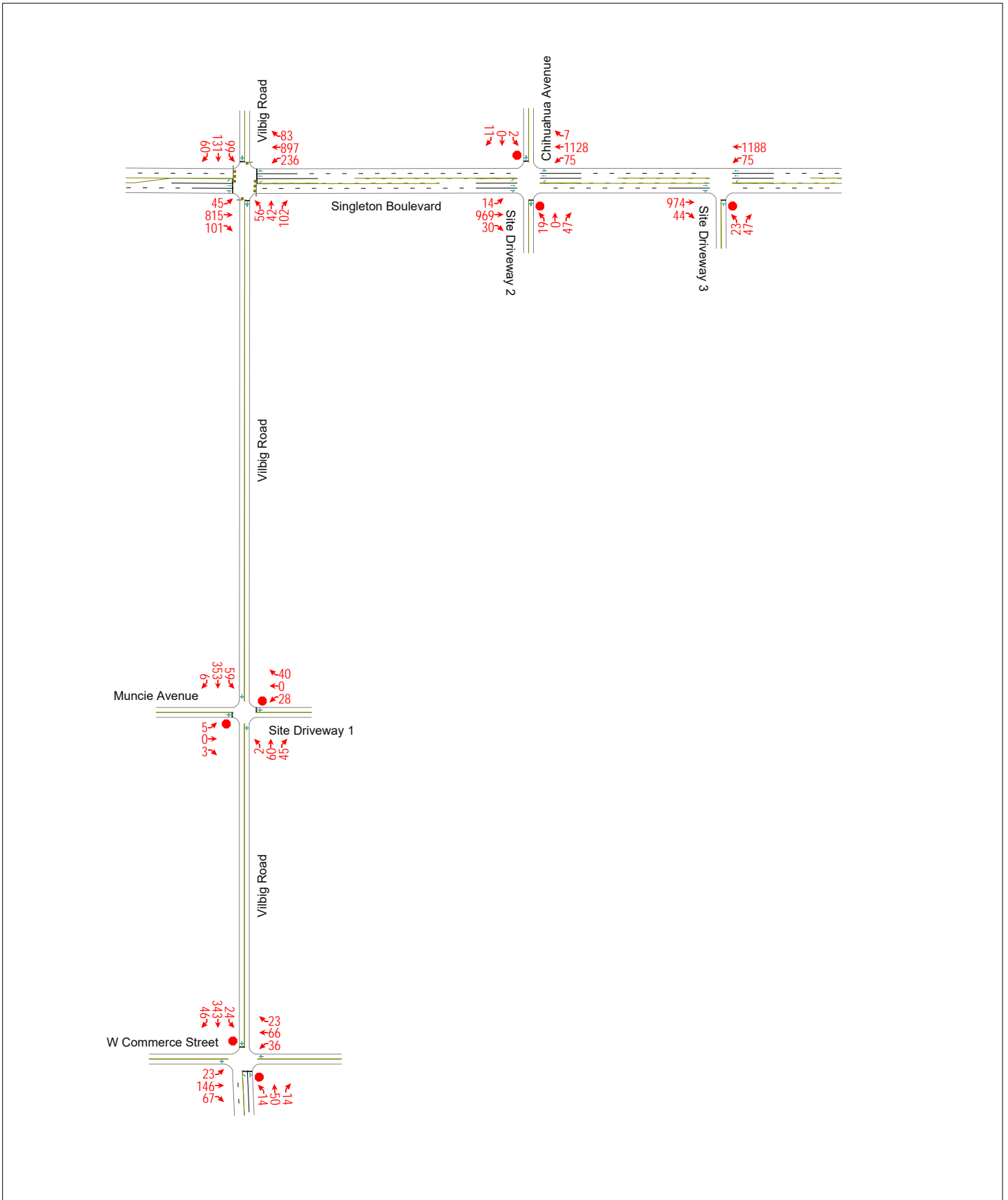
Appendix A10 - Horizon AM Peak Hour Traffic Volumes

North ^
Not to Scale



Appendix A11 - Horizon PM Peak Hour Traffic Volumes

North ^
Not to Scale



Appendix B. Detailed Traffic Volume Data

Intersection Turning Movement Counts

		NORTH LEG						EAST LEG						SOUTH LEG						WEST LEG					
		Southbound Approach on Singleton Boulevard						Westbound Approach on Vilbig Road						Northbound Approach on Singleton Boulevard						Eastbound Approach on Vilbig Road					
		Vehicles			Peds			Vehicles			Peds			Vehicles			Peds			Vehicles			Peds		
START	END	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	10	4	7		6	59	7				7	16	24				4	122	3			
State:	Texas	7:15 AM	7:30 AM	9	7	11		4	78	3				12	15	44				10	154	6			
Day:	Thursday	7:30 AM	7:45 AM	5	15	12		16	87	7				21	33	70				7	176	29			
Date:	February 8th	7:45 AM	8:00 AM	9	12	11		2	106	11				14	43	80				13	194	7			
Year:	2018	8:00 AM	8:15 AM	4	7	6		0	88	7				7	25	57				8	153	1			
Data Collector:	Camera	8:15 AM	8:30 AM	7	5	9		2	84	5				4	11	27				4	134	2			
Data Source:	CJ Hensch	8:30 AM	8:45 AM	4	4	14		5	81	6				4	11	26				10	160	2			
Traffic Control:	Traffic Signal	8:45 AM	9:00 AM	9	4	9		2	82	7				9	11	15				9	133	1			
Observations:		4:30 PM	4:45 PM	14	24	13		35	174	17				3	7	16				9	121	14			
		4:45 PM	5:00 PM	23	23	4		36	177	14				6	9	8				12	140	8			
		5:00 PM	5:15 PM	18	25	16		55	173	18				5	6	9				11	120	12			
		5:15 PM	5:30 PM	10	33	11		51	166	17				10	4	9				15	118	17			
		5:30 PM	5:45 PM	24	24	23		40	169	18				2	11	7				3	161	15			
		5:45 PM	6:00 PM	18	27	13		39	179	16				7	3	9				9	114	10			
		6:00 PM	6:15 PM	19	18	12		24	177	12				1	3	4				9	131	6			
		6:15 PM	6:30 PM	15	14	14		18	154	19				4	6	12				15	127	12			
AM Peak Hour	Intersection PHF:	0.84	Intersection PHV:	27	41	40		22	359	28				54	116	251				38	677	43			
	Peak Hour:	7:15 AM - 8:15 AM	PHF:	0.75	0.68	0.83		0.34	0.85	0.64				0.64	0.67	0.78				0.73	0.87	0.37			
PM Peak Hour	Study Area PHF:	0.84	Study Area PHV:	27	41	40		22	359	28				54	116	251				38	677	43			
	Peak Hour:	7:15 AM - 8:15 AM	PHF:	0.75	0.68	0.83		0.34	0.85	0.64				0.64	0.67	0.78				0.73	0.87	0.37			
AM Peak Hour	Intersection PHF:	0.95	Intersection PHV:	75	105	54		182	685	67				23	30	33				41	539	52			
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.78	0.80	0.59		0.83	0.97	0.93				0.58	0.68	0.92				0.68	0.84	0.76			
PM Peak Hour	Study Area PHF:	0.95	Study Area PHV:	75	105	54		182	685	67				23	30	33				41	539	52			
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.78	0.80	0.59		0.83	0.97	0.93				0.58	0.68	0.92				0.68	0.84	0.76			

Intersection Turning Movement Counts

		NORTH LEG							EAST LEG							SOUTH LEG									
		Southbound Approach on Chihuahua Avenue							Westbound Approach on Singleton Boulevard							Eastbound Approach on Singleton Boulevard									
		Vehicles				Peds			Vehicles				Peds			Vehicles				Peds					
		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	1	-	4				-	71	0								5	157	-			
State:	Texas	7:15 AM	7:30 AM	1	-	3				-	76	0								1	199	-			
Day:	Thursday	7:30 AM	7:45 AM	3	-	1				-	102	0								1	249	-			
Date:	February 8th	7:45 AM	8:00 AM	0	-	0				-	109	1								2	271	-			
Year:	2018	8:00 AM	8:15 AM	0	-	1				-	87	2								2	220	-			
Data Collector:	Camera	8:15 AM	8:30 AM	2	-	2				-	86	0								3	167	-			
Data Source:	CJ Hensch	8:30 AM	8:45 AM	2	-	1				-	91	0								1	170	-			
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	0	-	2				-	83	0								3	156	-			
Observations:		4:30 PM	4:45 PM	5	-	2				-	220	1								4	144	-			
		4:45 PM	5:00 PM	0	-	2				-	205	0								3	177	-			
		5:00 PM	5:15 PM	1	-	3				-	240	3								3	143	-			
		5:15 PM	5:30 PM	1	-	3				-	219	2								3	139	-			
		5:30 PM	5:45 PM	0	-	3				-	207	2								5	172	-			
		5:45 PM	6:00 PM	1	-	2				-	220	5								2	133	-			
		6:00 PM	6:15 PM	1	-	1				-	206	6								2	144	-			
		6:15 PM	6:30 PM	0	-	4				-	184	1								4	137	-			
AM Peak Hour	Intersection PHF:	0.87		Intersection PHV:			4	0	5		0	374	3						6	939	0				
	Peak Hour:	7:15 AM - 8:15 AM		PHF:			0.33	0.00	0.42		0.00	0.86	0.38						0.75	0.87	0.00				
PM Peak Hour	Study Area PHF:	0.87		Study Area PHV:			4	0	5		0	374	3						6	939	0				
	Peak Hour:	7:15 AM - 8:15 AM		PHF:			0.33	0.00	0.42		0.00	0.86	0.38						0.75	0.87	0.00				
AM Peak Hour	Intersection PHF:	0.98		Intersection PHV:			2	0	11		0	871	7						14	631	0				
	Peak Hour:	4:45 PM - 5:45 PM		PHF:			0.50	0.00	0.92		0.00	0.91	0.58						0.70	0.89	0.00				
PM Peak Hour	Study Area PHF:	0.98		Study Area PHV:			2	0	11		0	871	7						14	631	0				
	Peak Hour:	4:45 PM - 5:45 PM		PHF:			0.50	0.00	0.92		0.00	0.91	0.58						0.70	0.89	0.00				

Intersection Turning Movement Counts

			NORTH LEG						SOUTH LEG						WEST LEG								
			Southbound Approach on Vilbig Road						Northbound Approach on Vilbig Road						Eastbound Approach on Muncie Avenue								
			Vehicles			Peds			Vehicles			Peds			Vehicles			Peds					
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	-	6	1									0	33	-				2	-	0
State:	Texas	7:15 AM	7:30 AM	-	7	0									0	59	-				3	-	0
Day:	Thursday	7:30 AM	7:45 AM	-	25	1									0	110	-				0	-	0
Date:	February 8th	7:45 AM	8:00 AM	-	18	0									1	120	-				0	-	0
Year:	2018	8:00 AM	8:15 AM	-	9	0									1	85	-				1	-	0
Data Collector:	Camera	8:15 AM	8:30 AM	-	3	0									1	39	-				0	-	1
Data Source:	CJ Hensch	8:30 AM	8:45 AM	-	11	0									1	34	-				1	-	0
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	-	6	0									2	28	-				1	-	0
Observations:		4:30 PM	4:45 PM	-	51	4									1	15	-				2	-	0
		4:45 PM	5:00 PM	-	68	1									0	11	-				1	-	1
		5:00 PM	5:15 PM	-	86	2									1	15	-				1	-	1
		5:15 PM	5:30 PM	-	88	2									1	13	-				1	-	0
		5:30 PM	5:45 PM	-	78	1									0	15	-				2	-	1
		5:45 PM	6:00 PM	-	67	1									0	9	-				1	-	0
		6:00 PM	6:15 PM	-	51	3									0	6	-				0	-	0
		6:15 PM	6:30 PM	-	28	2									0	18	-				0	-	0
AM Peak Hour	Intersection PHF:	0.79		Intersection PHV:	0	59	1								2	374	0				4	0	0
	Peak Hour:	7:15 AM - 8:15 AM		PHF:	0.00	0.59	0.25								0.50	0.78	0.00				0.33	0.00	0.00
PM Peak Hour	Study Area PHF:	0.79		Study Area PHV:	0	59	1								2	374	0				4	0	0
	Peak Hour:	7:15 AM - 8:15 AM		PHF:	0.00	0.59	0.25								0.50	0.78	0.00				0.33	0.00	0.00
AM Peak Hour	Intersection PHF:	0.92		Intersection PHV:	0	320	6								2	54	0				5	0	3
	Peak Hour:	4:45 PM - 5:45 PM		PHF:	0.00	0.91	0.75								0.50	0.90	0.00				0.63	0.00	0.75
PM Peak Hour	Study Area PHF:	0.92		Study Area PHV:	0	320	6								2	54	0				5	0	3
	Peak Hour:	4:45 PM - 5:45 PM		PHF:	0.00	0.91	0.75								0.50	0.90	0.00				0.63	0.00	0.75

Intersection Turning Movement Counts

			NORTH LEG						EAST LEG						SOUTH LEG						WEST LEG					
			Southbound Approach on Vilbig Road						Westbound Approach on Commerce Street						Northbound Approach on Vilbig Road						Eastbound Approach on Commerce Street					
			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	2	7	1			2	14	8			10	68	3			42	21	8					
State:	Texas	7:15 AM	7:30 AM	1	10	2			1	33	16			28	53	13			23	31	15					
Day:	Thursday	7:30 AM	7:45 AM	2	23	1			0	30	49			14	55	2			32	18	9					
Date:	February 8th	7:45 AM	8:00 AM	2	16	4			3	31	32			19	58	2			39	18	12					
Year:	2018	8:00 AM	8:15 AM	1	7	3			0	20	7			6	61	7			21	30	12					
Data Collector:	Camera	8:15 AM	8:30 AM	3	4	1			3	24	10			7	39	8			9	26	2					
Data Source:	CJ Hensch	8:30 AM	8:45 AM	1	6	2			1	14	8			10	20	4			3	19	9					
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	1	5	0			4	27	7			10	9	3			13	32	9					
Observations:		4:30 PM	4:45 PM	5	57	5			8	17	2			6	7	1			1	28	17					
		4:45 PM	5:00 PM	2	49	9			14	15	0			4	6	4			2	25	14					
		5:00 PM	5:15 PM	2	72	5			9	14	2			4	8	3			2	34	12					
		5:15 PM	5:30 PM	6	86	10			5	19	3			1	5	2			2	45	16					
		5:30 PM	5:45 PM	3	95	9			5	12	2			4	13	4			1	28	19					
		5:45 PM	6:00 PM	9	68	2			6	12	3			2	5	3			1	32	13					
		6:00 PM	6:15 PM	5	52	1			5	7	0			4	7	2			1	31	11					
		6:15 PM	6:30 PM	0	23	0			5	8	3			1	3	3			0	20	14					
AM Peak Hour	Intersection PHF:	0.94		Intersection PHV:	7	56	8		6	108	105			71	234	20			136	88	44					
	Peak Hour:	7:00 AM - 8:00 AM		PHF:	0.88	0.61	0.50		0.50	0.82	0.54			0.63	0.86	0.38			0.81	0.71	0.73					
PM Peak Hour	Study Area PHF:	0.92		Study Area PHV:	6	56	10		4	114	104			67	227	24			115	97	48					
	Peak Hour:	7:15 AM - 8:15 AM		PHF:	0.75	0.61	0.63		0.33	0.86	0.53			0.60	0.93	0.46			0.74	0.78	0.80					
AM Peak Hour	Intersection PHF:	0.90		Intersection PHV:	20	321	26		25	57	10			11	31	12			6	139	60					
	Peak Hour:	5:00 PM - 6:00 PM		PHF:	0.56	0.84	0.65		0.69	0.75	0.83			0.69	0.60	0.75			0.75	0.77	0.79					
PM Peak Hour	Study Area PHF:	0.88		Study Area PHV:	13	302	33		33	60	7			13	32	13			7	132	61					
	Peak Hour:	4:45 PM - 5:45 PM		PHF:	0.54	0.79	0.83		0.59	0.79	0.58			0.81	0.62	0.81			0.88	0.73	0.80					

ROADWAY: Singleton Boulevard
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: February 8th
 YEAR: 2018
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME
17,663
 (WEEKDAY)

Singleton Boulevard

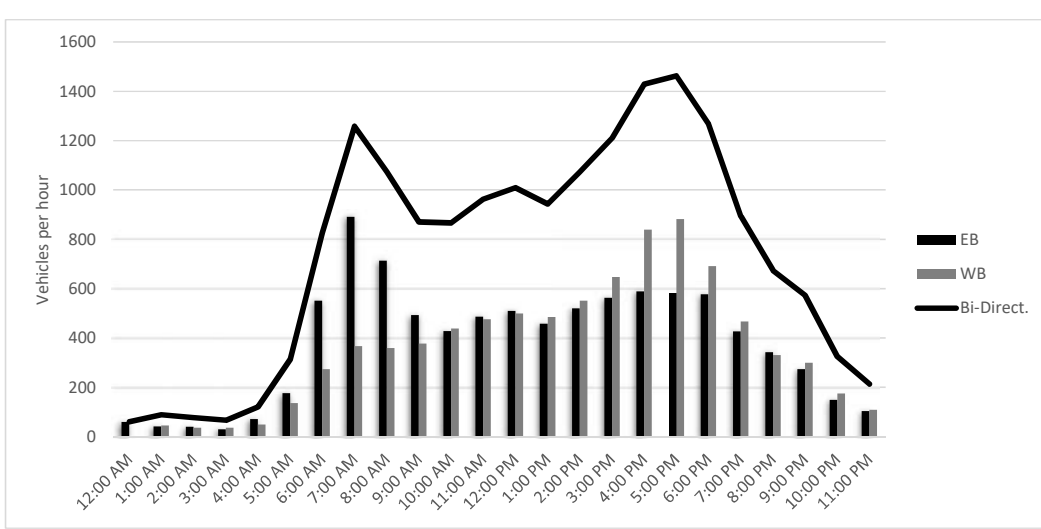
START TIME	Eastbound				Westbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	EB	WB	Bi-Direct.
12:00 AM	16	16	14	14	0	0	0	0	60	0	60
1:00 AM	14	10	10	8	8	16	10	12	42	46	88
2:00 AM	6	10	14	10	18	3	6	10	40	37	77
3:00 AM	11	3	6	10	4	14	9	10	30	37	67
4:00 AM	8	12	11	40	5	16	12	17	71	50	121
5:00 AM	34	28	46	69	24	28	40	45	177	137	314
6:00 AM	96	134	164	158	46	72	76	80	552	274	826
7:00 AM	161	210	247	274	79	71	102	115	892	367	1259
8:00 AM	211	170	187	146	91	90	90	89	714	360	1074
9:00 AM	146	110	123	114	94	87	88	109	493	378	871
10:00 AM	100	90	109	129	116	120	92	111	428	439	867
11:00 AM	101	122	124	140	110	123	114	129	487	476	963
12:00 PM	118	132	140	120	146	113	133	108	510	500	1010
1:00 PM	110	124	110	114	118	123	122	122	458	485	943
2:00 PM	110	131	128	152	133	124	152	143	521	552	1073
3:00 PM	122	159	162	120	168	171	145	164	563	648	1211
4:00 PM	138	130	150	171	208	194	227	210	589	839	1428
5:00 PM	139	140	160	142	234	224	220	204	581	882	1463
6:00 PM	136	145	144	152	216	179	150	147	577	692	1269
7:00 PM	126	116	97	88	130	118	120	99	427	467	894
8:00 PM	94	97	91	61	88	91	79	73	343	331	674
9:00 PM	62	68	78	66	76	86	66	72	274	300	574
10:00 PM	46	43	34	26	56	55	30	34	149	175	324
11:00 PM	36	22	24	22	32	26	33	18	104	109	213

7:15 AM 8:15 AM
 4:45 PM 5:45 PM
 7:15 AM 8:15 AM
 4:30 PM 5:30 PM

24-Hour Total: 17,663
 (Bi-Direct.) AM Peak Hour Total: 1,321
 (Bi-Direct.) PM Peak Hour Total: 1,498
 Highest By Direction (EB): 942
 Highest By Direction (WB): 895

	EB	WB	Bi-Direct.
24-Hour Total:	9,082	8,581	17,663
(Bi-Direct.) AM Peak Hour Total:	942	379	1,321
(Bi-Direct.) PM Peak Hour Total:	610	888	1,498
Highest By Direction (EB):	942		
Highest By Direction (WB):		895	

Graph



ROADWAY: Vilbig Road
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: February 8th
 YEAR: 2018
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME
2,368
 (WEEKDAY)

Vilbig Road

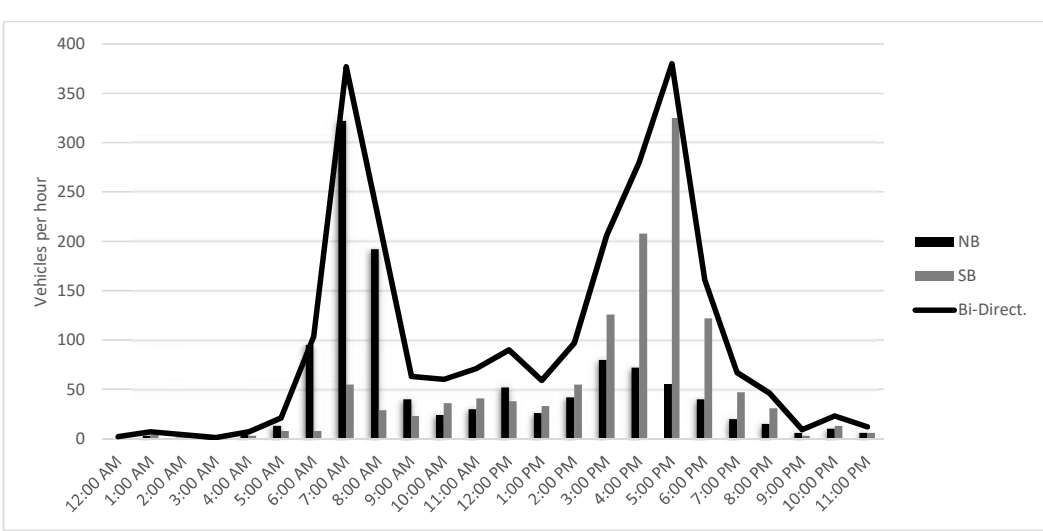
START TIME	Northbound				Southbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	NB	SB	Bi-Direct.
12:00 AM	0	0	0	0	0	0	1	1	0	2	2
1:00 AM	0	1	0	2	0	2	0	2	3	4	7
2:00 AM	0	0	1	0	1	0	1	1	1	3	4
3:00 AM	0	0	0	0	0	0	1	0	0	1	1
4:00 AM	1	1	0	2	0	1	1	1	4	3	7
5:00 AM	4	2	4	3	0	2	3	3	13	8	21
6:00 AM	5	21	19	50	1	5	2	0	95	8	103
7:00 AM	39	61	107	115	8	5	24	18	322	55	377
8:00 AM	85	39	37	31	9	3	10	7	192	29	221
9:00 AM	16	12	9	3	6	8	4	5	40	23	63
10:00 AM	6	5	7	6	6	9	12	9	24	36	60
11:00 AM	7	6	4	13	12	11	10	8	30	41	71
12:00 PM	18	18	5	11	11	11	7	9	52	38	90
1:00 PM	8	6	5	7	11	5	7	10	26	33	59
2:00 PM	8	8	13	13	6	10	14	25	42	55	97
3:00 PM	30	12	19	19	19	25	27	55	80	126	206
4:00 PM	25	16	19	12	42	46	53	67	72	208	280
5:00 PM	15	13	15	12	87	89	83	66	55	325	380
6:00 PM	7	17	8	8	56	29	24	13	40	122	162
7:00 PM	5	4	5	6	15	10	11	11	20	47	67
8:00 PM	3	3	4	5	10	11	6	4	15	31	46
9:00 PM	4	1	0	1	2	0	0	1	6	3	9
10:00 PM	0	5	3	2	3	5	1	4	10	13	23
11:00 PM	2	1	0	3	0	2	2	2	6	6	12

7:15 AM 8:15 AM
 4:45 PM 5:45 PM
 7:15 AM 8:15 AM
 4:45 PM 5:45 PM

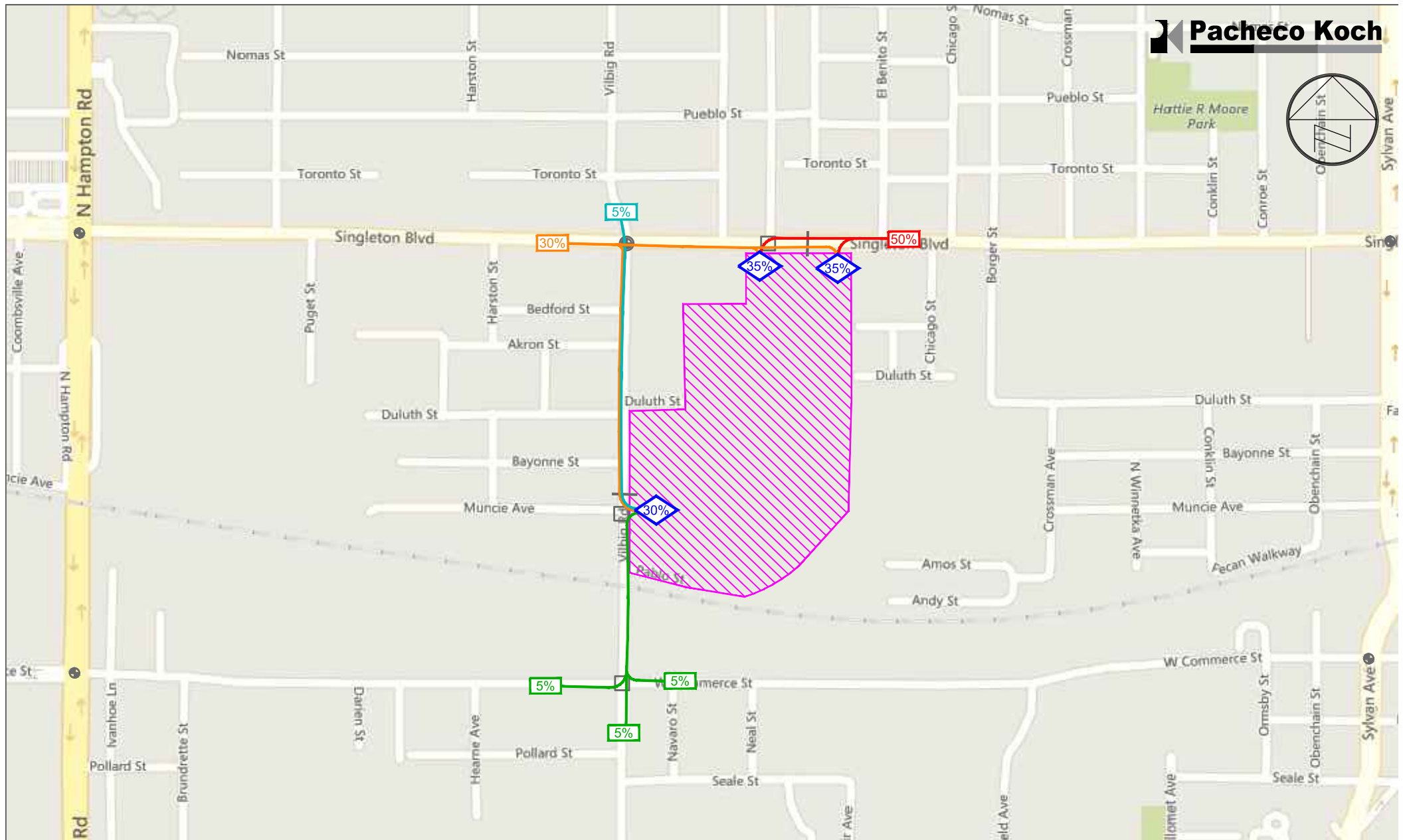
24-Hour Total: 2,368
 (Bi-Direct.) AM Peak Hour Total: 424
 (Bi-Direct.) PM Peak Hour Total: 381
 Highest By Direction (NB): 368
 Highest By Direction (SB): 326

	NB	SB	Bi-Direct.
24-Hour Total:	1,148	1,220	2,368
(Bi-Direct.) AM Peak Hour Total:	368	56	424
(Bi-Direct.) PM Peak Hour Total:	55	326	381
Highest By Direction (NB):	368		
Highest By Direction (SB):		326	

Graph



Appendix C. Site-Generated Traffic Supplement

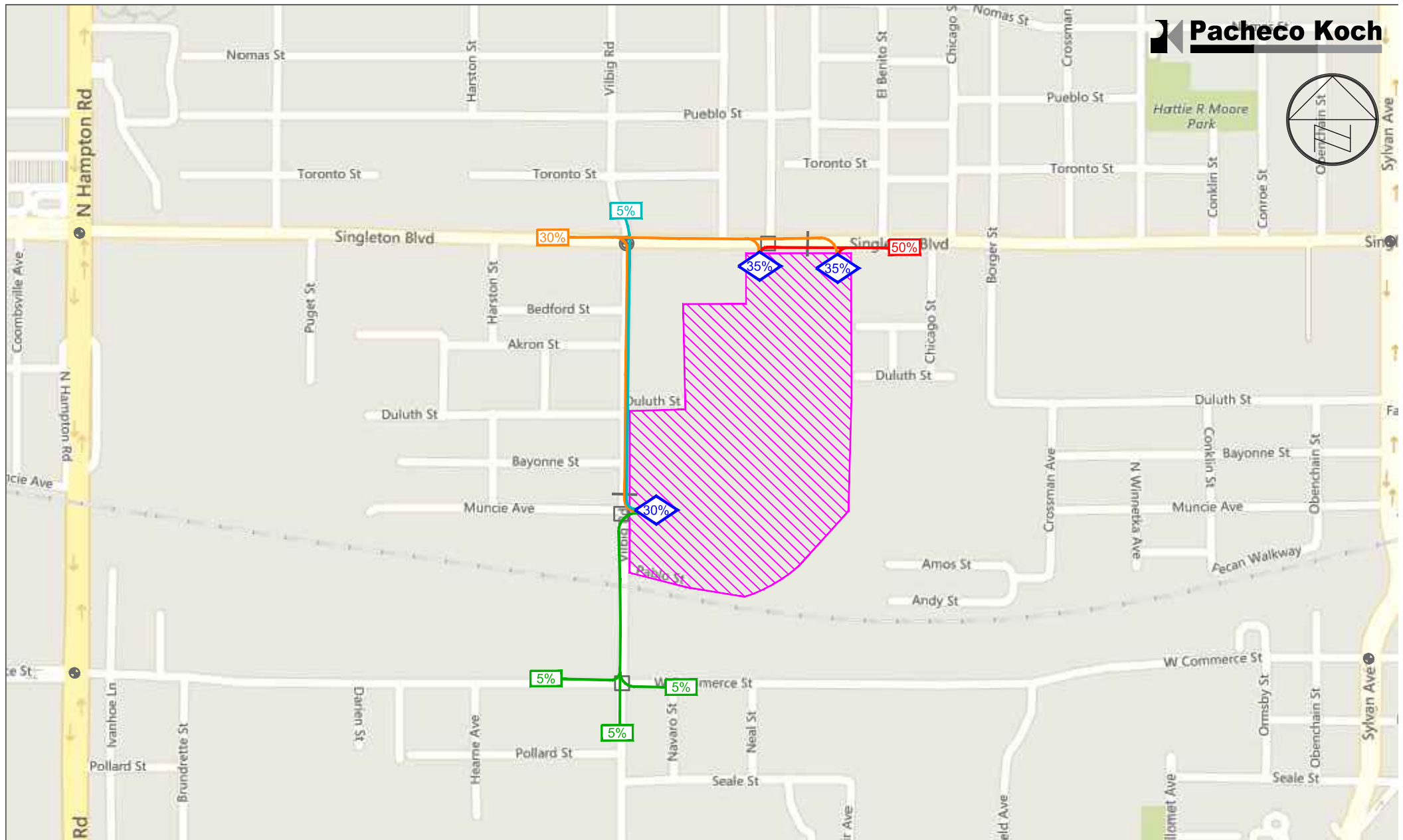


- Project Location
- Study Area Intersection (Signalized)
- Road-Tube Counts
- Traffic Signal
- Study Area Intersection (Unsignalized)
- Traffic Assignment

Site Generated Trip Distribution - Inbound

Villages at Soho, Dallas, Texas

PK #3859-17.399 (HWL: 04/11/18)



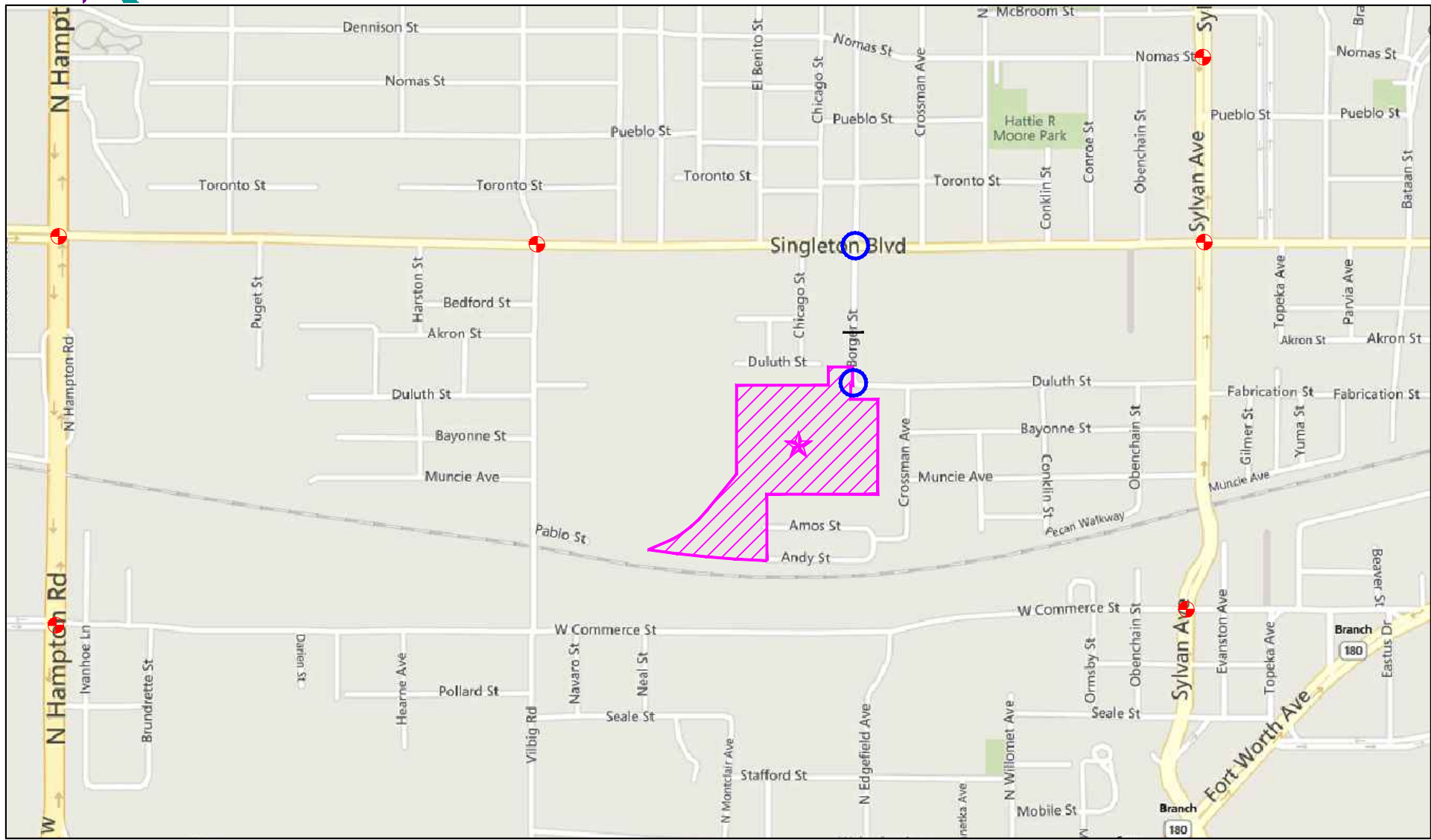
- Project Location
- Study Area Intersection (Signalized)
- Road-Tube Counts
- Traffic Signal
- Study Area Intersection (Unsignalized)
- Traffic Assignment

Site Generated Trip Distribution - Outbound

Villages at Soho, Dallas, Texas

PK #3859-17.399 (HWL: 04/11/18)

	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"	Multifamily - Low Rise	575	DU	4306	58	193	251	176	104	280
Use "B"	Multifamily - Mid Rise	340	DU	1851	30	84	114	87	56	143
Subtotal (no adjustments)				6157	88	277	365	263	160	423
Ped/Trans Reductions										
Subtotal				6157	88	277	365	263	160	423
Net Driveway Vols				6157	88	277	365	263	160	423



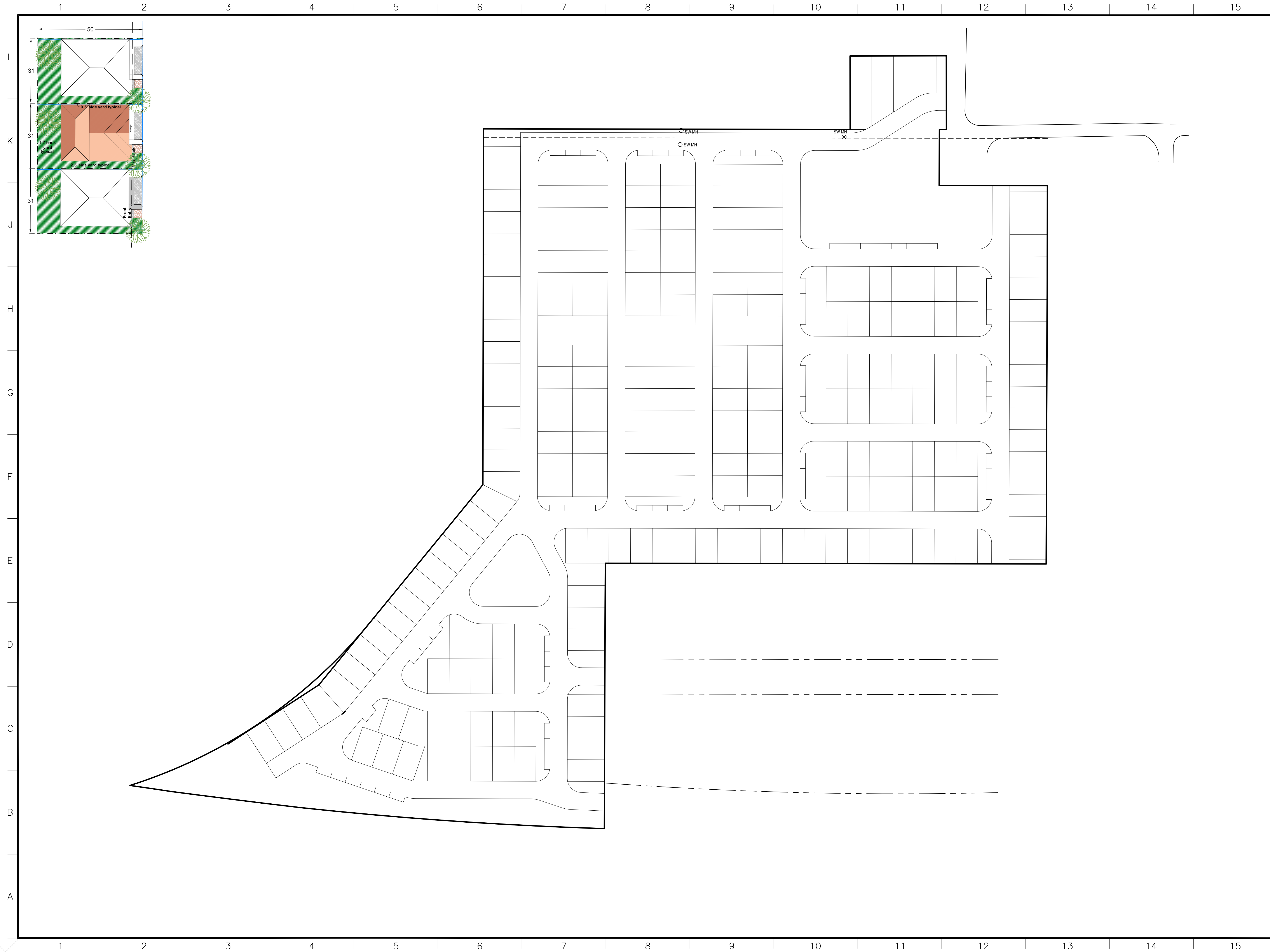
N
Not to Scale

LEGEND:	
- Study Site	- Study Intersections
- Existing Traffic Signal	- 24-Hour Tube Counts

Site Location Map

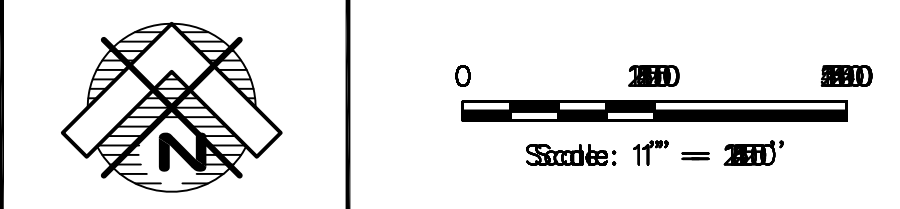
West Dallas SF Traffic Impact Analysis in Dallas, Texas.

PROJECT #15031



NOTE:
 CAUTION: THIS IS A LAND STUDY AND IS SUBJECT TO FURTHER REFINEMENT INCLUDING COLLECTION OF FIELD INFORMATION ON EASEMENTS, TREE COVER, UTILITIES, TOPO, AND VERIFICATION OF CODE COMPLIANCE - LOT YIELD MAY VARY UPON REFINEMENT.

NO.	REVISIONS / SUBMISSIONS	DATE




Ion Design Group
 7075 Twin Hills Ave
 Suite 350
 Dallas, Texas 75231
 Firm TX F6701
 214.370.3470 Ph

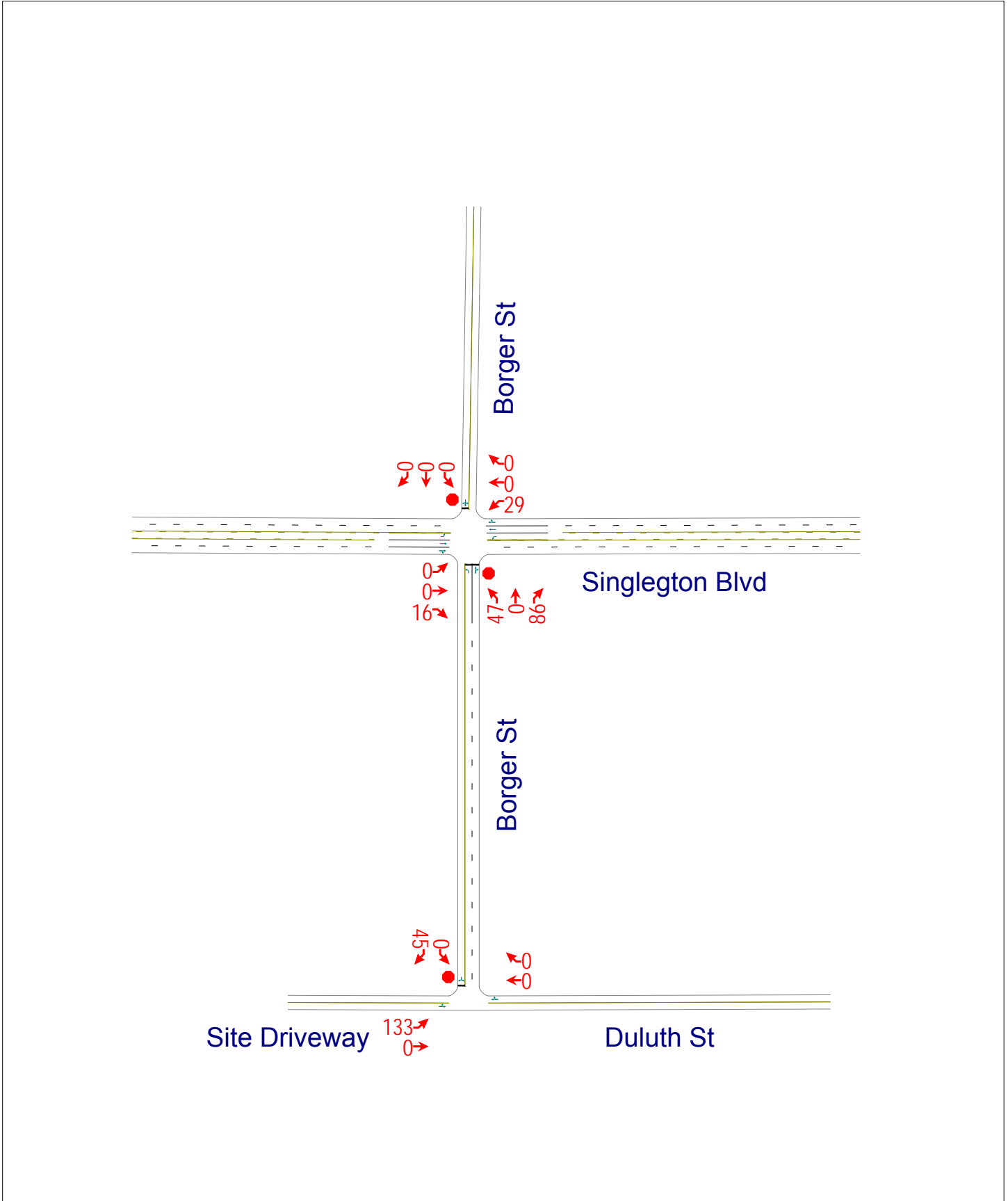
JOB NAME
DALLAS DULUTH STREET
 CITY OF DALLAS DALLAS COUNTY TEXAS

DRAWING TITLE

SEAL	DRAWN F.M.	SCALE HH:1"=200'
	CHECKED J.T.	FILENAME
	REVIEWED B.K.	DRAWING NO.
	DATE 10.27.2014	
	PROJECT NO. 00000.00	___ of ___

Appendix A7. Site Generated AM Peak Hour Traffic Volumes

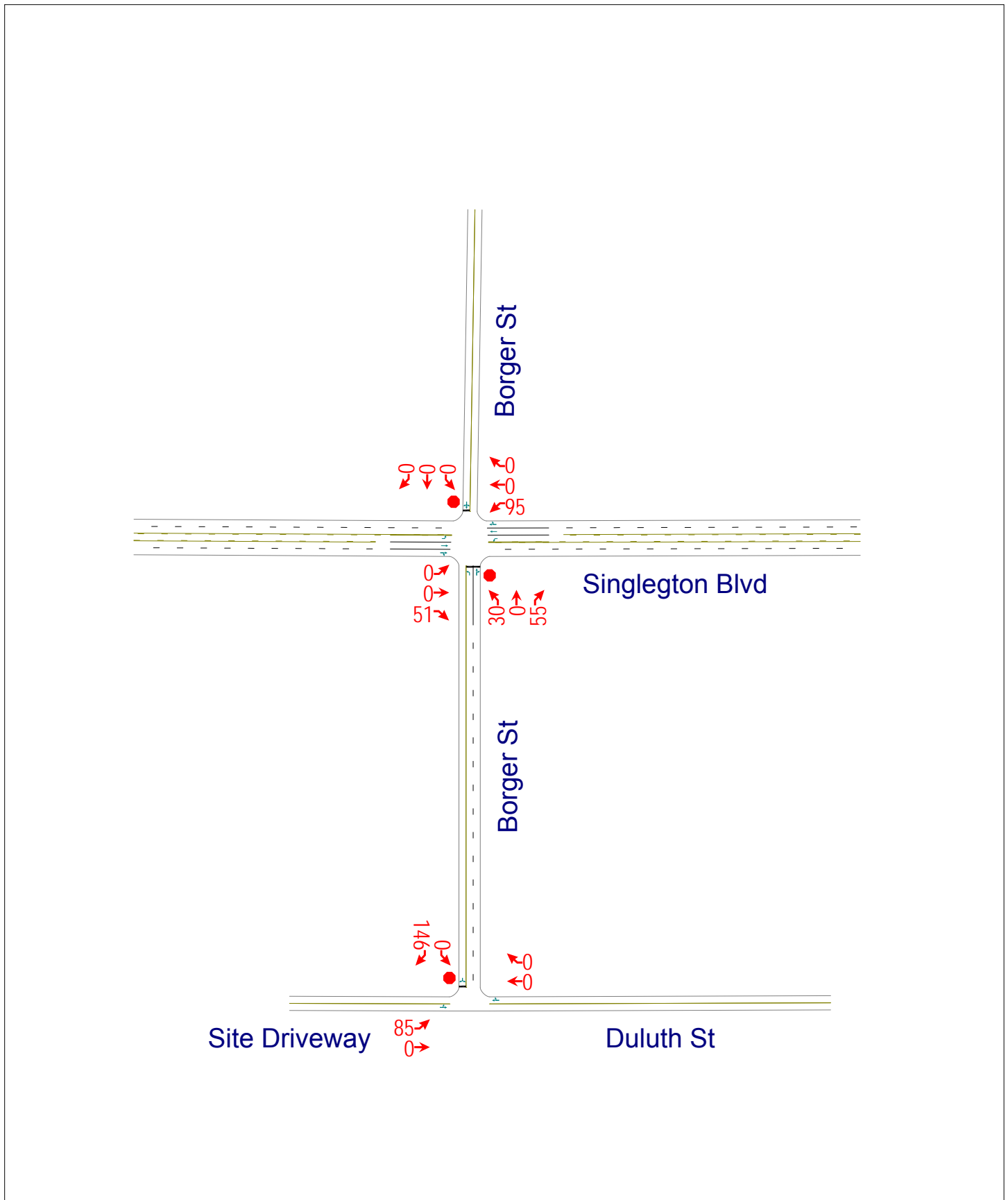
Plan North ^
Not to Scale



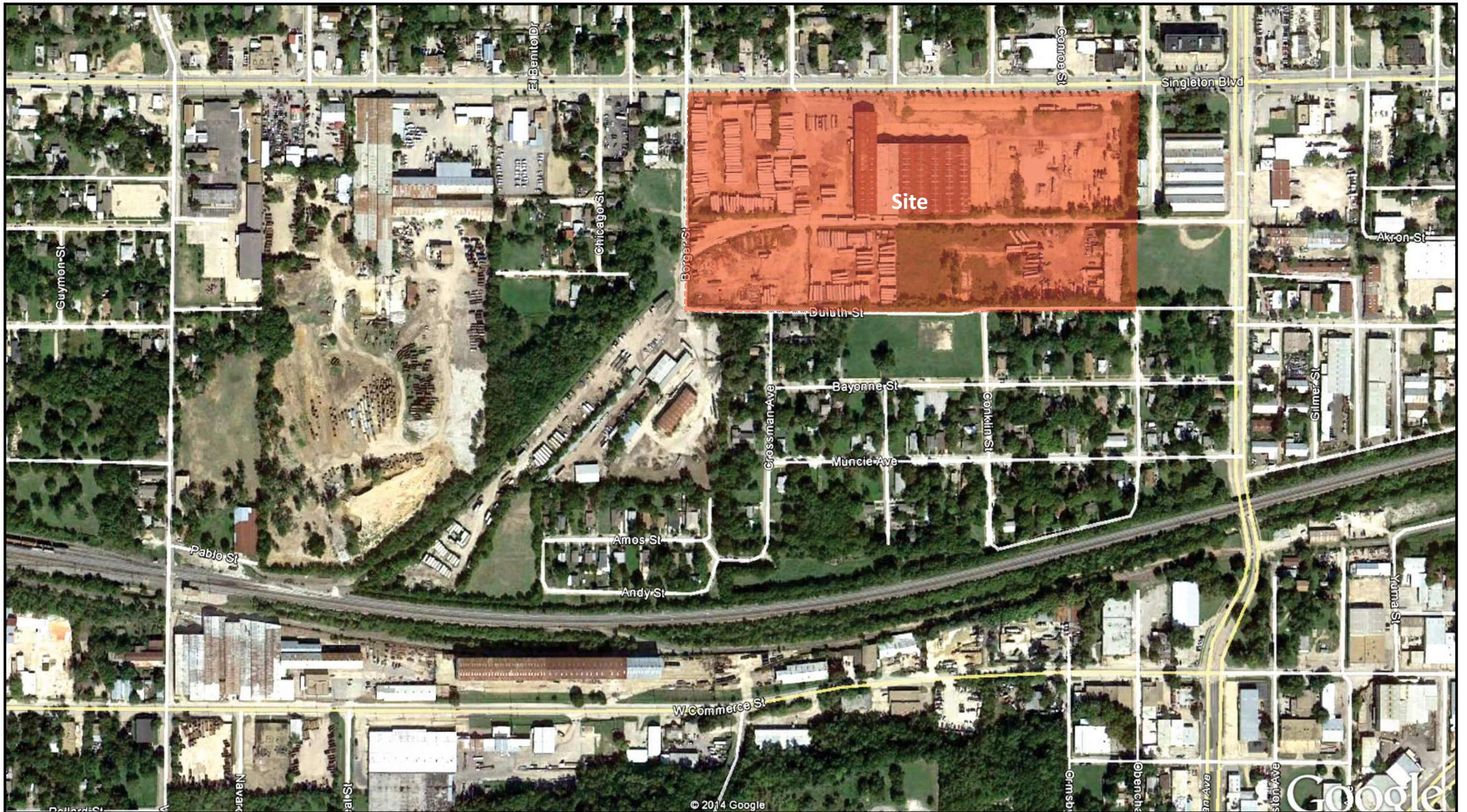
DeShazo Group, Inc

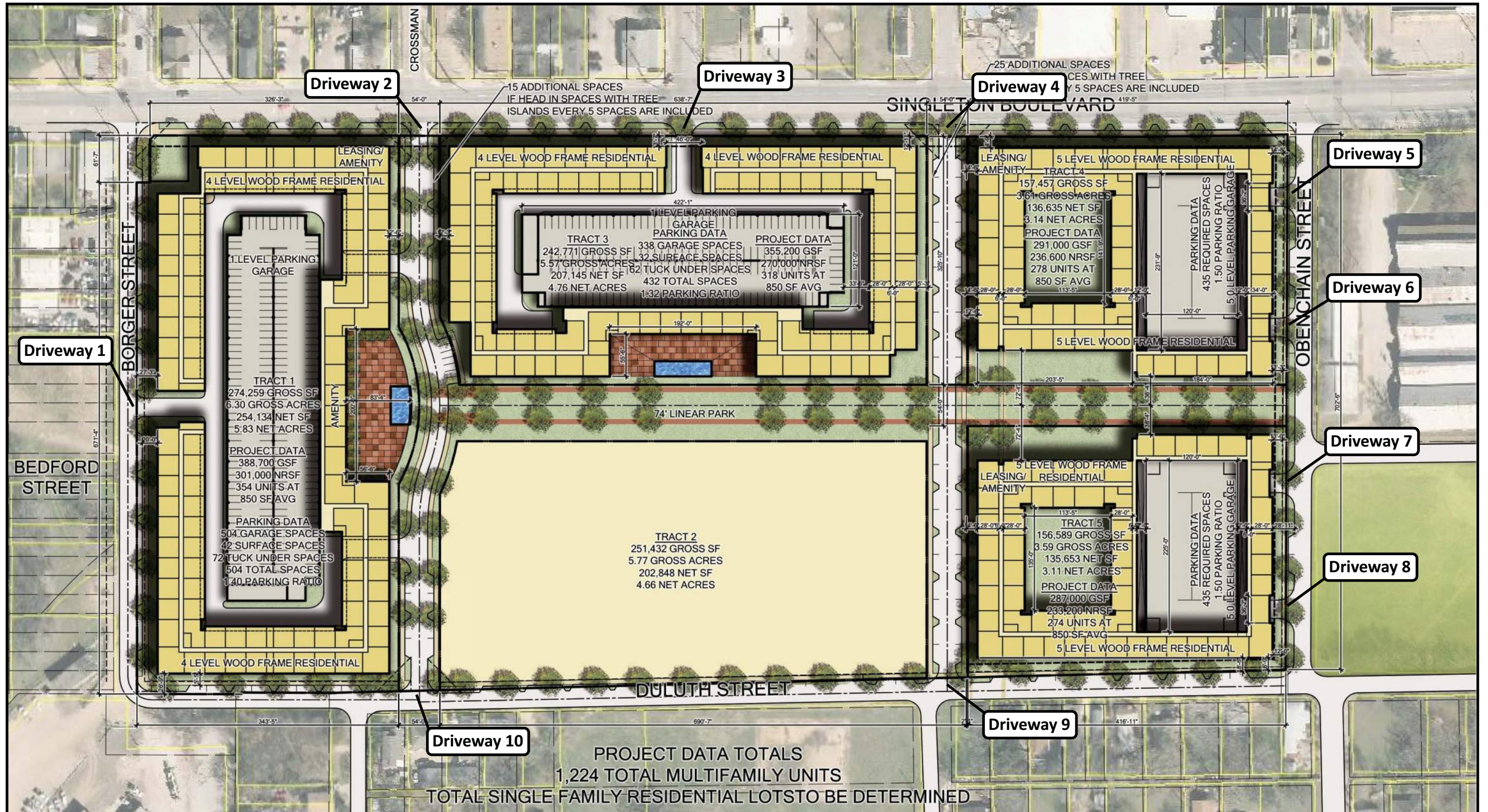
Appendix A8. Site Generated PM Peak Hour Traffic Volumes

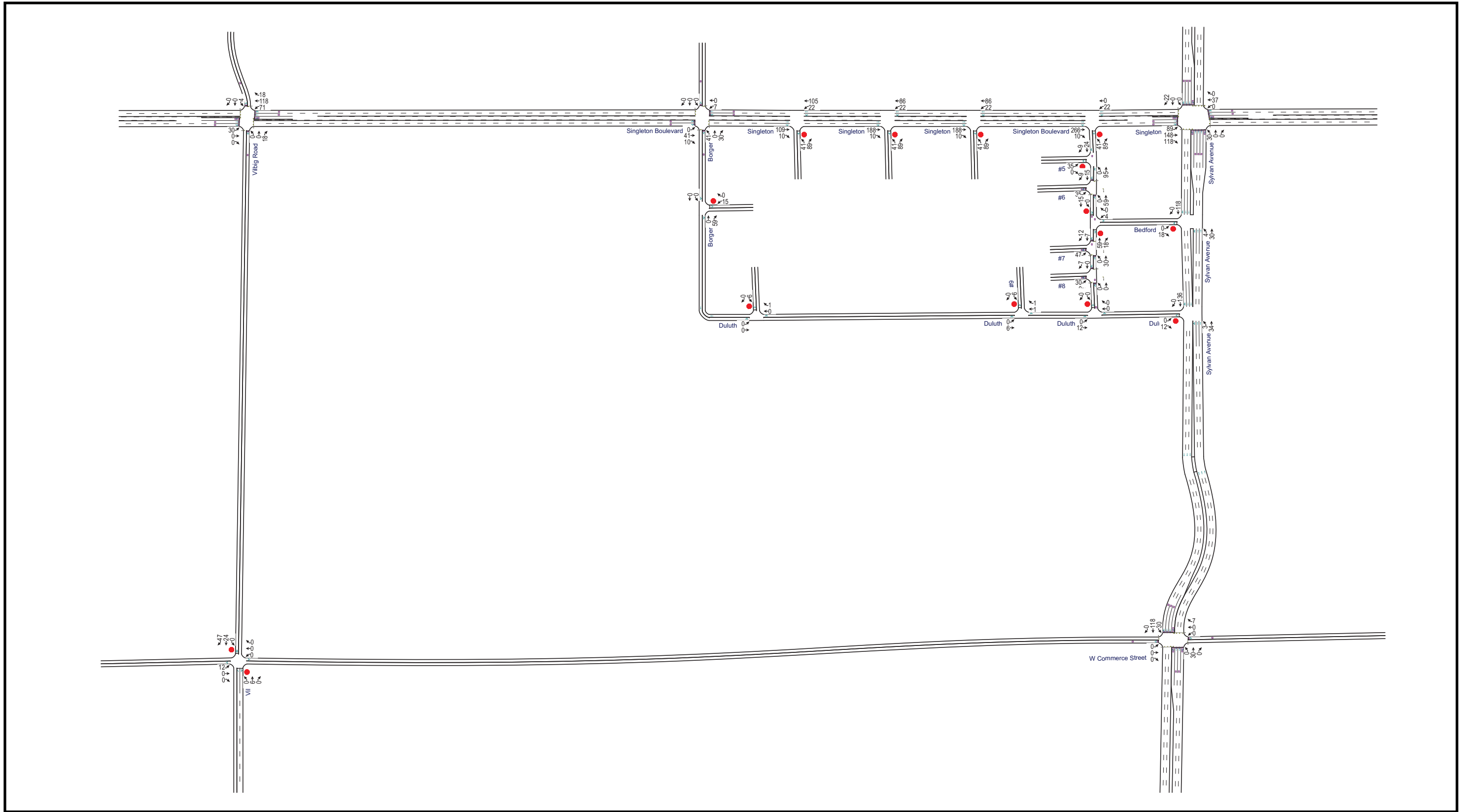
Plan North ^
Not to Scale

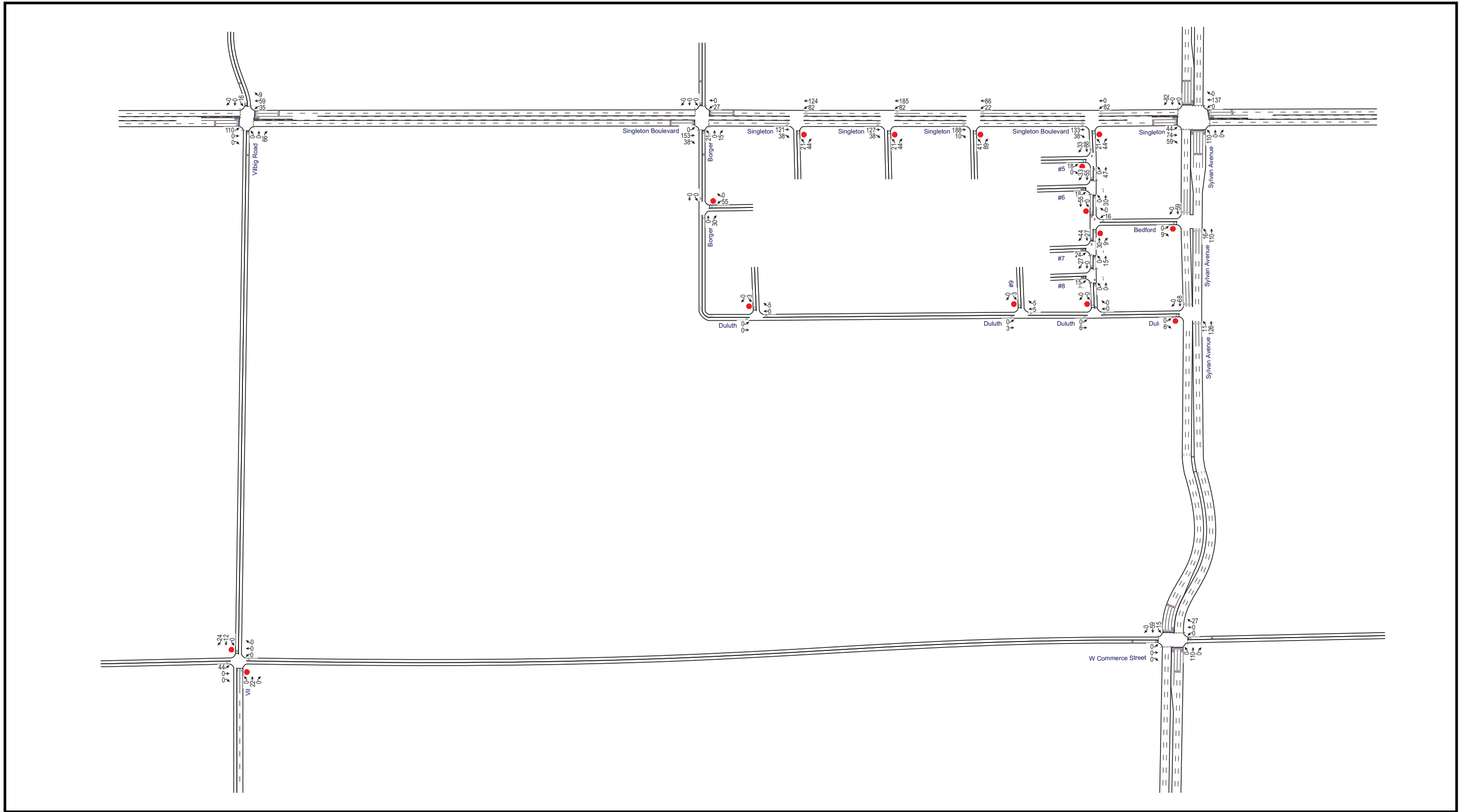


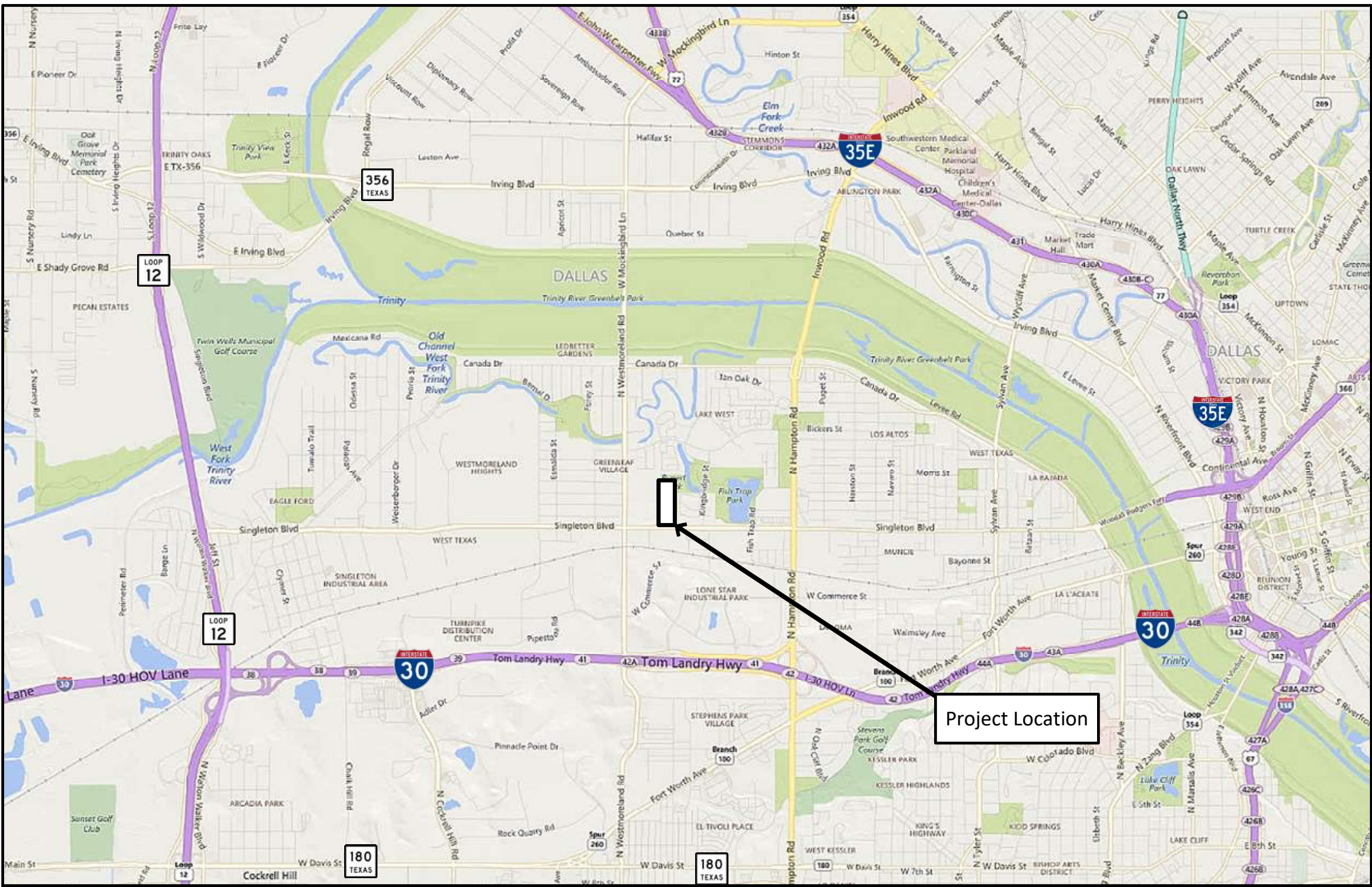
DeShazo Group, Inc











Vicinity Map

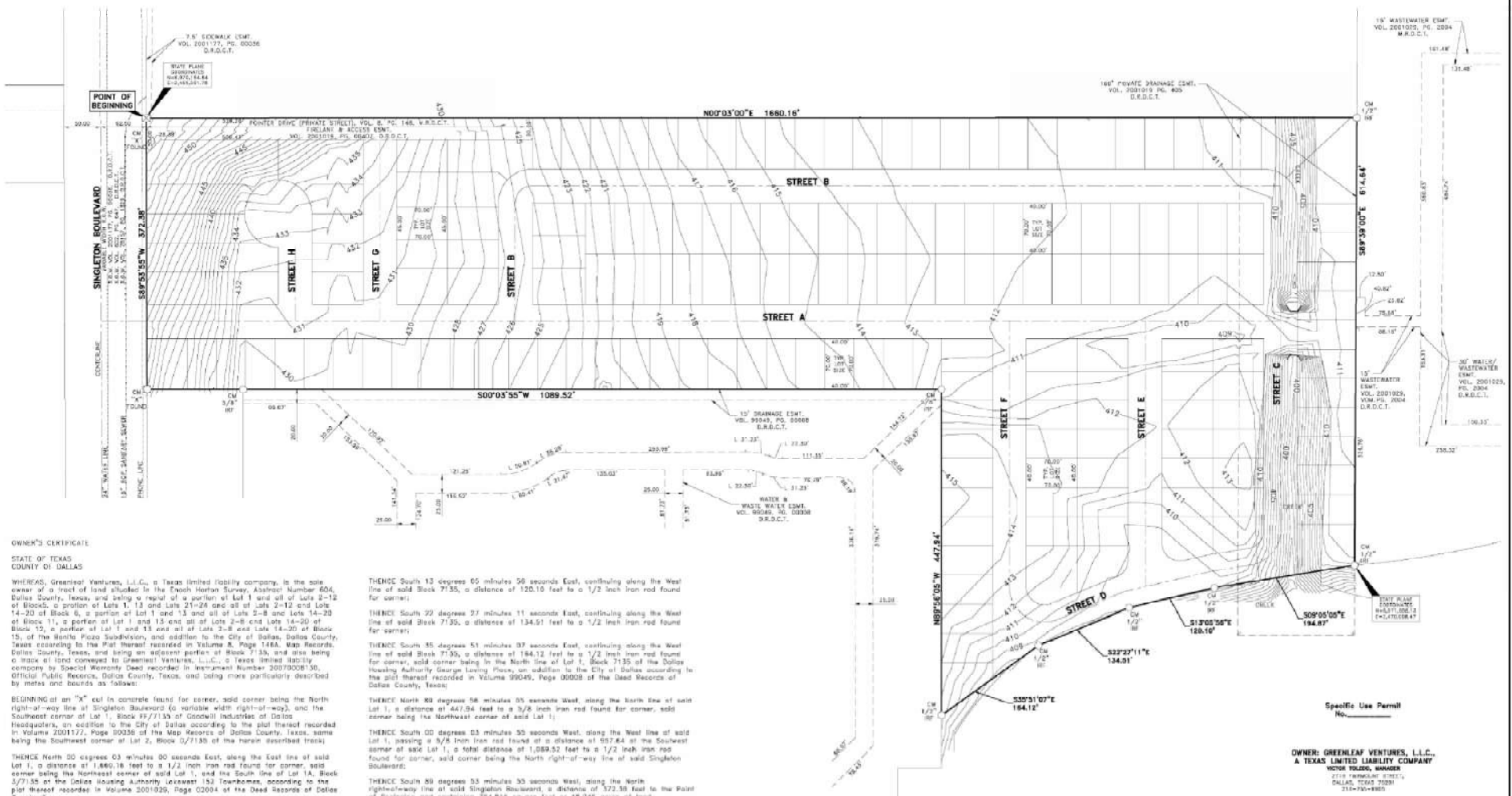
Project No: 17-TX09102-1

Figure 2

Date: 16 March 2017

Villas on Singleton - Dallas - Greenleaf Ventures, LLC





OWNER'S CERTIFICATE

STATE OF TEXAS
COUNTY OF DALLAS

WHEREAS, Greenleaf Ventures, L.L.C., a Texas limited liability company, is the sole owner of a tract of land situated in the Peach Haven Survey, Abstract Number 804, Dallas County, Texas, and being a portion of a portion of Lot 1 and all of Lots 2-12 of Block 4, a portion of Lots 1, 13 and Lots 21-24 and all of Lots 2-12 and Lots 14-20 of Block 6, a portion of Lot 1 and 13 and all of Lots 2-8 and Lots 14-20 of Block 11, a portion of Lot 1 and 13 and all of Lots 2-8 and Lots 14-20 of Block 12, a portion of Lot 1 and 13 and all of Lots 2-8 and Lots 14-20 of Block 15, of the Benthico Pico Subdivision, and section to the City of Dallas, Dallas County, Texas, according to the Plat thereof recorded in Volume 8, Page 148A, Map Records, Dallas County, Texas, and being an adjacent portion of Block 7135, and also being a tract of land conveyed to Greenleaf Ventures, L.L.C., a Texas limited liability company by Special Warranty Deed recorded in Instrument Number 20070008130, Official Public Records, Dallas County, Texas, and being more particularly described by metes and bounds as follows:

BEGINNING at an "X" set in concrete found for corner, said corner being the North right-of-way line of Singleton Boulevard (a variable width right-of-way), and the Southwest corner of Lot 1, Block 777135 of Goodwill Industries of Dallas Headquarters, an addition to the City of Dallas according to the plat thereof recorded in Volume 2001177, Page 00036 of the Map Records of Dallas County, Texas, same being the Southwest corner of Lot 2, Block 377138 of the herein described tract;

THENCE North 30 degrees 03 minutes 00 seconds East, along the East line of said Lot 1, a distance of 1,660.18 feet to a 1/2 inch iron rod found for corner, said corner being the Northeast corner of said Lot 1, and the South line of Lot 1A, Block 377135 of the Dallas Housing Authority (excepted 153 Townhomes, according to the plat thereof recorded in Volume 2001029, Page 02004 of the Deed Records of Dallas County, Texas;

THENCE South 69 degrees 39 minutes 00 seconds East, along the South line of said Lot 1A, a distance of 514.84 feet to a 1/2 inch iron rod found for corner, said corner being the Southeast corner of said Lot 1A, along the West line of Block 7135 of the Dallas Housing Authority, according to the Plat thereof recorded in Volume 43, Page 58 of the Deed Records, Dallas County, Texas;

THENCE South 09 degrees 05 minutes 05 seconds East, continuing along the West line of said Block 7135, a distance of 194.87 feet to a 1/2 inch iron rod found for corner;

THENCE South 13 degrees 05 minutes 56 seconds East, continuing along the West line of said Block 7135, a distance of 120.10 feet to a 1/2 inch iron rod found for corner;

THENCE South 22 degrees 27 minutes 11 seconds East, continuing along the West line of said Block 7135, a distance of 134.91 feet to a 1/2 inch iron rod found for corner;

THENCE South 55 degrees 51 minutes 07 seconds East, continuing along the West line of said Block 7135, a distance of 184.12 feet to a 1/2 inch iron rod found for corner, said corner being in the North line of Lot 1, Block 7135 of the Dallas Housing Authority George Loving Place, on addition to the City of Dallas according to the plat thereof recorded in Volume 99049, Page 00028 of the Deed Records of Dallas County, Texas;

THENCE North 88 degrees 08 minutes 05 seconds West, along the North line of said Lot 1, a distance of 447.94 feet to a 3/8 inch iron rod found for corner, said corner being the Northwest corner of said Lot 1;

THENCE South 00 degrees 03 minutes 30 seconds West, along the West line of said Lot 1, passing a 3/8 inch iron rod found at a distance of 587.84 of the Southwest corner of said Lot 1, a total distance of 1,059.52 feet to a 1/2 inch iron rod found for corner, said corner being the North right-of-way line of said Singleton Boulevard;

THENCE South 89 degrees 03 minutes 30 seconds West, along the North right-of-way line of said Singleton Boulevard, a distance of 372.38 feet to the Point of Beginning and containing 734,818 square feet or 16,248 acres of land.

Specific Use Permit No. _____

OWNER: GREENLEAF VENTURES, L.L.C., A TEXAS LIMITED LIABILITY COMPANY
VICTOR VOLKOV, MANAGER
2118 PINEWIND DRIVE, SUITE 1
DALLAS, TEXAS 75221
310-720-8800

REVISIONS	DATE	BY	NOTES

LEGEND	SYMBOL	DESCRIPTION

C.B.G. Surveying, Inc.
10000 Inland Rd, Suite 230
Dallas, Texas 75228
P 214 349 9485 F 214 349 2216
Fax No. 817 4800
www.cbg-surveying.com

SITE PLAN
VILLAS ON SINGLETON ADDITION
CITY OF DALLAS, DALLAS COUNTY, TEXAS
ENOCH HORTON SURVEY, ABSTRACT NO. 804

Site Plan

Figure 1

Villas on Singleton - Dallas - Greenleaf Ventures, LLC

Project No: 17-TX09102-1

Date: 16 March 2017





Site Trips

Figure 5

Villas on Singleton - Dallas - Greenleaf Ventures, LLC

Project No: 17-TX09102-1

Date: 15 November 2017

TRAFFIC IMPACT
GROUP, LLC

Appendix D. Detailed Intersection Capacity Analysis Results

1: Vilbig Road & Singleton Boulevard
3859-17.399

Existing
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	38	677	43	22	359	28	54	116	251	27	41	40
Future Volume (vph)	38	677	43	22	359	28	54	116	251	27	41	40
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)	41	736	47	24	390	30	59	126	273	29	45	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	783	0	24	420	0	0	458	0	0	117	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	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)	22.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	33.0	33.0		19.0	52.0		28.0	28.0		28.0	28.0	
Total Split (%)	41.3%	41.3%		23.8%	65.0%		35.0%	35.0%		35.0%	35.0%	
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	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	43.1	43.1		47.5	47.5		23.5	23.5		23.5	23.5	
Actuated g/C Ratio	0.54	0.54		0.59	0.59		0.29	0.29		0.29	0.29	
v/c Ratio	0.08	0.41		0.06	0.20		0.85	0.85		0.26	0.26	
Control Delay	11.6	12.6		7.1	7.5		37.6	37.6		16.9	16.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.6	12.6		7.1	7.5		37.6	37.6		16.9	16.9	
LOS	B	B		A	A		D	D		B	B	
Approach Delay		12.6			7.4			37.6			16.9	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	8	96		5	44			173			30	
Queue Length 95th (ft)	30	186		13	65			#340			70	
Internal Link Dist (ft)		223			617			1212			91	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	507	1894		522	2085			541			444	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.41		0.05	0.20			0.85			0.26	

Intersection Summary

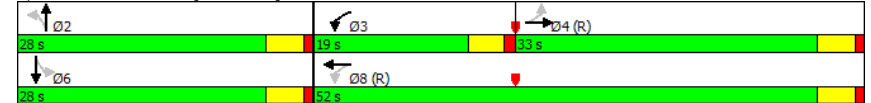
Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85

1: Vilbig Road & Singleton Boulevard
3859-17.399

Existing
Timing Plan: AM

Intersection Signal Delay: 17.8
 Intersection LOS: B
 Intersection Capacity Utilization 63.4%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue
3859-17.399

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	4	0	2	374	59	1
Future Vol, veh/h	4	0	2	374	59	1
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	4	0	2	407	64	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	476	65	65	0	-	0
Stage 1	65	-	-	-	-	-
Stage 2	411	-	-	-	-	-
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	548	999	1537	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	547	999	1537	-	-	-
Mov Cap-2 Maneuver	547	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	668	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1537	-	547	-	-
HCM Lane V/C Ratio	0.001	-	0.008	-	-
HCM Control Delay (s)	7.3	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Existing
Timing Plan: AM

Intersection												
Int Delay, s/veh	14.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Traffic Vol, veh/h	115	97	48	4	114	104	67	227	24	6	56	10
Future Vol, veh/h	115	97	48	4	114	104	67	227	24	6	56	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	125	105	52	4	124	113	73	247	26	7	61	11

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	237	0	0	158	0	0	607	628	132	707	597	180
Stage 1	-	-	-	-	-	-	382	382	-	189	189	-
Stage 2	-	-	-	-	-	-	225	246	-	518	408	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1330	-	-	1422	-	-	408	400	917	350	416	863
Stage 1	-	-	-	-	-	-	640	613	-	813	744	-
Stage 2	-	-	-	-	-	-	778	703	-	541	597	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1330	-	-	1422	-	-	324	357	917	140	372	863
Mov Cap-2 Maneuver	-	-	-	-	-	-	324	357	-	140	372	-
Stage 1	-	-	-	-	-	-	573	549	-	728	742	-
Stage 2	-	-	-	-	-	-	703	701	-	259	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.1	32	18.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	324	379	1330	-	-	1422	-	-	351
HCM Lane V/C Ratio	0.225	0.72	0.094	-	-	0.003	-	-	0.223
HCM Control Delay (s)	19.3	35.4	8	0	-	7.5	0	-	18.2
HCM Lane LOS	C	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.8	5.5	0.3	-	-	0	-	-	0.8

4: Singleton Boulevard & Chihuahua Avenue
3859-17.399

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑	↑↑		↔	
Traffic Vol, veh/h	6	939	374	3	4	5
Future Vol, veh/h	6	939	374	3	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	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	1021	407	3	4	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	410	0	-	0	931 205
Stage 1	-	-	-	-	408 -
Stage 2	-	-	-	-	523 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	1145	-	-	-	*679 802
Stage 1	-	-	-	-	*640 -
Stage 2	-	-	-	-	*679 -
Platoon blocked, %	-	-	-	-	1
Mov Cap-1 Maneuver	1145	-	-	-	*675 802
Mov Cap-2 Maneuver	-	-	-	-	*675 -
Stage 1	-	-	-	-	*640 -
Stage 2	-	-	-	-	*675 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1145	-	-	-	740
HCM Lane V/C Ratio	0.006	-	-	-	0.013
HCM Control Delay (s)	8.2	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

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

1: Vilbig Road & Singleton Boulevard
3859-17.399

Existing
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗	↘	↖ ↗	↖ ↗	↘	↖ ↗	↖ ↗	↘	↖ ↗	↖ ↗	↘
Traffic Volume (vph)	41	539	52	182	685	67	23	30	33	75	105	54
Future Volume (vph)	41	539	52	182	685	67	23	30	33	75	105	54
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)	45	586	57	198	745	73	25	33	36	82	114	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	643	0	198	818	0	0	94	0	0	255	0
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8				2			6	
Permitted Phases	4		8				2			6		
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	30.0	12.0	30.0			18.0	18.0		18.0	18.0	
Total Split (%)	20.0%	50.0%	20.0%	50.0%			30.0%	30.0%		30.0%	30.0%	
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	C-Max	None	C-Max			Max	Max		Max	Max	
Act Effct Green (s)	31.9	25.8	36.0	33.0			13.5	13.5		13.5	13.5	
Actuated g/C Ratio	0.53	0.43	0.60	0.55			0.22	0.22		0.22	0.22	
v/c Ratio	0.10	0.43	0.41	0.42			0.25	0.25		0.25	0.68	
Control Delay	5.1	12.7	7.6	9.7			15.0	15.0		15.0	30.7	
Queue Delay	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0	
Total Delay	5.1	12.7	7.6	9.7			15.0	15.0		15.0	30.7	
LOS	A	B	A	A			B	B		B	C	
Approach Delay		12.2		9.3			15.0	15.0		15.0	30.7	
Approach LOS		B		A			B	B		B	C	
Queue Length 50th (ft)	5	78	26	62			17	17		17	77	
Queue Length 95th (ft)	14	116	48	152			50	50		50	#169	
Internal Link Dist (ft)		223		617			1212	1212		1212	91	
Turn Bay Length (ft)	150		150									
Base Capacity (vph)	492	1512	487	1932			381	381		381	374	
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	0.09	0.43	0.41	0.42			0.25	0.25		0.25	0.68	

Intersection Summary

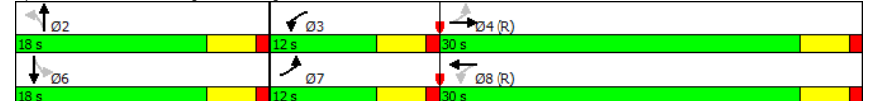
Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68

1: Vilbig Road & Singleton Boulevard
3859-17.399

Existing
Timing Plan: PM

Intersection Signal Delay: 13.2
 Intersection LOS: B
 Intersection Capacity Utilization 56.4%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue
3859-17.399

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↗	↗	
Traffic Vol, veh/h	5	3	2	54	320	6
Future Vol, veh/h	5	3	2	54	320	6
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	5	3	2	59	348	7

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	414	351	354	0	0
Stage 1	351	-	-	-	-
Stage 2	63	-	-	-	-
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	595	692	1205	-	-
Stage 1	713	-	-	-	-
Stage 2	960	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	594	692	1205	-	-
Mov Cap-2 Maneuver	594	-	-	-	-
Stage 1	713	-	-	-	-
Stage 2	958	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1205	-	627	-	-
HCM Lane V/C Ratio	0.002	-	0.014	-	-
HCM Control Delay (s)	8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Existing
Timing Plan: PM

Intersection												
Int Delay, s/veh	12.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↖	↗			↖	↗
Traffic Vol, veh/h	7	132	61	33	60	7	13	32	13	13	302	33
Future Vol, veh/h	7	132	61	33	60	7	13	32	13	13	302	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	143	66	36	65	8	14	35	14	14	328	36

Major/Minor	Major1	Major2	Minor1	Minor2	
Conflicting Flow All	73	0	0	210	0
Stage 1	-	-	-	-	192
Stage 2	-	-	-	-	323
Critical Hdwy	4.12	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	6.12
Critical Hdwy Stg 2	-	-	-	-	6.12
Follow-up Hdwy	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	1527	-	-	1361	-
Stage 1	-	-	-	-	810
Stage 2	-	-	-	-	689
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1527	-	-	1361	-
Mov Cap-2 Maneuver	-	-	-	-	229
Stage 1	-	-	-	-	805
Stage 2	-	-	-	-	366

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.5	13.6	23.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	229	627	1527	-	-	1361	-	-	568
HCM Lane V/C Ratio	0.062	0.078	0.005	-	-	0.026	-	-	0.666
HCM Control Delay (s)	21.8	11.2	7.4	0	-	7.7	0	-	23.1
HCM Lane LOS	C	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0.3	0	-	-	0.1	-	-	4.9

4: Singleton Boulevard & Chihuahua Avenue
3859-17.399

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Vol, veh/h	14	631	871	7	2	11
Future Vol, veh/h	14	631	871	7	2	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	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	15	686	947	8	2	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	954	0	-	0	1324 477
Stage 1	-	-	-	-	951 -
Stage 2	-	-	-	-	373 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	716	-	-	-	*225 534
Stage 1	-	-	-	-	*336 -
Stage 2	-	-	-	-	*811 -
Platoon blocked, %	-	-	-	-	1
Mov Cap-1 Maneuver	716	-	-	-	*220 534
Mov Cap-2 Maneuver	-	-	-	-	*289 -
Stage 1	-	-	-	-	*336 -
Stage 2	-	-	-	-	*794 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	716	-	-	-	472
HCM Lane V/C Ratio	0.021	-	-	-	0.03
HCM Control Delay (s)	10.1	-	-	-	12.9
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

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

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	40	777	49	94	528	47	75	122	282	32	43	42
Future Volume (vph)	40	777	49	94	528	47	75	122	282	32	43	42
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)	43	845	53	102	574	51	82	133	307	35	47	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	898	0	102	625	0	0	522	0	0	128	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	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)	22.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	33.0	33.0		19.0	52.0		28.0	28.0		28.0	28.0	
Total Split (%)	41.3%	41.3%		23.8%	65.0%		35.0%	35.0%		35.0%	35.0%	
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	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	37.6	37.6		47.5	47.5		23.5	23.5		23.5	23.5	
Actuated g/C Ratio	0.47	0.47		0.59	0.59		0.29	0.29		0.29	0.29	
v/c Ratio	0.12	0.54		0.29	0.30		0.98	0.98		0.32	0.32	
Control Delay	14.9	17.4		9.3	8.2		59.8	59.8		18.3	18.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.9	17.4		9.3	8.2		59.8	59.8		18.3	18.3	
LOS	B	B		A	A		E	E		B	B	
Approach Delay		17.3			8.4		59.8	59.8		18.3	18.3	
Approach LOS		B			A		E	E		B	B	
Queue Length 50th (ft)	12	167		20	71		219	219		35	35	
Queue Length 95th (ft)	34	235		40	98		#423	#423		80	80	
Internal Link Dist (ft)		223			617		1212	1212		91	91	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	362	1652		473	2084		533	533		405	405	
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	0.12	0.54		0.22	0.30		0.98	0.98		0.32	0.32	

Intersection Summary

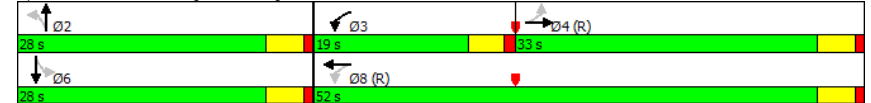
Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background
Timing Plan: AM

Intersection Signal Delay: 24.1
 Intersection LOS: C
 Intersection Capacity Utilization 71.6%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue/Site Driveway 1
3859-17.399

Background
Timing Plan: AM

Intersection													
Int Delay, s/veh	0.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	4	0	0	0	0	18	2	393	0	4	62	1	
Future Vol, veh/h	4	0	0	0	0	18	2	393	0	4	62	1	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	4	0	0	0	0	20	2	427	0	4	67	1	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	518	509	68	509	509	427	68	0	0	427	0	0	
Stage 1	77	77	-	432	432	-	-	-	-	-	-	-	
Stage 2	441	432	-	77	77	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	468	467	995	475	467	628	1533	-	-	1132	-	-	
Stage 1	932	831	-	602	582	-	-	-	-	-	-	-	
Stage 2	595	582	-	932	831	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	451	464	995	473	464	628	1533	-	-	1132	-	-	
Mov Cap-2 Maneuver	451	464	-	473	464	-	-	-	-	-	-	-	
Stage 1	930	828	-	601	581	-	-	-	-	-	-	-	
Stage 2	575	581	-	928	828	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	10.9	0	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1533	-	-	451	628	1132	-	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.031	0.004	-	-
HCM Control Delay (s)	7.4	0	-	13.1	10.9	8.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Background
Timing Plan: AM

Intersection													
Int Delay, s/veh	17.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	121	102	50	4	120	109	70	239	25	6	59	11	
Future Vol, veh/h	121	102	50	4	120	109	70	239	25	6	59	11	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	132	111	54	4	130	118	76	260	27	7	64	12	

Major/Minor	Major1	Major2	Minor1	Minor2									
Conflicting Flow All	249	0	0	165	0	0	637	659	138	743	626	190	
Stage 1	-	-	-	-	-	-	401	401	-	198	198	-	
Stage 2	-	-	-	-	-	-	236	258	-	545	428	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1317	-	-	1413	-	-	390	384	910	331	401	852	
Stage 1	-	-	-	-	-	-	626	601	-	804	737	-	
Stage 2	-	-	-	-	-	-	767	694	-	523	585	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1317	-	-	1413	-	-	303	340	910	111	355	852	
Mov Cap-2 Maneuver	-	-	-	-	-	-	303	340	-	111	355	-	
Stage 1	-	-	-	-	-	-	557	534	-	715	735	-	
Stage 2	-	-	-	-	-	-	688	692	-	232	520	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.6	0.1	39.4	19.8
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	303	361	1317	-	-	1413	-	-	326
HCM Lane V/C Ratio	0.251	0.795	0.1	-	-	0.003	-	-	0.253
HCM Control Delay (s)	20.8	44.3	8	0	-	7.6	0	-	19.8
HCM Lane LOS	C	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1	6.7	0.3	-	-	0	-	-	1

4: Site Driveway 2/Chihuahua Avenue & Singleton Boulevard
3859-17.399

Background
Timing Plan: AM

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↔			↔	
Traffic Vol, veh/h	6	1073	0	0	633	3	0	0	0	4	0	5
Future Vol, veh/h	6	1073	0	0	633	3	0	0	0	4	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1166	0	0	688	3	0	0	0	4	0	5

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	691	0	0	1166
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	900	-	-	*960
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	1
Mov Cap-1 Maneuver	900	-	-	*960
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	11.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	900	-	-	*960	-	-	578
HCM Lane V/C Ratio	-	0.007	-	-	-	-	-	0.017
HCM Control Delay (s)	0	9	-	-	0	-	-	11.3
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

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

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background
Timing Plan: PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	43	726	69	226	823	79	36	32	101	95	110	57
Future Volume (vph)	43	726	69	226	823	79	36	32	101	95	110	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)	47	789	75	246	895	86	39	35	110	103	120	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	864	0	246	981	0	0	184	0	0	285	0
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8			2	2			6	6
Permitted Phases	4		8				2				6	
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	30.0	12.0	30.0			18.0	18.0			18.0	18.0
Total Split (%)	20.0%	50.0%	20.0%	50.0%			30.0%	30.0%			30.0%	30.0%
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			Yes	Yes			Yes	Yes
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes			Yes	Yes
Recall Mode	None	C-Max	None	C-Max			Max	Max			Max	Max
Act Effct Green (s)	31.8	25.7	35.4	30.9			13.5	13.5			13.5	13.5
Actuated g/C Ratio	0.53	0.43	0.59	0.52			0.22	0.22			0.22	0.22
v/c Ratio	0.13	0.57	0.62	0.54			0.44	0.44			0.85	0.85
Control Delay	5.4	14.6	13.9	12.2			12.8	12.8			46.3	46.3
Queue Delay	0.0	0.0	0.0	0.0			0.0	0.0			0.0	0.0
Total Delay	5.4	14.6	13.9	12.2			12.8	12.8			46.3	46.3
LOS	A	B	B	B			B	B			D	D
Approach Delay		14.1		12.5			12.8	12.8			46.3	46.3
Approach LOS		B		B			B	B			D	D
Queue Length 50th (ft)	6	116	33	131			22	22			91	91
Queue Length 95th (ft)	15	166	#82	193			70	70			#215	#215
Internal Link Dist (ft)		223		617			1212	1212			91	91
Turn Bay Length (ft)	150		150									
Base Capacity (vph)	413	1505	402	1809			420	420			337	337
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	0.11	0.57	0.61	0.54			0.44	0.44			0.85	0.85

Intersection Summary

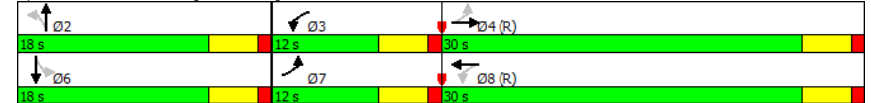
Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background
Timing Plan: PM

Intersection Signal Delay: 16.8
 Intersection LOS: B
 Intersection Capacity Utilization 70.6%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue/Site Driveway 1
3859-17.399

Background
Timing Plan: PM

Intersection													
Int Delay, s/veh	0.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕	↕		↕	↕		↕		↕	↕	↕	
Traffic Vol, veh/h	5	0	3	0	0	12	2	57	0	14	336	6	
Future Vol, veh/h	5	0	3	0	0	12	2	57	0	14	336	6	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	5	0	3	0	0	13	2	62	0	15	365	7	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	472	465	368	467	468	62	372	0	0	62	0	0	
Stage 1	399	399	-	66	66	-	-	-	-	-	-	-	
Stage 2	73	66	-	401	402	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	502	495	677	506	493	1003	1186	-	-	1541	-	-	
Stage 1	627	602	-	945	840	-	-	-	-	-	-	-	
Stage 2	937	840	-	626	600	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	490	488	677	498	486	1003	1186	-	-	1541	-	-	
Mov Cap-2 Maneuver	490	488	-	498	486	-	-	-	-	-	-	-	
Stage 1	626	595	-	943	838	-	-	-	-	-	-	-	
Stage 2	923	838	-	616	593	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	8.6	0.3	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1186	-	-	547	1003	1541	-	-
HCM Lane V/C Ratio	0.002	-	-	0.016	0.013	0.01	-	-
HCM Control Delay (s)	8	0	-	11.7	8.6	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Background
Timing Plan: PM

Intersection													
Int Delay, s/veh	14.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕	↕		↕	↕		↕		↕	↕	↕	
Traffic Vol, veh/h	7	139	64	35	63	7	14	34	14	14	317	35	
Future Vol, veh/h	7	139	64	35	63	7	14	34	14	14	317	35	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	8	151	70	38	68	8	15	37	15	15	345	38	

Major/Minor	Major1	Major2	Minor1	Minor2									
Conflicting Flow All	76	0	0	221	0	0	541	353	186	375	384	72	
Stage 1	-	-	-	-	-	-	201	201	-	148	148	-	
Stage 2	-	-	-	-	-	-	340	152	-	227	236	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1523	-	-	1348	-	-	452	572	856	582	550	990	
Stage 1	-	-	-	-	-	-	801	735	-	855	775	-	
Stage 2	-	-	-	-	-	-	675	772	-	776	710	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1523	-	-	1348	-	-	203	552	856	528	531	990	
Mov Cap-2 Maneuver	-	-	-	-	-	-	203	552	-	528	531	-	
Stage 1	-	-	-	-	-	-	796	731	-	850	753	-	
Stage 2	-	-	-	-	-	-	342	750	-	719	706	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.6	14.3	26.1
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	203	616	1523	-	-	1348	-	-	556
HCM Lane V/C Ratio	0.075	0.085	0.005	-	-	0.028	-	-	0.716
HCM Control Delay (s)	24.2	11.4	7.4	0	-	7.7	0	-	26.1
HCM Lane LOS	C	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.2	0.3	0	-	-	0.1	-	-	5.8

4: Site Driveway 2/Chihuahua Avenue & Singleton Boulevard
3859-17.399

Background
Timing Plan: PM

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↔			↔	
Traffic Vol, veh/h	14	905	0	0	1063	7	0	0	0	2	0	11
Future Vol, veh/h	14	905	0	0	1063	7	0	0	0	2	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	984	0	0	1155	8	0	0	0	2	0	12

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	1163	0	0	984
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	596	-	-	*1052
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	1
Mov Cap-1 Maneuver	596	-	-	*1052
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	0	16.4
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	596	-	-	*1052	-	-	331
HCM Lane V/C Ratio	-	0.026	-	-	-	-	-	0.043
HCM Control Delay (s)	0	11.2	-	-	0	-	-	16.4
HCM Lane LOS		A	B	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1

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

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background Plus Site Generated
Timing Plan: AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	40	797	59	94	589	47	106	137	282	32	48	42
Future Volume (vph)	40	797	59	94	589	47	106	137	282	32	48	42
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)	43	866	64	102	640	51	115	149	307	35	52	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	930	0	102	691	0	0	571	0	0	133	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	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)	22.5	22.5		9.5	22.5		22.5	22.5		28.0	22.5	
Total Split (s)	33.0	33.0		19.0	52.0		28.0	28.0		28.0	28.0	
Total Split (%)	41.3%	41.3%		23.8%	65.0%		35.0%	35.0%		35.0%	35.0%	
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	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	37.6	37.6		47.5	47.5		23.5	23.5		23.5	23.5	
Actuated g/C Ratio	0.47	0.47		0.59	0.59		0.29	0.29		0.29	0.29	
v/c Ratio	0.13	0.56		0.30	0.33		1.12	1.12		0.33	0.33	
Control Delay	15.1	17.7		9.4	8.5		104.0	104.0		19.0	19.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.1	17.7		9.4	8.5		104.0	104.0		19.0	19.0	
LOS	B	B		A	A		F	F		B	B	
Approach Delay		17.6			8.6			104.0			19.0	
Approach LOS		B			A			F			B	
Queue Length 50th (ft)	12	175		20	81		-306	-306		38	38	
Queue Length 95th (ft)	34	246		40	111		#503	#503		84	84	
Internal Link Dist (ft)		223			617			1212			91	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	340	1651		464	2085		509	509		403	403	
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	0.13	0.56		0.22	0.33		1.12	1.12		0.33	0.33	

Intersection Summary

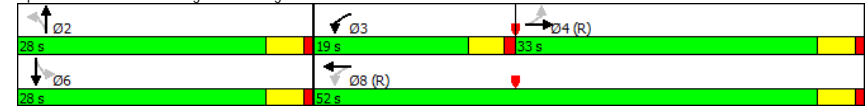
Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background Plus Site Generated
Timing Plan: AM

Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 77.4%
 ICU Level of Service D
 Analysis Period (min) 15
 - Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue/Site Driveway 1
3859-17.399

Background Plus Site Generated
Timing Plan: AM

Intersection													
Int Delay, s/veh	2.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Vol, veh/h	4	0	0	46	0	64	2	393	15	19	62	1	
Future Vol, veh/h	4	0	0	46	0	64	2	393	15	19	62	1	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	-
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	50	0	70	2	427	16	21	67	1	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	583	557	68	549	550	435	68	0	0	443	0	0	
Stage 1	109	109	-	440	440	-	-	-	-	-	-	-	
Stage 2	474	448	-	109	110	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	424	439	995	446	443	621	1533	-	-	1117	-	-	
Stage 1	896	805	-	596	578	-	-	-	-	-	-	-	
Stage 2	571	573	-	896	804	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	370	429	995	439	433	621	1533	-	-	1117	-	-	
Mov Cap-2 Maneuver	370	429	-	439	433	-	-	-	-	-	-	-	
Stage 1	894	789	-	595	577	-	-	-	-	-	-	-	
Stage 2	506	572	-	878	788	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	13.8	0	1.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1533	-	-	370	529	1117	-	-
HCM Lane V/C Ratio	0.001	-	-	0.012	0.226	0.018	-	-
HCM Control Delay (s)	7.4	0	-	14.8	13.8	8.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.9	0.1	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Background Plus Site Generated
Timing Plan: AM

Intersection													
Int Delay, s/veh	20.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Vol, veh/h	126	102	50	4	120	114	70	244	25	22	74	26	
Future Vol, veh/h	126	102	50	4	120	114	70	244	25	22	74	26	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	-
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	137	111	54	4	130	124	76	265	27	24	80	28	

Major/Minor	Major1	Major2	Minor1	Minor2									
Conflicting Flow All	254	0	0	165	0	0	667	675	138	759	640	192	
Stage 1	-	-	-	-	-	-	412	412	-	201	201	-	
Stage 2	-	-	-	-	-	-	255	263	-	558	439	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1311	-	-	1413	-	-	372	376	910	323	393	850	
Stage 1	-	-	-	-	-	-	617	594	-	801	735	-	
Stage 2	-	-	-	-	-	-	749	691	-	514	578	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1311	-	-	1413	-	-	269	331	910	97	346	850	
Mov Cap-2 Maneuver	-	-	-	-	-	-	269	331	-	97	346	-	
Stage 1	-	-	-	-	-	-	545	525	-	708	733	-	
Stage 2	-	-	-	-	-	-	643	689	-	218	511	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.7	0.1	44.4	32.6
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	269	352	1311	-	-	1413	-	-	259
HCM Lane V/C Ratio	0.283	0.831	0.104	-	-	0.003	-	-	0.512
HCM Control Delay (s)	23.6	49.8	8.1	0	-	7.6	0	-	32.6
HCM Lane LOS	C	E	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1.1	7.4	0.3	-	-	0	-	-	2.7

4: Site Driveway 2/Chihuahua Avenue & Singleton Boulevard Background Plus Site Generated
3859-17.399
Timing Plan: AM

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	6	1083	10	25	663	3	31	0	76	4	0	5
Future Vol, veh/h	6	1083	10	25	663	3	31	0	76	4	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1177	11	27	721	3	34	0	83	4	0	5

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	724	0	0	1188
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	874	-	-	*960
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	874	-	-	*960
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	18.1	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	391	874	-	-	*960	-	-	454
HCM Lane V/C Ratio	0.297	0.007	-	-	0.028	-	-	0.022
HCM Control Delay (s)	18.1	9.2	-	-	8.9	-	-	13.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.2	0	-	-	0.1	-	-	0.1

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

5: Site Driveway 3 & Singleton Boulevard Background Plus Site Generated
3859-17.399
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	1150	14	25	655	37	76
Future Vol, veh/h	1150	14	25	655	37	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	1250	15	27	712	40	83

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1265
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	*902
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	*902
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	14.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	503	-	-	*902	-
HCM Lane V/C Ratio	0.244	-	-	0.03	-
HCM Control Delay (s)	14.5	-	-	9.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.1	-

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

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background Plus Site Generated
Timing Plan: PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	43	786	99	226	860	79	55	41	101	95	125	57
Future Volume (vph)	43	786	99	226	860	79	55	41	101	95	125	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)	47	854	108	246	935	86	60	45	110	103	136	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	962	0	246	1021	0	0	215	0	0	301	0
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8			2		2		6	
Permitted Phases	4		8				2				6	
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	30.0	12.0	30.0			18.0	18.0			18.0	18.0
Total Split (%)	20.0%	50.0%	20.0%	50.0%			30.0%	30.0%			30.0%	30.0%
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	C-Max	None	C-Max			Max	Max			Max	Max
Act Effct Green (s)	31.8	25.6	35.4	30.9			13.5				13.5	
Actuated g/C Ratio	0.53	0.43	0.59	0.52			0.22				0.22	
v/c Ratio	0.13	0.64	0.67	0.56			0.58				0.92	
Control Delay	5.5	15.6	19.0	12.5			20.2				58.2	
Queue Delay	0.0	0.0	0.0	0.0			0.0				0.0	
Total Delay	5.5	15.6	19.0	12.5			20.2				58.2	
LOS	A	B	B	B			C				E	
Approach Delay		15.1		13.8			20.2				58.2	
Approach LOS		B		B			C				E	
Queue Length 50th (ft)	6	133	33	139			42				100	
Queue Length 95th (ft)	15	191	#117	204			103				#235	
Internal Link Dist (ft)		223		617			1212				91	
Turn Bay Length (ft)	150		150									
Base Capacity (vph)	399	1501	368	1808			369				328	
Starvation Cap Reductn	0	0	0	0			0				0	
Spillback Cap Reductn	0	0	0	0			0				0	
Storage Cap Reductn	0	0	0	0			0				0	
Reduced v/c Ratio	0.12	0.64	0.67	0.56			0.58				0.92	

Intersection Summary

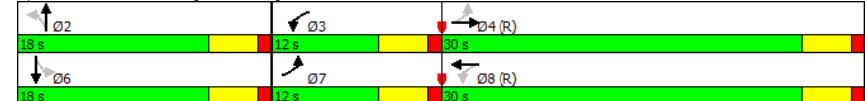
Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92

1: Vilbig Road & Singleton Boulevard
3859-17.399

Background Plus Site Generated
Timing Plan: PM

Intersection Signal Delay: 19.5
 Intersection LOS: B
 Intersection Capacity Utilization 70.7%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



2: Vilbig Road & Muncie Avenue/Site Driveway 1
3859-17.399

Background Plus Site Generated
Timing Plan: PM

Intersection													
Int Delay, s/veh	2.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	5	0	3	28	0	40	2	57	45	59	336	6	
Future Vol, veh/h	5	0	3	28	0	40	2	57	45	59	336	6	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	5	0	3	30	0	43	2	62	49	64	365	7	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	610	612	368	589	591	86	372	0	0	111	0	0	
Stage 1	497	497	-	91	91	-	-	-	-	-	-	-	
Stage 2	113	115	-	498	500	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	407	408	677	420	420	973	1186	-	-	1479	-	-	
Stage 1	555	545	-	916	820	-	-	-	-	-	-	-	
Stage 2	892	800	-	554	543	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	372	385	677	400	396	973	1186	-	-	1479	-	-	
Mov Cap-2 Maneuver	372	385	-	400	396	-	-	-	-	-	-	-	
Stage 1	554	515	-	914	818	-	-	-	-	-	-	-	
Stage 2	850	798	-	521	513	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	11.7	0.2	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1186	-	-	448	612	1479	-	-
HCM Lane V/C Ratio	0.002	-	-	0.019	0.121	0.043	-	-
HCM Control Delay (s)	8	0	-	13.2	11.7	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-	-

3: Vilbig Road & W Commerce Street
3859-17.399

Background Plus Site Generated
Timing Plan: PM

Intersection													
Int Delay, s/veh	19.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	22	139	64	35	63	22	14	49	14	23	327	44	
Future Vol, veh/h	22	139	64	35	63	22	14	49	14	23	327	44	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	24	151	70	38	68	24	15	53	15	25	355	48	

Major/Minor	Major1	Major2	Minor1	Minor2									
Conflicting Flow All	92	0	0	221	0	0	592	402	186	425	425	80	
Stage 1	-	-	-	-	-	-	234	234	-	157	157	-	
Stage 2	-	-	-	-	-	-	358	168	-	268	268	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1503	-	-	1348	-	-	418	537	856	540	521	980	
Stage 1	-	-	-	-	-	-	769	711	-	845	768	-	
Stage 2	-	-	-	-	-	-	660	759	-	738	687	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1503	-	-	1348	-	-	161	512	856	471	496	980	
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	512	-	471	496	-	
Stage 1	-	-	-	-	-	-	755	698	-	830	745	-	
Stage 2	-	-	-	-	-	-	318	736	-	658	675	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2.3	15.5	35.9
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	161	562	1503	-	-	1348	-	-	523
HCM Lane V/C Ratio	0.095	0.122	0.016	-	-	0.028	-	-	0.819
HCM Control Delay (s)	29.7	12.3	7.4	0	-	7.7	0	-	35.9
HCM Lane LOS	D	B	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.3	0.4	0	-	-	0.1	-	-	8.1

4: Site Driveway 2/Chihuahua Avenue & Singleton Boulevard Background Plus Site Generated
3859-17.399
Timing Plan: PM

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕	↕	↕	↕	↕		↕		↕	↕	↕
Traffic Vol, veh/h	14	935	30	75	1081	7	19	0	47	2	0	11
Future Vol, veh/h	14	935	30	75	1081	7	19	0	47	2	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1016	33	82	1175	8	21	0	51	2	0	12

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	1183	0	0	1049
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	586	-	-	*1052
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	1
Mov Cap-1 Maneuver	586	-	-	*1052
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.6	27.7	20.7
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	229	586	-	-	*1052	-	-	243
HCM Lane V/C Ratio	0.313	0.026	-	-	0.077	-	-	0.058
HCM Control Delay (s)	27.7	11.3	-	-	8.7	-	-	20.7
HCM Lane LOS	D	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.3	-	-	0.2

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

5: Site Driveway 3 & Singleton Boulevard Background Plus Site Generated
3859-17.399
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	940	44	75	1141	23	47
Future Vol, veh/h	940	44	75	1141	23	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	1022	48	82	1240	25	51

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1070
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	1029
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	1
Mov Cap-1 Maneuver	-	-	1029
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	14.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	455	-	-	1029	-
HCM Lane V/C Ratio	0.167	-	-	0.079	-
HCM Control Delay (s)	14.5	-	-	8.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-

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

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	126	102	50	4	120	114	70	244	25	22	74	26
Future Vol, veh/h	126	102	50	4	120	114	70	244	25	22	74	26
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	137	111	54	4	130	124	76	265	27	24	80	28
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	14.6	12.8	14.6	11.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	45%	2%	18%
Vol Thru, %	0%	91%	37%	50%	61%
Vol Right, %	0%	9%	18%	48%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	269	278	238	122
LT Vol	70	0	126	4	22
Through Vol	0	244	102	120	74
RT Vol	0	25	50	114	26
Lane Flow Rate	76	292	302	259	133
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.146	0.513	0.493	0.41	0.233
Departure Headway (Hd)	6.893	6.318	5.874	5.709	6.314
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	517	567	607	626	564
Service Time	4.671	4.096	3.958	3.796	4.414
HCM Lane V/C Ratio	0.147	0.515	0.498	0.414	0.236
HCM Control Delay	10.9	15.6	14.6	12.8	11.4
HCM Lane LOS	B	C	B	B	B
HCM 95th-tile Q	0.5	2.9	2.7	2	0.9

3: Vilbig Road & W Commerce Street
3859-17.399

Background Plus Site Generated
Timing Plan: PM

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	22	139	64	35	63	22	14	49	14	23	327	44
Future Vol, veh/h	22	139	64	35	63	22	14	49	14	23	327	44
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	151	70	38	68	24	15	53	15	25	355	48
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11.6	10.2	9.5	16.3
HCM LOS	B	B	A	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	29%	6%
Vol Thru, %	0%	78%	62%	53%	83%
Vol Right, %	0%	22%	28%	18%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	63	225	120	394
LT Vol	14	0	22	35	23
Through Vol	0	49	139	63	327
RT Vol	0	14	64	22	44
Lane Flow Rate	15	68	245	130	428
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.028	0.114	0.367	0.207	0.617
Departure Headway (Hd)	6.675	6.009	5.409	5.706	5.187
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	536	596	665	627	698
Service Time	4.423	3.756	3.449	3.752	3.219
HCM Lane V/C Ratio	0.028	0.114	0.368	0.207	0.613
HCM Control Delay	9.6	9.5	11.6	10.2	16.3
HCM Lane LOS	A	A	B	B	C
HCM 95th-tile Q	0.1	0.4	1.7	0.8	4.3

1: Vilbig Road & Singleton Boulevard
3859-17.399

Horizon
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	42	833	62	95	608	49	109	143	295	34	50	44
Future Volume (vph)	42	833	62	95	608	49	109	143	295	34	50	44
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)	46	905	67	103	661	53	118	155	321	37	54	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	972	0	103	714	0	0	594	0	0	139	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	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)	22.5	22.5		9.5	22.5		22.5	22.5		28.0	22.5	
Total Split (s)	33.0	33.0		19.0	52.0		28.0	28.0		28.0	28.0	
Total Split (%)	41.3%	41.3%		23.8%	65.0%		35.0%	35.0%		35.0%	35.0%	
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	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)	37.5	37.5		47.5	47.5		23.5	23.5		23.5	23.5	
Actuated g/C Ratio	0.47	0.47		0.59	0.59		0.29	0.29		0.29	0.29	
v/c Ratio	0.14	0.59		0.32	0.34		1.17	1.17		0.35	0.35	
Control Delay	15.4	18.2		9.7	8.6		121.6	121.6		19.7	19.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.4	18.2		9.7	8.6		121.6	121.6		19.7	19.7	
LOS	B	B		A	A		F	F		B	B	
Approach Delay		18.0			8.7		121.6	121.6		19.7	19.7	
Approach LOS		B			A		F	F		B	B	
Queue Length 50th (ft)	13	186		20	84		-332	-332		40	40	
Queue Length 95th (ft)	36	261		40	115		#530	#530		89	89	
Internal Link Dist (ft)		223			617		1212	1212		91	91	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	332	1650		452	2085		508	508		392	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	0.14	0.59		0.23	0.34		1.17	1.17		0.35	0.35	

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17

1: Vilbig Road & Singleton Boulevard
3859-17.399

Horizon
Timing Plan: AM

Intersection Signal Delay: 39.1
 Intersection Capacity Utilization 79.8%
 Intersection LOS: D
 ICU Level of Service D

Analysis Period (min) 15

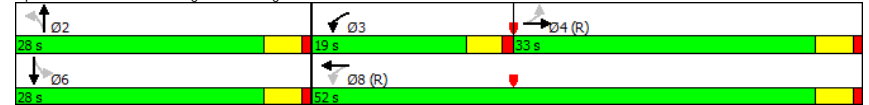
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard



1: Vilbig Road & Singleton Boulevard
3859-17.399

Horizon
Timing Plan: PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗		↖ ↗	↖ ↗			↕			↕	
Traffic Volume (vph)	45	815	101	236	897	83	56	42	102	99	131	60
Future Volume (vph)	45	815	101	236	897	83	56	42	102	99	131	60
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)	49	886	110	257	975	90	61	46	111	108	142	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	996	0	257	1065	0	0	218	0	0	315	0
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2				6	
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	30.0		12.0	30.0		18.0	18.0			18.0	18.0
Total Split (%)	20.0%	50.0%		20.0%	50.0%		30.0%	30.0%			30.0%	30.0%
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
Total Lost Time (s)	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	C-Max		None	C-Max		Max	Max			Max	Max
Act Effct Green (s)	31.7	25.5		35.4	30.9			13.5			13.5	
Actuated g/C Ratio	0.53	0.42		0.59	0.52			0.22			0.22	
v/c Ratio	0.14	0.67		0.72	0.59			0.60			0.96	
Control Delay	5.6	16.1		23.4	12.9			21.0			67.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.6	16.1		23.4	12.9			21.0			67.7	
LOS	A	B		C	B			C			E	
Approach Delay		15.6			14.9			21.0			67.7	
Approach LOS		B			B			C			E	
Queue Length 50th (ft)	6	140		35	148			43			106	
Queue Length 95th (ft)	15	200		#138	217			#106			#250	
Internal Link Dist (ft)		223			617			1212			91	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	385	1496		356	1806			364			327	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.13	0.67		0.72	0.59			0.60			0.96	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96

1: Vilbig Road & Singleton Boulevard
3859-17.399

Horizon
Timing Plan: PM

Intersection Signal Delay: 21.4
 Intersection LOS: C
 Intersection Capacity Utilization 73.1%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Vilbig Road & Singleton Boulevard

