

November 14, 2017

PK# 2672-17.432

TRAFFIC IMPACT ANALYSIS

Project:

Ross-Washington Multifamily

In Dallas, Texas

Prepared for:

City of Dallas

On behalf of:

Leon Capital Group

Prepared by:

Steve E. Stoner

Steve E. Stoner, P.E., PTOE



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TX. REG: ENGINEERING FIRM F-14439

TX. REG. SURVEYING FIRM LS-10193805-00

EXECUTIVE SUMMARY

The services of **Pacheco Koch** were retained by Baldwin Associates, on behalf of **Leon Capital Group**, to prepare a Traffic Impact Analysis (TIA) for the proposed multifamily development located at 3700 Ross Avenue in Dallas, Texas. Buildout of the Project is estimated to occur by 2018. A TIA is required for review by the City of Dallas as part of the Owner's request to create a new PD Subdistrict for 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: Adjacent to the subject site, both Ross Avenue and N. Washington Avenue accommodate traffic volumes much higher than the respective, theoretical roadway link capacities. Both San Jacinto and Villars streets operate carry extremely low volumes of traffic and operate under capacity.

FINDING: The traffic-signalized intersection of Ross Avenue and N. Washington Avenue currently operates efficiently with a good Level of Service during peak periods.

FINDING: Left-turn maneuvers at the STOP-sign-controlled (i.e., unsignalized) intersections of Ross Avenue and Villars Street and N. Washington Avenue and San Jacinto Street currently operate reasonably well due to the very low traffic volumes on the minor street. With the addition of site-related traffic, the turning volume to/from the minor street will increase appreciably and the Level of Service for those maneuvers will degrade. However, neither intersection is a candidate for traffic signalization due to insufficient traffic volumes and proximity to the existing traffic signal. Also, due to the regular street grid, motorists also have other route options to avoid locations with unacceptable delay. Restriping the roadways to provide dedicated left-turn lanes is another option to consider, although this measure does not necessarily improve Levels of Service and are therefore not recommended.

- ❖ **RECOMMENDATION:** Adjustments to the existing on-street parking along San Jacinto Street will be required to accommodate visibility triangles in accordance with City standards.

END

Hinga Mbogo
Doc. No. 201600113033
OPDCT

Dallas ISD
Vol. 84216, Pg. 1285 DRDCT



TABULATION:
+/- 365 UNITS (5 STORY)
+/- 4.0 ACRES
+/- 91 UNITS/ACRE

PARKING:
+/- 550 SPACES GARAGE
+/- 6 LEVELS
(1.5 PER UNIT)

SAN JACINTO STREET
public R.O.W.

DISD SITE
DALLAS, TEXAS
CONCEPTUAL SITE PLAN
SCALE: 1"=30'-0"

ARCHITECTURE DEMAREST
17022
12-12-17

TRAFFIC IMPACT ANALYSIS

Ross-Washington Multifamily

Dallas, Texas

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INTRODUCTION

The services of **Pacheco Koch** (PK) were retained by Baldwin Associates, on behalf of **Leon Capital Group**, to prepare a Traffic Impact Analysis (TIA) for a proposed multifamily development located at 3700 Ross Avenue in Dallas, Texas. The Project is referred to herein as Ross-Washington Multifamily. A preliminary site plan for the Project, prepared by **Architecture Demarest**, 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, Leon Capital Group (the "Applicant") has made a request to the City of Dallas (the "Approving Agency") for creation of a new PD Subdistrict for 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 approximately 380 multifamily dwelling units. Buildout of the Project is estimated to occur by 2018. Prior use on the site was administrative offices for Dallas Independent School District, however the property was vacant at the time of this study.

The proposed development is also planned to contain an parking structure for residents and visitors. Primary vehicular access to the site will be on San Jacinto Street.

The 4.02-acre subject site is currently zoned PD 298 - the Bryan Area Special Purpose District (Subarea 1A). The proposed zoning change would create a new PD Subdistrict for the property.

Per request of the City staff, a parking code analysis for the proposed development is provided in **Appendix E**.

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 5-year horizon period with site-generated traffic ("Horizon" or "Regional" 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.

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) Ross Avenue and N Washington Avenue: *traffic-signal-controlled*
- (b) Ross Avenue and Villars Street: *STOP-controlled on Villars Street*
- (c) N Washington Avenue and San Jacinto Street: *STOP-controlled on San Jacinto Street*
- (d) Major site driveways: *STOP-controlled on driveway*

Roadway Links:

- (A) Ross Avenue adjacent to site
 - ❑ Existing operation and cross-section: *five lanes (two lanes in each direction with a continuous, two-way center left-turn lane); two-way operation; no median*
 - ❑ City of Dallas Thoroughfare Plan Designation: *Community Collector /Existing*
 - ❑ Current Daily Traffic Volume: *23,032 (Thursday, October 26, 2017)*
- (B) N Washington Avenue adjacent to site
 - ❑ Existing operation and cross-section: *two lanes, two-way operation, no median*
 - ❑ City of Dallas Thoroughfare Plan Designation: *none (local street)*
 - ❑ Current Daily Traffic Volume: *12,754 (Thursday, October 26, 2017)*
- (C) Villars Street adjacent to site
 - ❑ Existing operation and cross-section: *one lane with on-street parking, one-way operation, no median*
 - ❑ City of Dallas Thoroughfare Plan Designation: *none (local street)*
 - ❑ Current Daily Traffic Volume: *94 (Thursday, October 26, 2017)*
- (D) San Jacinto Street adjacent to site
 - ❑ Existing operation and cross-section: *two lanes with on-street parking, two-way operation, no median*
 - ❑ City of Dallas Thoroughfare Plan Designation: *none (local street)*
 - ❑ Current Daily Traffic Volume: *843 (Thursday, October 26, 2017)*

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, October 26, and Tuesday, October 31, 2017. 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 1** 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 1. Historical Daily Traffic Volume Data

ROADWAY SEGMENT	HISTORICAL DAILY VOLUME (DATE)	ANNUAL GROWTH RATE
Ross Avenue, from McCoy Street to N Hall Street	19,196 ('16) ^A 14,637 ('10) ^A	4.62%

Data Source: A = TxDOT

According to historical data, traffic volumes in the vicinity of the subject site appear to be increasing in recent years. For the site buildout conditions, Pacheco Koch assumed a growth rate of 4.62 percent to estimate future background traffic volumes. For years beyond the site buildout year, an annual growth rate of 1.0 percent per year was assumed.

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 (9th Edition). ITE *Trip Generation* is a compilation of actual, vehicular traffic volume generation data and statistics by land use as collected over several decades by creditable sources across the country. Using the ITE equations and rates is an accepted methodology to calculate the projected site-generated traffic volumes for many land uses (though engineering judgment is strongly advised).

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

Table 2 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 2. 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	2,426	190 (38/152)	227 (147/79)

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 2**) 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	$> 10 - \leq 20$	$> 10 - \leq 15$
LOS C	$> 20 - \leq 35$	$> 15 - \leq 25$
LOS D	$> 35 - \leq 55$	$> 25 - \leq 35$
LOS E	$> 55 - \leq 80$	$> 35 - \leq 50$
LOS F	> 80	> 50

Analysis Traffic Volumes

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

- Existing traffic volumes during study peak hours
- Projected Background traffic volumes at the Site Buildout Year during study peak hours
- Projected Site-Generated traffic volumes during study peak hours
- Projected Background-plus-Site-Generated traffic volumes at the Site Buildout Year during study peak hours
- Projected 5-year horizon period 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 3** and **Table 4** 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.

Table 3. 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
Ross Avenue @ N Washington Avenue	B (19.3)	C (24.0)	C (20.2)	C (25.6)	C (21.8)	C (29.0)	C (23.1)	C (31.9)

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

INTERSECTION	TRAFFIC MANEUVER	EXISTING CONDITIONS		BACKGROUND CONDITIONS		BUILDOUT CONDITIONS		HORIZON CONDITIONS	
		AM	PM	AM	PM	AM	PM	AM	PM
N Washington Avenue @ San Jacinto Street	NBL	A (8.6)	A (8.8)	A (8.7)	A (8.9)	A (8.7)	A (9.1)	-	-
	EBLTR	C (16.4)	C (15.4)	C (17.0)	C (15.9)	C (23.5)	C (22.0)	-	-
	WBLTR	C (15.7)	C (20.3)	C (16.2)	C (21.8)	C (16.5)	C (24.6)	-	-
	SBL	A (8.3)	A (8.3)	A (8.3)	A (8.3)	A (8.3)	A (8.3)	-	-
Ross Avenue @ Villars Street	NBLR	C (24.6)	F (64.5)	D (27.3)	F (84.1)	D (30.0)	F (>100)	-	-
	WBL	A (0.0)	B (14.5)	A (0.0)	C (15.3)	A (0.0)	C (15.8)	-	-
Ross Avenue @ Site Driveway 1	NBLR	-	-	-	-	A (7.3)	E (38.0)	-	-
	WBL	-	-	-	-	A (9.1)	C (16.1)	-	-
San Jacinto Street @ Site Driveway 2	EBL	-	-	-	-	C (19.8)	A (7.4)	-	-
	SBLR	-	-	-	-	A (9.6)	A (9.0)	-	-

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

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.

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 5**. See specific recommendations in the *Recommendations* section of this report.

Table 5. Roadway Link Capacity Analysis Results Summary

ROADWAY/ SCENARIO	DAILY VOLUME	THEORETICAL DAILY CAPACITY	V:C RATIO/ LEVEL OF SERVICE
<u>Ross Avenue</u>			
Existing Conditions	23,032	17,000	1.35 - F
Background Conditions	30,201	17,000	1.78 - F
Site Buildout Conditions (30%)	30,929	17,000	1.82 - F
<u>N. Washington Avenue</u>			
Existing Conditions	12,754	8,500	1.50 - F
Background Conditions	16,724	8,500	1.97 - F
Site Buildout Conditions (15%)	17,088	8,500	2.01 - F
<u>San Jacinto Street</u>			
Existing Conditions	843	8,500	0.10 - A
Background Conditions	1,105	8,500	0.13 - A
Site Buildout Conditions (65%)	1,833	8,500	0.22 - B
<u>Villars Street</u>			
Existing Conditions	94	4,250	0.02 - A
Background Conditions	123	4,250	0.03 - A
Site Buildout Conditions (15%)	184	4,250	0.04 - A

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: Adjacent to the subject site, both Ross Avenue and N. Washington Avenue accommodate traffic volumes much higher than the respective, theoretical roadway link capacities. Both San Jacinto and Villars streets operate carry extremely low volumes of traffic and operate under capacity.

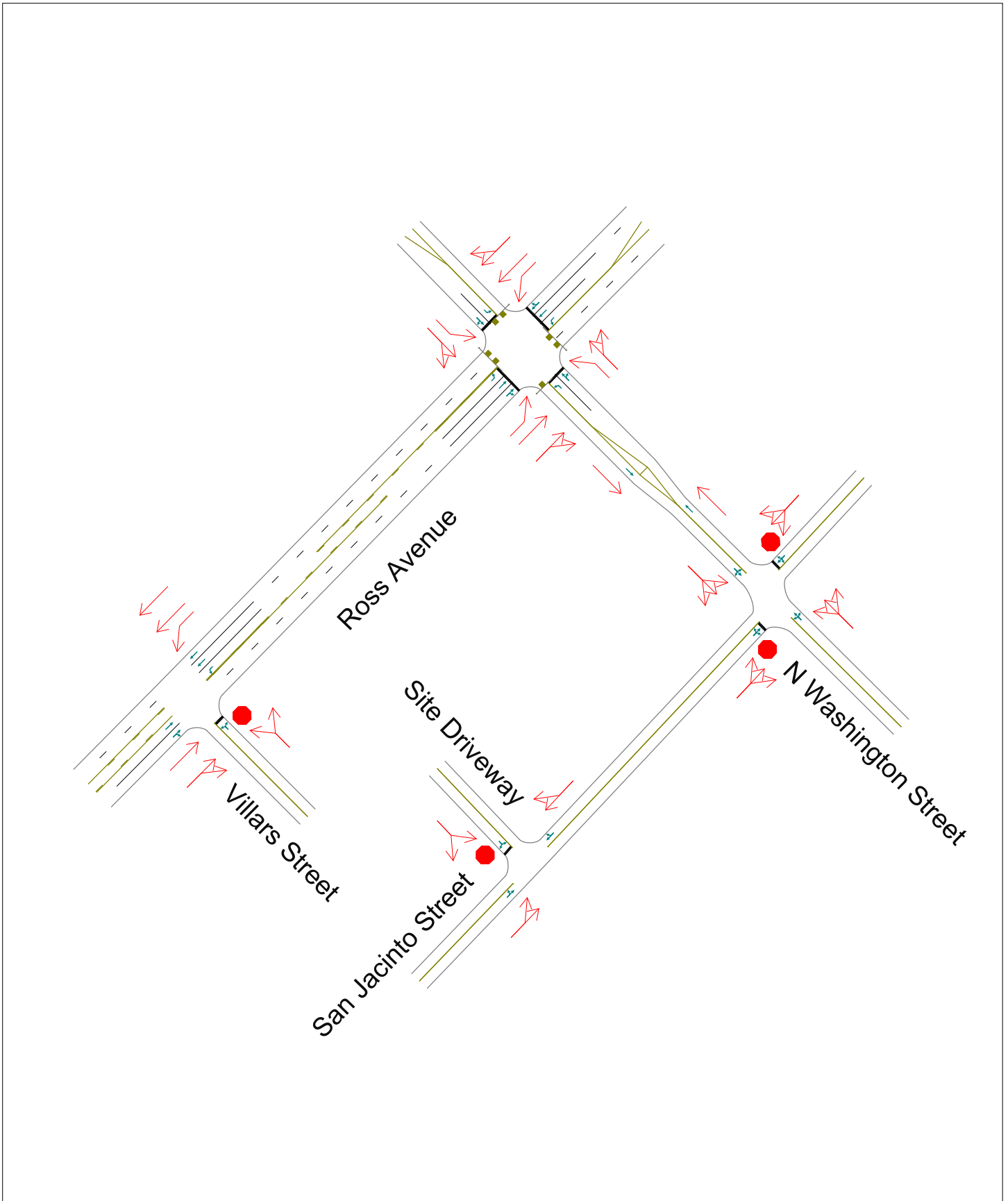
FINDING: The traffic-signalized intersection of Ross Avenue and N. Washington Avenue currently operates efficiently with a good Level of Service during peak periods.

FINDING: Left-turn maneuvers at the STOP-sign-controlled (i.e., unsignalized) intersections of Ross Avenue and Villars Street and N. Washington Avenue and San Jacinto Street currently operate reasonably well due to the very low traffic volumes on the minor street. With the addition of site-related traffic, the turning volume to/from the minor street will increase appreciably and the Level of Service for those maneuvers will degrade. However, neither intersection is a candidate for traffic signalization due to insufficient traffic volumes and proximity to the existing traffic signal. Also, due to the regular street grid, motorists also have other route options to avoid locations with unacceptable delay. Restriping the roadways to provide dedicated left-turn lanes is another option to consider, although this measure does not necessarily improve Levels of Service and are therefore not recommended.

- ❖ **RECOMMENDATION:** Adjustments to the existing on-street parking along San Jacinto Street will be required to accommodate visibility triangles in accordance with City standards.

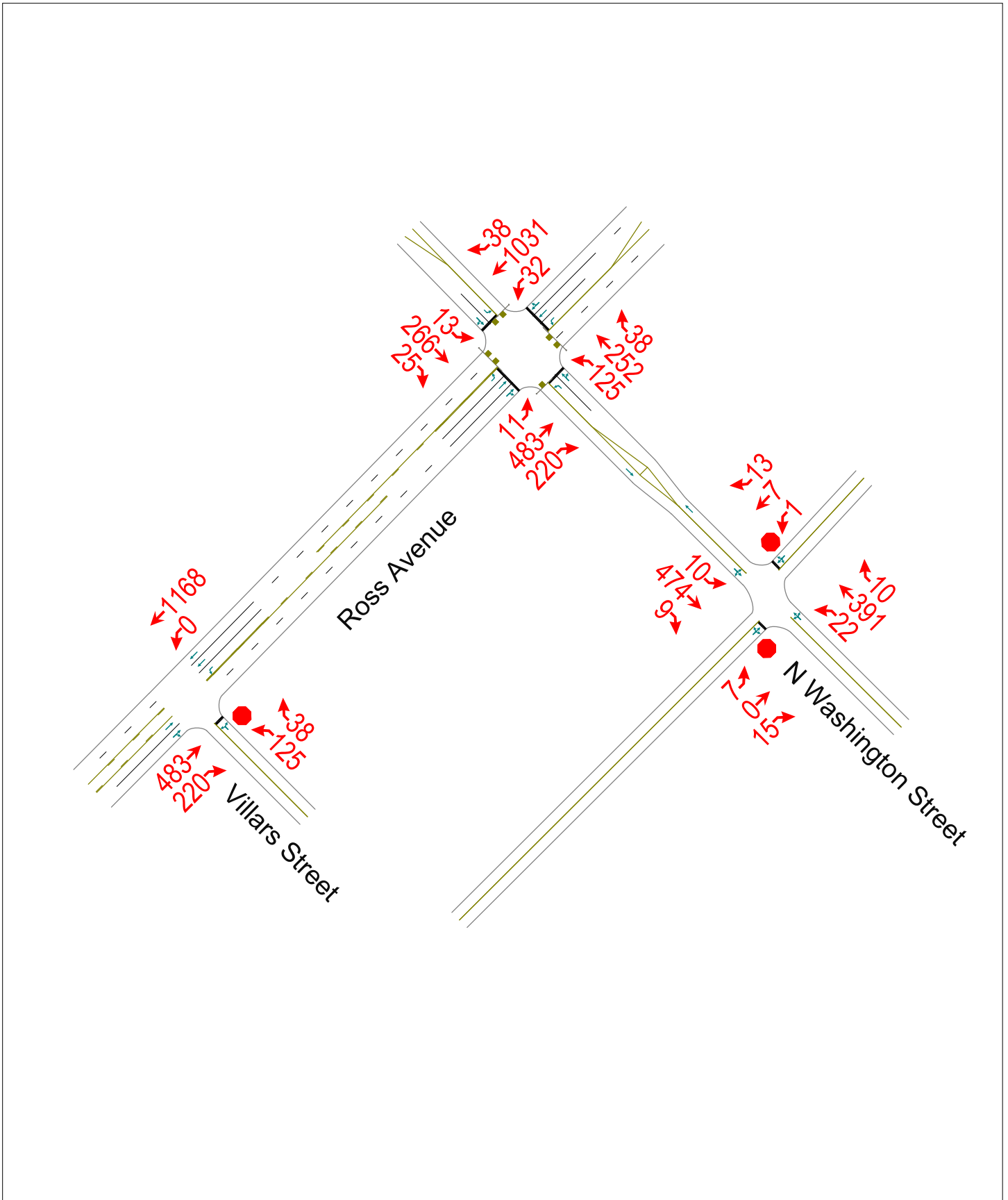
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Appendix A. Traffic Volume Exhibits



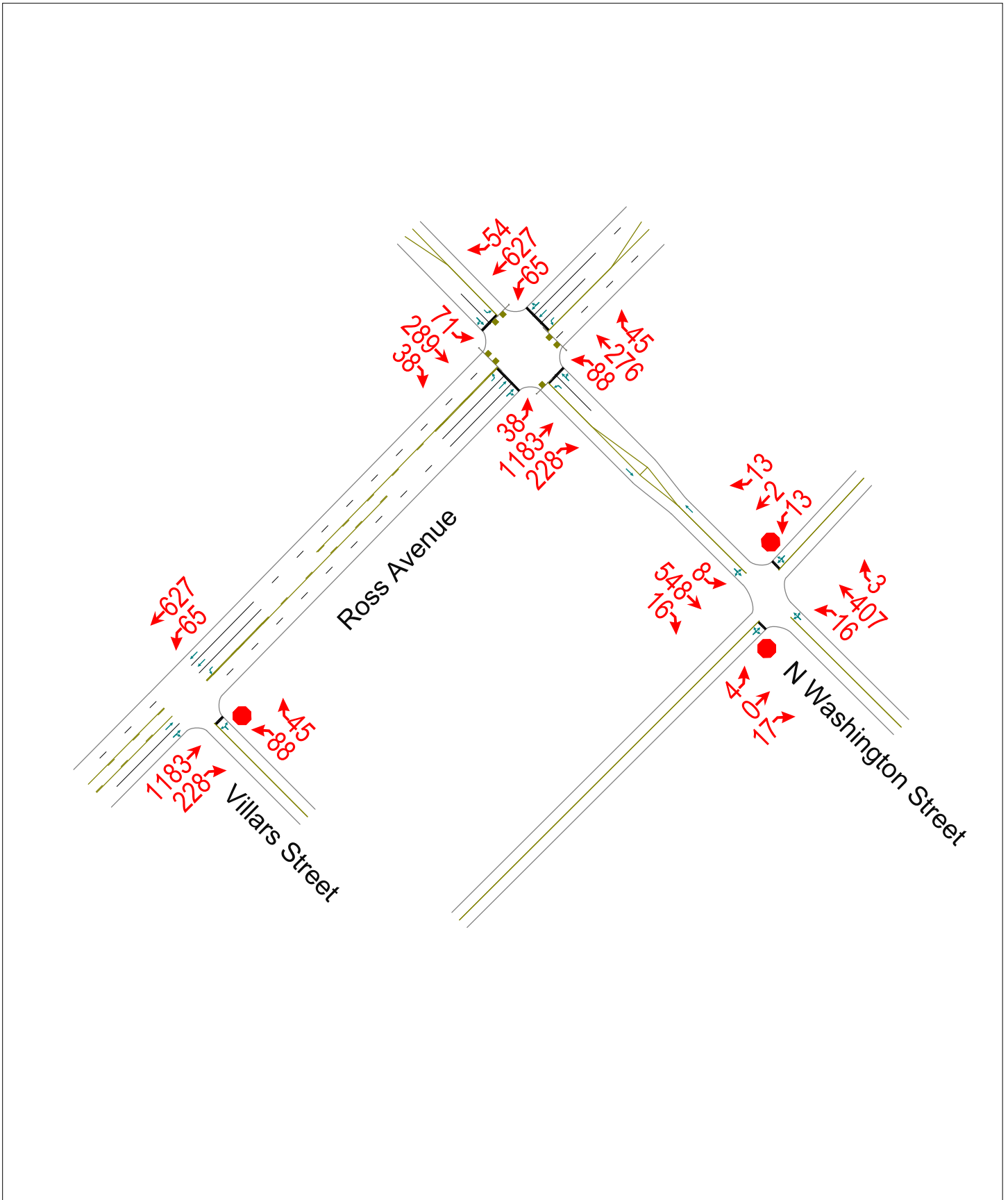
Appendix A2 - Existing AM Peak Hour Traffic Volumes

North ^
Not to Scale



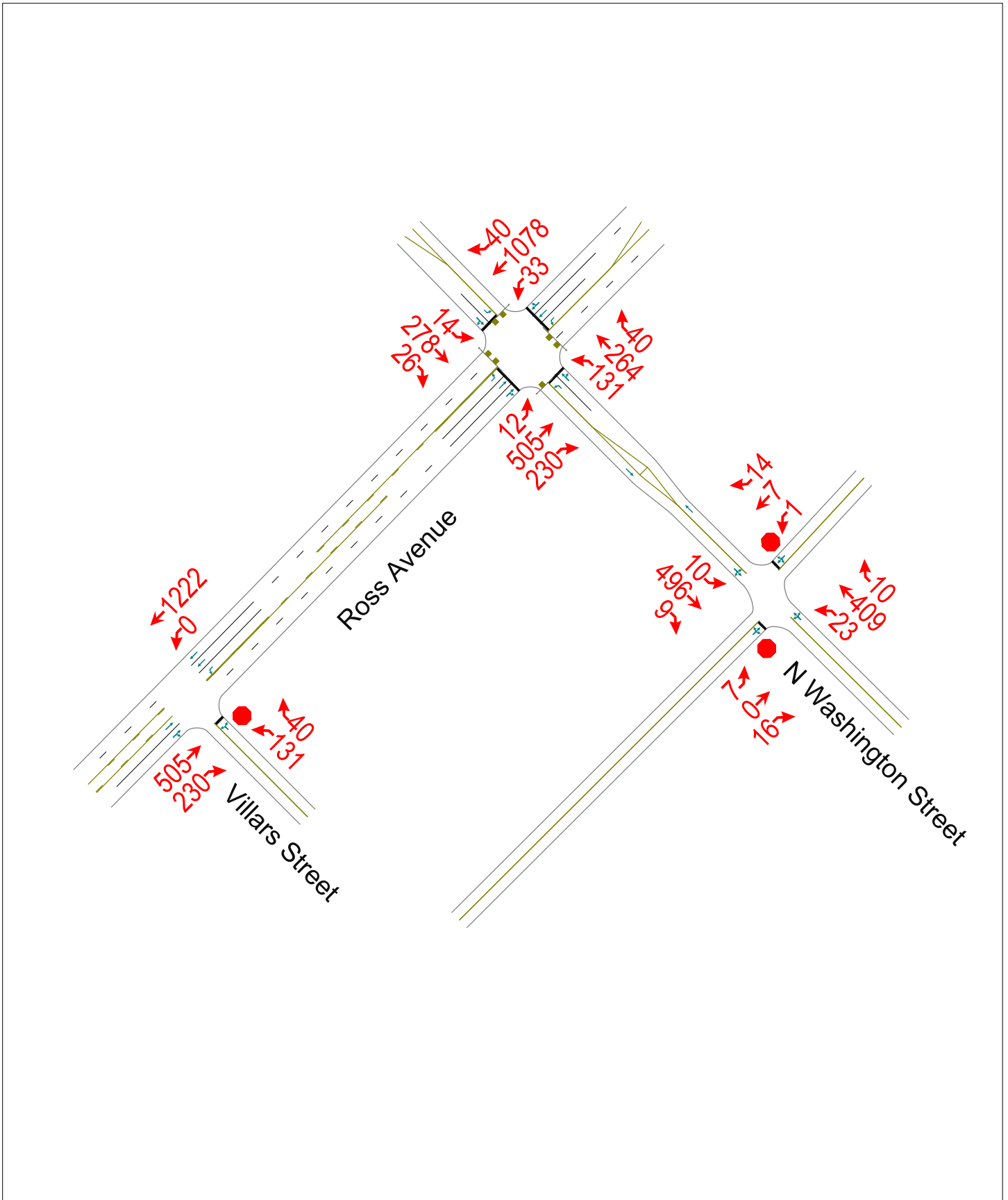
Appendix A3 - Existing PM Peak Hour Traffic Volumes

North ^
Not to Scale



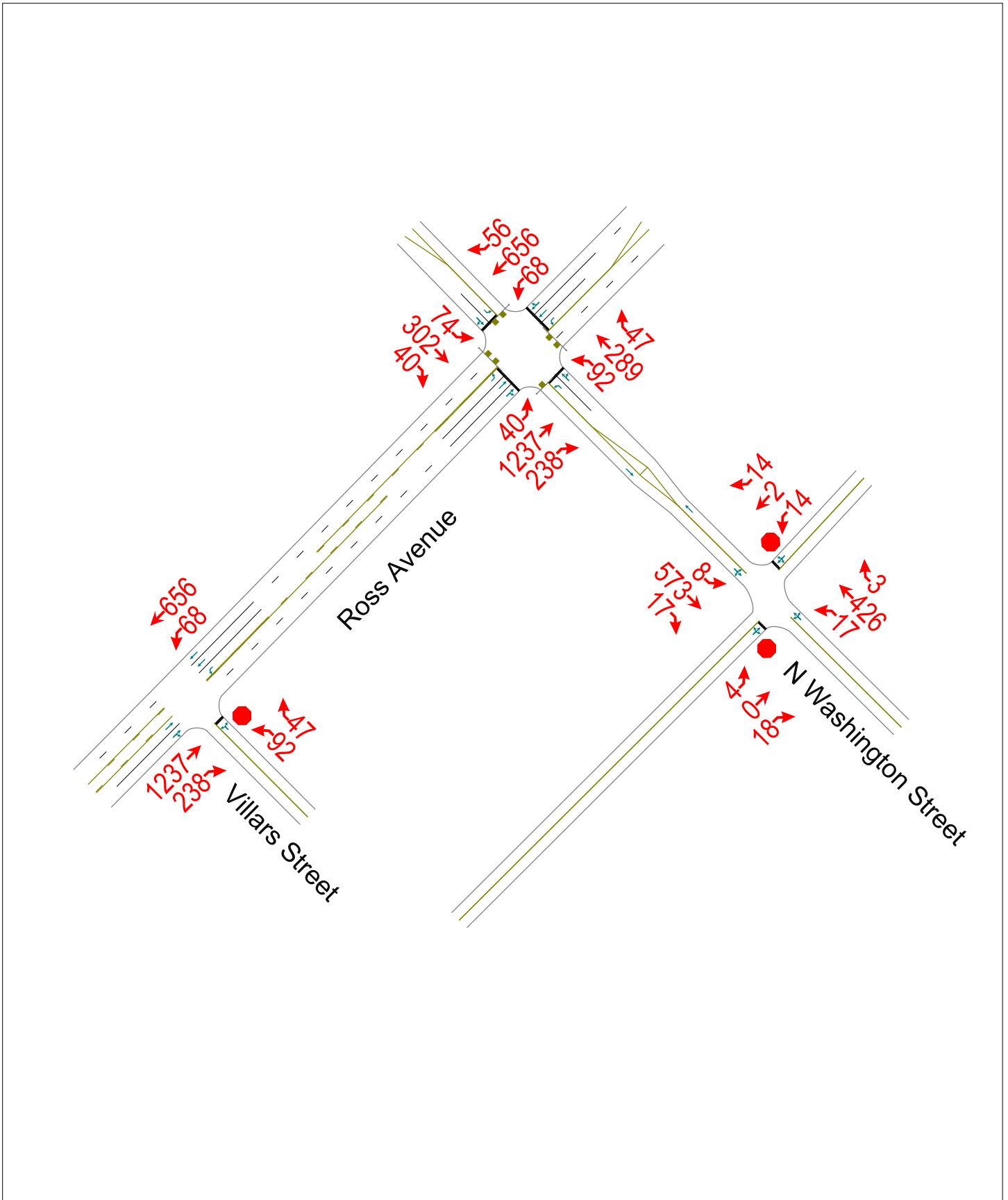
Appendix A4 - Background AM Peak Hour Traffic Volumes

North ^
Not to Scale



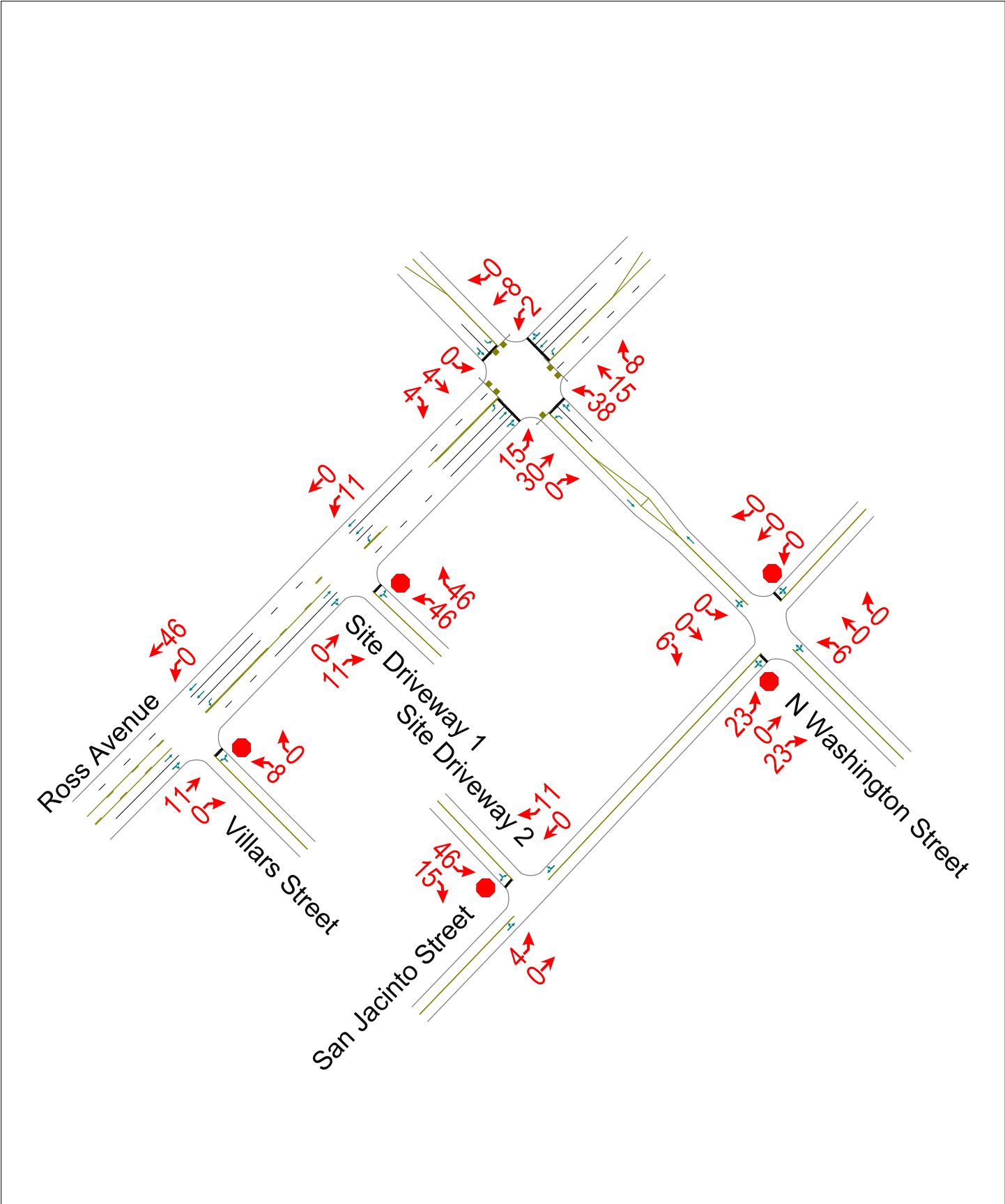
Appendix A5 - Background PM Peak Hour Traffic Volumes

North ^
Not to Scale



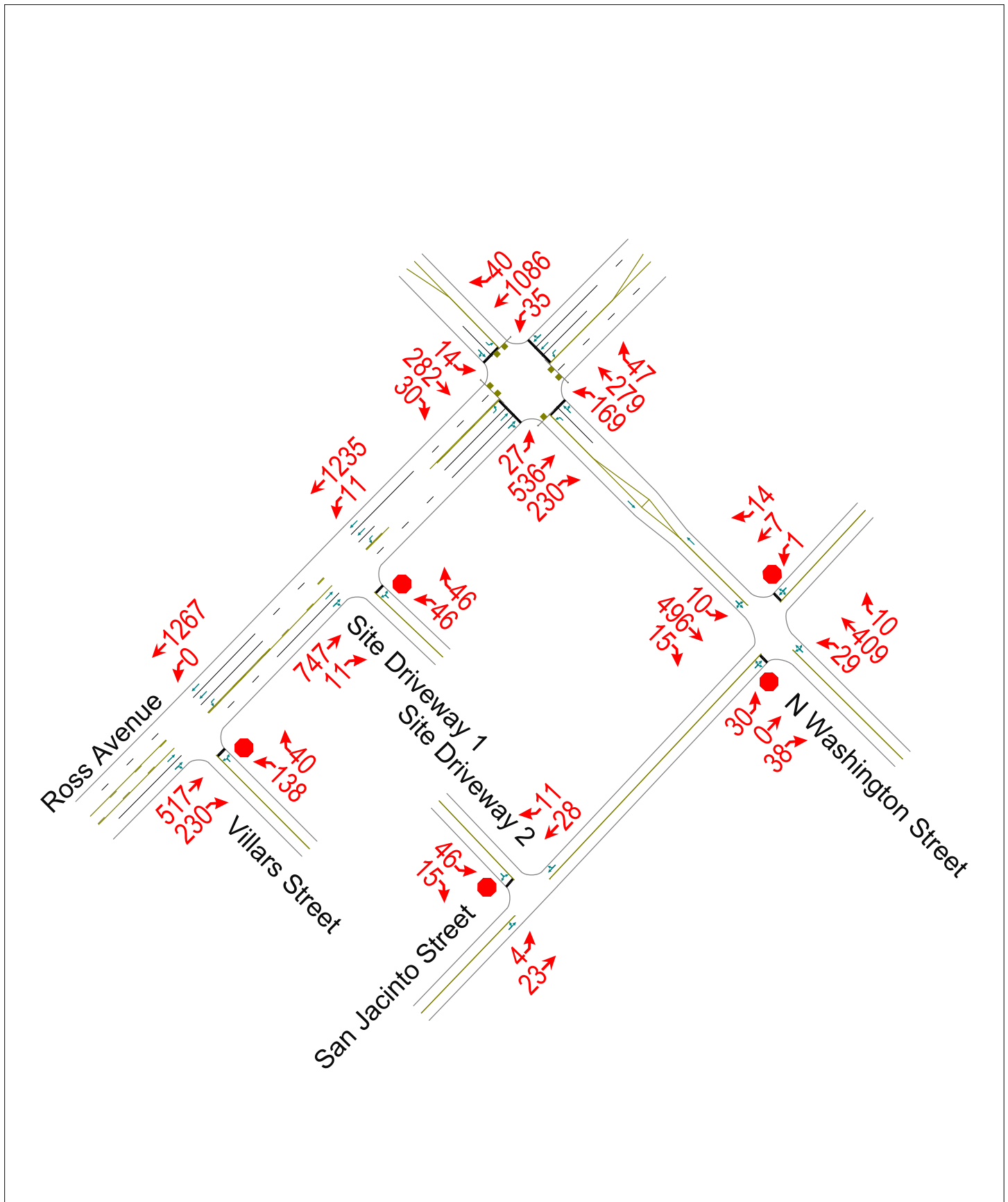
Appendix A6 - Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale



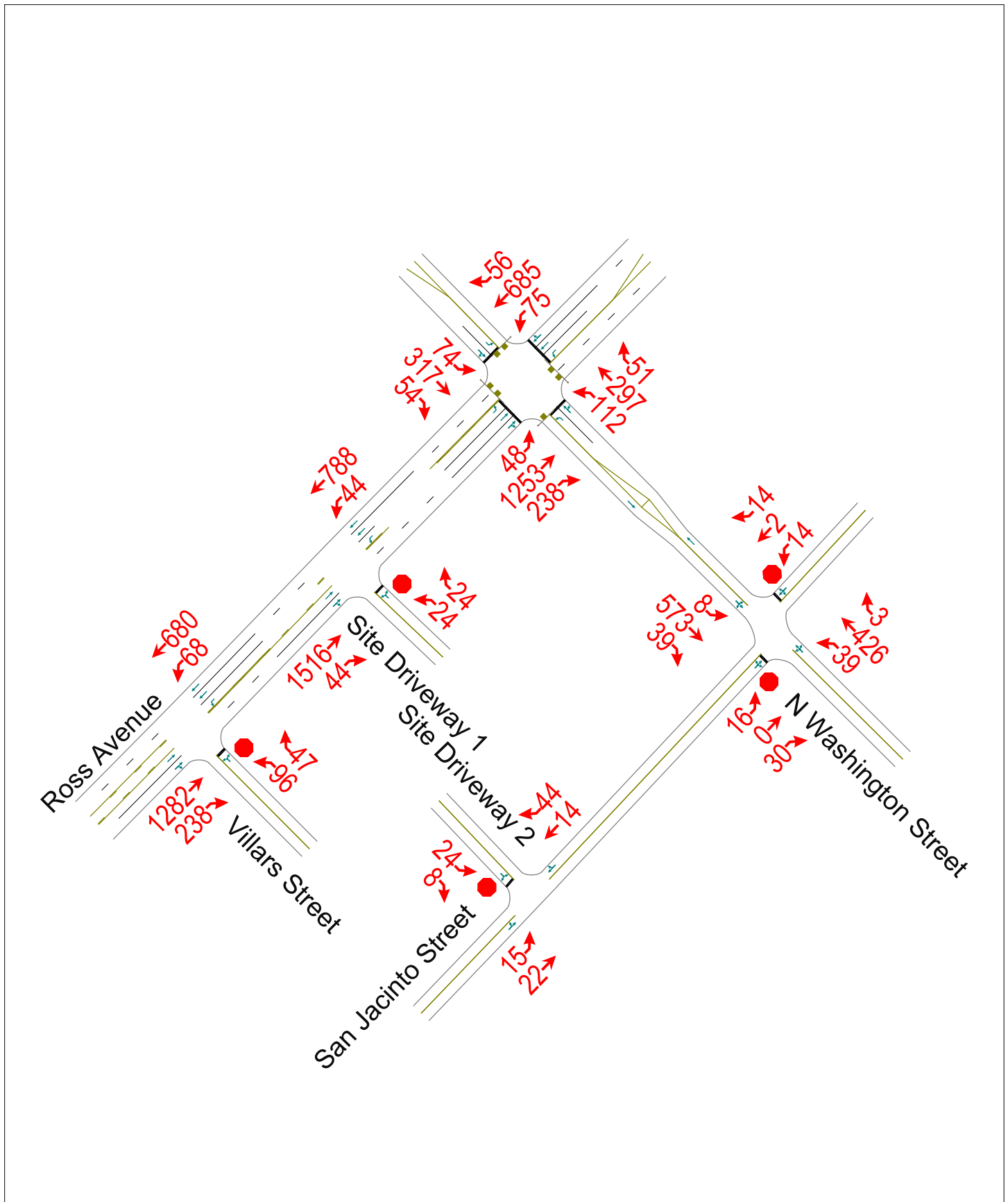
Appendix A8 - Background Plus Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale



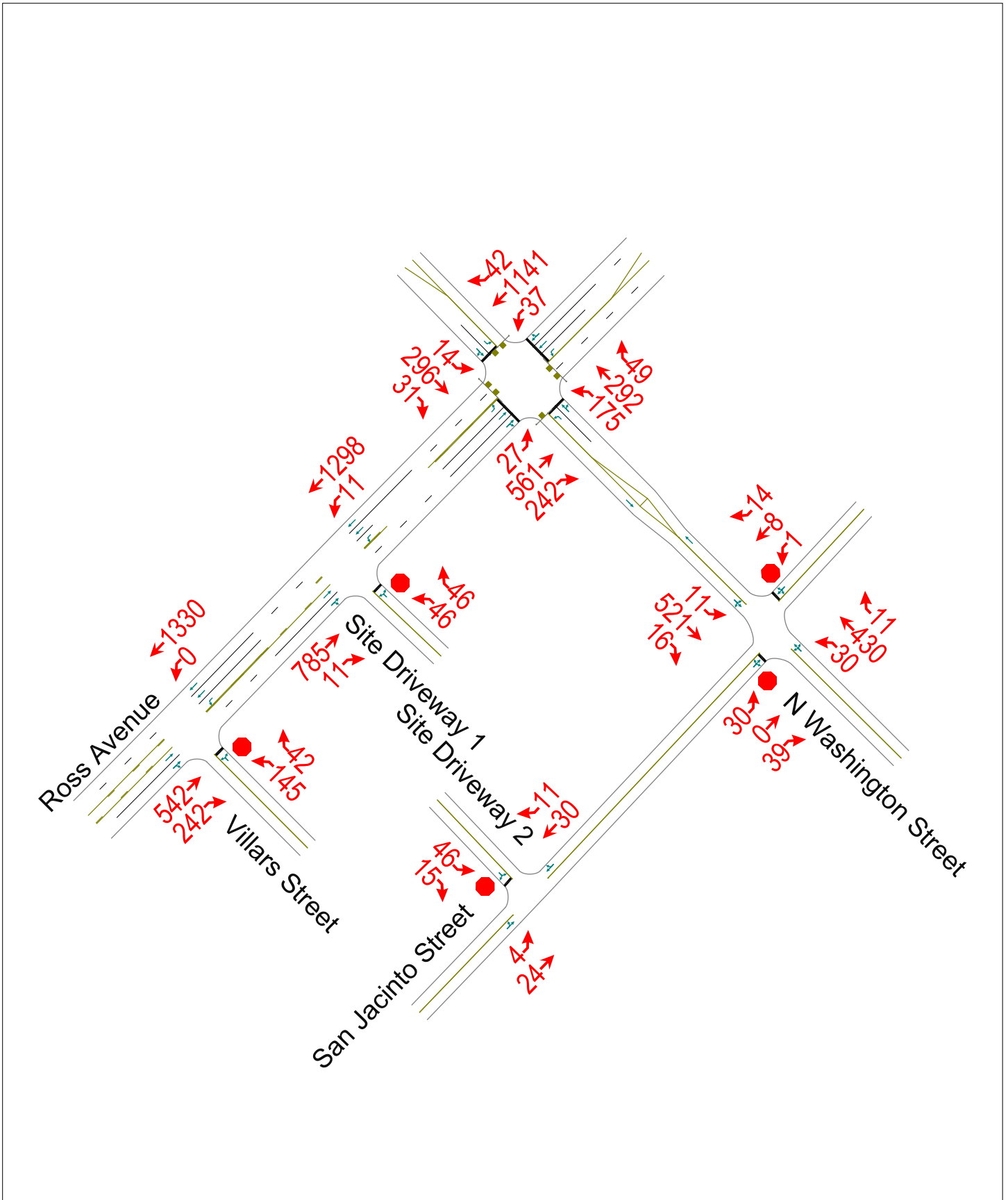
Appendix A9 - Background Plus Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale



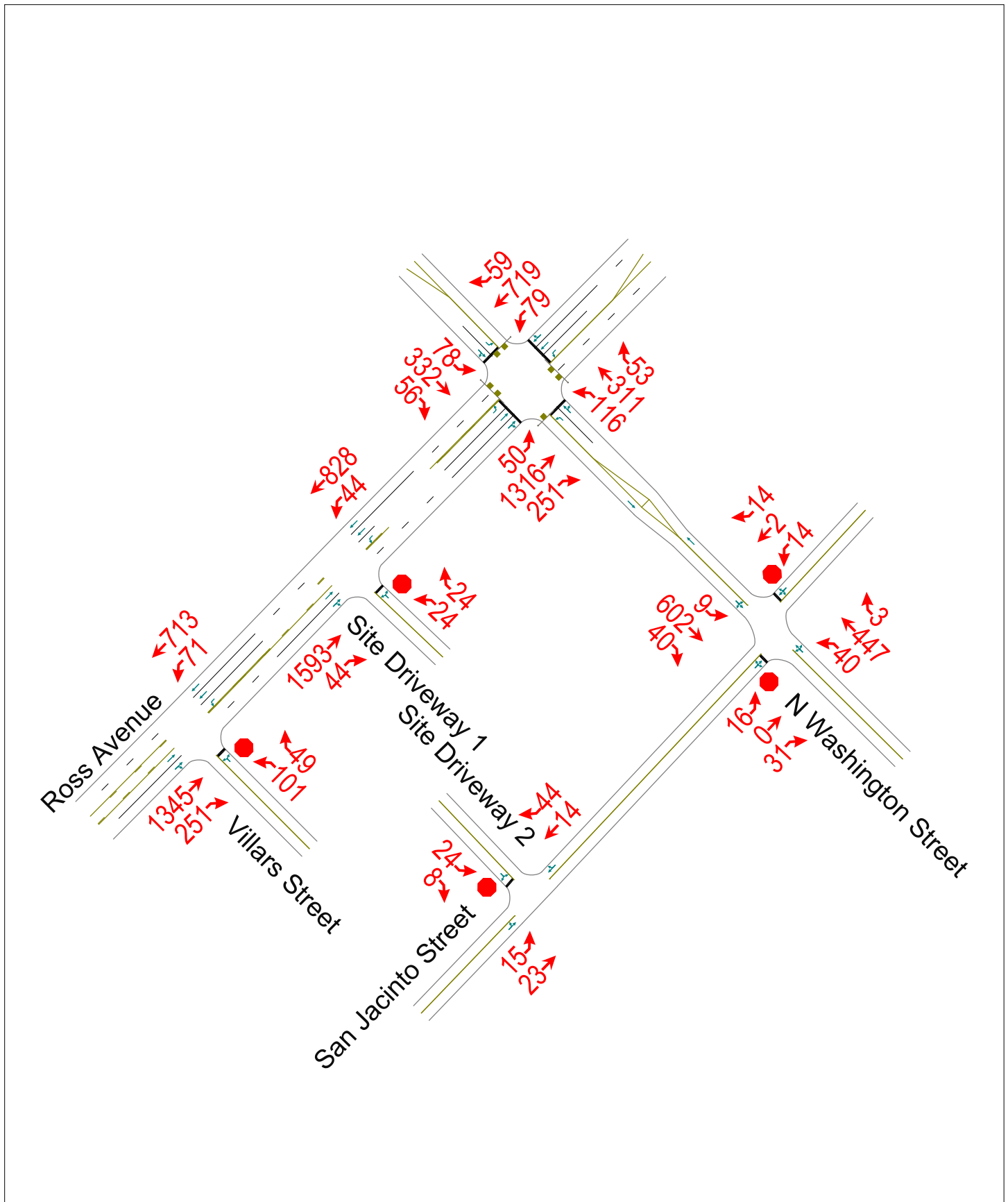
Appendix A10 - Horizon AM Peak Hour Traffic Volumes

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 N Washington Avenue					Westbound Approach on Ross Avenue					Northbound Approach on N Washington Avenue					Eastbound Approach on Ross Avenue								
			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	4	49	3			2	184	11			19	48	7			2	72	56					
State:	Texas	7:15 AM	7:30 AM	4	70	4			8	197	4			29	63	13			7	93	47					
Day:	Thursday	7:30 AM	7:45 AM	1	56	2			8	263	8			35	77	15			0	117	60					
Date:	September 26th	7:45 AM	8:00 AM	3	76	5			5	268	11			37	58	7			4	115	63					
Year:	2017	8:00 AM	8:15 AM	6	61	6			11	257	7			30	58	11			3	130	51					
Data Collector:	Camera	8:15 AM	8:30 AM	3	73	12			8	243	12			23	59	5			4	121	46					
Data Source:	CJ Hensch	8:30 AM	8:45 AM	4	61	9			10	244	7			25	65	13			5	112	40					
Traffic Control:	Traffic Signal	8:45 AM	9:00 AM	2	63	6			4	240	5			33	50	8			5	106	41					
Observations:		4:30 PM	4:45 PM	13	64	16			26	117	14			22	76	14			12	267	47					
		4:45 PM	5:00 PM	19	63	16			17	176	17			24	73	13			10	289	43					
		5:00 PM	5:15 PM	16	74	7			12	124	14			24	79	13			9	295	62					
		5:15 PM	5:30 PM	17	74	9			18	149	15			22	60	8			9	297	59					
		5:30 PM	5:45 PM	19	78	6			18	178	8			18	64	11			10	302	64					
		5:45 PM	6:00 PM	16	69	10			16	141	9			16	77	19			10	277	55					
		6:00 PM	6:15 PM	3	80	12			10	137	14			15	62	6			6	313	66					
		6:15 PM	6:30 PM	8	75	7			15	133	16			15	38	6			6	319	45					
AM Peak Hour	Intersection PHF:	0.97	Intersection PHV:	0	13	266	25		0	32	1,031	38		0	125	252	38		0	11	483	220				
	Peak Hour:	7:30 AM - 8:30 AM	PHF:	0.54	0.88	0.52			0.73	0.96	0.79			0.84	0.82	0.63			0.69	0.93	0.87					
	Study Area PHF:	0.97	Study Area PHV:	0	13	266	25		0	32	1,031	38		0	125	252	38		0	11	483	220				
	Peak Hour:	7:30 AM - 8:30 AM	PHF:	0.54	0.88	0.52			0.73	0.96	0.79			0.84	0.82	0.63			0.69	0.93	0.87					
PM Peak Hour	Intersection PHF:	0.97	Intersection PHV:	0	71	289	38		0	65	627	54		0	88	276	45		0	38	1,183	228				
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.93	0.93	0.59			0.90	0.88	0.79			0.92	0.87	0.87			0.95	0.98	0.89					
	Study Area PHF:	0.97	Study Area PHV:	0	71	289	38		0	65	627	54		0	88	276	45		0	38	1,183	228				
	Peak Hour:	4:45 PM - 5:45 PM	PHF:	0.93	0.93	0.59			0.90	0.88	0.79			0.92	0.87	0.87			0.95	0.98	0.89					

Intersection Turning Movement Counts

			EAST LEG						SOUTH LEG						WEST LEG							
			Westbound Approach on Ross Avenue						Northbound Approach on Villars Street						Eastbound Approach on Ross 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						0	203	-				19	-	7			-	72	56
State:	Texas	7:15 AM	7:30 AM						0	245	-				29	-	13			-	93	47
Day:	Thursday	7:30 AM	7:45 AM						0	297	-				35	-	15			-	117	60
Date:	September 26th	7:45 AM	8:00 AM						0	306	-				37	-	7			-	115	63
Year:	2017	8:00 AM	8:15 AM						0	295	-				30	-	11			-	130	51
Data Collector:	Camera	8:15 AM	8:30 AM						0	270	-				23	-	5			-	121	46
Data Source:	CJ Hensch	8:30 AM	8:45 AM						0	273	-				25	-	13			-	112	40
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM						0	276	-				33	-	8			-	106	41
Observations:		4:30 PM	4:45 PM						26	117	-				22	-	14			-	267	47
		4:45 PM	5:00 PM						17	176	-				24	-	13			-	289	43
		5:00 PM	5:15 PM						12	124	-				24	-	13			-	295	62
		5:15 PM	5:30 PM						18	149	-				22	-	8			-	297	59
		5:30 PM	5:45 PM						18	178	-				18	-	11			-	302	64
		5:45 PM	6:00 PM						16	141	-				16	-	19			-	277	55
		6:00 PM	6:15 PM						10	137	-				15	-	6			-	313	66
		6:15 PM	6:30 PM						15	133	-				15	-	6			-	319	45
AM Peak Hour	Intersection PHF:	0.96		Intersection PHV:			0	0	1,168	0		0	125	0	38		0	0	483	220		
	Peak Hour:	7:30 AM - 8:30 AM		PHF:			0.00	0.95	0.00			0.84	0.00	0.63			0.00	0.93	0.87			
	Study Area PHF:	0.96		Study Area PHV:			0	0	1,168	0		0	125	0	38		0	0	483	220		
	Peak Hour:	7:30 AM - 8:30 AM		PHF:			0.00	0.95	0.00			0.84	0.00	0.63			0.00	0.93	0.87			
PM Peak Hour	Intersection PHF:	0.95		Intersection PHV:			0	65	627	0		0	88	0	45		0	0	1,183	228		
	Peak Hour:	4:45 PM - 5:45 PM		PHF:			0.90	0.88	0.00			0.92	0.00	0.87			0.00	0.98	0.89			
	Study Area PHF:	0.95		Study Area PHV:			0	65	627	0		0	88	0	45		0	0	1,183	228		
	Peak Hour:	4:45 PM - 5:45 PM		PHF:			0.90	0.88	0.00			0.92	0.00	0.87			0.00	0.98	0.89			

Intersection Turning Movement Counts

			NORTH LEG					EAST LEG					SOUTH LEG					WEST LEG								
			Southbound Approach on N Washington Avenue					Westbound Approach on San Jacinto Street					Northbound Approach on N Washington Avenue					Eastbound Approach on San Jacinto 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	1	95	0			1	0	3			1	76	2			2	0	0					
State:	Texas	7:15 AM	7:30 AM	2	135	0			0	0	4			3	94	0			5	0	3					
Day:	Thursday	7:30 AM	7:45 AM	1	137	0			0	1	4			3	111	1			3	0	4					
Date:	September 26th	7:45 AM	8:00 AM	5	119	4			1	5	3			13	111	2			1	0	2					
Year:	2017	8:00 AM	8:15 AM	3	129	1			0	1	4			5	86	5			2	0	8					
Data Collector:	Camera	8:15 AM	8:30 AM	1	89	4			0	0	2			1	83	2			1	0	1					
Data Source:	CJ Hensch	8:30 AM	8:45 AM	0	104	2			0	2	4			4	83	2			2	0	3					
Traffic Control:	Minor Approach Stop	8:45 AM	9:00 AM	3	98	2			1	0	4			1	70	1			3	1	8					
Observations:		4:30 PM	4:45 PM	3	126	5			2	1	2			5	104	3			4	1	6					
		4:45 PM	5:00 PM	2	113	1			5	1	4			4	106	1			0	0	2					
		5:00 PM	5:15 PM	2	141	3			2	1	2			6	122	0			0	0	4					
		5:15 PM	5:30 PM	2	149	4			2	0	3			3	93	1			1	0	7					
		5:30 PM	5:45 PM	2	145	8			4	0	4			3	86	1			3	0	4					
		5:45 PM	6:00 PM	2	133	8			2	1	7			1	92	1			4	0	9					
		6:00 PM	6:15 PM	4	146	6			2	4	7			4	77	2			1	0	4					
		6:15 PM	6:30 PM	2	125	3			1	2	2			0	58	1			2	0	7					
AM Peak Hour	Intersection PHF:	0.96	Intersection PHV:	0	11	520	5		0	1	7	15		0	24	402	8		0	11	0	17				
	Peak Hour:	7:15 AM - 8:15 AM	PHF:	0.55	0.95	0.31	PHF:	0.25	0.35	0.94	PHF:	0.46	0.91	0.40	PHF:	0.55	0.00	0.53								
	Study Area PHF:	0.96	Study Area PHV:	0	11	520	5		0	1	7	15		0	24	402	8		0	11	0	17				
	Peak Hour:	7:15 AM - 8:15 AM	PHF:	0.55	0.95	0.31	PHF:	0.25	0.35	0.94	PHF:	0.46	0.91	0.40	PHF:	0.55	0.00	0.53								
PM Peak Hour	Intersection PHF:	0.94	Intersection PHV:	0	8	568	23		0	10	2	16		0	13	393	3		0	8	0	24				
	Peak Hour:	5:00 PM - 6:00 PM	PHF:	1.00	0.95	0.72	PHF:	0.63	0.50	0.57	PHF:	0.54	0.81	0.75	PHF:	0.50	0.00	0.67								
	Study Area PHF:	0.94	Study Area PHV:	0	8	568	23		0	10	2	16		0	13	393	3		0	8	0	24				
	Peak Hour:	5:00 PM - 6:00 PM	PHF:	1.00	0.95	0.72	PHF:	0.63	0.50	0.57	PHF:	0.54	0.81	0.75	PHF:	0.50	0.00	0.67								

ROADWAY: N Washington Avenue
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: October 26th
 YEAR: 2016
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME
12,754
 (WEEKDAY)

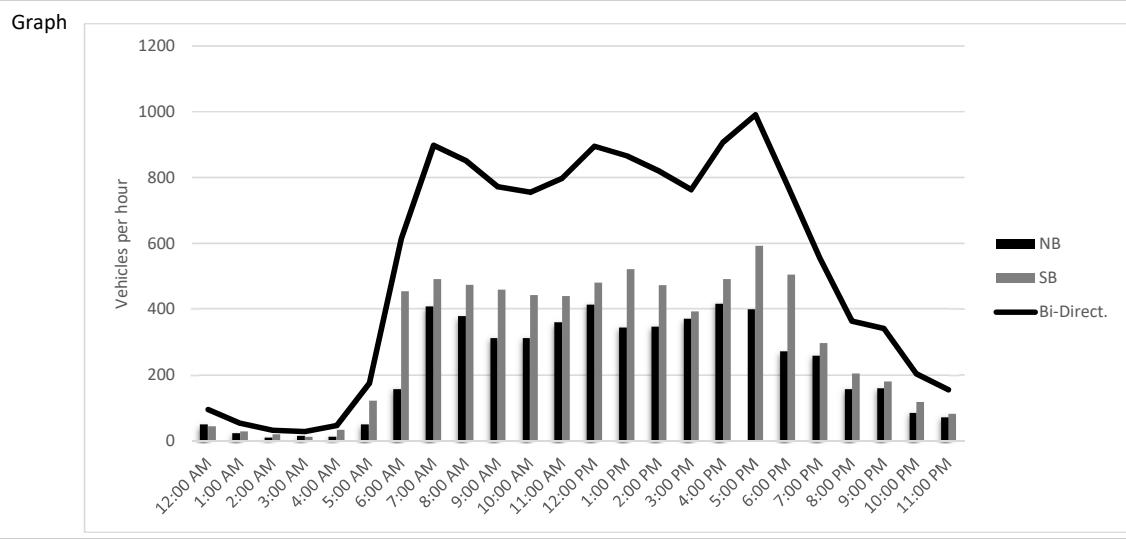
N Washington Avenue

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	24	11	9	7	16	8	10	10	51	44	95
1:00 AM	10	4	5	6	6	7	5	10	25	28	53
2:00 AM	2	4	0	5	6	3	9	2	11	20	31
3:00 AM	5	8	3	0	3	3	4	2	16	12	28
4:00 AM	2	4	3	4	1	4	9	19	13	33	46
5:00 AM	8	7	13	23	14	30	35	43	51	122	173
6:00 AM	12	34	46	67	89	129	116	121	159	455	614
7:00 AM	74	105	121	106	107	127	119	139	406	492	898
8:00 AM	98	84	107	89	124	129	113	108	378	474	852
9:00 AM	79	76	86	72	117	119	98	125	313	459	772
10:00 AM	70	80	88	74	116	102	111	114	312	443	755
11:00 AM	92	80	94	92	109	116	111	104	358	440	798
12:00 PM	118	102	107	87	110	99	137	135	414	481	895
1:00 PM	89	80	93	82	137	134	115	136	344	522	866
2:00 PM	99	87	83	78	108	121	129	115	347	473	820
3:00 PM	90	93	85	102	103	82	105	103	370	393	763
4:00 PM	97	111	107	101	121	115	131	125	416	492	908
5:00 PM	117	85	94	102	142	151	156	144	398	593	991
6:00 PM	84	61	73	54	157	131	124	93	272	505	777
7:00 PM	66	76	63	54	90	59	78	70	259	297	556
8:00 PM	37	40	39	42	58	50	50	47	158	205	363
9:00 PM	45	46	48	22	48	41	46	45	161	180	341
10:00 PM	25	26	17	18	31	29	22	36	86	118	204
11:00 PM	24	12	26	11	26	14	28	14	73	82	155

7:15 AM 8:15 AM
 5:00 PM 6:00 PM
 4:15 PM 5:15 PM
 5:15 PM 6:15 PM

24-Hour Total: 12,754
 (Bi-Direct.) AM Peak Hour Total: 898
 (Bi-Direct.) PM Peak Hour Total: 991
 Highest By Direction (NB): 436
 Highest By Direction (SB): 608

	NB	SB	Bi-Direct.
24-Hour Total:	5,391	7,363	12,754
(Bi-Direct.) AM Peak Hour Total:	430	509	939
(Bi-Direct.) PM Peak Hour Total:	398	593	991
Highest By Direction (NB):	436		
Highest By Direction (SB):		608	



ROADWAY: Ross Avenue
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: October 26th
 YEAR: 2016
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME
23,032
 (WEEKDAY)

Ross Avenue

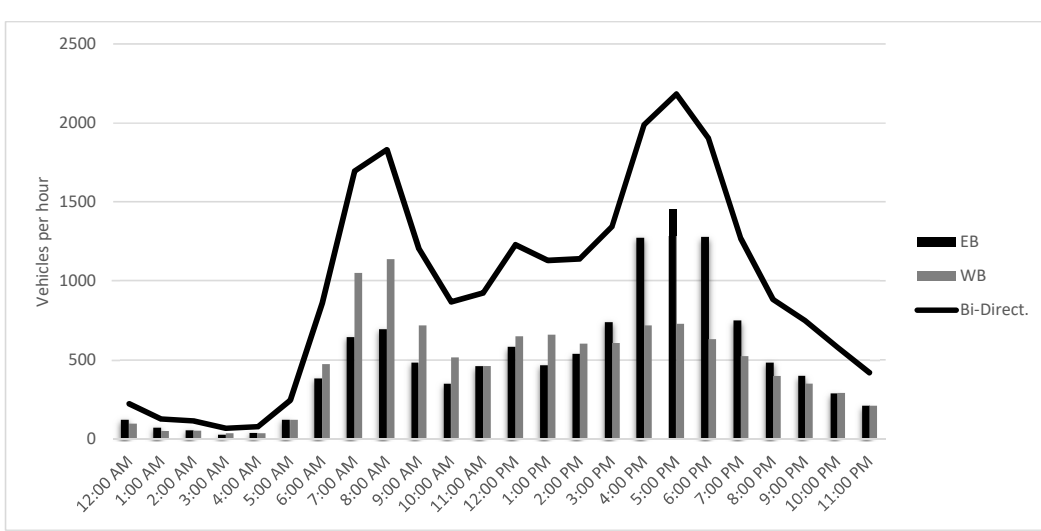
START TIME	Eastbound				Westbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	EB	WB	Bi-Direct.
12:00 AM	41	42	20	22	30	28	23	15	125	96	221
1:00 AM	24	17	21	12	13	13	12	12	74	50	124
2:00 AM	13	20	16	11	18	11	11	11	60	51	111
3:00 AM	8	8	8	7	11	8	8	8	31	35	66
4:00 AM	4	6	12	18	6	10	7	12	40	35	75
5:00 AM	14	34	32	44	16	25	35	44	124	120	244
6:00 AM	70	92	104	120	68	102	143	160	386	473	859
7:00 AM	134	153	181	178	204	232	289	325	646	1050	1696
8:00 AM	196	176	168	153	290	282	282	283	693	1137	1830
9:00 AM	160	119	105	100	214	186	154	164	484	718	1202
10:00 AM	80	89	86	96	148	124	117	126	351	515	866
11:00 AM	91	114	112	144	108	114	116	123	461	461	922
12:00 PM	173	128	141	138	170	137	158	184	580	649	1229
1:00 PM	128	118	101	122	187	177	160	136	469	660	1129
2:00 PM	130	121	161	125	174	148	130	150	537	602	1139
3:00 PM	147	176	193	223	153	131	152	170	739	606	1345
4:00 PM	280	326	337	328	172	167	179	200	1271	718	1989
5:00 PM	365	358	371	360	165	184	194	186	1454	729	2183
6:00 PM	396	342	301	234	160	168	153	150	1273	631	1904
7:00 PM	218	162	202	164	140	128	144	112	746	524	1270
8:00 PM	124	116	113	132	103	106	95	94	485	398	883
9:00 PM	114	101	87	96	104	114	76	56	398	350	748
10:00 PM	71	82	68	68	80	86	72	52	289	290	579
11:00 PM	62	54	52	41	64	40	59	46	209	209	418

7:30 AM 8:30 AM
 5:15 PM 6:15 PM
 5:15 PM 6:15 PM
 7:30 AM 8:30 AM

24-Hour Total: 11,925
 (Bi-Direct.) AM Peak Hour Total: 731
 (Bi-Direct.) PM Peak Hour Total: 1,485
 Highest By Direction (EB): 1,485
 Highest By Direction (WB): 1,186

	EB	WB	Bi-Direct.
24-Hour Total:	11,925	11,107	23,032
(Bi-Direct.) AM Peak Hour Total:	731	1,186	1,917
(Bi-Direct.) PM Peak Hour Total:	1,485	724	2,209
Highest By Direction (EB):	1,485		
Highest By Direction (WB):		1,186	

Graph



ROADWAY: San Jacinto Street
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: October 26th
 YEAR: 2016
 SOURCE: CJ Hensch

24-HOUR, BI-DIRECTIONAL VOLUME
843
 (WEEKDAY)

San Jacinto Street

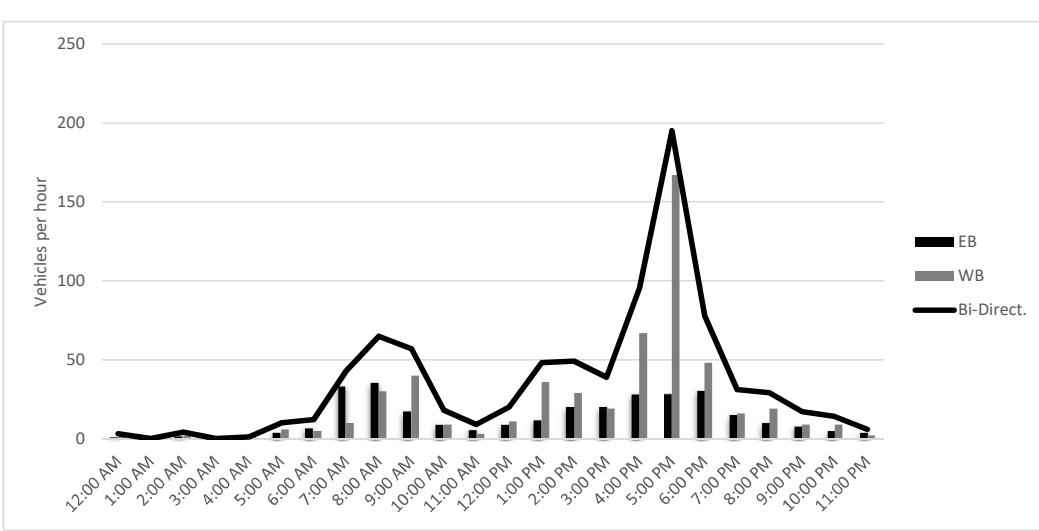
START TIME	Eastbound				Westbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	EB	WB	Bi-Direct.
12:00 AM	0	1	0	0	0	0	2	0	1	2	3
1:00 AM	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	1	1	0	0	0	1	1	2	2	4
3:00 AM	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	1	0	0	1	1
5:00 AM	0	1	1	2	0	1	3	2	4	6	10
6:00 AM	1	2	2	2	1	1	1	2	7	5	12
7:00 AM	1	8	7	17	1	3	4	2	33	10	43
8:00 AM	9	10	11	5	9	6	4	11	35	30	65
9:00 AM	3	7	0	7	10	15	7	8	17	40	57
10:00 AM	2	4	1	2	2	2	2	3	9	9	18
11:00 AM	1	1	2	2	0	1	1	1	6	3	9
12:00 PM	2	2	3	2	1	2	3	5	9	11	20
1:00 PM	1	4	4	3	6	15	8	7	12	36	48
2:00 PM	4	7	3	6	9	5	7	8	20	29	49
3:00 PM	6	4	3	7	5	4	4	6	20	19	39
4:00 PM	4	11	7	6	14	7	16	30	28	67	95
5:00 PM	10	5	6	7	16	42	46	63	28	167	195
6:00 PM	5	9	11	5	12	11	16	9	30	48	78
7:00 PM	2	9	4	0	6	3	4	3	15	16	31
8:00 PM	3	2	3	2	6	6	3	4	10	19	29
9:00 PM	2	2	2	2	0	4	3	2	8	9	17
10:00 PM	1	3	1	0	4	0	2	3	5	9	14
11:00 PM	1	0	1	2	1	1	0	0	4	2	6

7:45 AM 8:45 AM
 5:00 PM 6:00 PM
 7:45 AM 8:45 AM
 5:00 PM 6:00 PM

24-Hour Total: 843
 (Bi-Direct.) AM Peak Hour Total: 68
 (Bi-Direct.) PM Peak Hour Total: 195
 Highest By Direction (EB): 47
 Highest By Direction (WB): 167

	EB	WB	Bi-Direct.
24-Hour Total:	303	540	843
(Bi-Direct.) AM Peak Hour Total:	47	21	68
(Bi-Direct.) PM Peak Hour Total:	28	167	195
Highest By Direction (EB):	47		
Highest By Direction (WB):		167	

Graph



ROADWAY: Villars Street
 LOCATION: Adjacent to site
 DAY: Thursday
 DATE: October 26th
 YEAR: 2016
 SOURCE: CJ Hensch

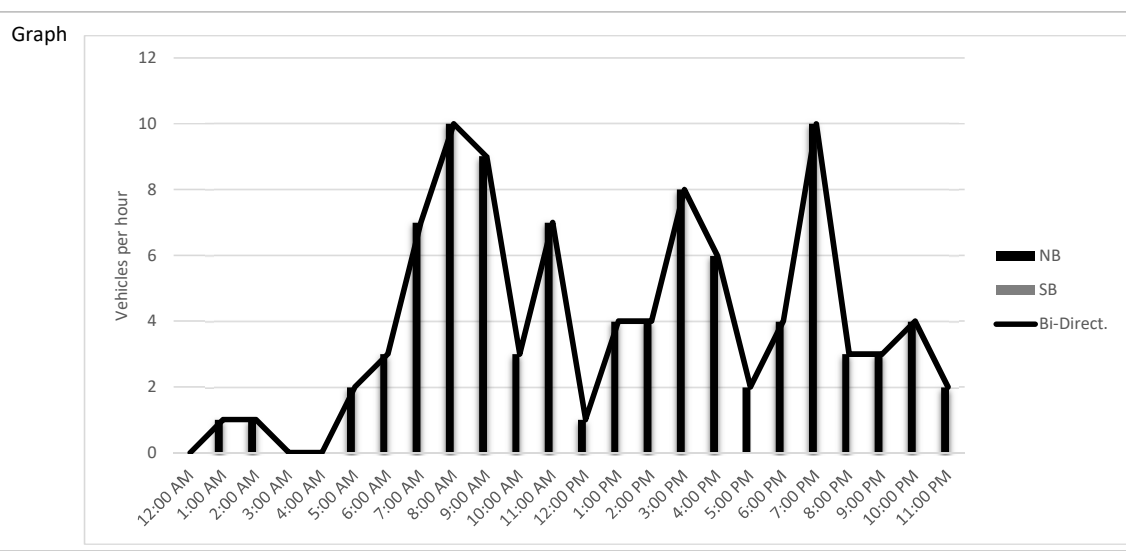
24-HOUR, BI-DIRECTIONAL VOLUME
94
 (WEEKDAY)

Villars Street

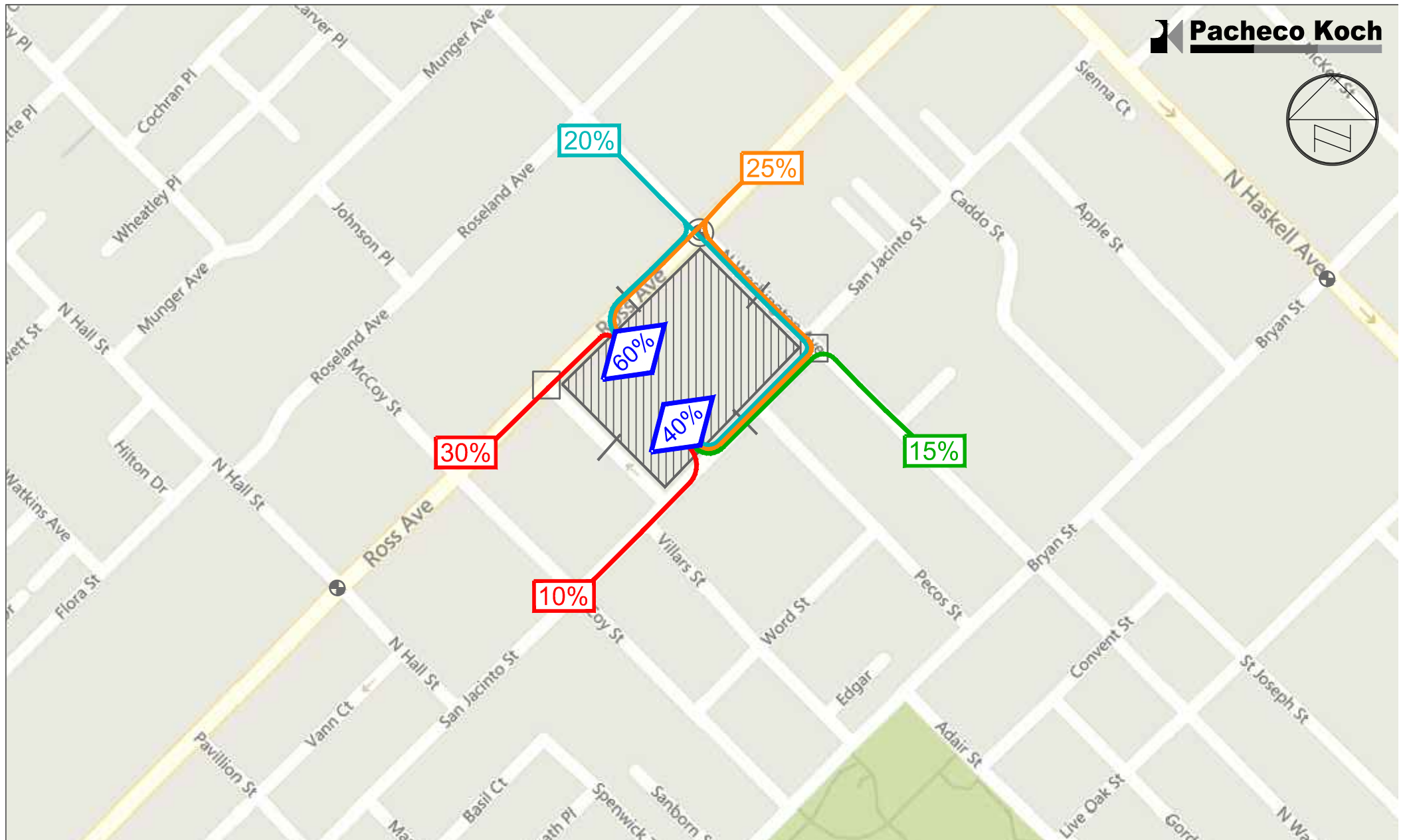
START TIME	Northbound				Southbound				Totals		
	0:00	0:15	0:30	0:45	0:00	0:15	0:30	0:45	NB	SB	Bi-Direct.
12:00 AM	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	1	0	0	0	0	1	0	1
2:00 AM	1	0	0	0	0	0	0	0	1	0	1
3:00 AM	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	1	0	0	1	0	0	0	0	2	0	2
6:00 AM	0	0	1	2	0	0	0	0	3	0	3
7:00 AM	2	2	1	2	0	0	0	0	7	0	7
8:00 AM	5	1	2	2	0	0	0	0	10	0	10
9:00 AM	3	2	2	2	0	0	0	0	9	0	9
10:00 AM	1	0	2	0	0	0	0	0	3	0	3
11:00 AM	1	2	1	3	0	0	0	0	7	0	7
12:00 PM	0	1	0	0	0	0	0	0	1	0	1
1:00 PM	2	0	2	0	0	0	0	0	4	0	4
2:00 PM	3	1	0	0	0	0	0	0	4	0	4
3:00 PM	2	1	1	4	0	0	0	0	8	0	8
4:00 PM	2	0	2	2	0	0	0	0	6	0	6
5:00 PM	0	0	2	0	0	0	0	0	2	0	2
6:00 PM	0	1	1	2	0	0	0	0	4	0	4
7:00 PM	2	3	2	3	0	0	0	0	10	0	10
8:00 PM	0	0	1	2	0	0	0	0	3	0	3
9:00 PM	1	0	1	1	0	0	0	0	3	0	3
10:00 PM	2	0	1	1	0	0	0	0	4	0	4
11:00 PM	0	0	1	1	0	0	0	0	2	0	2

	NB	SB	Bi-Direct.
24-Hour Total:	94	0	94
(Bi-Direct.) AM Peak Hour Total:	10	0	10
(Bi-Direct.) PM Peak Hour Total:	10	0	10
Highest By Direction (NB):	10		
Highest By Direction (SB):		0	

7:15 AM 8:15 AM
 7:00 PM 8:00 PM
 7:15 AM 8:15 AM
 11:00 PM 12:00 AM



Appendix C. Site-Generated Traffic Supplement

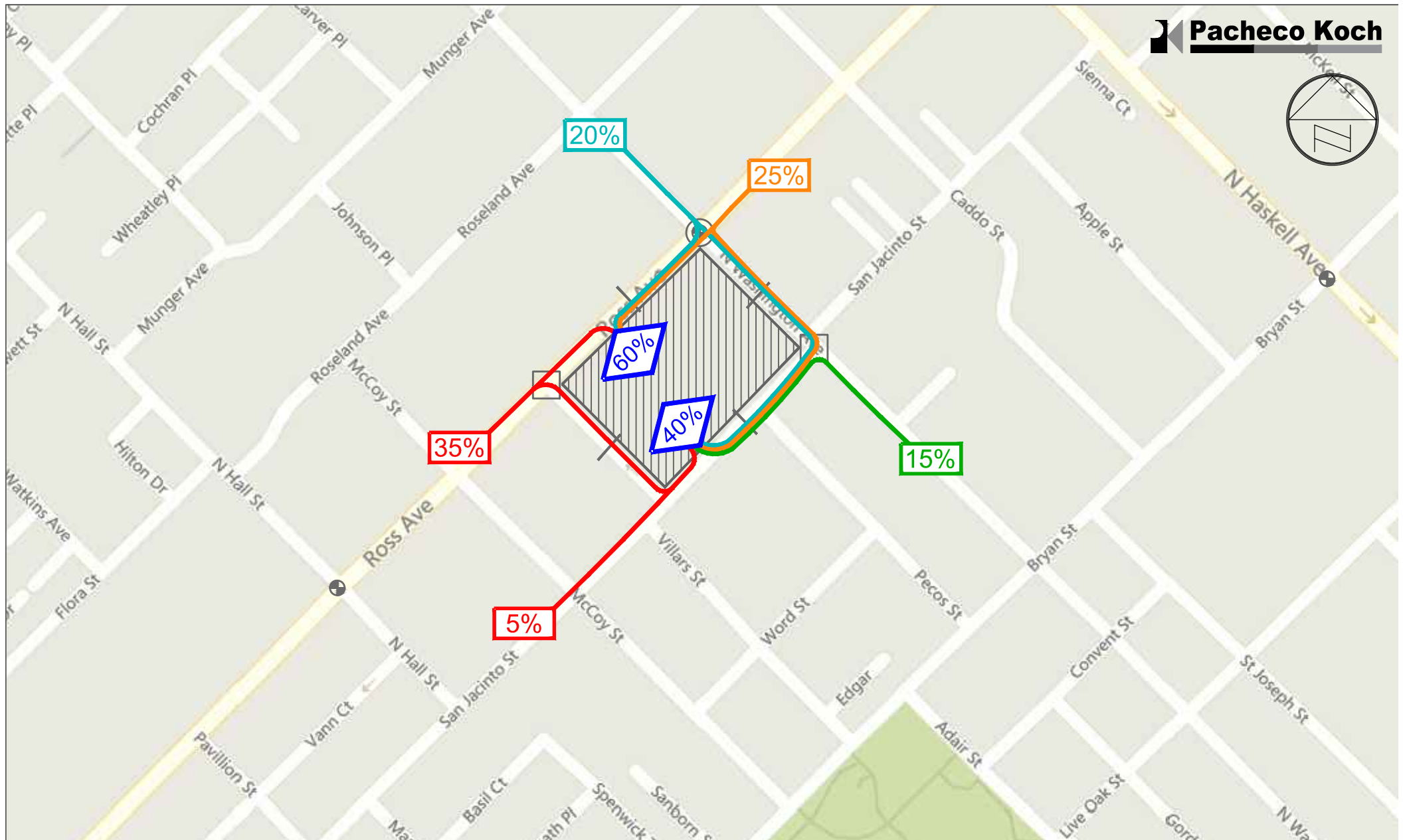


- Project Location
- Study Area Intersection (Signalized)
- Road-Tube Counts
- Traffic Signal
- Study Area Intersection (Unsignalized)
- Traffic Assignment

Site Generated Trip Distribution - Inbound

Ross-Washington Multifamily, Dallas, Texas

PK #2672-17.432 (HWL: 12/28/17)



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

Site Generated Trip Distribution - Outbound

Ross-Washington Multifamily, Dallas, Texas

PK #2672-17.432 (HWL: 12/28/17)

Detailed Land Use Data
 For 380 Dwelling Units of APT 1
 (220) Apartment

Project: 2672-17.432

Open Date: 11/10/2017
 Analysis Date: 11/10/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips Source : Trip Generation Manual 9th Edition	2426	0	6.65	1.27	12.5	3.07	210	50	50	True	$T = 6.06(X) + 123.56$	0.87
Weekday AM Peak Hour of Adjacent Street Traffic Source : Trip Generation Manual 9th Edition	190	0	0.51	0.1	1.02	0.73	235	20	80	True	$T = 0.49(X) + 3.73$	0.83
Weekday PM Peak Hour of Adjacent Street Traffic Source : Trip Generation Manual 9th Edition	227	0	0.62	0.1	1.64	0.82	233	65	35	True	$T = 0.55(X) + 17.65$	0.77

Trip Generation Summary

Alternative: Alternative 1

Phase:

Open Date: 11/10/2017

Project: 2672-17.432

Analysis Date: 11/10/2017

ITE	Land Use	Weekday Average Daily Trips			Weekday AM Peak Hour of Adjacent Street Traffic			Weekday PM Peak Hour of Adjacent Street Traffic					
		*	Enter	Exit	Total	*	Enter	Exit	Total	*	Enter	Exit	Total
220	APT 1 380 Dwelling Units		1213	1213	2426		38	152	190		148	79	227
Unadjusted Volume			1213	1213	2426		38	152	190		148	79	227
Internal Capture Trips			0	0	0		0	0	0		0	0	0
Pass-By Trips			0	0	0		0	0	0		0	0	0
Volume Added to Adjacent Streets			1213	1213	2426		38	152	190		148	79	227

Total Weekday Average Daily Trips Internal Capture = 0 Percent

Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2014, TRAFFICWARE, LLC

Appendix D. Detailed Intersection Capacity Analysis Results

1: N Washington Street & Ross Avenue
2672-17.432

Existing
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	11	483	220	32	1031	38	125	252	38	13	266	25
Future Volume (vph)	11	483	220	32	1031	38	125	252	38	13	266	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	11	498	227	33	1063	39	129	260	39	13	274	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	725	0	33	1102	0	129	299	0	13	300	0
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases		4			8			5		2		6
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	56.0	56.0		56.0	56.0		12.0	34.0		22.0	22.0	
Total Split (%)	62.2%	62.2%		62.2%	62.2%		13.3%	37.8%		24.4%	24.4%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	51.5	51.5		51.5	51.5		29.5	29.5		17.5	17.5	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.33	0.33		0.19	0.19	
v/c Ratio	0.05	0.36		0.09	0.55		0.54	0.50		0.06	0.83	
Control Delay	9.5	8.8		9.6	13.2		31.2	26.9		30.6	55.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.5	8.8		9.6	13.2		31.2	26.9		30.6	55.2	
LOS	A	A		A	B		C	C		C	E	
Approach Delay		8.8			13.1			28.2			54.2	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	3	85		8	189		53	131		6	163	
Queue Length 95th (ft)	11	120		22	243		96	209		22	#300	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	202	1988		354	2018		237	604		209	361	
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	0.05	0.36		0.09	0.55		0.54	0.50		0.06	0.83	

Intersection Summary

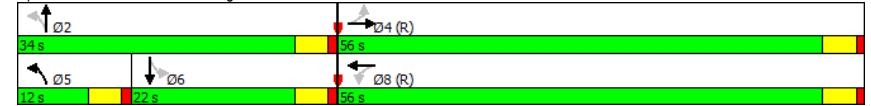
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 32 (36%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 19.3 Intersection LOS: B
 Intersection Capacity Utilization 63.4% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Existing
Timing Plan: AM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Existing
Timing Plan: AM

Intersection												
Int Delay, s/veh 1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔			↔			↔		
Traffic Vol, veh/h	7	0	15	1	7	13	22	391	10	10	474	9
Future Vol, veh/h	7	0	15	1	7	13	22	391	10	10	474	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	17	1	8	14	24	434	11	11	527	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1054	1048	532	1051	1048	440	537	0	0	446	0	0
Stage 1	554	554	-	489	489	-	-	-	-	-	-	-
Stage 2	500	494	-	562	559	-	-	-	-	-	-	-
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	204	228	547	205	228	617	1031	-	-	1114	-	-
Stage 1	517	514	-	561	549	-	-	-	-	-	-	-
Stage 2	553	546	-	512	511	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	187	218	547	192	218	617	1031	-	-	1114	-	-
Mov Cap-2 Maneuver	187	218	-	192	218	-	-	-	-	-	-	-
Stage 1	501	507	-	544	532	-	-	-	-	-	-	-
Stage 2	516	529	-	489	504	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.4			15.7			0.4			0.2		
HCM LOS	C			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1031	-	-	339	360	1114	-	-
HCM Lane V/C Ratio	0.024	-	-	0.072	0.065	0.01	-	-
HCM Control Delay (s)	8.6	0	-	16.4	15.7	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Existing
Timing Plan: AM

Intersection						
Int Delay, s/veh 2						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕		↕	↕↕	↕	
Traffic Vol, veh/h	483	220	0	1168	125	38
Future Vol, veh/h	483	220	0	1168	125	38
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	503	229	0	1217	130	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	732	0	1226	366
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	608	-
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	-	-	868	-	171	631
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	506	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	868	-	171	631
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	506	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0		24.6	
HCM LOS					C	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	350	-	-	868	-
HCM Lane V/C Ratio	0.485	-	-	-	-
HCM Control Delay (s)	24.6	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.5	-	-	0	-

1: N Washington Street & Ross Avenue
2672-17.432

Existing
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	38	1183	228	65	627	54	88	276	45	71	289	38
Future Volume (vph)	38	1183	228	65	627	54	88	276	45	71	289	38
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	39	1220	235	67	646	56	91	285	46	73	298	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	1455	0	67	702	0	91	331	0	73	337	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8			5			2	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	73.0	73.0		73.0	73.0		10.0	37.0		27.0	27.0	
Total Split (%)	66.4%	66.4%		66.4%	66.4%		9.1%	33.6%		24.5%	24.5%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	68.5	68.5		68.5	68.5		32.5	32.5		22.5	22.5	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.30	0.30		0.20	0.20	
v/c Ratio	0.10	0.67		0.52	0.32		0.58	0.61		0.39	0.89	
Control Delay	9.1	15.0		28.9	10.0		45.3	38.2		45.3	68.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.1	15.0		28.9	10.0		45.3	38.2		45.3	68.5	
LOS	A	B		C	B		D	D		D	E	
Approach Delay		14.8			11.7			39.8			64.4	
Approach LOS		B			B			D			E	
Queue Length 50th (ft)	10	316		24	111		48	196		45	230	
Queue Length 95th (ft)	25	391		85	143		#94	294		92	#397	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	406	2165		130	2183		156	543		185	378	
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	0.10	0.67		0.52	0.32		0.58	0.61		0.39	0.89	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Pretimed
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 24.0 Intersection LOS: C
 Intersection Capacity Utilization 81.5% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Existing
Timing Plan: PM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Existing
Timing Plan: PM

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	4	0	17	13	2	13	16	407	3	8	548	16
Future Vol, veh/h	4	0	17	13	2	13	16	407	3	8	548	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	18	14	2	14	17	442	3	9	596	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1109	1102	604	1110	1109	444	613	0	0	446	0	0
Stage 1	622	622	-	479	479	-	-	-	-	-	-	-
Stage 2	487	480	-	631	630	-	-	-	-	-	-	-
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	187	212	498	187	210	614	966	-	-	1114	-	-
Stage 1	474	479	-	568	555	-	-	-	-	-	-	-
Stage 2	562	554	-	469	475	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	176	205	498	175	203	614	966	-	-	1114	-	-
Mov Cap-2 Maneuver	176	205	-	175	203	-	-	-	-	-	-	-
Stage 1	463	473	-	555	542	-	-	-	-	-	-	-
Stage 2	534	541	-	446	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	20.3	0.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	369	266	1114	-	-
HCM Lane V/C Ratio	0.018	-	-	0.062	0.114	0.008	-	-
HCM Control Delay (s)	8.8	0	-	15.4	20.3	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.4	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Existing
Timing Plan: PM

Intersection						
Int Delay, s/veh	4.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	1183	228	65	627	88	45
Future Vol, veh/h	1183	228	65	627	88	45
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1245	240	68	660	93	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1485	0	1832	743
Stage 1	-	-	-	-	1365	-
Stage 2	-	-	-	-	467	-
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	-	-	449	-	~ 68	358
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	449	-	~ 58	358
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	507	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	64.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	189	-	-	449	-
HCM Lane V/C Ratio	0.741	-	-	0.152	-
HCM Control Delay (s)	64.5	-	-	14.5	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	4.8	-	-	0.5	-

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

1: N Washington Street & Ross Avenue
2672-17.432

Background
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	12	505	230	33	1078	40	131	264	40	14	278	26
Future Volume (vph)	12	505	230	33	1078	40	131	264	40	14	278	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	12	521	237	34	1111	41	135	272	41	14	287	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	758	0	34	1152	0	135	313	0	14	314	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8			5			2	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	56.0	56.0		56.0	56.0		12.0	34.0		22.0	22.0	
Total Split (%)	62.2%	62.2%		62.2%	62.2%		13.3%	37.8%		24.4%	24.4%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	51.5	51.5		51.5	51.5		29.5	29.5		17.5	17.5	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.33	0.33		0.19	0.19	
v/c Ratio	0.06	0.38		0.10	0.57		0.59	0.52		0.07	0.87	
Control Delay	9.8	9.0		9.8	13.5		33.3	27.5		30.8	60.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.8	9.0		9.8	13.5		33.3	27.5		30.8	60.0	
LOS	A	A		A	B		C	C		C	E	
Approach Delay		9.1			13.4			29.2			58.7	
Approach LOS		A			B			C			E	
Queue Length 50th (ft)	3	91		8	202		55	139		7	172	
Queue Length 95th (ft)	11	128		23	260		100	219		23	#319	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	185	1988		338	2018		230	604		206	361	
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	0.06	0.38		0.10	0.57		0.59	0.52		0.07	0.87	

Intersection Summary

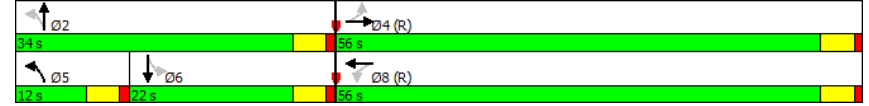
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 32 (36%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 20.2 Intersection LOS: C
 Intersection Capacity Utilization 65.8% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Background
Timing Plan: AM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Background
Timing Plan: AM

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔			↔			↔		
Traffic Vol, veh/h	7	0	16	1	7	14	23	409	10	10	496	9
Future Vol, veh/h	7	0	16	1	7	14	23	409	10	10	496	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	18	1	8	16	26	454	11	11	551	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1101	1095	556	1098	1094	460	561	0	0	466	0	0
Stage 1	578	578	-	511	511	-	-	-	-	-	-	-
Stage 2	523	517	-	587	583	-	-	-	-	-	-	-
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	189	214	531	190	214	601	1010	-	-	1095	-	-
Stage 1	501	501	-	545	537	-	-	-	-	-	-	-
Stage 2	537	534	-	496	499	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	172	203	531	177	203	601	1010	-	-	1095	-	-
Mov Cap-2 Maneuver	172	203	-	177	203	-	-	-	-	-	-	-
Stage 1	483	493	-	526	518	-	-	-	-	-	-	-
Stage 2	497	515	-	472	492	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	17			16.2			0.5			0.2		
HCM LOS	C			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1010	-	-	325	347	1095	-	-
HCM Lane V/C Ratio	0.025	-	-	0.079	0.07	0.01	-	-
HCM Control Delay (s)	8.7	0	-	17	16.2	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.2	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Background
Timing Plan: AM

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	505	230	0	1222	131	40
Future Vol, veh/h	505	230	0	1222	131	40
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	526	240	0	1273	136	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	766	0	1282	383
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	636	-
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	-	-	843	-	157	615
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	843	-	157	615
Mov Cap-2 Maneuver	-	-	-	-	294	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	489	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0		27.3	
HCM LOS					D	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	335	-	-	843	-
HCM Lane V/C Ratio	0.532	-	-	-	-
HCM Control Delay (s)	27.3	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	3	-	-	0	-

1: N Washington Street & Ross Avenue
2672-17.432

Background
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	40	1237	238	68	656	56	92	289	47	74	302	40
Future Volume (vph)	40	1237	238	68	656	56	92	289	47	74	302	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	41	1275	245	70	676	58	95	298	48	76	311	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1520	0	70	734	0	95	346	0	76	352	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8			5			2	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	73.0	73.0		73.0	73.0		10.0	37.0		27.0	27.0	
Total Split (%)	66.4%	66.4%		66.4%	66.4%		9.1%	33.6%		24.5%	24.5%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	68.5	68.5		68.5	68.5		32.5	32.5		22.5	22.5	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.30	0.30		0.20	0.20	
v/c Ratio	0.11	0.70		0.61	0.34		0.61	0.64		0.44	0.93	
Control Delay	9.2	15.7		40.3	10.2		47.1	39.2		47.5	75.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.2	15.7		40.3	10.2		47.1	39.2		47.5	75.1	
LOS	A	B		D	B		D	D		D	E	
Approach Delay		15.6			12.8			40.9			70.2	
Approach LOS		B			B			D			E	
Queue Length 50th (ft)	11	342		28	117		50	207		47	243	
Queue Length 95th (ft)	26	422		#113	152		#101	308		97	#422	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	389	2165		114	2183		156	543		173	378	
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	0.70		0.61	0.34		0.61	0.64		0.44	0.93	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Pretimed
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 25.6 Intersection LOS: C
 Intersection Capacity Utilization 84.4% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Background
Timing Plan: PM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Background
Timing Plan: PM

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔			↔			↔		
Traffic Vol, veh/h	4	0	18	14	2	14	17	426	3	8	573	17
Future Vol, veh/h	4	0	18	14	2	14	17	426	3	8	573	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	20	15	2	15	18	463	3	9	623	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1159	1152	632	1161	1161	465	641	0	0	466	0	0
Stage 1	649	649	-	502	502	-	-	-	-	-	-	-
Stage 2	510	503	-	659	659	-	-	-	-	-	-	-
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	173	198	480	172	195	597	943	-	-	1095	-	-
Stage 1	458	466	-	552	542	-	-	-	-	-	-	-
Stage 2	546	541	-	453	461	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	162	190	480	160	187	597	943	-	-	1095	-	-
Mov Cap-2 Maneuver	162	190	-	160	187	-	-	-	-	-	-	-
Stage 1	446	460	-	538	528	-	-	-	-	-	-	-
Stage 2	516	527	-	429	455	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	15.9			21.8			0.3			0.1		
HCM LOS	C			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	354	247	1095	-	-
HCM Lane V/C Ratio	0.02	-	-	0.068	0.132	0.008	-	-
HCM Control Delay (s)	8.9	0	-	15.9	21.8	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.4	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Background
Timing Plan: PM

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↓	↑↑	↓	
Traffic Vol, veh/h	1237	238	68	656	92	47
Future Vol, veh/h	1237	238	68	656	92	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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1302	251	72	691	97	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1553	0	1915	776
Stage 1	-	-	-	-	1427	-
Stage 2	-	-	-	-	488	-
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	-	-	422	-	~ 59	340
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	422	-	~ 49	340
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	484	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		1.4		84.1	
HCM LOS					F	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	175	-	-	422	-
HCM Lane V/C Ratio	0.836	-	-	0.17	-
HCM Control Delay (s)	84.1	-	-	15.3	-
HCM Lane LOS	F	-	-	C	-
HCM 95th %tile Q(veh)	5.8	-	-	0.6	-

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

1: N Washington Street & Ross Avenue
2672-17.432

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)	27	536	230	35	1086	40	169	279	47	14	282	30
Future Volume (vph)	27	536	230	35	1086	40	169	279	47	14	282	30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	553	237	36	1120	41	174	288	48	14	291	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	790	0	36	1161	0	174	336	0	14	322	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	56.0	56.0		56.0	56.0		12.0	34.0		22.0	22.0	
Total Split (%)	62.2%	62.2%		62.2%	62.2%		13.3%	37.8%		24.4%	24.4%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	51.5	51.5		51.5	51.5		29.5	29.5		17.5	17.5	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.33	0.33		0.19	0.19	
v/c Ratio	0.15	0.40		0.11	0.58		0.76	0.56		0.07	0.89	
Control Delay	11.6	9.5		9.9	13.6		45.8	28.3		30.8	63.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.6	9.5		9.9	13.6		45.8	28.3		30.8	63.2	
LOS	B	A		A	B		D	C		C	E	
Approach Delay		9.5			13.5			34.3			61.8	
Approach LOS		A			B			C			E	
Queue Length 50th (ft)	7	100		9	204		73	151		7	177	
Queue Length 95th (ft)	22	138		24	263		#145	237		23	#332	
Internal Link Dist (ft)		188			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	183	1987		323	2018		230	604		202	361	
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	0.15	0.40		0.11	0.58		0.76	0.56		0.07	0.89	

Intersection Summary

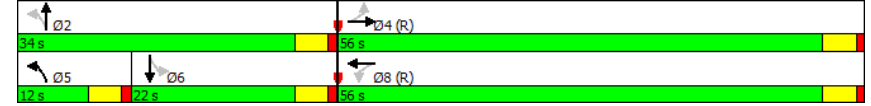
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 32 (36%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 21.8 Intersection LOS: C
 Intersection Capacity Utilization 68.6% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: AM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Background Plus Site Generated
Timing Plan: AM

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	38	1	7	14	29	409	10	10	496	15
Future Vol, veh/h	30	0	38	1	7	14	29	409	10	10	496	15
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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	0	42	1	8	16	32	454	11	11	551	17

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	1118	1112	559	1127
Stage 1	582	582	-	524
Stage 2	536	530	-	603
Critical Hdwy	7.12	6.52	6.22	7.12
Critical Hdwy Stg 1	6.12	5.52	-	6.12
Critical Hdwy Stg 2	6.12	5.52	-	6.12
Follow-up Hdwy	3.518	4.018	3.318	3.518
Pot Cap-1 Maneuver	184	209	529	182
Stage 1	499	499	-	537
Stage 2	529	527	-	486
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	166	197	529	160
Mov Cap-2 Maneuver	166	197	-	160
Stage 1	478	492	-	514
Stage 2	486	504	-	441

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	16.5	0.6	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1004	-	-	269	337	1095	-	-
HCM Lane V/C Ratio	0.032	-	-	0.281	0.073	0.01	-	-
HCM Control Delay (s)	8.7	0	-	23.5	16.5	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.2	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: AM

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	517	230	0	1267	138	40
Future Vol, veh/h	517	230	0	1267	138	40
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	539	240	0	1320	144	42

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	778
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	-	-	834
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	834
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	30
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	324	-	-	834	-
HCM Lane V/C Ratio	0.572	-	-	-	-
HCM Control Delay (s)	30	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	3.4	-	-	0	-

5: San Jacinto Street & Site Driveway 2
2672-17.432

Background Plus Site Generated
Timing Plan: AM

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	4	23	28	11	46	15
Future Vol, veh/h	4	23	28	11	46	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	25	30	12	50	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	42	0	0	70	36
Stage 1	-	-	-	36	-
Stage 2	-	-	-	34	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1567	-	-	934	1037
Stage 1	-	-	-	986	-
Stage 2	-	-	-	988	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1567	-	-	931	1037
Mov Cap-2 Maneuver	-	-	-	931	-
Stage 1	-	-	-	986	-
Stage 2	-	-	-	985	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1567	-	-	-	955
HCM Lane V/C Ratio	0.003	-	-	-	0.069
HCM Control Delay (s)	7.3	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

7: Site Driveway 1 & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	747	11	11	1235	46	46
Future Vol, veh/h	747	11	11	1235	46	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	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	812	12	12	1342	50	50

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	824	0	1513
Stage 1	-	-	-	818	-
Stage 2	-	-	-	695	-
Critical Hdwy	-	-	4.14	-	6.84
Critical Hdwy Stg 1	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52
Pot Cap-1 Maneuver	-	-	802	-	111
Stage 1	-	-	-	394	-
Stage 2	-	-	-	456	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	802	-	109
Mov Cap-2 Maneuver	-	-	-	241	-
Stage 1	-	-	-	394	-
Stage 2	-	-	-	449	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	342	-	-	802	-
HCM Lane V/C Ratio	0.292	-	-	0.015	-
HCM Control Delay (s)	19.8	-	-	9.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.2	-	-	0	-

1: N Washington Street & Ross Avenue
2672-17.432

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)	40	1241	246	105	656	56	112	304	63	74	332	40
Future Volume (vph)	40	1241	246	105	656	56	112	304	63	74	332	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	41	1279	254	108	676	58	115	313	65	76	342	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1533	0	108	734	0	115	378	0	76	383	0
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	NA	
Protected Phases		4			8			5	2			6
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	73.0	73.0		73.0	73.0		10.0	37.0		27.0	27.0	
Total Split (%)	66.4%	66.4%		66.4%	66.4%		9.1%	33.6%		24.5%	24.5%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	68.5	68.5		68.5	68.5		32.5	32.5		22.5	22.5	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.30	0.30		0.20	0.20	
v/c Ratio	0.11	0.71		0.97	0.34		0.74	0.70		0.51	1.01	
Control Delay	9.2	15.9		104.6	10.2		58.8	41.3		52.4	93.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.2	15.9		104.6	10.2		58.8	41.3		52.4	93.4	
LOS	A	B		F	B		E	D		D	F	
Approach Delay		15.7			22.3			45.4			86.6	
Approach LOS		B			C			D			F	
Queue Length 50th (ft)	11	347		67	117		61	230		48	-274	
Queue Length 95th (ft)	26	428		#112	152		#119	340		100	#473	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	389	2164		111	2183		156	543		149	378	
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	0.71		0.97	0.34		0.74	0.70		0.51	1.01	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Pretimed
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 31.4 Intersection LOS: C
 Intersection Capacity Utilization 89.1% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.

1: N Washington Street & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: PM

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: N Washington Street & Ross Avenue



2: N Washington Street & San Jacinto Street
2672-17.432

Background Plus Site Generated
Timing Plan: PM

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	0	30	14	2	14	39	426	3	8	573	39
Future Vol, veh/h	16	0	30	14	2	14	39	426	3	8	573	39
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	17	0	33	15	2	15	42	463	3	9	623	42

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	1219	1212	644	1227
Stage 1	661	661	-	549
Stage 2	558	551	-	678
Critical Hdwy	7.12	6.52	6.22	7.12
Critical Hdwy Stg 1	6.12	5.52	-	6.12
Critical Hdwy Stg 2	6.12	5.52	-	6.12
Follow-up Hdwy	3.518	4.018	3.318	3.518
Pot Cap-1 Maneuver	157	182	473	155
Stage 1	452	460	-	520
Stage 2	514	515	-	442
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	143	169	473	136
Mov Cap-2 Maneuver	143	169	-	136
Stage 1	424	454	-	488
Stage 2	468	484	-	406

Approach	EB	WB	NB	SB
HCM Control Delay, s	22	24.6	0.8	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	262	216	1095	-	-
HCM Lane V/C Ratio	0.046	-	-	0.191	0.151	0.008	-	-
HCM Control Delay (s)	9.1	0	-	22	24.6	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.5	0	-	-

3: Villars Street & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: PM

Intersection						
Int Delay, s/veh	6.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	1282	238	68	680	96	47
Future Vol, veh/h	1282	238	68	680	96	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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1349	251	72	716	101	49

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1600
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	-	-	405
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	405
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	103.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	165	-	-	405	-
HCM Lane V/C Ratio	0.912	-	-	0.177	-
HCM Control Delay (s)	103.8	-	-	15.8	-
HCM Lane LOS	F	-	-	C	-
HCM 95th %tile Q(veh)	6.7	-	-	0.6	-

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

5: San Jacinto Street & Site Driveway 2
2672-17.432

Background Plus Site Generated
Timing Plan: PM

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	15	22	14	44	24	8
Future Vol, veh/h	15	22	14	44	24	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	24	15	48	26	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	63	0	0	96	39
Stage 1	-	-	-	39	-
Stage 2	-	-	-	57	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1540	-	-	903	1033
Stage 1	-	-	-	983	-
Stage 2	-	-	-	966	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1540	-	-	893	1033
Mov Cap-2 Maneuver	-	-	-	893	-
Stage 1	-	-	-	983	-
Stage 2	-	-	-	955	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1540	-	-	-	924
HCM Lane V/C Ratio	0.011	-	-	-	0.038
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

7: Site Driveway 1 & Ross Avenue
2672-17.432

Background Plus Site Generated
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕		↕	↕	↕
Traffic Vol, veh/h	1516	44	44	788	24	24
Future Vol, veh/h	1516	44	44	788	24	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	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	1648	48	48	857	26	26

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	1696	0	2196 848
Stage 1	-	-	-	-	1672 -
Stage 2	-	-	-	-	524 -
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	-	-	372	-	38 305
Stage 1	-	-	-	-	138 -
Stage 2	-	-	-	-	559 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	372	-	33 305
Mov Cap-2 Maneuver	-	-	-	-	108 -
Stage 1	-	-	-	-	138 -
Stage 2	-	-	-	-	487 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	38
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	160	-	-	372	-
HCM Lane V/C Ratio	0.326	-	-	0.129	-
HCM Control Delay (s)	38	-	-	16.1	-
HCM Lane LOS	E	-	-	C	-
HCM 95th %tile Q(veh)	1.3	-	-	0.4	-

1: N Washington Street & Ross Avenue
2672-17.432

Horizon
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	27	561	242	37	1141	42	175	292	49	14	296	31
Future Volume (vph)	27	561	242	37	1141	42	175	292	49	14	296	31
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	578	249	38	1176	43	180	301	51	14	305	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	827	0	38	1219	0	180	352	0	14	337	0
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	56.0	56.0		56.0	56.0		12.0	34.0		22.0	22.0	
Total Split (%)	62.2%	62.2%		62.2%	62.2%		13.3%	37.8%		24.4%	24.4%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	51.5	51.5		51.5	51.5		29.5	29.5		17.5	17.5	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.33	0.33		0.19	0.19	
v/c Ratio	0.17	0.42		0.12	0.60		0.78	0.58		0.07	0.93	
Control Delay	12.3	9.7		10.2	14.1		48.6	29.1		30.9	70.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.3	9.7		10.2	14.1		48.6	29.1		30.9	70.3	
LOS	B	A		B	B		D	C		C	E	
Approach Delay		9.8			14.0			35.7			68.7	
Approach LOS		A			B			D			E	
Queue Length 50th (ft)	7	106		9	220		76	160		7	188	
Queue Length 95th (ft)	23	146		25	283		#155	250		23	#352	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	165	1987		307	2018		230	603		199	361	
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	0.17	0.42		0.12	0.60		0.78	0.58		0.07	0.93	

Intersection Summary

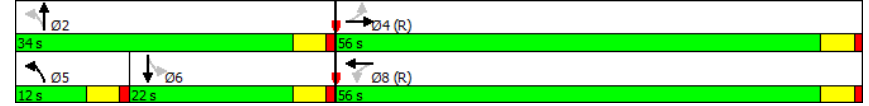
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 32 (36%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 23.1 Intersection LOS: C
 Intersection Capacity Utilization 71.3% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

1: N Washington Street & Ross Avenue
2672-17.432

Horizon
Timing Plan: AM

Queue shown is maximum after two cycles.

Splits and Phases: 1: N Washington Street & Ross Avenue



1: N Washington Street & Ross Avenue
2672-17.432

Horizon
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	50	1316	251	79	719	59	116	311	53	78	332	56
Future Volume (vph)	50	1316	251	79	719	59	116	311	53	78	332	56
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	1357	259	81	741	61	120	321	55	80	342	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	1616	0	81	802	0	120	376	0	80	400	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8			5		2		6
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	73.0	73.0		73.0	73.0		10.0	37.0		27.0	27.0	
Total Split (%)	66.4%	66.4%		66.4%	66.4%		9.1%	33.6%		24.5%	24.5%	
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	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Act Effect Green (s)	68.5	68.5		68.5	68.5		32.5	32.5		22.5	22.5	
Actuated g/C Ratio	0.62	0.62		0.62	0.62		0.30	0.30		0.20	0.20	
v/c Ratio	0.15	0.75		0.86	0.37		0.77	0.69		0.53	1.06	
Control Delay	9.9	17.0		85.4	10.5		62.7	41.4		53.6	104.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.9	17.0		85.4	10.5		62.7	41.4		53.6	104.6	
LOS	A	B		F	B		E	D		D	F	
Approach Delay		16.8			17.4			46.5			96.1	
Approach LOS		B			B			D			F	
Queue Length 50th (ft)	14	383		43	132		64	230		51	-307	
Queue Length 95th (ft)	33	473		#150	168		#130	338		105	#501	
Internal Link Dist (ft)		457			116			141			103	
Turn Bay Length (ft)	100			100			70			80		
Base Capacity (vph)	356	2165		94	2185		156	543		150	378	
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	0.15	0.75		0.86	0.37		0.77	0.69		0.53	1.06	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Pretimed
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 31.9 Intersection LOS: C
 Intersection Capacity Utilization 91.1% ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.

1: N Washington Street & Ross Avenue
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Horizon
Timing Plan: PM

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: N Washington Street & Ross Avenue



Appendix E. Parking Analysis



7557 Rambler Road, Suite 1400
 Dallas, Texas 75231-2388
 (972) 235-3031 www.pkce.com
 TX. REG: ENGINEERING FIRM F-14439
 TX. REG. SURVEYING FIRM LS-10193805-00

MEMORANDUM

Subject: Proposed Multifamily Development at South Corner of Ross Avenue and N. Washington Avenue Intersection – Code Parking Analysis
PK #2672-17.432

Parking Analysis

PROPOSE USE: 'Multifamily'

EXISTING ZONING: PD 298—The Bryan Place Special Purpose District, Subarea 1A

REQUIRED PARKING: per Section 51P-298.115 → see Division 51A, except as modified under (a)(1)-(6), per 51A-4.209(b)(5)(C): **One (1) space per bedroom with a minimum of one space per dwelling unit. An additional one-quarter space per dwelling unit must be provided for guest parking if the required parking is restricted to resident parking only. No additional parking is required for accessory uses that are limited principally to residents.**

UNIT SUMMARY	NUMBER OF UNITS*	TOTAL BEDROOMS
1-bedroom units	277	277
2-bedroom units	88	176
3-bedroom units	0	0
Total Units	365	453

** Based upon development program provided by Architecture Demarest, dated 11/01/2017.*

453 bedrooms @ 1 space per bedroom + ¼ space per unit

= 453 resident spaces + 95 guest spaces

= 548 total spaces

PARKING PROVIDED: TBD spaces

CODE SURPLUS/(DEFICIT): TBD spaces