Volume 1 – Traffic Impact Analysis

Pepper Square Redevelopment
Dallas, Texas

Third Updated Submission: March 21, 2024
Second Updated Submission: November 8, 2023
First Updated Submission: September 9, 2022
Original Submission: August 18, 2021

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Dallas, Texas

Project #063928006
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Kimley»Horn

Traffic Impact Analysis

Pepper Square Redevelopment
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EXECUTIVE SUMMARY

March 2024 Update Note: To address comments provided by the City of Dallas, this TIA has been updated to include peak hour link analysis, a crash analysis for the intersection of Belt Line Road and Preston Road, and a theoretical discussion of the effects of removing a driveway along Preston Road.

November 2023 Update Note: This TIA has been updated to match a reduced site plan and to add the Alexis Tonti background development to the background traffic. The southern areas of the site, along Alexis Drive, are no longer included in the site plan.

The proposed Pepper Square Redevelopment is located south of Belt Line Road and east of Preston Road in Dallas, Texas. The site is proposed to be built in three separate phases. At buildout, the proposed building plan was modeled in this analysis with 350 mid-rise multifamily apartment units, 1,200 high-rise multifamily apartment units, 30,000 SF of retail uses, and 37,000 SF of high-turnover restaurant uses. The redevelopment also includes renovating and rejuvenating a considerable amount of the existing Pepper Square retail area. Since the buildings themselves are already there, these renovations are not technically new developments, but they are either unused or underutilized today. The intention of the Pepper Square Redevelopment is to revitalize a well-positioned commercial area, so these renovated developments are included in the trip generation for the site. It was observed that these retail areas were generating very low amounts of traffic, so there was no attempt to remove their trip generation from the proposed trip generation for the Pepper Square Redevelopment. It was conservatively assumed that the removed retail was not generating any trips and that the renovated retail will generate new trips.

This study is intended to identify traffic generation characteristics, identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts.

The proposed changes to the existing Pepper Square site will be referred to as the “Pepper Square Redevelopment”, and the existing site will be referred to as the “Pepper Square Existing Site”.

The following existing intersections were selected to be part of this study:

- Belt Line Road at Preston Road (SH 289)
- Preston Road at Arapaho Road
- Preston Road at Belt Line Village Driveway
- Preston Road at Alexis Drive
- Preston Road at Spring Valley Road
- Belt Line Road at Prestonwood Boulevard
- Belt Line Road at median opening east of Preston Road
- Belt Line Road at Berry Trail

- Belt Line Road at median opening between Berry Trail and Alexis Drive
- Belt Line Road at Alexis Drive
- Belt Line Road at Meadowcreek Drive
- Preston Road at Pepper Square Driveway

The development is not adding any access points to the Pepper Square existing site. The analysis included the following existing minor driveways having access in and out of the site:

- Drive 1, which is a right-in/right-out driveway (RIRO) to Preston Road between Alexis Drive and the Pepper Square Driveway.
- Drive 2, which is a RIRO driveway to Preston Road between the Pepper Square Driveway and the Belt Line Village Driveway.
- Drive 3, which is a RIRO driveway to Preston Road between the Belt Line Village Driveway and Belt Line Road.
- Drive 4, which is a RIRO driveway to Preston Road between the Belt Line Village Driveway and Belt Line Road north of Drive 3.
- Drive 5, which is a RIRO driveway to Belt Line Road just east of Preston Road.
- Drive 6, which is a RIRO driveway just west of Berry Trail.
- Drive 7, which is a RIRO driveway just east of Berry Trail. Drive 7 will be removed with Phase 1 of the development.

Traffic operations were analyzed at the study intersections for existing volumes, 2026 (Phase 1), 2028 (Phase P), and 2033 (Phase N) background traffic volumes, and 2026 (Phase 1), 2028 (Phase P), and 2033 (Phase N) background plus site-generated traffic volumes. Conditions were analyzed for the weekday AM and PM peak hours.

The background traffic conditions included existing traffic with compound growth rates, plus explicit modeling of the following development in the vicinity:

- TerraCap Multi-Family Residential Redevelopment Project, a development consisting of 912 mid-rise multifamily units, 1,120 high-rise multifamily units, 16,000 SF shopping center, and 16,000 SF restaurant, located north of Belt Line Road and west of Preston Road in Dallas, Texas. Halff Engineering performed a TIA for this site, dated May 11, 2022, which was provided by the City of Dallas for this report. The TerraCap development will replace 353 existing low-rise multifamily units, so the trips generated from these units were deducted from the proposed TerraCap trip generation. The development is expected to be built out in three phases, spaced out to be completed every other year until the final completion year of 2033. The site was assumed to be 20% complete by 2026, 40% complete by 2028, and 100% complete by 2033. The total site traffic was factored down by these percentages for the specific study years for each of the traffic scenarios of this report.
- Alexis Tonti Residential Development, a development consisting of 1,268 mid-rise multifamily units, located south of Alexis Drive and east of Preston Road in Dallas, Texas. A formal TIA has not been prepared for the development. Spiars Engineering has provided a site plan and the site details. The development is expected to be built in

4 phases. The first phase is assumed to open in 2025, and the phases are assumed to be spaced out every two years, for a final completion of 2031. In 2026, Phase 1 will be complete; in 2028, Phases 1 and 2 will be complete; by 2033, all four phases will be complete.

The Pepper Square Redevelopment is expected to generate approximately 757 new weekday AM peak hour one-way vehicle trips and 588 new weekday PM peak hour one-way vehicle trips at buildout. The distribution of the site-generated traffic volumes onto the street system was based on the surrounding roadway network, existing traffic patterns, and the project's proposed access locations.

By right, the Pepper Square site could be developed with approximately 400,000 SF of retail, 75,000 SF of supermarket, and 275,000 SF of restaurant, which would lead to over 40,000 daily trips, nearly 3,200 AM peak hour trips, and over 2,400 PM peak hour trips. The proposed site generates 76% fewer daily, AM peak hour, and PM peak hour trips. A full lease-up of the existing Pepper Square businesses would generate approximately half of the full by-right trips, so the proposed Pepper Square redevelopment generates approximately 50% fewer trips than the existing site would generate if fully leased. The proposed redevelopment plan significantly reduces the by-right trip generation for the Pepper Square site.

The intersection of Belt Line Road and Preston Road recorded 75,464 daily vehicles. The Pepper Square redevelopment is projected to send 42.5% of its daily traffic through the intersection, which amounts to just under 4,300 daily vehicles, an increase of less than 6% of the current traffic at the intersection after the buildout of the site.

Based on the analysis presented in this report, the proposed Pepper Square Redevelopment can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development.

The following improvements to the external roadway network are required for the site:

- Signalize the intersection of Berry Trail and Belt Line Road. According to a traffic signal warrant analysis performed by the City of Dallas, the intersection meets traffic signal warrants with existing traffic. This was confirmed with the traffic counts collected for this report.
- Construct the westbound approach of the Belt Line Village Driveway to Preston Road as a two-lane approach. This improvement is recommended to coincide with the opening of Phase P of the redevelopment, the western portion of the site.
- Construct a right-turn deceleration lane for the northbound right-turning movement from Preston Road to the Belt Line Village Driveway. This is recommended only at the opening of Phase N and is not required for Phase 1 or P.
- Construct a right-turn deceleration lane for the northbound right-turning movement from Preston Road to the Pepper Square Driveway. This is recommended only at the opening of Phase P and is not required for Phase 1.

I. INTRODUCTION

A. Purpose

Kimley-Horn was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the redevelopment of the Pepper Square existing site located in Dallas, Texas. A site vicinity map is provided as **Exhibit 1**. **Exhibit 2** shows the proposed conceptual site plan. This study is intended to identify traffic generation characteristics and identify potential traffic related impacts on the local street system.

B. Methodology

Traffic operations were analyzed at the study intersections for AM and PM peak hours for the following scenarios:

- 2022 existing traffic
- 2026 background traffic
- 2026 background plus Phase 1 site traffic
- 2028 background traffic
- 2028 background plus Phase 1 and P site traffic
- 2033 background traffic
- 2033 background plus Phase 1, P and N site traffic

The capacity analyses were conducted using the *Synchro*™ software package and its associated *Intersection* reports for signalized intersections and *Highway Capacity Manual* reports for unsignalized intersections.

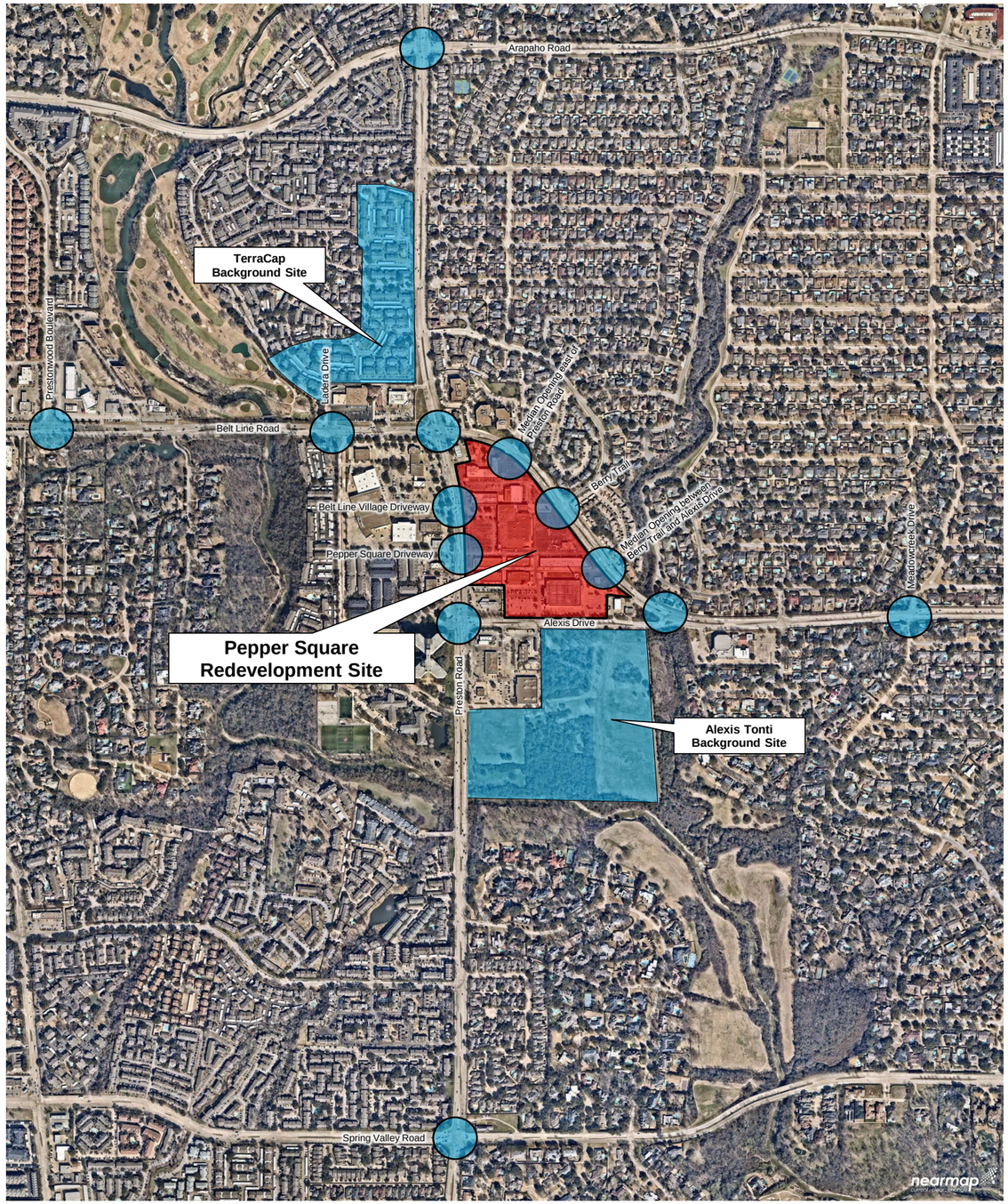

EXHIBIT 1

Vicinity Map

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:

= Study Intersection

North

Not To Scale

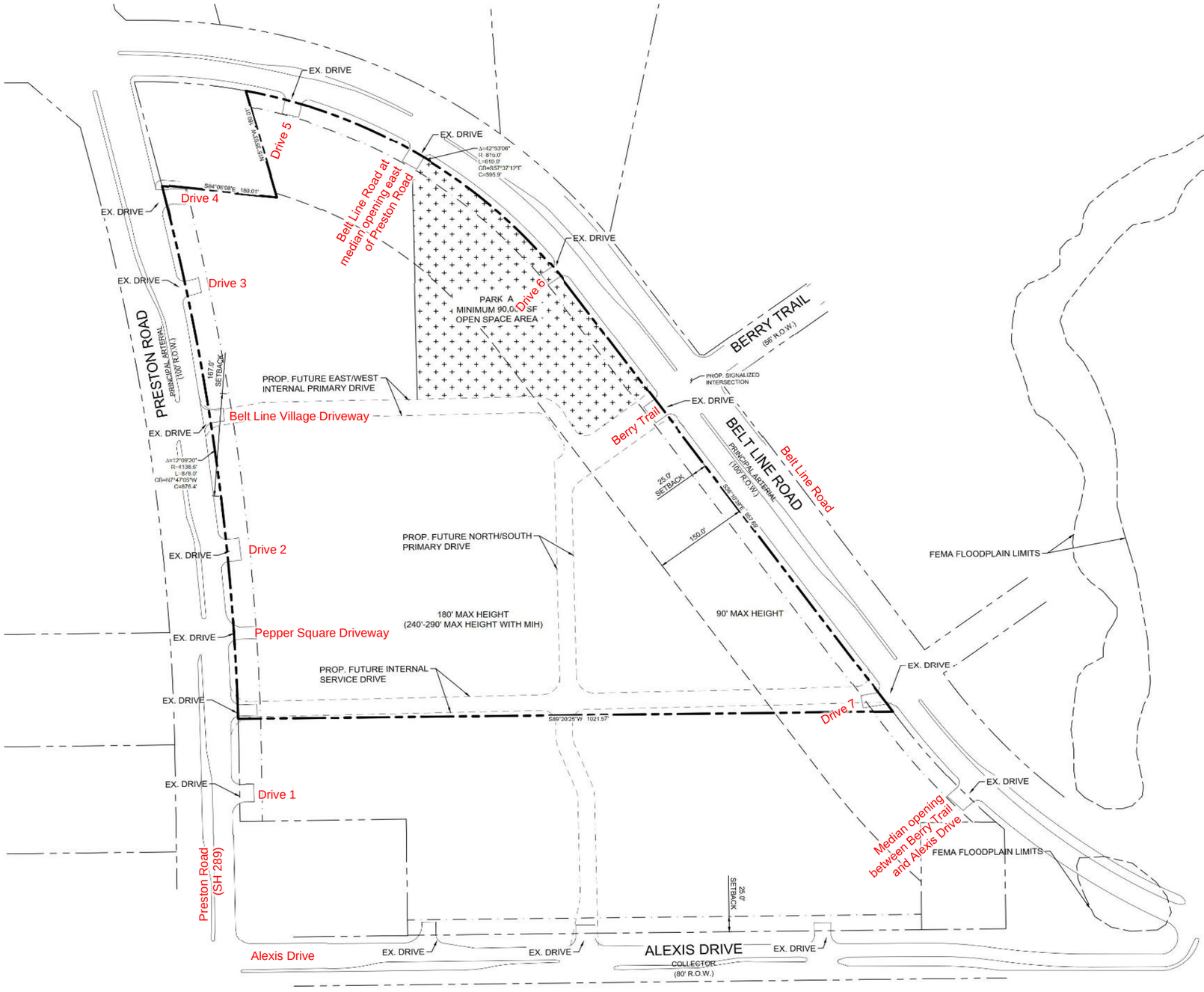

EXHIBIT 2

Conceptual Site Plan

Pepper Square - Dallas, Texas

Kimley»Horn

North

Not To Scale

II. EXISTING AND FUTURE AREA CONDITIONS

A. Roadway Characteristics

The following signalized intersections were evaluated as part of this study:

- Belt Line Road at Preston Road (SH 289)
- Preston Road at Arapaho Road
- Preston Road at Belt Line Village Driveway
- Preston Road at Alexis Drive
- Preston Road at Spring Valley Road
- Belt Line Road at Prestonwood Boulevard

The following unsignalized intersections were evaluated as part of this study:

- Belt Line Road at median opening east of Preston Road
- Belt Line Road at Berry Trail
- Belt Line Road at median opening between Berry Trail and Alexis Drive
- Belt Line Road at Alexis Drive
- Belt Line Road at Meadowcreek Drive
- Preston Road at Pepper Square Driveway
- The seven existing Pepper Square driveways to Preston Road and Belt Line Road

The major study area roadways are described below.

Preston Road – is a six-lane divided arterial and is a TxDOT facility (SH 289). Preston Road runs north/south through the City of Dallas. Per the City of Dallas Thoroughfare Plan, Preston Road is considered a principal arterial with a M-6-D(A) roadway classification. Preston Road has been constructed to its full thoroughfare potential. There are numerous median openings on Preston Road for driveway access to large commercial and industrial land uses as well as residential developments within the study area. The posted speed limit near the proposed redevelopment is 45 MPH.

Belt Line Road – is a six-lane divided arterial that runs east/west through the City of Dallas. Per the City of Dallas Thoroughfare Plan, Belt Line Road is considered a principal arterial with a M-6-D(A) roadway classification. Like Preston Road, Belt Line Road has been constructed to its full thoroughfare potential. There are numerous median openings on Belt Line Road for driveway access to large commercial and industrial land uses as well as residential developments within the study area. The posted speed limit near the proposed redevelopment is 40 MPH.

B. Existing Study Area

Currently, the Pepper Square existing site is zoned for Community Retail (CR). However, the area is being rezoned to Mixed-Use 3 (MU-3) which allows for multifamily residential

uses to be places into the existing commercial area. The Pepper Square existing site currently contains commercial and retail developments as well as restaurants.

C. Planned Area Developments by Others

Currently, there is a proposed redevelopment project for the existing multifamily residential complex located on the west side of Preston Road, between Belt Line Road and Arapaho Road. TerraCap Management Inc. will be redeveloping the site with new mid-rise and high-rise multifamily buildings, restaurants, and retail. For purposes of this TIA, the redevelopment site has been referred to as the TerraCap development. The Alexis Tonti development is located south of Alexis Drive and east of Preston Road and includes mid-rise multifamily buildings.

The traffic included for these developments is described later in this report in **Table 5** and **Table 6**.

D. Proposed Site Improvements

The development as proposed includes, at full buildout, 350 mid-rise multifamily apartment units, 1,200 high-rise multifamily apartment units, 30,000 SF of retail uses, and 37,000 SF of high-turnover restaurant uses. The development is located south of Belt Line Road and east of Preston Road. The redevelopment also includes renovating and rejuvenating a considerable amount of the existing Pepper Square retail area. Since the buildings themselves are already there, these renovations are not technically new developments, but they are either unused or underutilized today.

As shown in the lane assignment exhibits (**Exhibit 3** - **Exhibit 5)**, the Redevelopment will utilize existing driveways to the Pepper Square existing site. With the proposed Redevelopment, Drive 7 will be removed. The major site driveways, those located at median openings, in this analysis are as follows:

Pepper Square Driveway – is an existing full-access driveway that provides access from Preston Road to the Pepper Square Redevelopment north of Alexis Drive. The driveway currently has one inbound and one outbound lane.

Belt Line Village Driveway – is an existing, signalized, full-access driveway which provides access to Preston Road. The driveway currently has one inbound and one outbound lane. An extra outbound lane will be added with the Redevelopment.

Berry Trail – is an existing, full-access driveway to Belt Line Road. The redevelopment would modify the existing driveway by extending Berry Trail further south within the site. The driveway currently has one inbound and one outbound lane. An extra outbound lane will be added with the Redevelopment. The intersection of Berry Trail and Belt Line Road meets traffic signal volume warrants with existing traffic and will be signalized with the development of the site.

Median Opening Drive between Berry Trail and Alexis Drive – is an existing full-access driveway to the median opening. The driveway was modeled with one inbound and one outbound lane.

E. Existing Traffic Volumes

24-hour machine counts were collected in 2021 near the site Berry Trail. In addition, 24-hour turning movement counts were collected at Belt Line Road at Preston Road. The raw count sheets, as well as a comparison between the 24-hour volumes collected and previous 24-hour counts, are provided in **Volume 2** of this report.

The 2021 24-hour counts showed the daily volume on the roadway links as follows:

- Preston Road: 47,957 vehicles per day (vpd)
- Belt Line Road: 22,233 vpd
- Berry Trail: 1,801 vpd

In 2022, traffic counts were recollected to compare to the 2021 and other historical counts. 48-hour traffic counts were collected near the site along Preston Road and Belt Line Road. These counts are also available in **Volume 2**.

The 24-hour average of the 2022 counts showed the daily volume on the roadway links as follows:

- Preston Road: 50,014 vehicles per day (vpd)
- Belt Line Road: 24,303 vpd

Due to the traffic volume impacts of the circumstances surrounding COVID-19, the peak hours of the traffic counts on Belt Line Road and Preston Road were analyzed to historical traffic counts to find an appropriate adjustment factor. **Table 1** shows the historical and observed traffic counts and the applied adjustment factors. **Exhibit 6** shows the existing weekday AM and PM peak hour traffic volumes, adjusted to account for the impact of COVID-19 on traffic volumes.

Table 1 – COVID-19 Traffic Count Adjustment Factors

Street	Year	AM Peak Period (7:30 - 8:30am)	PM Peak Period (4:30 - 5:30am)
		Volume (veh)	Volume (veh)
EB Belt Line Road (east of Preston Road)	2019 (Observed)	556	1,303
	2021 (Observed)	510	1,134
	Higher Volume	556	1,303
	2022 (Observed, Wednesday)	543	1,290
	2022 (Observed, Thursday)	590	1,236
	2022 Average Volume	567	1,263
	Correction Factor	0.0%	3.2%
WB Belt Line Road (east of Preston Road)	2019 (Observed)	1,303	731
	2021 (Observed)	942	805
	Higher Volume	1,303	805
	2022 (Observed, Wednesday)	1,237	773
	2022 (Observed, Thursday)	1,257	756
	2022 Average Volume	1,247	765
	Correction Factor	4.5%	5.2%
NB Preston Road (south of Belt Line Road)	2014 (Observed)	1,542	2,160
	2021 (Observed)	1,645	2,161
	Higher Volume	1,645	2,161
	2022 (Observed, Wednesday)	1,600	2,224
	2022 (Observed, Thursday)	1,500	2,176
	2022 Average Volume	1,550	2,200
	Correction Factor	6.1%	0.0%
SB Preston Road (south of Belt Line Road)	2014 (Observed)	2,202	1,779
	2021 (Observed)	1,907	1,684
	Higher Volume	2,202	1,779
	2022 (Observed, Wednesday)	2,151	1,827
	2022 (Observed, Thursday)	2,147	1,793
	2022 Average Volume	2,149	1,810
	Correction Factor	2.5%	0.0%

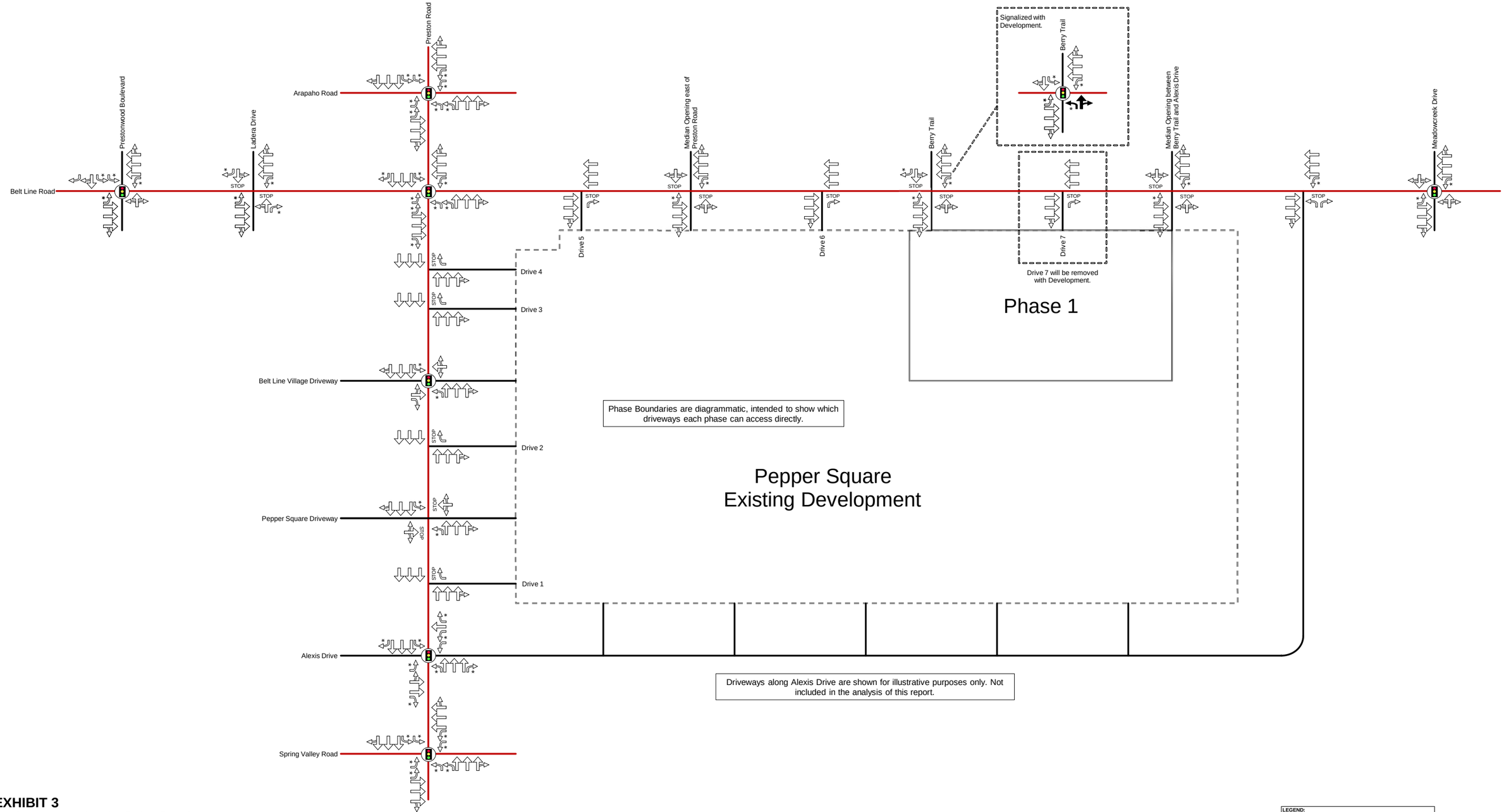

EXHIBIT 3

Lane Assignment and Intersection Control - Phase 1

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:

= Signalized Intersection
STOP = Stop-Controlled Approach
= Travel Lane
* = Turn Bay
= Driveway Lanes or Off-Site Improvements
TWLTL = Two-Way Left Turn Lane

North

Not To Scale

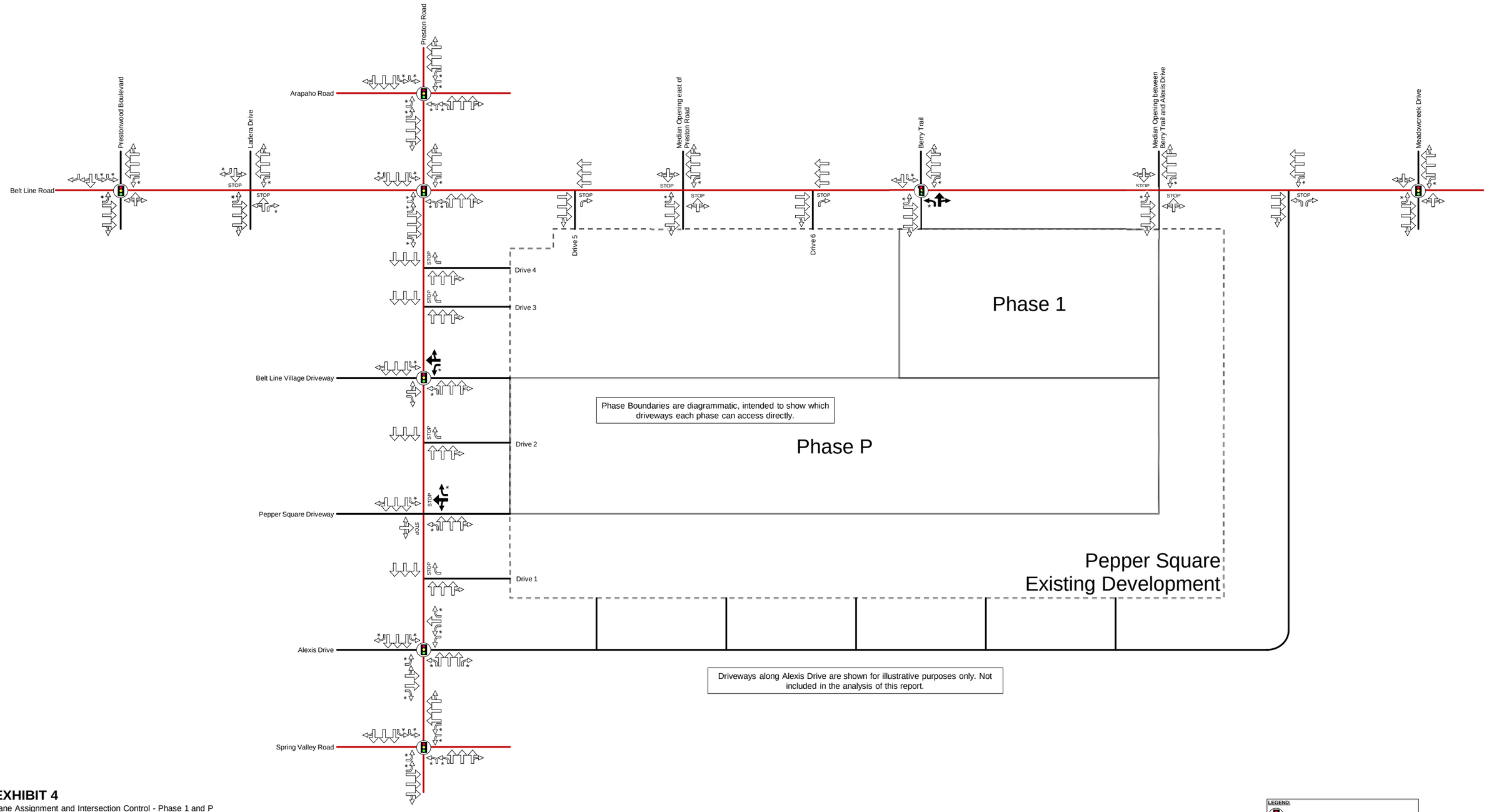

EXHIBIT 4

Lane Assignment and Intersection Control - Phase 1 and P

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:

= Signalized Intersection

STOP = Stop-Controlled Approach

= Travel Lane

* = Turn Bay

= Driveway Lanes or Off-Site Improvements

TWLTL = Two-Way Left Turn Lane

North

Not To Scale

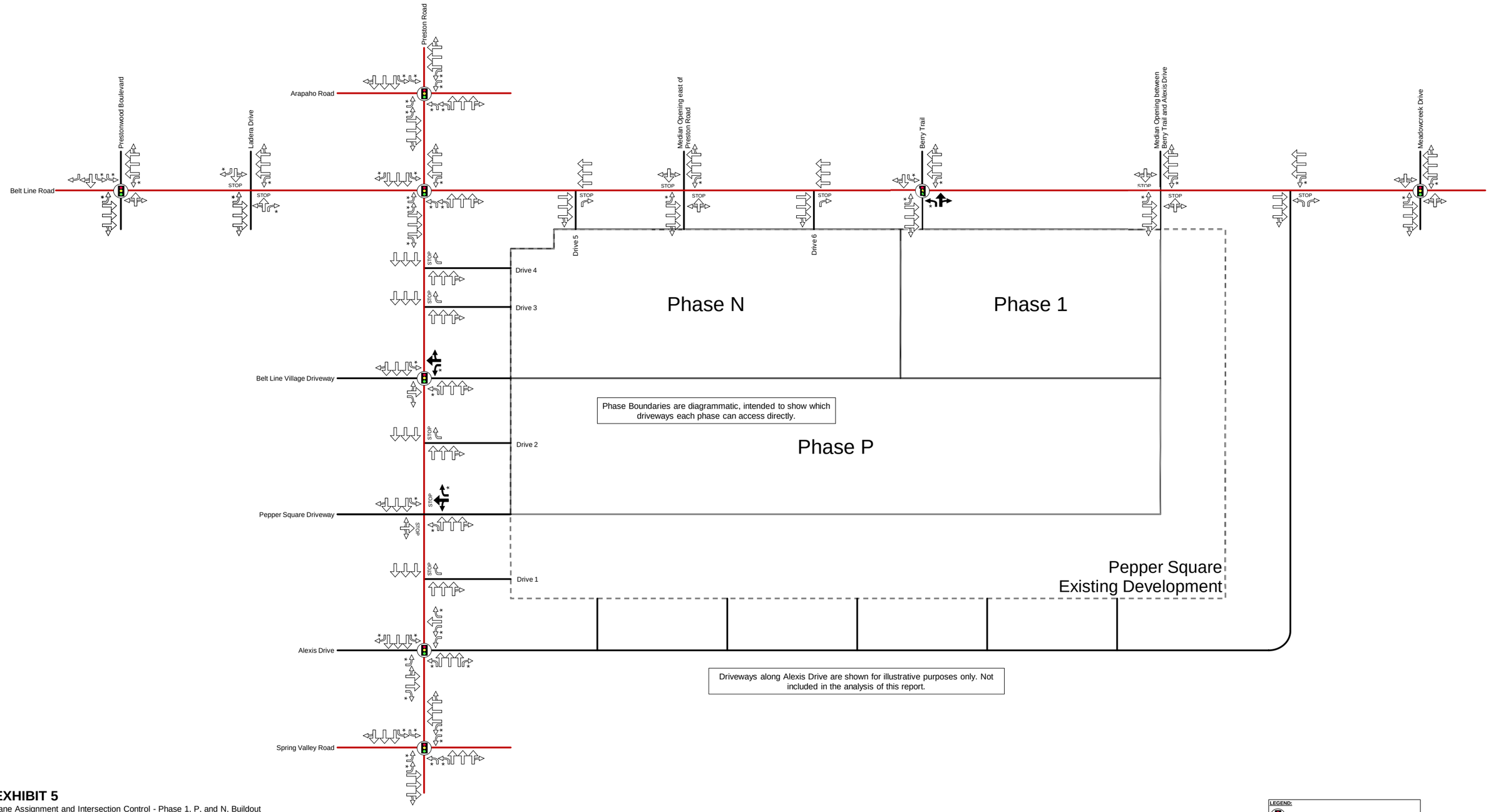

EXHIBIT 5

Lane Assignment and Intersection Control - Phase 1, P, and N, Buildout

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:

= Signalized Intersection

STOP = Stop-Controlled Approach

= Travel Lane

* = Turn Bay

= Driveway Lanes or Off-Site Improvements

TWLTL = Two-Way Left Turn Lane

North

Not To Scale

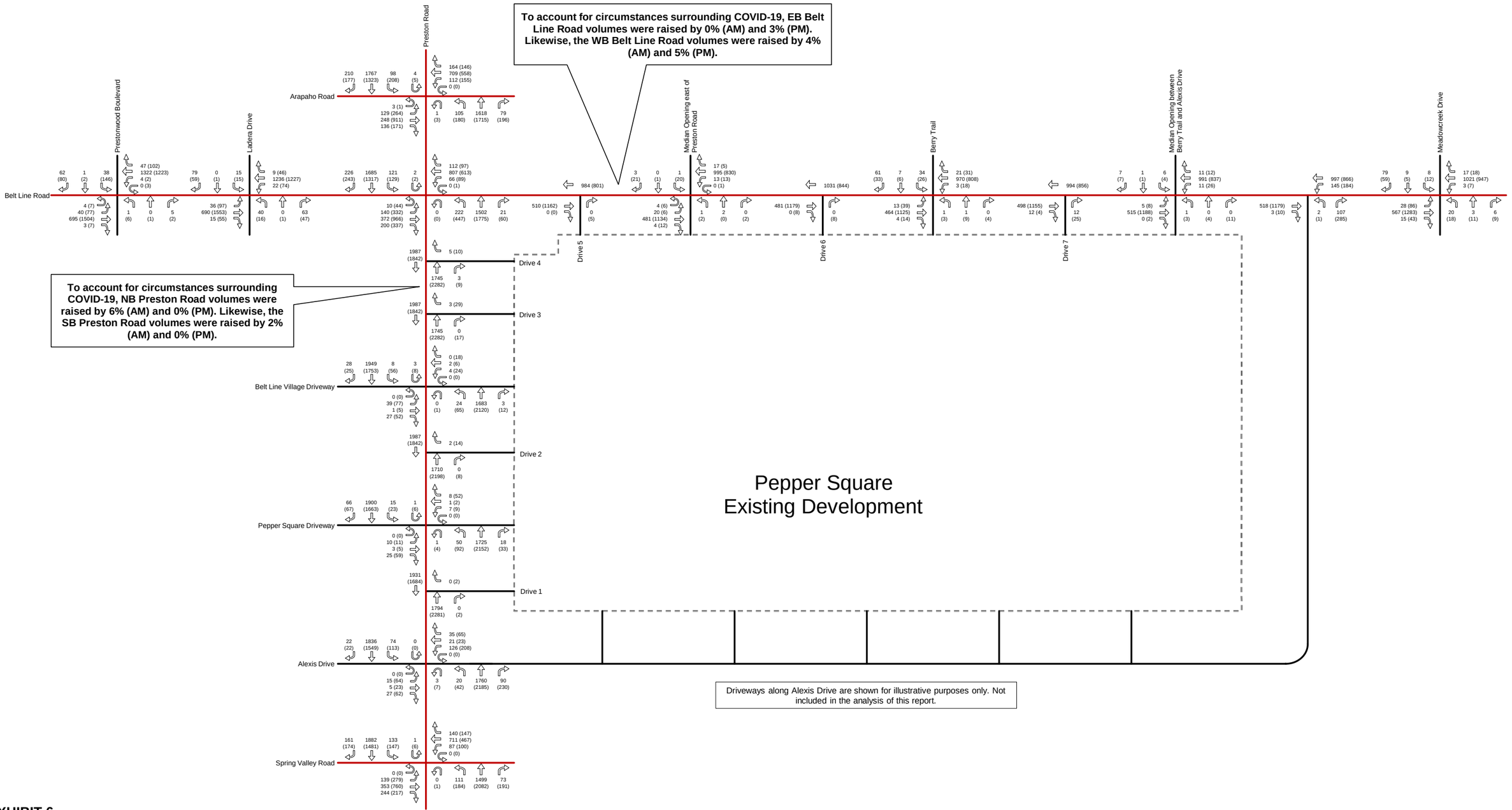

EXHIBIT 6

2021 Adjusted Existing Traffic Volumes

Pepper Square - Dallas, Texas

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III. PROJECT TRAFFIC CHARACTERISTICS

A. Site-Generated Traffic

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the 11th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or *trip ends*, where one vehicle entering and exiting the site is counted as one inbound trip and one outbound trip.

Reductions to the base trip generation estimates are sometimes applied due to internal capture. Internal capture is the tendency for customers or tenants to visit several parts of the mixed-use development in one trip but be counted twice in the trip generation since the formulae assume the residential, retail, restaurant, and office developments are isolated. Since the development will be mixed land use, reductions for internal capture were taken. Internal capture worksheets can be found in **Volume 2** of this report.

The term “pass-by trips” describes how some drivers that use retail and restaurant uses often have a different primary purpose for their trip, and the retail or restaurant use is simply a stop along the way. These trips are already present in the main street traffic volumes. They only patronize the specific retail or restaurant use because that use happens to be along their already-chosen route. Therefore, these trips are not added to the main street volumes. Rather, they are removed from the through volumes of the major street where they enter the site and they are added back into the main street traffic volumes where they exit the site. According to the ITE 2021 Pass-By Tables (located in the Trip Gen Appendices), the pass-by rates for the uses of the Pepper Square Redevelopment are as follows:

- 40% for PM peak hour of Retail/Shopping Center (Shopping Plaza 40k-150k) (ITE 821)
    - Pass-by rates were not provided for retail sites less than 40,000 SF, so the 40% PM peak hour was used for all the retail included in this analysis, regardless of size
- 43% for PM peak hour of High-Turnover (Sit-Down) Restaurant (ITE 932)
- AM pass-by rates were not available for any of the included uses, so the AM pass-by rates were assumed to be 0%
- Only the two uses above had pass-by data available

The proposed development is approximately 1.5 miles away from the Knoll Trail station of the proposed Silver Line (previously known as the “Cotton Belt”) DART rail line. However, no reductions were taken for multimodal use.

The redevelopment also includes renovating and rejuvenating a considerable amount of the existing Pepper Square retail area. Since the buildings themselves are already there, these are not technically new developments, but they are either unused or underutilized today. The intention of the Pepper Square Redevelopment is to revitalize a well-positioned commercial area, so these renovated developments are included in the trip generation for the site. It was observed that these retail areas were generating very low amounts of traffic, so there was no attempt to remove their trip generation from the proposed trip generation for the Pepper Square Redevelopment. It was conservatively assumed that the removed retail was not generating any trips and that the renovated retail will generate new trips.

The resulting daily and weekday AM and PM peak hour trip generation for the proposed development, showing new external trips, are shown in the following tables:

- Phase 1 – **Table 2**
- Phases 1 and P – **Table 3**
- Phases 1, P and N – **Table 4**

Table 2 – Trip Generation – Phase 1

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Phase 1										
Multifamily Housing (Mid-Rise)	350	Units	221	1,623	33	109	142	31	87	118
High-Turnover (Sit-Down) Restaurant	7,000	SF	932	785	39	31	70	42	26	68
Development Totals										
Raw Trip Generation Total:				2,408	72	140	212	73	113	186
Internal Capture Total:				220	9	9	18	6	6	12
External Trips:				2,188	63	131	194	67	107	174
Pass-By Trips (43% for Restaurant PM Peak):				0	0	0	0	18	11	29
Total Net New External Vehicle Trips:				**2,188**	**63**	**131**	**194**	**49**	**96**	**145**

Trip Generation rates based on *ITE's Trip Generation Manual*, 11th Edition.
Pass-by percentages from *ITE 2021 Pass-By Tables for ITE Trip Gen Appendices.*
Internal Capture procedure from *ITE Trip Generation Handbook*, 3rd Edition (2017).

Table 3 – Trip Generation – Phases 1 and P

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Phase 1										
Multifamily Housing (Mid-Rise)	350	Units	221	1,623	33	109	142	31	87	118
High-Turnover (Sit-Down) Restaurant	7,000	SF	932	785	39	31	70	42	26	68
Phase P										
Multifamily Housing (High-Rise)	750	Units	222	3,197	63	121	184	122	96	218
High-Turnover (Sit-Down) Restaurant	20,000	SF	932	2,144	105	86	191	110	71	181
Retail/Shopping Center (Strip Retail Plaza < 40k)	20,000	SF	822	1,074	27	18	45	64	63	127
Development Totals										
Raw Trip Generation Total:				8,823	267	365	632	369	343	712
Internal Capture Total:				1,716	17	17	34	66	66	132
External Trips:				7,107	250	348	598	303	277	580
Pass-By Trips (40% for Retail PM Peak, 43% for Restaurant PM Peak):				0	0	0	0	91	67	158
Total Net New External Vehicle Trips:				**7,107**	**250**	**348**	**598**	**212**	**210**	**422**

Trip Generation rates based on *ITE's Trip Generation Manual*, 11th Edition.
Pass-by percentages from *ITE 2021 Pass-By Tables for ITE Trip Gen Appendices.*
Internal Capture procedure from *ITE Trip Generation Handbook*, 3rd Edition (2017).

Table 4 – Trip Generation – Phases 1, P and N

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Phase 1										
Multifamily Housing (Mid-Rise)	350	Units	221	1,623	33	109	142	31	87	118
High-Turnover (Sit-Down) Restaurant	7,000	SF	932	785	39	31	70	42	26	68
Phase P										
Multifamily Housing (High-Rise)	750	Units	222	3,197	63	121	184	122	96	218
High-Turnover (Sit-Down) Restaurant	20,000	SF	932	2,144	105	86	191	110	71	181
Retail/Shopping Center (Strip Retail Plaza < 40k)	20,000	SF	822	1,074	27	18	45	64	63	127
Phase N										
Multifamily Housing (High-Rise)	450	Units	222	2,069	40	78	118	78	62	140
High-Turnover (Sit-Down) Restaurant	10,000	SF	932	1,072	53	43	96	56	35	91
Retail/Shopping Center (Strip Retail Plaza < 40k)	10,000	SF	822	652	17	12	29	39	39	78
Development Totals										
Raw Trip Generation Total:				12,616	377	498	875	542	479	1,021
Internal Capture Total:				2,562	59	59	118	102	102	204
External Trips:				10,054	318	439	757	440	377	817
Pass-By Trips (40% for Retail PM Peak, 43% for Restaurant PM Peak):				0	0	0	0	131	98	229
Total Net New External Vehicle Trips:				**10,054**	**318**	**439**	**757**	**309**	**279**	**588**

Trip Generation rates based on *ITE's Trip Generation Manual*, 11th Edition.

Pass-by percentages from *ITE 2021 Pass-By Tables for ITE Trip Gen Appendices.*

Internal Capture procedure from *ITE Trip Generation Handbook*, 3rd Edition (2017).

B. Other Development Traffic Modeling

For the Terracap site, located on the west side of Preston Road between Belt Line Road and Arapaho Road, the trip distribution and assignment were obtained from the TIA completed for the Terracap site by Halff Engineering, dated May 2022. The distribution for the Terracap site has been attached for references purposes in **Volume 2** of this report. The TerraCap development is expected to be built out in three phases, spaced out to be completed every other year until the final completion year of 2033. The site was assumed to be 20% complete by 2026, 40% complete by 2028, and 100% complete by 2033. The total site traffic was factored down by these percentages for the specific study years for each of the traffic scenarios of this report. Likewise, the Alexis Tonti site is expected to be completed by 2031, with Phase 1 complete by 2026, Phases 1-2 complete by 2028, and all four phases complete by 2033. **Table 5** shows the trip generation calculations for the TerraCap background site, and **Table 6** shows calculations for the Alexis Tonti Site.

Table 5 – Background Site (TerraCap) Trip Generation

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Existing Development (2019)										
Multifamily Housing (Low-Rise)	353	Units	220	2,628	36	122	158	114	67	181
Buildout Development (2033)										
Proposed Development Raw Trip Generation:				***13,477***	***259***	***569***	***828***	***646***	***440***	***1,086***
Development Totals										
Difference between Existing Development and Buildout Development:				10,849	223	447	670	532	373	905
% Expect to be Complete by 2026:				20%	20%	20%	20%	20%	20%	20%
Total Net New External Vehicle Trips 2026:				**2,170**	**45**	**89**	**134**	**106**	**75**	**181**
% Expect to be Complete by 2028:				40%	40%	40%	40%	40%	40%	40%
Total Net New External Vehicle Trips 2028:				**4,340**	**89**	**179**	**268**	**213**	**149**	**362**
% Expect to be Complete by 2033:				100%	100%	100%	100%	100%	100%	100%
Total Net New External Vehicle Trips 2033:				**10,849**	**223**	**447**	**670**	**532**	**373**	**905**

Trip Generation rates based on *ITE's Trip Generation Manual*, 10th Edition.
Internal Capture was not used in the Halff TIA.

Table 6 – Background Site (Alexis Tonti) Trip Generation

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) - Phase 1	326	Units	221	1,509	18	114	132	94	33	127
Multifamily Housing (Mid-Rise) - Phase 2	279	Units	221	1,284	16	95	111	81	28	109
Multifamily Housing (Mid-Rise) - Phase 3	263	Units	221	1,208	15	89	104	76	27	103
Multifamily Housing (Mid-Rise) - Phase 4	400	Units	221	1,862	23	141	164	115	41	156
Development Totals										
Total Net New External Vehicle Trips 2026 (Phase 1):				**1,509**	**18**	**114**	**132**	**94**	**33**	**127**
Total Net New External Vehicle Trips 2028 (Phases 1-2):				**2,793**	**34**	**209**	**243**	**175**	**61**	**236**
Total Net New External Vehicle Trips 2033 (Phases 1-4, All Phases):				**5,863**	**72**	**439**	**511**	**366**	**129**	**495**

Trip Generation rates based on *ITE's Trip Generation Manual*, 11th Edition.

C. Trip Distribution and Assignment

The distribution of the site-generated traffic volumes in to and out of the site driveways and onto the street system was based on the area street system characteristics, existing traffic patterns, relative land use density, and the locations of the proposed driveway access to/from the site.

The corresponding inbound and outbound traffic assignment, where the directional distribution is applied using the most probable paths to and from the site, can be found in the exhibits as described in **Table 7**. The resulting site-generated weekday AM and weekday PM peak hour turning movements, calculated by multiplying the new external trip generation by the respective traffic assignment percentages, are also found in the exhibits described by **Table 7**.

Table 7 – Development Scenario Included Traffic

Scenario	Percent Growth	Development Traffic Added	Exhibit
2021 Adjusted Existing	0.5%	2021 Turning Movement Counts Adjusted to Address COVID Effects	2021 Adjusted Existing Volume: **Exhibit 6**
2026 Background	0.5%	20% Terracap Background Development Phase 1 Alexis Tonti Background Development	2026 Background Volume: **Exhibit 10**
2026 Background + Site	N/A	20% Terracap Background Development Phase 1 Alexis Tonti Background Development Phase 1 Site Traffic	Site Trip Distribution: **Exhibit 7** Pass By Trip Distribution: **Exhibit 8** Site Generated Volumes: **Exhibit 9** 2026 Total Volume: **Exhibit 11**
2028 Background	0.5%	40% Terracap Background Development Phases 1-2 Alexis Tonti Background Development	2028 Background Volume: **Exhibit 15**
2028 Background + Site	N/A	40% Terracap Background Development Phases 1-2 Alexis Tonti Background Development Phases 1 & P Site Traffic	Site Trip Distribution: **Exhibit 12** Pass By Trip Distribution: **Exhibit 13** Site Generated Volumes: **Exhibit 14** 2028 Total Volume: **Exhibit 16**
2033 Background	0.5%	100% Terracap Background Development Phases 1-4 Alexis Tonti Background Development	2033 Background Volume: **Exhibit 20**
2033 Background + Site	N/A	100% Terracap Background Development Phases 1-4 Alexis Tonti Background Development Phases 1, P, and N Site Traffic	Site Trip Distribution: **Exhibit 17** Pass By Trip Distribution: **Exhibit 18** Site Generated Volumes: **Exhibit 19** 2033 Total Volume: **Exhibit 21**

D. Development of Background and Total Traffic

The growth rates, background developments, and site-generated traffic included in each scenario is summarized in **Table 7**. The site trip distributions for new trips and pass-by trips are listed as well.

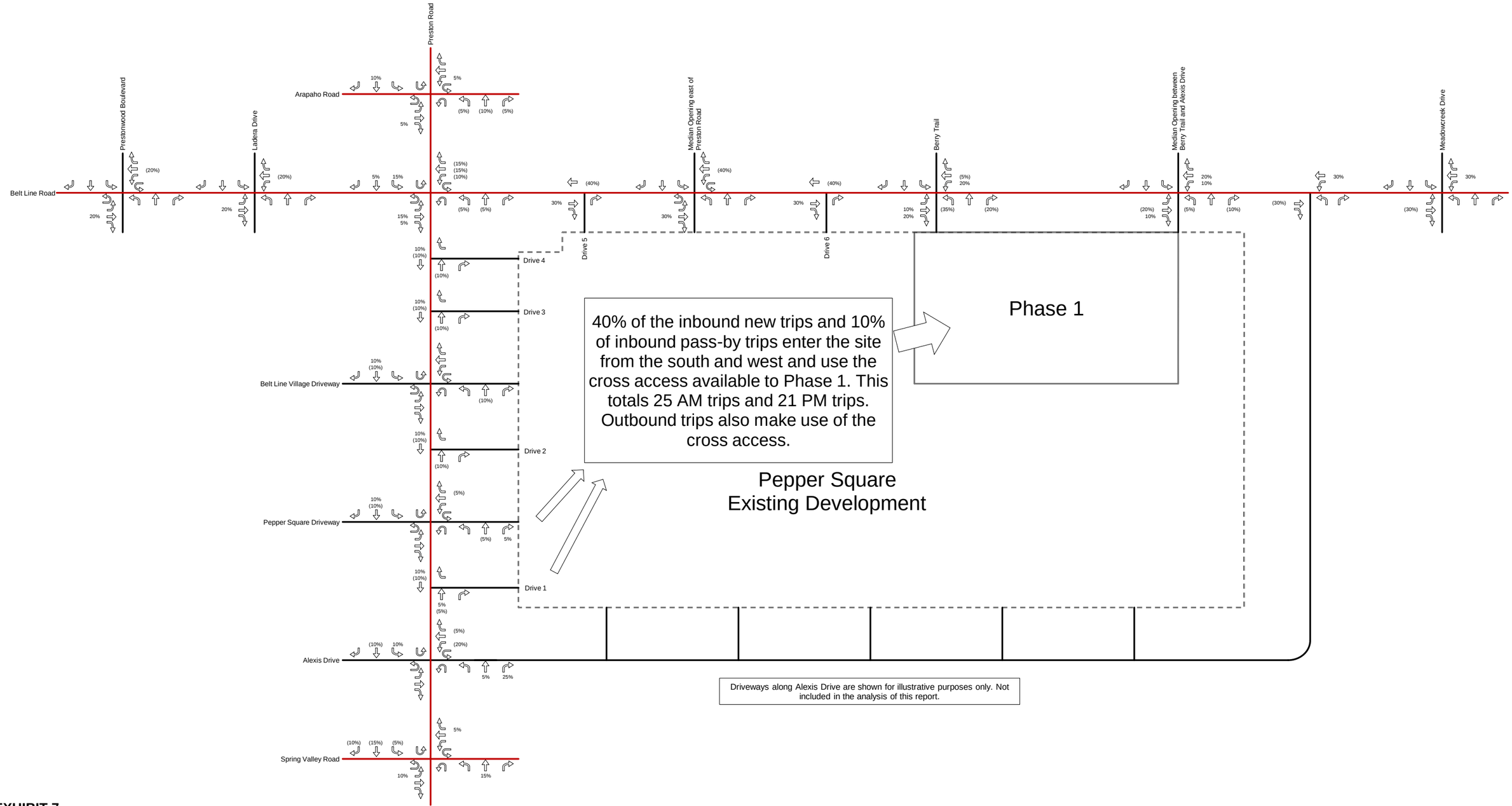

EXHIBIT 7

Trip Distribution and Traffic Assignment - Phase 1

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

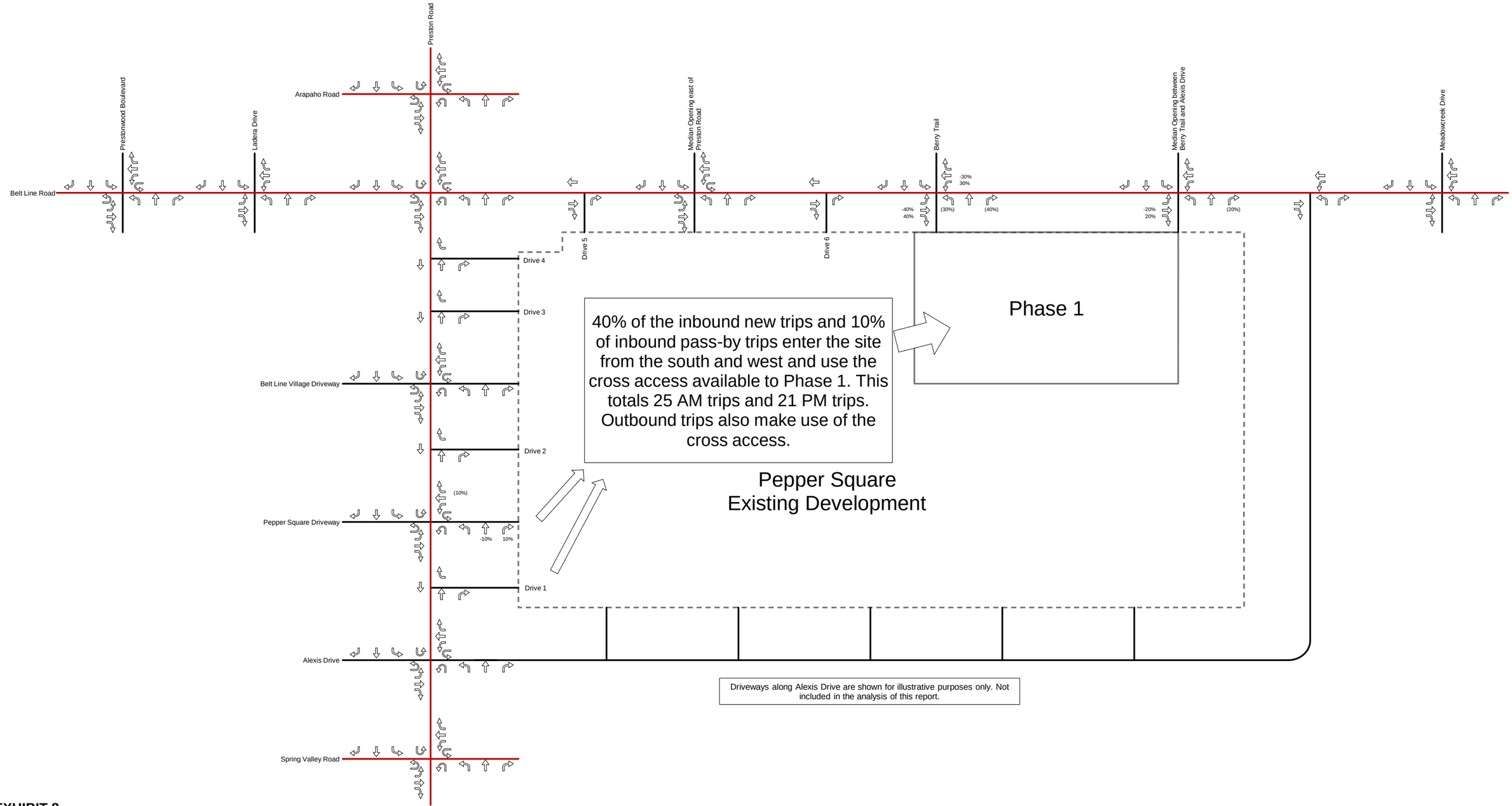

EXHIBIT 8

Trip Distribution and Traffic Assignment - Phase 1, Pass-By Trips

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

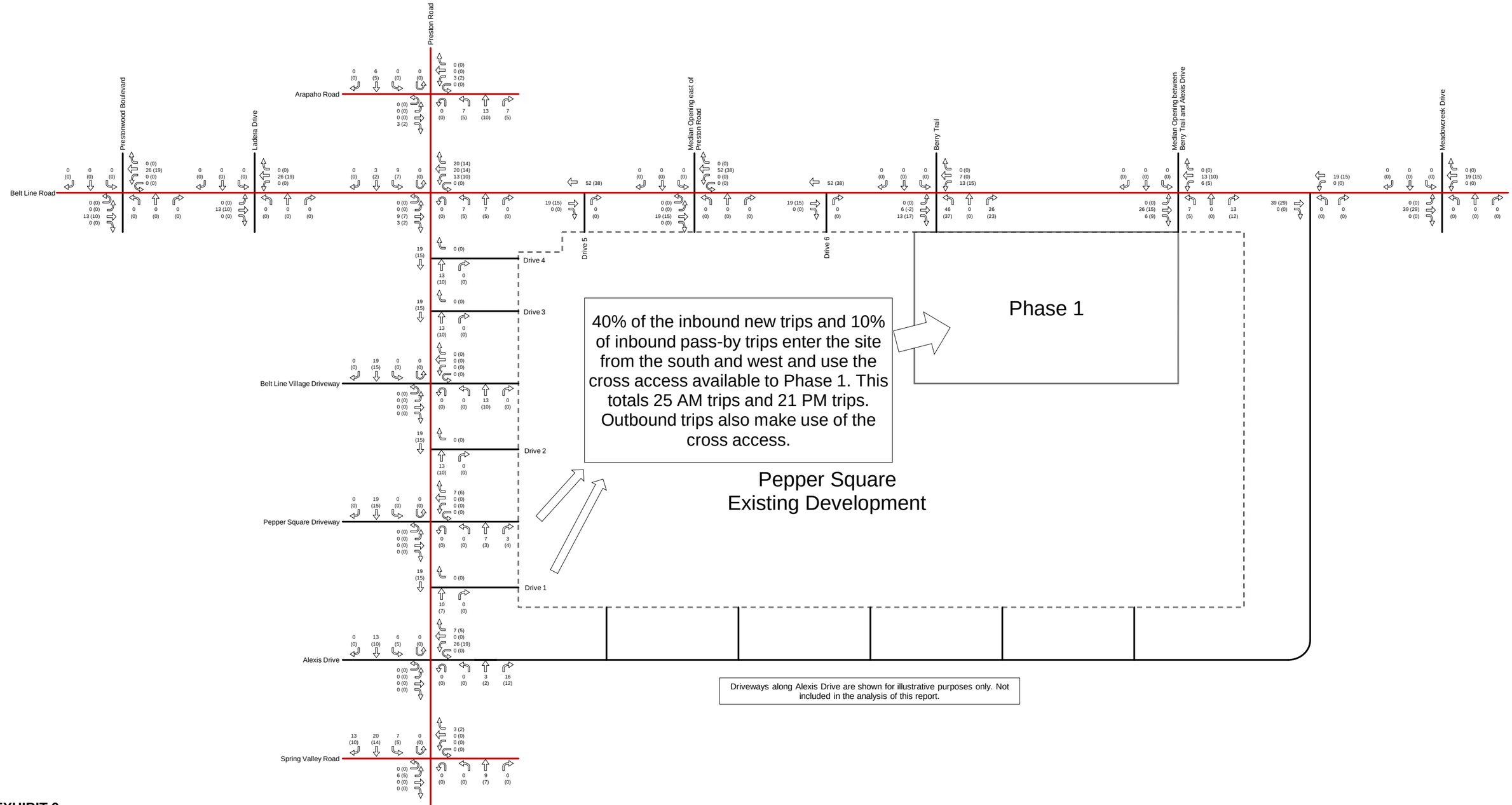

EXHIBIT 9

Site-Generated Traffic Volumes - Phase 1, Total

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

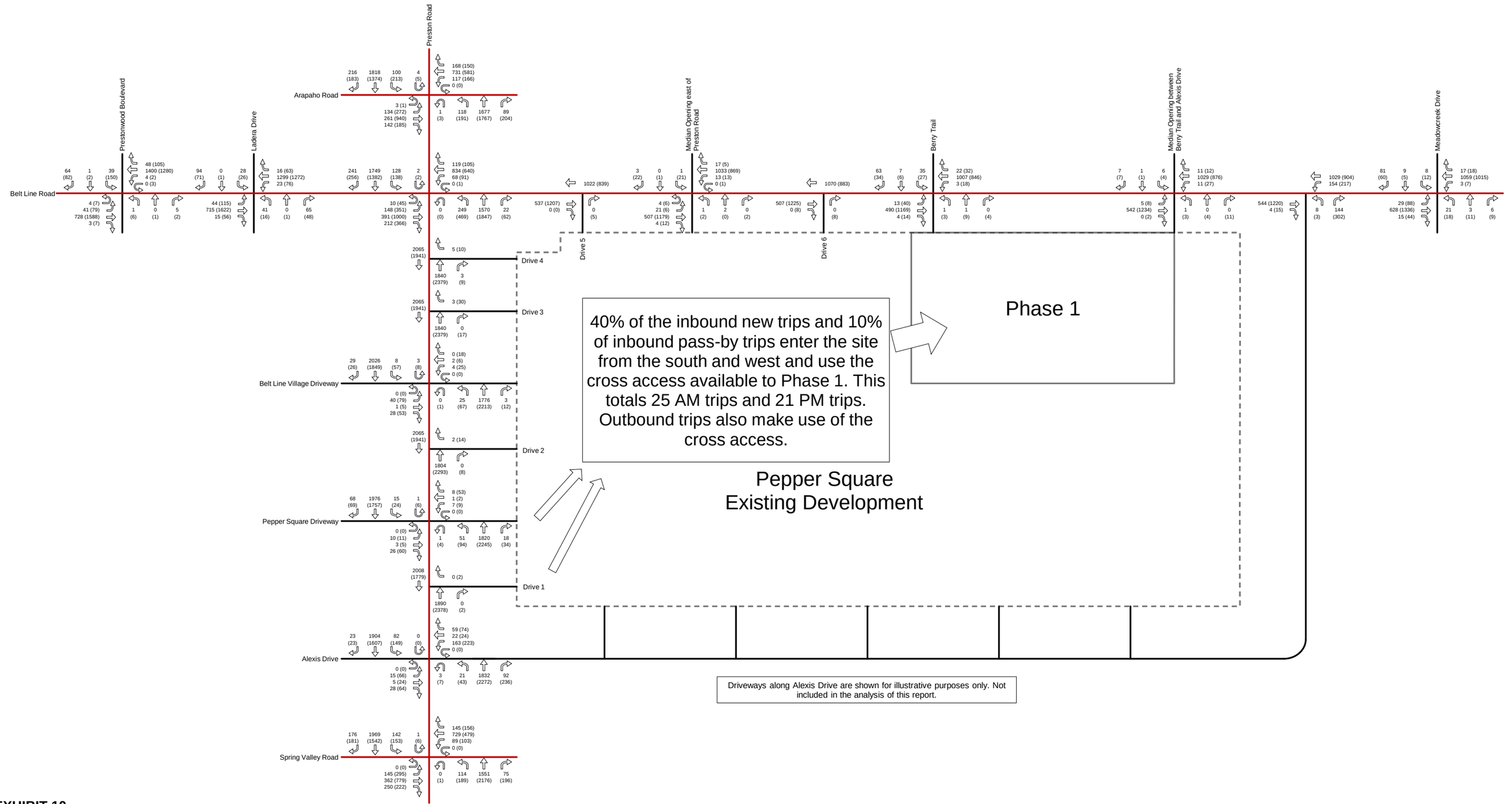

EXHIBIT 10

2026 Background Traffic Volumes

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

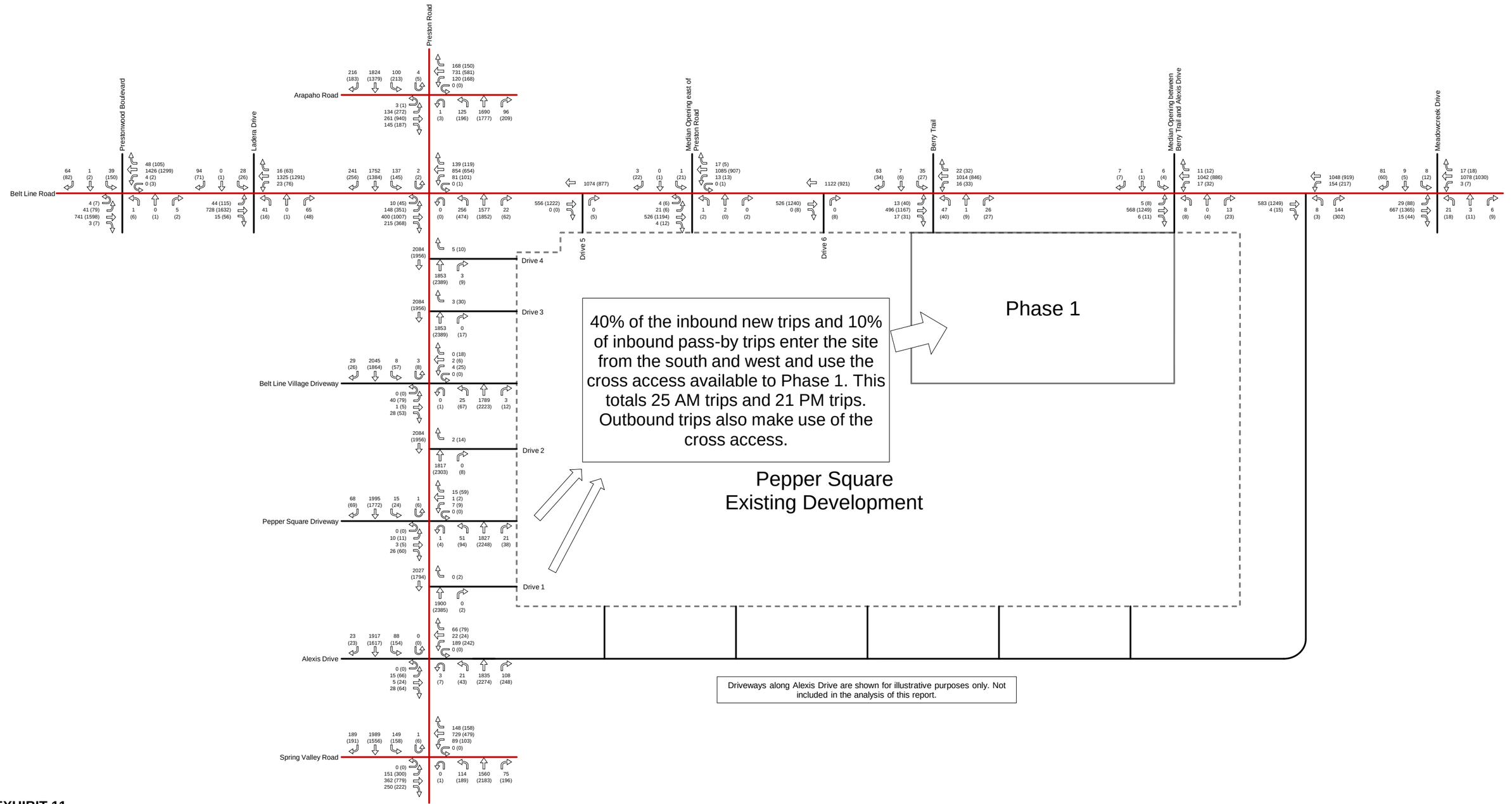

EXHIBIT 11

2026 Background Plus Site-Generated Traffic Volumes - Phase 1

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

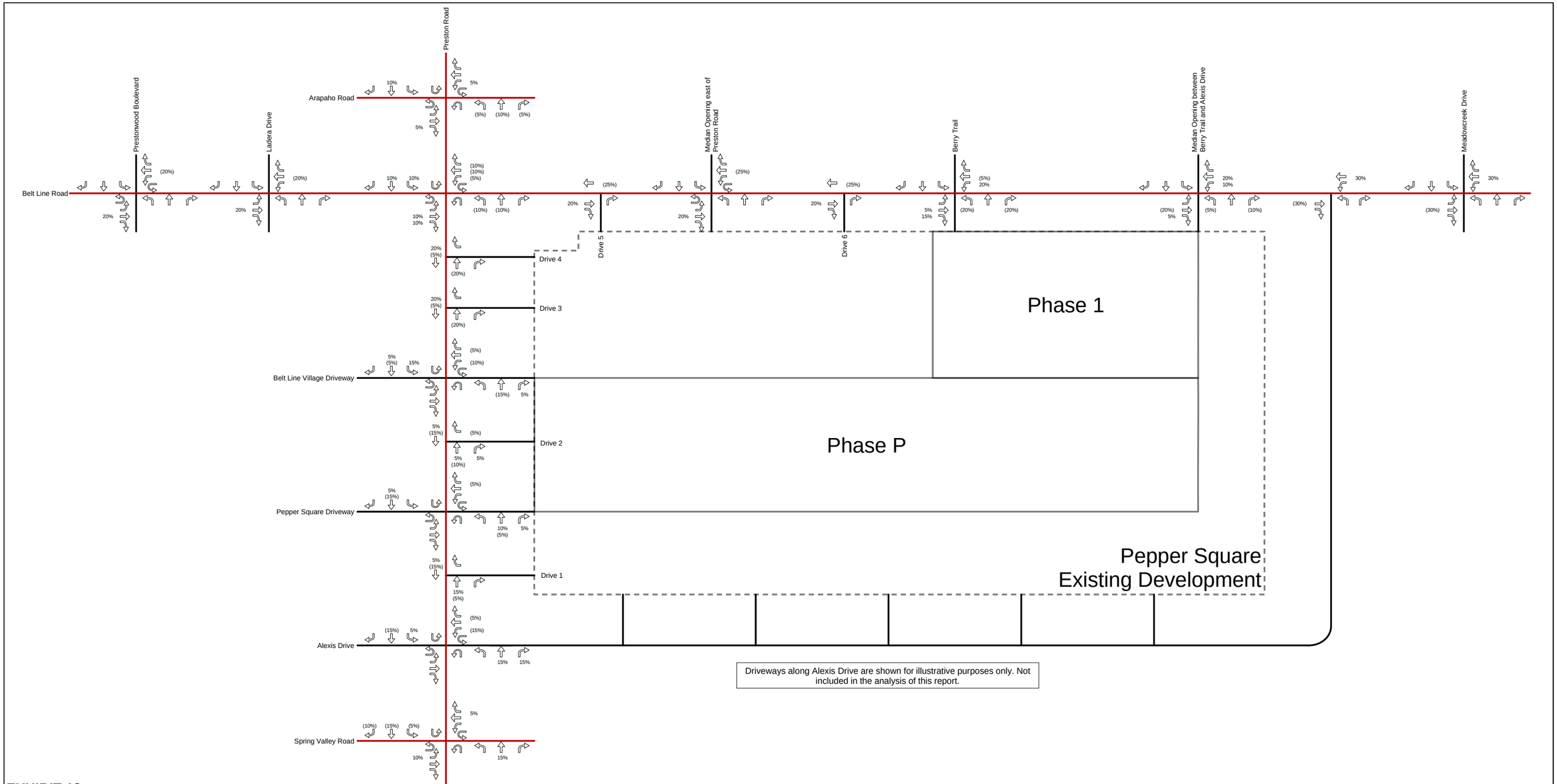

EXHIBIT 12

Trip Distribution and Traffic Assignment- Phase 1 and P

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

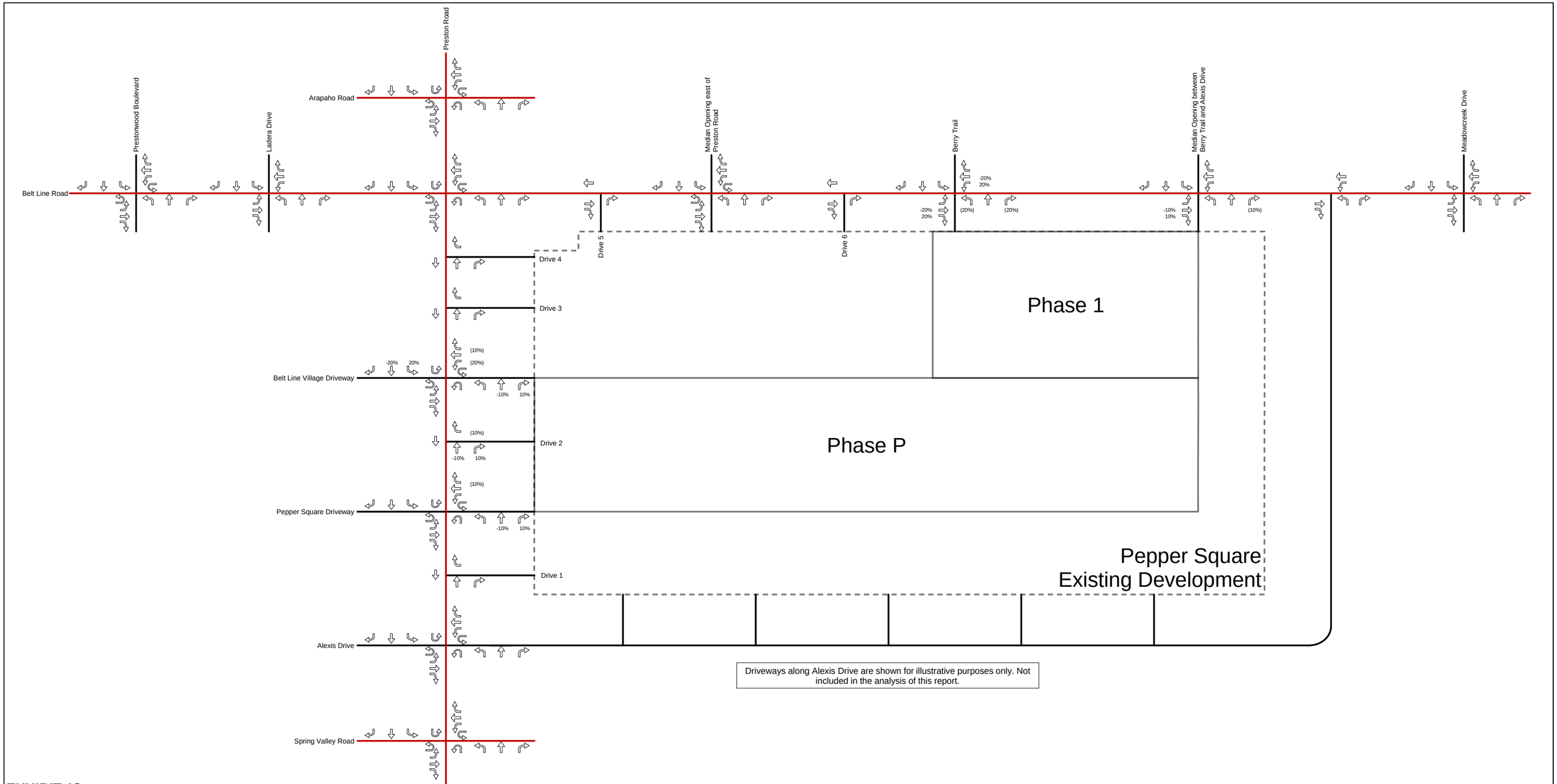

EXHIBIT 13

Trip Distribution and Traffic Assignment- Phase 1 and P, Pass-By Trips

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

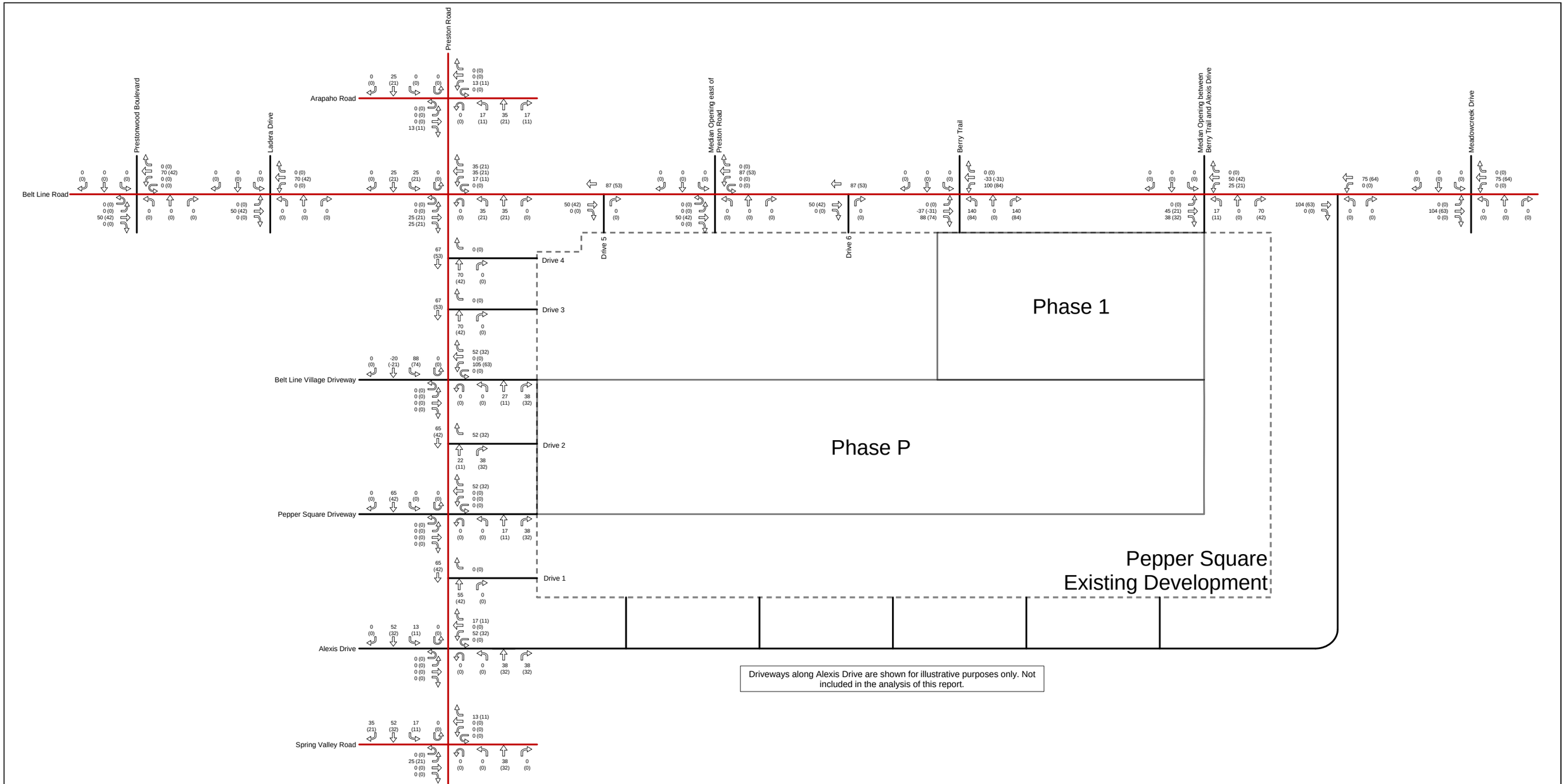

EXHIBIT 14

Site-Generated Traffic Volumes- Phase 1 and P, Total

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North

Not To Scale

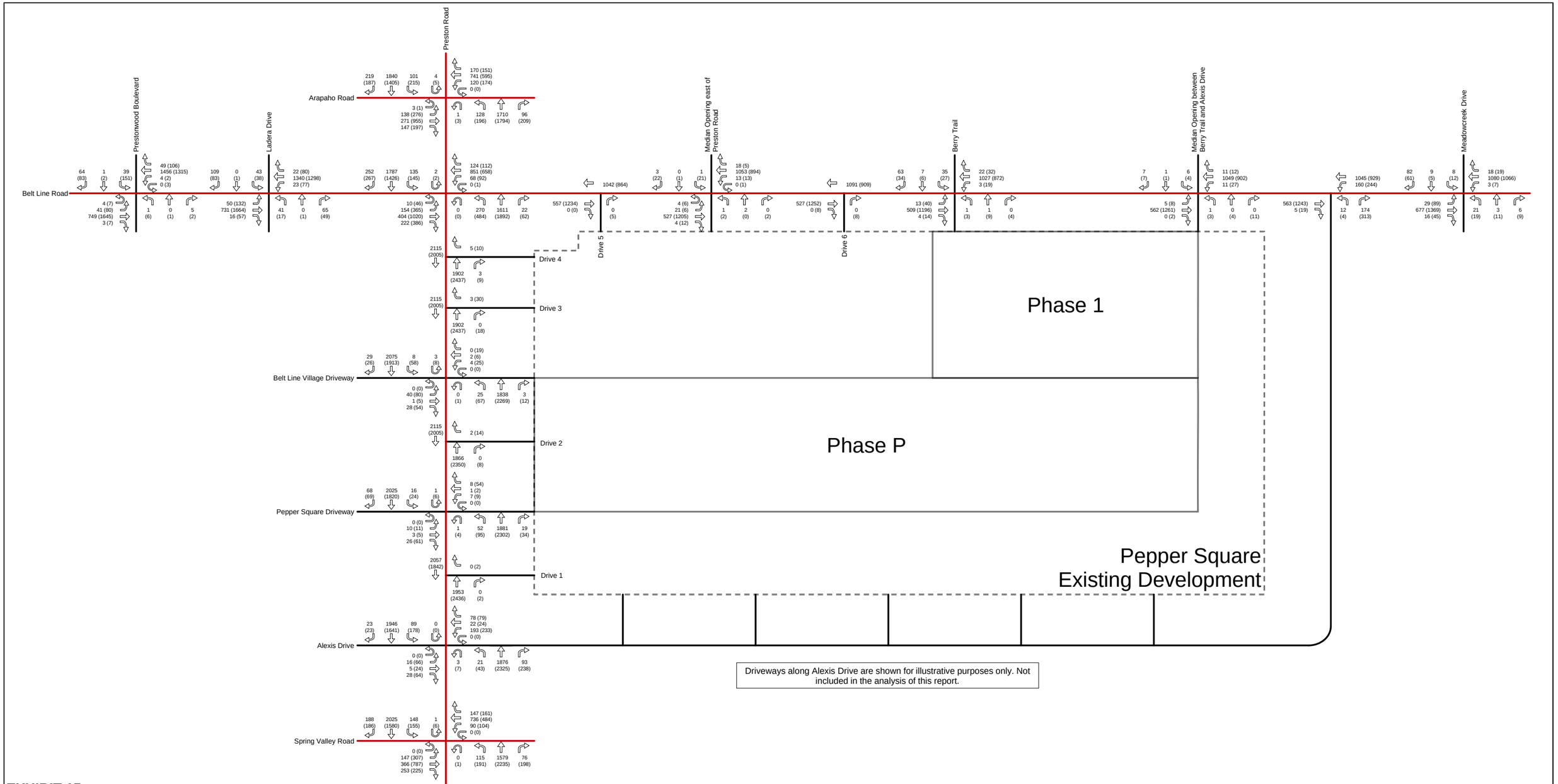

EXHIBIT 15
2028 Background Traffic Volumes
Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North
Not To Scale

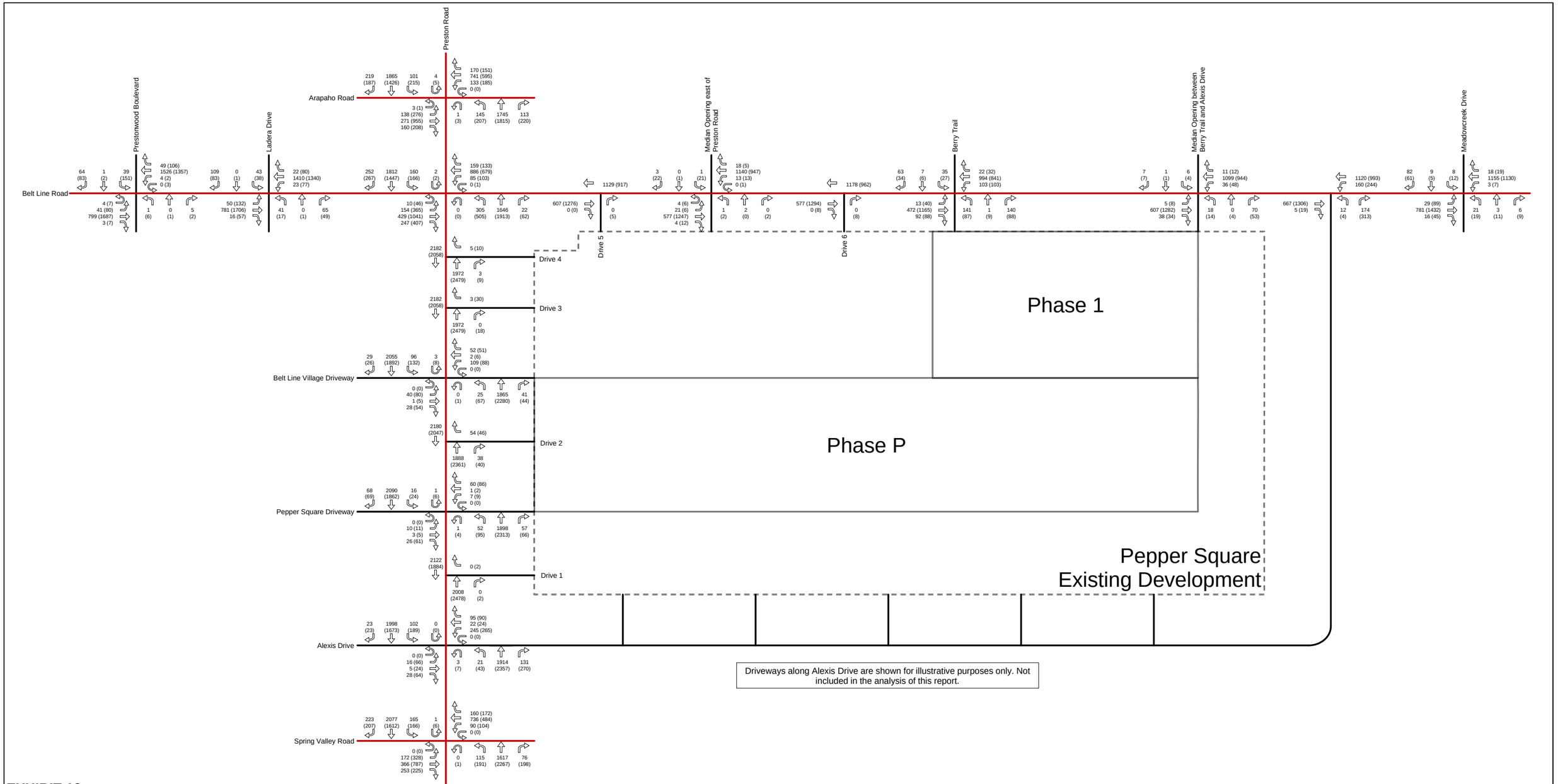

EXHIBIT 16

2028 Background Plus Site-Generated Traffic Volumes- Phase 1 and P

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North

Not To Scale

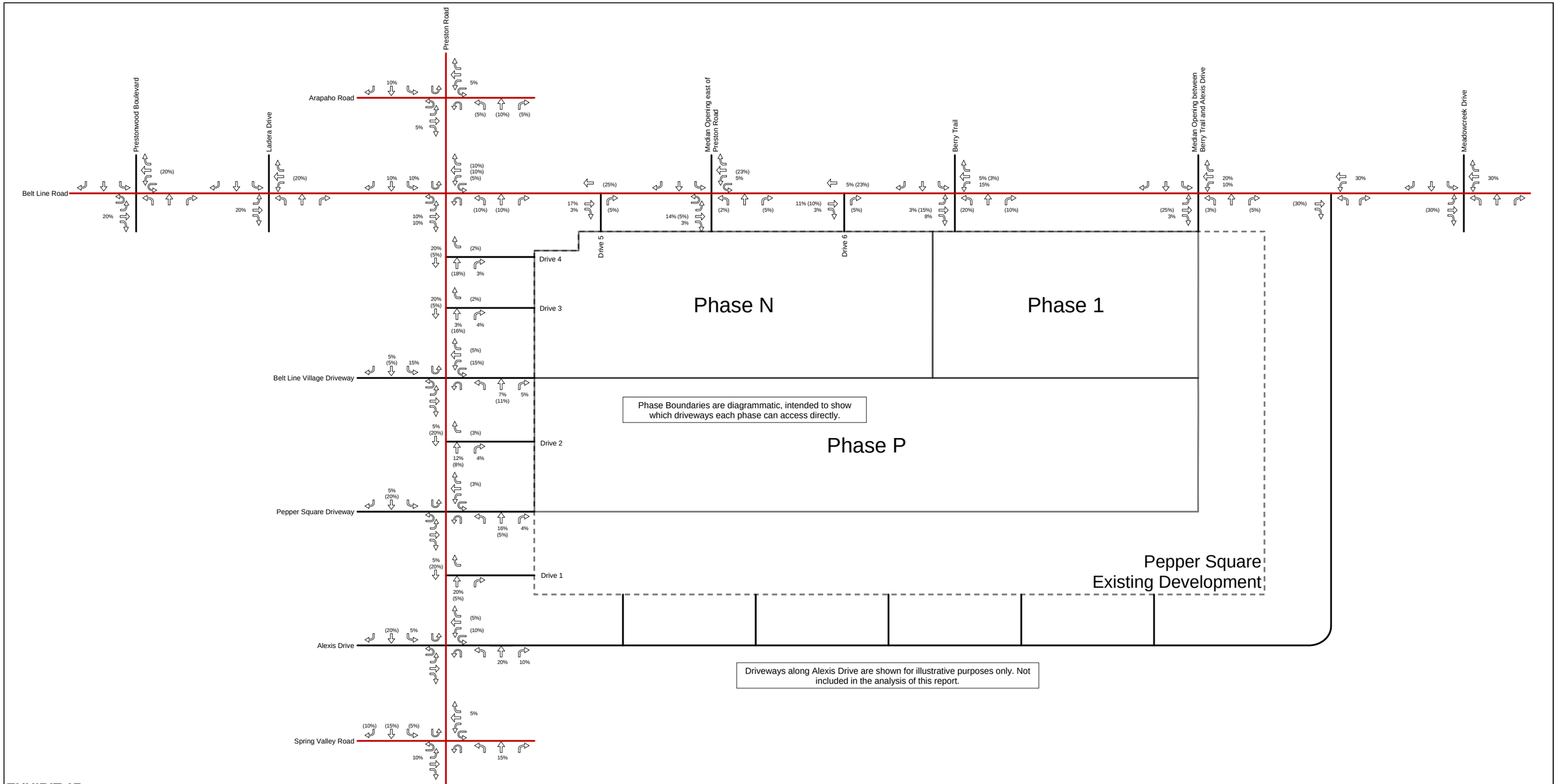

EXHIBIT 17

Trip Distribution and Traffic Assignment- Phase 1, P, and N

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

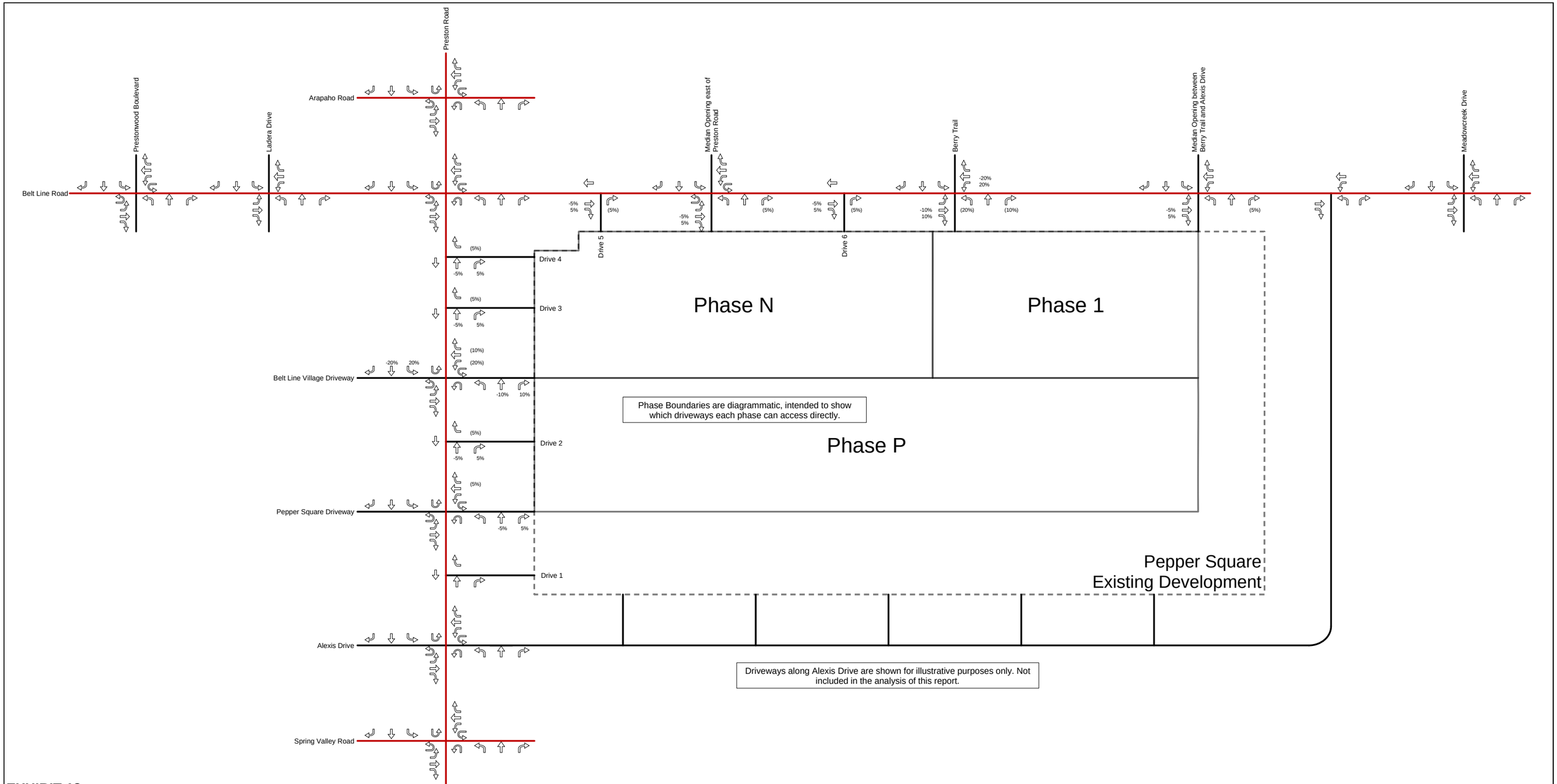

EXHIBIT 18

Trip Distribution and Traffic Assignment- Phase 1, P, and N, Pass-By Trips

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North

Not To Scale

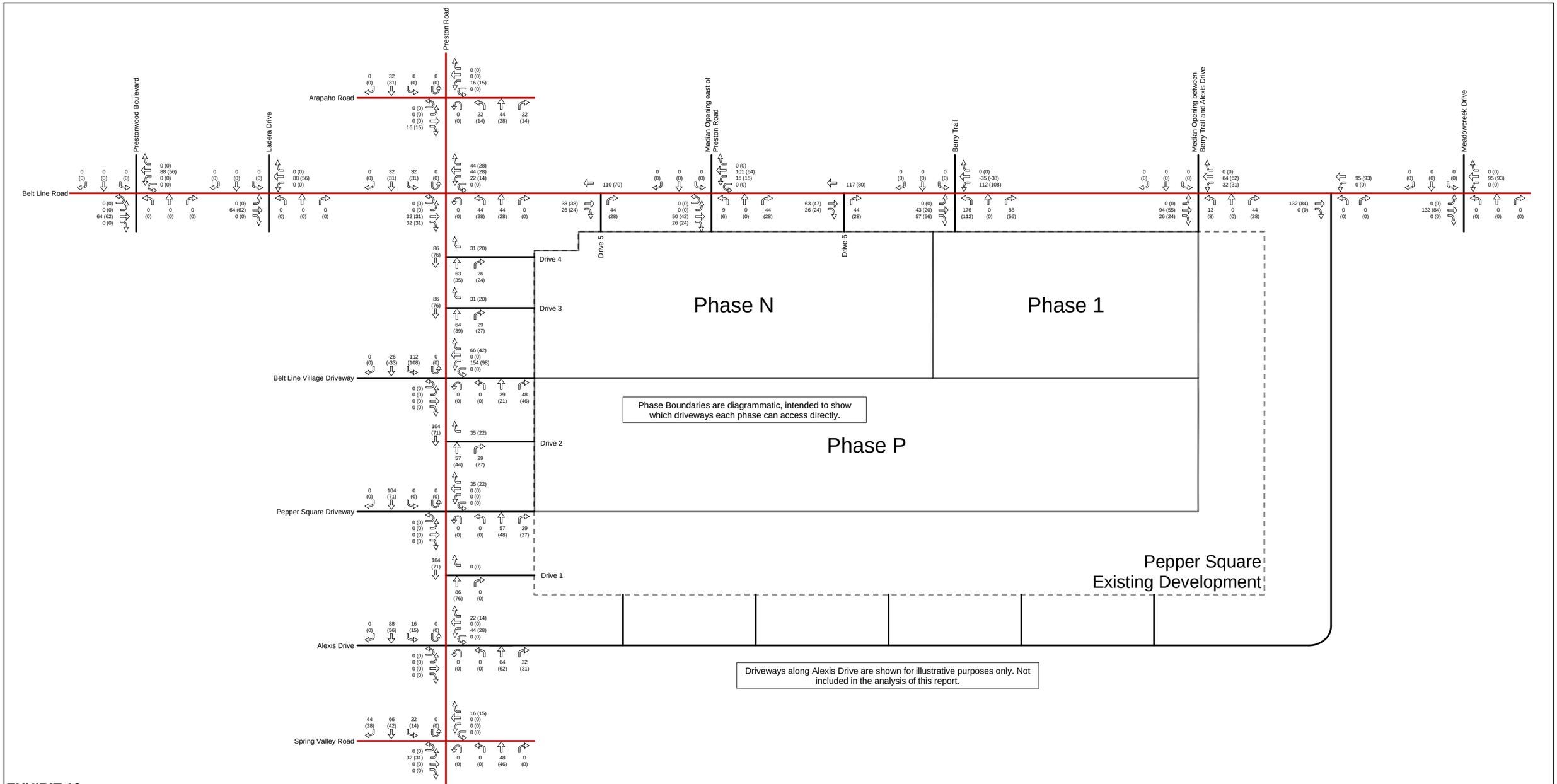

EXHIBIT 19

Site-Generated Traffic Volumes- Phase 1, P, and N, Total

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

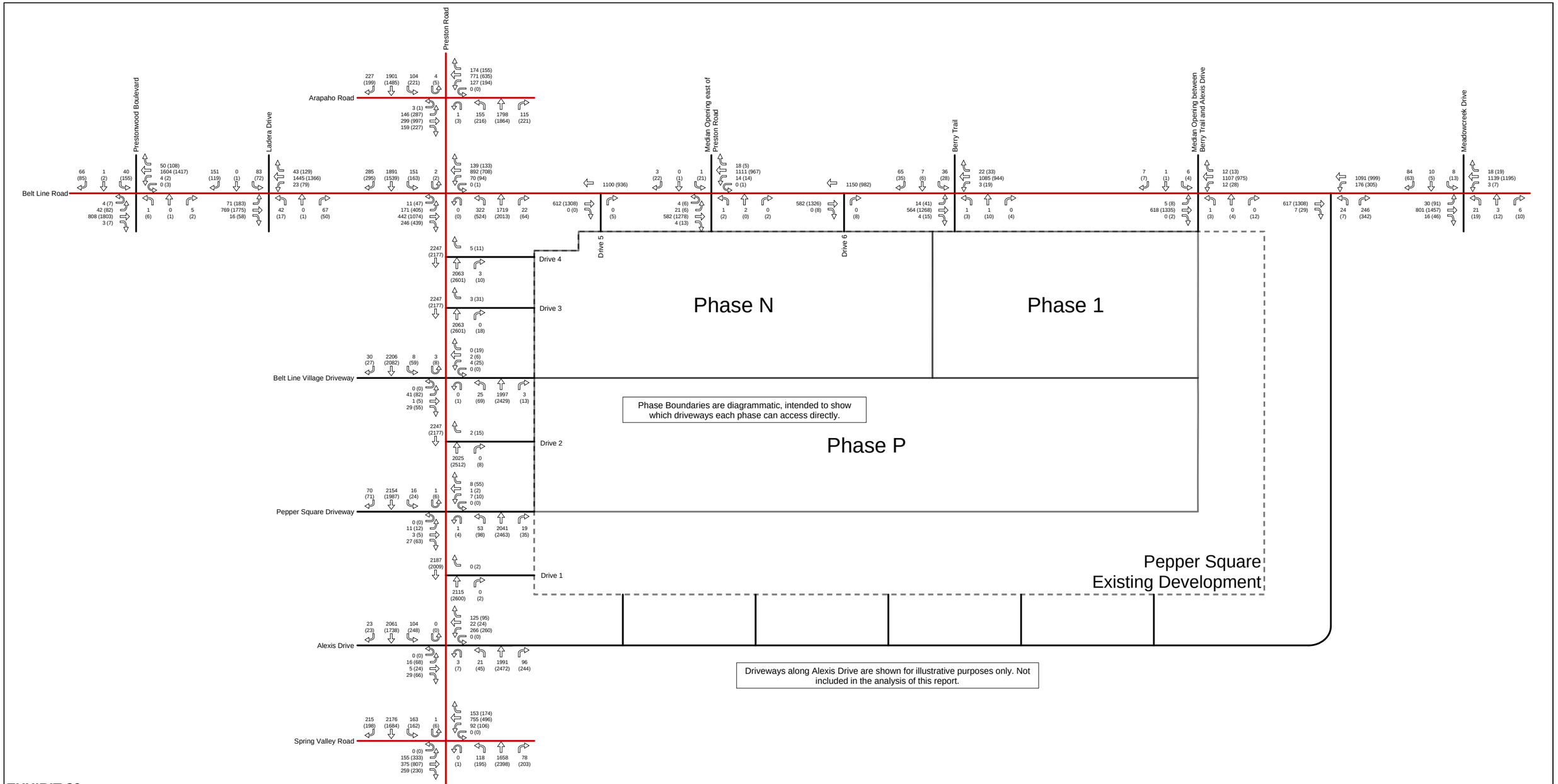

EXHIBIT 20

2033 Background Traffic Volumes

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North

Not To Scale

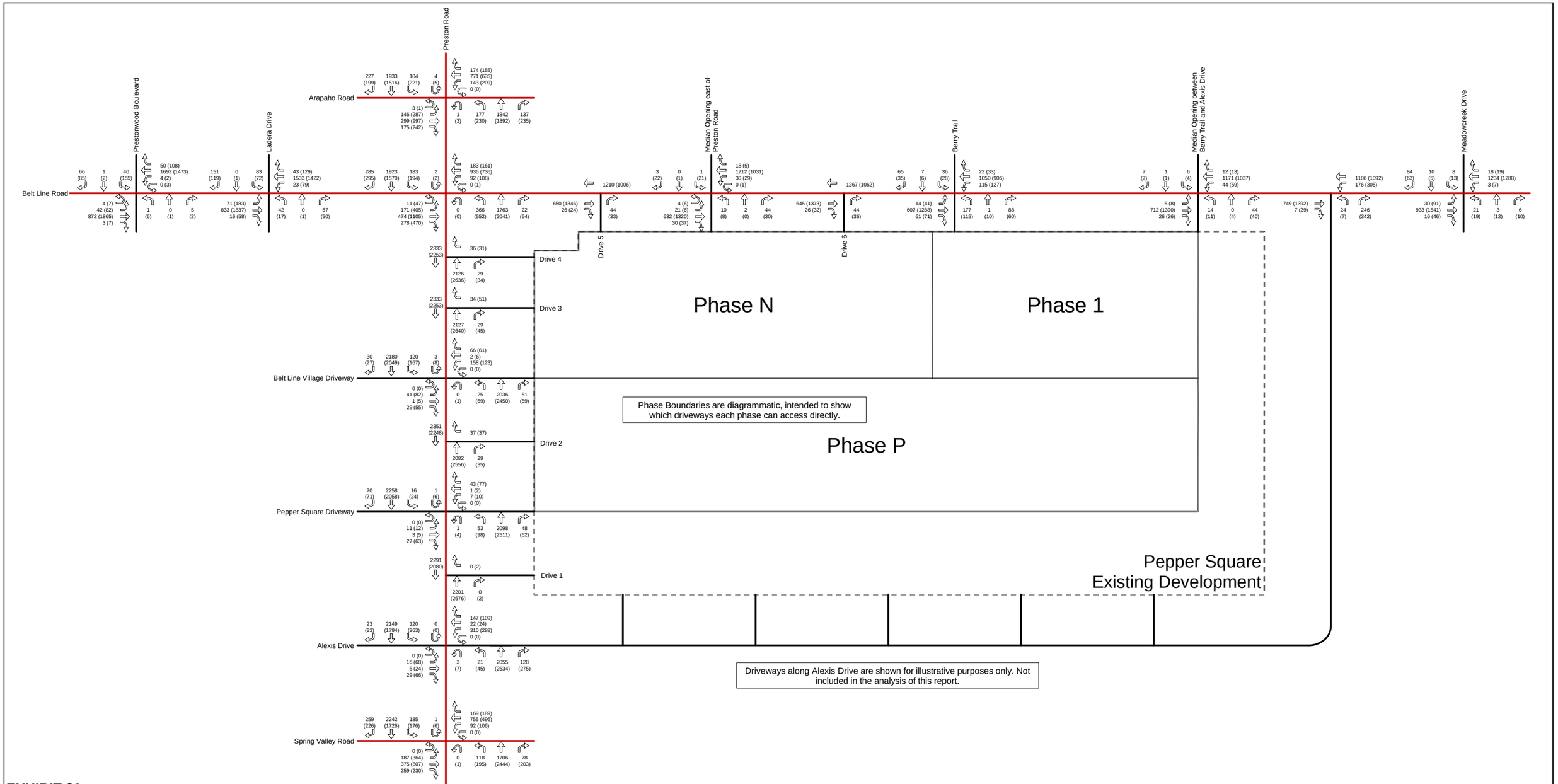

EXHIBIT 21

2033 Background Plus Site-Generated Traffic Volumes- Phase 1, P, and N

Pepper Square - Dallas, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

IV. TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis (TSWA) was performed for Belt Line Road at Berry Trail using procedures outlined in the 2011 TxMUTCD. Traffic volume data was collected at the intersection on Wednesday, May 12, 2021.

Several variables affect the thresholds needed to meet the nine signal warrants outlined in the 2011 TxMUTCD. For example, speed on the major road, population characteristics of the surrounding area, number of crashes, and distance to the nearest signal all impact the volumes needed to warrant a traffic signal. It is stated in the TxMUTCD that if the posted speed limit or the 85th percentile speed exceeds 40 MPH for the major street, then traffic volumes in the 70 percent column of Table 4C-1 in the TxMUTCD may be used in place of the 100 percent traffic volumes. The City of Dallas 2017 signal warrant analysis lists the 85th percentile speed on Belt Line Road as 44 MPH. This exceeds the 40 MPH speed limit threshold, so the reduction was applied to the volumes for the TSWA. The results from the 2017 City of Dallas study and the updated 2021 results from this study are included in **Table 8**. Traffic volume data and further TSWA details are provided separately in **Volume 2** of this report.

Table 8 – Belt Line Rd at Berry Trail TSWA Results

Traffic Signal Warrant	Dallas (2017)	Existing (2021)
1. Eight Hour Vehicle Volume	**Met**	**Met**
Hours Met for Warrant 1A Minimum Vehicular Volume	0	0
Hours Met for Warrant 1B Interruption of Continuous Traffic	9	8
2. Four Hour Vehicular Volume	**Not Met**	**Not Met**
Hours Met for Warrant 2	3	2
3. Peak Hour Vehicular Volume	*N/A*	*N/A*
4. Pedestrian Volume	*Not Evaluated*	*Not Evaluated*
5. School Crossing	*N/A*	*N/A*
6. Coordinated Signal System	*N/A*	*N/A*
7. Crash Experience	*Not Evaluated*	*Not Evaluated*
8. Roadway Network	*N/A*	*N/A*
9. Intersection near a Grade Crossing	*N/A*	*N/A*

As seen in **Table 8,** the intersection meets the eight-hour signal warrant with existing traffic volumes before the addition of the site-generated trips from the Pepper Square Redevelopment.

V. TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in the 2022, 2026 (Phase 1), 2028 (Phases 1 and P), and 2033 (Phase 1, P, and N, total buildout) study years at the study intersections.

The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual.*

A. Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). Level of service and the corresponding analysis methodology are explained in **Appendix A**.

Signal timings for the signalized intersections are based on Dallas signal timing sheets. The timing was held constant across the traffic scenarios. Calculations for the level of service at the key intersections identified for study are provided in **Volume 2** of this report. The analyses assumed the lane geometry and intersection control shown in **Exhibit 3** through **Exhibit 5**.

B. Analysis Results

Table 9 and **Table 10** show the signalized and unsignalized intersection operational results for the weekday AM peak hour. **Table 11** and **Table 12** show the signalized and unsignalized intersection operational results for the weekday PM peak hour.

Table 9 – Traffic Operational Results – Weekday AM Peak Hour – Signalized Intersections

INTERSECTION	APPROACH	Existing Traffic		2026 Background Traffic		2026 Background + Site Traffic		2028 Background Traffic		2028 Background + Site Traffic		2033 Background Traffic		2033 Background + Site Traffic	
		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Signalized Intersection															
Belt Line Road @ Preston Road	EB	38.5	D	39.3	D	39.4	D	39.8	D	40.1	D	42.3	D	43.6	D
	WB	57.0	E	28.5	C	31.4	C	29.3	C	35.9	D	31.4	C	40.6	D
	NB	31.3	C	34.9	C	35.8	D	37.3	D	71.9	E	47.5	D	71.1	E
	SB	17.2	B	17.8	B	18.3	B	18.5	B	20.4	C	20.6	C	23.8	C
	Overall	**31.6**	**C**	**28.0**	**C**	**29.1**	**C**	**29.3**	**C**	**42.4**	**D**	**34.1**	**C**	**44.8**	**D**
Belt Line Village Driveway @ Preston Road	EB	39.4	D	39.2	D	39.2	D	39.2	D	37.0	D	39.3	D	33.1	C
	WB	61.2	E	61.2	E	61.2	E	61.2	E	58.8	E	61.2	E	63.1	E
	NB	4.5	A	6.6	A	6.6	A	6.5	A	11.9	B	7.2	A	11.4	B
	SB	2.5	A	2.6	A	2.6	A	2.8	A	3.0	A	3.2	A	4.3	A
	Overall	**4.2**	**A**	**5.2**	**A**	**5.1**	**A**	**5.2**	**A**	**9.6**	**A**	**5.7**	**A**	**10.7**	**B**
Alexis Drive @ Preston Road	EB	32.7	C	32.2	C	32.2	C	33.0	C	33.0	C	32.0	C	32.0	C
	WB	63.1	E	60.4	E	60.9	E	59.7	E	60.5	E	59.8	E	60.0	E
	NB	4.4	A	5.3	A	5.7	A	6.0	A	7.2	A	7.9	A	9.5	A
	SB	1.4	A	1.7	A	1.9	A	2.0	A	3.7	A	2.9	A	5.4	A
	Overall	**6.0**	**A**	**7.0**	**A**	**7.8**	**A**	**8.0**	**A**	**10.1**	**B**	**10.3**	**B**	**12.7**	**B**
Belt Line Road @ Berry Trail	EB	-	-	3.8	A	6.7	A	3.8	A	10.2	B	4.0	A	11.4	B
	WB	-	-	1.0	A	1.7	A	1.0	A	2.9	A	1.2	A	3.4	A
	NB	-	-	71.0	E	57.1	E	71.0	E	48.3	D	71.0	E	69.3	E
	SB	-	-	51.9	D	49.1	D	51.9	D	46.2	D	51.9	D	44.9	D
	Overall	**-**	**-**	**5.2**	**A**	**8.4**	**A**	**5.1**	**A**	**13.3**	**B**	**5.1**	**A**	**15.6**	**B**
Belt Line Road @ Meadowcreek Drive	EB	2.7	A	1.3	A	1.3	A	1.4	A	3.3	A	1.6	A	4.3	A
	WB	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A
	NB	39.7	D	40.0	D	39.9	D	39.9	D	39.7	D	39.7	D	39.0	D
	SB	15.6	B	15.5	B	15.5	B	15.4	B	15.3	B	15.4	B	16.7	B
	Overall	**2.6**	**A**	**2.1**	**A**	**2.0**	**A**	**2.1**	**A**	**2.7**	**A**	**2.1**	**A**	**3.1**	**A**
Belt Line Road @ Prestonwood Boulevard	EB	1.6	A	1.6	A	1.6	A	1.7	A	1.7	A	1.8	A	1.8	A
	WB	1.8	A	1.8	A	1.8	A	1.8	A	1.7	A	1.9	A	1.8	A
	NB	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A
	SB	38.2	D	38.2	D	38.2	D	38.2	D	38.2	D	38.1	D	38.1	D
	Overall	**3.4**	**A**	**3.4**	**A**	**3.3**	**A**	**3.3**	**A**	**3.2**	**A**	**3.3**	**A**	**3.2**	**A**
Arapaho Road @ Preston Road	EB	52.4	D	53.7	D	53.5	D	54.5	D	54.3	D	56.9	E	56.5	E
	WB	63.2	E	63.8	E	63.9	E	64.2	E	64.5	E	65.1	E	65.5	E
	NB	27.5	C	28.4	C	29.3	C	28.9	C	31.5	C	30.5	C	34.3	C
	SB	45.9	D	47.1	D	47.3	D	47.6	D	48.3	D	49.3	D	50.1	D
	Overall	**43.5**	**D**	**44.4**	**D**	**44.8**	**D**	**44.9**	**D**	**46.0**	**D**	**46.4**	**D**	**47.9**	**D**
Spring Valley Road @ Preston Road	EB	62.3	E	63.1	E	63.6	E	63.4	E	65.4	E	64.2	E	67.6	E
	WB	59.9	E	60.0	E	59.9	E	60.0	E	60.0	E	60.2	E	60.2	E
	NB	53.9	D	51.7	D	51.4	D	50.8	D	49.0	D	48.4	D	47.4	D
	SB	40.3	D	42.8	D	43.7	D	44.6	D	47.1	D	49.1	D	53.1	D
	Overall	**50.7**	**D**	**51.0**	**D**	**51.3**	**D**	**51.5**	**D**	**52.2**	**D**	**52.6**	**D**	**54.4**	**D**

Table 10 – Traffic Operational Results – Weekday AM Peak Hour – Unsignalized Intersections

INTERSECTION	APPROACH	Existing Traffic		2026 Background Traffic		2026 Background + Site Traffic		2028 Background Traffic		2028 Background + Site Traffic		2033 Background Traffic		2033 Background + Site Traffic	
		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR		AM PEAK HOUR	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Unsignalized Intersection															
Alexis Drive @ Belt Line Road	WBL	13.3	B	9.8	A	10.1	B	10.0	A	10.0	A	10.2	B	10.4	B
	NBL*	15.4	C	12.4	B	12.5	B	12.6	B	12.9	B	13.3	B	13.9	B
	NBR*	12.7	B	10.7	B	10.7	B	11.0	B	11.4	B	12.2	B	12.7	B
Median Opening between Berry Trail and Alexis Drive @ Belt Line Road	EBL	9.6	A	9.5	A	9.6	A	9.7	A	9.6	A	9.7	A	9.8	A
	WBL	10.9	B	8.8	A	9.0	A	8.9	A	9.2	A	8.9	A	9.5	A
	NB*	10.7	B	11.2	B	10.4	B	11.2	B	10.8	B	11.4	B	10.7	B
	SB*	11.9	B	11.1	B	11.3	B	11.3	B	11.8	B	11.4	B	12.3	B
Drive 7 @ Belt Line Road	NBR*	10.9	B	-	-	-	-	-	-	-	-	-	-	-	-
Berry Trail @ Belt Line Road	EBL	16.6	C	-	-	-	-	-	-	-	-	-	-	-	-
	WBL	10.6	B	-	-	-	-	-	-	-	-	-	-	-	-
	NB*	22.2	C	-	-	-	-	-	-	-	-	-	-	-	-
	SBL*	43.3	E	-	-	-	-	-	-	-	-	-	-	-	-
	SBR*	18.3	C	-	-	-	-	-	-	-	-	-	-	-	-
Drive 6 @ Belt Line Road	NBR*	-	-	-	-	-	-	-	-	-	-	-	-	12.1	B
Median Opening east of Preston Road @ Belt Line Road	EBL	14.8	B	9.1	A	9.2	A	9.1	A	9.3	A	9.2	A	9.4	A
	WBL	10.5	B	10.6	B	10.7	B	10.8	B	11.1	B	11.1	B	11.9	B
	NB*	21.8	C	13.8	B	14.1	B	14.1	B	14.6	B	14.7	B	12.6	B
	SB*	17.5	C	10.8	B	10.9	B	10.8	B	11.0	B	11.0	B	11.5	B
Drive 5 @ Belt Line Road	NBR*	-	-	-	-	-	-	-	-	-	-	-	-	12.1	B
Drive 4 @ Preston Road	WBR*	21.5	C	22.9	C	23.0	C	23.8	C	25.0	C	26.6	D	34.9	D
Drive 3 @ Preston Road	WBR*	21.3	C	22.7	C	22.8	C	23.6	C	24.7	C	26.3	D	34.4	D
Drive 2 @ Preston Road	WBR*	20.7	C	22.0	C	22.2	C	22.9	C	31.6	D	25.5	D	33.7	D
Pepper Square Driveway @ Preston Road	NBL	12.3	B	12.8	B	13.2	B	13.9	B	14.2	B	14.7	B	14.6	B
	SBL	35.7	E	40.4	E	41.2	E	44.4	E	49.0	E	56.5	F	64.9	F
	EB*	26.6	D	29.2	D	30.6	D	32.7	D	42.0	E	42.1	E	55.1	F
	WB*	110.0	F	134.7	F	118.7	F	154.3	F	66.7	F	200.0+	F	106.5	F
	WBL*	-	-	-	-	-	-	-	-	200.0+	F	-	-	200.0+	F
	WBR*	-	-	-	-	-	-	-	-	37.1	E	-	-	39.7	E
Drive 1 @ Preston Road	WBR*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ladera Drive @ Belt Line Road	EBL	21.4	C	24.0	C	24.8	C	26.2	D	28.9	D	36.3	E	42.6	E
	WBL	9.0	A	9.2	A	8.9	A	9.0	A	9.3	A	9.2	A	9.2	A
	NBL*	25.1	D	31.4	D	31.6	D	38.4	E	44.9	E	183.0	F	200.0+	F
	NBR*	10.2	B	10.2	B	10.3	B	10.3	B	10.3	B	10.3	B	10.4	B
	SBL*	65.0	F	100.3	F	116.2	F	194.3	F	200.0+	F	200.0+	F	200.0+	F
	SBR*	19.5	C	21.8	C	22.3	C	24.3	C	26.2	D	36.4	E	42.1	E

Table 11 – Traffic Operational Results – Weekday PM Peak Hour – Signalized Intersections

INTERSECTION	APPROACH	Existing Traffic		2026 Background Traffic		2026 Background + Site Traffic		2028 Background Traffic		2028 Background + Site Traffic		2033 Background Traffic		2033 Background + Site Traffic	
		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Signalized Intersection															
Belt Line Road @ Preston Road	EB	60.0	E	59.7	E	54.7	D	59.6	E	55.0	D	60.1	E	56.4	E
	WB	95.1	F	73.2	E	91.9	F	84.6	F	112.1	F	123.6	F	160.2	F
	NB	24.3	C	26.6	C	29.2	C	28.6	C	33.1	C	39.5	D	49.4	D
	SB	41.9	D	42.9	D	42.6	D	43.5	D	46.4	D	46.2	D	54.7	D
	Overall	**47.0**	**D**	**45.3**	**D**	**47.4**	**D**	**47.6**	**D**	**52.4**	**D**	**57.2**	**E**	**67.0**	**E**
Belt Line Village Driveway @ Preston Road	EB	41.2	D	41.4	D	41.4	D	41.3	D	40.2	D	41.7	D	37.9	D
	WB	44.7	D	46.1	D	46.1	D	45.6	D	57.3	E	45.6	D	63.9	E
	NB	2.6	A	2.6	A	2.5	A	2.7	A	2.8	A	3.0	A	4.7	A
	SB	3.6	A	4.0	A	3.8	A	4.3	A	7.5	A	5.2	A	13.9	B
	Overall	**4.7**	**A**	**4.9**	**A**	**4.8**	**A**	**5.1**	**A**	**7.6**	**A**	**5.5**	**A**	**11.8**	**B**
Alexis Drive @ Preston Road	EB	47.8	D	47.9	D	47.9	D	47.9	D	47.9	D	48.0	D	48.0	D
	WB	63.1	E	63.1	E	64.6	E	63.6	E	65.8	E	65.1	E	67.7	E
	NB	14.8	B	16.2	B	16.5	B	16.9	B	17.9	B	19.5	B	21.1	C
	SB	4.7	A	6.1	A	6.4	A	7.8	A	9.1	A	18.3	B	22.4	C
	Overall	**15.3**	**B**	**16.6**	**B**	**17.2**	**B**	**17.6**	**B**	**19.1**	**B**	**23.2**	**C**	**25.9**	**C**
Belt Line Road @ Berry Trail	EB	-	-	1.7	A	2.4	A	1.8	A	3.3	A	1.9	A	4.2	A
	WB	-	-	1.1	A	1.7	A	1.1	A	3.0	A	1.2	A	4.5	A
	NB	-	-	69.2	E	58.8	E	69.2	E	50.0	D	70.3	E	60.8	E
	SB	-	-	49.7	D	53.8	D	49.7	D	52.2	D	49.5	D	50.9	D
	Overall	**-**	**-**	**3.4**	**A**	**5.5**	**A**	**3.4**	**A**	**7.9**	**A**	**3.5**	**A**	**9.4**	**A**
Belt Line Road @ Meadowcreek Drive	EB	1.6	A	1.0	A	1.1	A	1.0	A	0.9	A	1.1	A	0.9	A
	WB	0.1	A	0.1	A	0.1	A	0.1	A	0.1	A	0.1	A	0.2	A
	NB	95.2	F	95.8	F	95.8	F	99.9	F	99.9	F	98.7	F	98.7	F
	SB	35.7	D	35.6	D	35.6	D	35.5	D	35.5	D	35.7	D	35.7	D
	Overall	**3.5**	**A**	**3.1**	**A**	**3.1**	**A**	**3.1**	**A**	**2.9**	**A**	**3.0**	**A**	**2.8**	**A**
Belt Line Road @ Prestonwood Boulevard	EB	4.9	A	5.2	A	5.3	A	5.4	A	5.6	A	6.0	A	6.3	A
	WB	21.2	C	21.1	C	20.8	C	21.3	C	20.8	C	20.9	C	20.7	C
	NB	67.0	E	67.0	E	67.0	E	67.0	E	67.0	E	67.0	E	67.0	E
	SB	55.7	E	55.8	E	55.8	E	55.7	E	55.7	E	55.6	E	55.6	E
	Overall	**15.6**	**B**	**15.6**	**B**	**15.5**	**B**	**15.7**	**B**	**15.5**	**B**	**15.6**	**B**	**15.6**	**B**
Arapaho Road @ Preston Road	EB	57.7	E	58.6	E	58.6	E	59.3	E	59.4	E	61.3	E	61.7	E
	WB	60.3	E	63.8	E	64.8	E	66.8	E	70.7	E	75.1	E	82.3	F
	NB	31.3	C	32.6	C	33.0	C	33.8	C	35.3	D	38.0	D	42.9	D
	SB	38.5	D	39.8	D	40.1	D	40.5	D	41.2	D	42.9	D	43.8	D
	Overall	**43.4**	**D**	**45.0**	**D**	**45.3**	**D**	**46.2**	**D**	**47.5**	**D**	**50.1**	**D**	**53.1**	**D**
Spring Valley Road @ Preston Road	EB	56.3	E	56.9	E	57.0	E	57.3	E	57.5	E	58.0	E	58.2	E
	WB	50.8	D	51.7	D	51.9	D	52.4	D	53.1	D	53.6	D	54.7	D
	NB	59.6	E	68.8	E	69.5	E	76.2	E	80.5	F	100.6	F	107.9	F
	SB	28.1	C	28.9	C	29.4	C	29.5	C	31.0	C	31.3	C	33.5	C
	Overall	**48.8**	**D**	**52.9**	**D**	**53.3**	**D**	**56.1**	**E**	**58.2**	**E**	**66.7**	**E**	**70.2**	**E**

Table 12 – Traffic Operational Results – Weekday PM Peak Hour – Unsignalized Intersections

INTERSECTION	APPROACH	Existing Traffic		2026 Background Traffic		2026 Background + Site Traffic		2028 Background Traffic		2028 Background + Site Traffic		2033 Background Traffic		2033 Background + Site Traffic	
		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Unsignalized Intersection															
Alexis Drive @ Belt Line Road	WBL	37.8	E	11.3	B	11.3	B	11.6	B	11.8	B	12.8	B	13.1	B
	NBL*	35.8	E	13.8	B	13.8	B	14.2	B	14.7	B	16.0	C	16.8	C
	NBR*	46.9	E	16.1	C	16.1	C	16.5	C	17.1	C	18.4	C	19.3	C
Median Opening between Berry Trail and Alexis Drive @ Belt Line Road	EBL	9.0	A	9.0	A	9.0	A	9.0	A	9.1	A	9.1	A	9.2	A
	WBL	18.7	C	9.6	A	9.7	A	9.6	A	9.9	A	9.8	A	10.1	B
	NB*	22.8	C	11.7	B	11.8	B	11.8	B	12.3	B	12.1	B	12.5	B
	SB*	13.6	B	11.2	B	11.3	B	11.2	B	11.7	B	11.5	B	12.1	B
Drive 7 @ Belt Line Road	NBR*	15.6	C	-	-	-	-	-	-	-	-	-	-	-	-
Berry Trail @ Belt Line Road	EBL	14.0	B	-	-	-	-	-	-	-	-	-	-	-	-
	WBL	17.4	C	-	-	-	-	-	-	-	-	-	-	-	-
	NB*	31.9	D	-	-	-	-	-	-	-	-	-	-	-	-
	SBL*	31.5	D	-	-	-	-	-	-	-	-	-	-	-	-
	SBR*	17.3	C	-	-	-	-	-	-	-	-	-	-	-	-
Drive 6 @ Belt Line Road	NBR*	15.3	C	15.7	C	15.8	C	15.9	C	16.3	C	16.6	C	18.7	C
Median Opening east of Preston Road @ Belt Line Road	EBL	12.0	B	8.6	A	8.6	A	8.6	A	8.6	A	8.6	A	8.7	A
	WBL	17.2	C	17.9	C	18.1	C	18.3	C	19.1	C	19.8	C	22.7	C
	NB*	25.8	D	29.5	D	29.5	D	30.2	D	31.9	D	32.8	D	28.4	D
	SB*	21.7	C	13.6	B	13.8	B	13.8	B	14.1	B	14.3	B	15.9	C
Drive 5 @ Belt Line Road	NBR*	15.0	B	15.3	C	15.5	C	15.6	C	16.0	C	16.2	C	18.1	C
Drive 4 @ Preston Road	WBR*	30.6	D	33.0	D	33.2	D	34.4	D	35.6	E	39.4	E	51.0	F
Drive 3 @ Preston Road	WBR*	35.0	D	38.7	E	39.0	E	40.6	E	42.5	E	48.3	E	66.5	F
Drive 2 @ Preston Road	WBR*	29.4	D	31.6	D	31.8	D	33.0	D	44.6	E	37.9	E	49.9	E
Pepper Square Driveway @ Preston Road	NBL	11.1	B	11.4	B	11.6	B	11.6	B	11.9	B	12.5	B	12.9	B
	SBL	56.2	F	66.6	F	68.6	F	74.0	F	89.7	F	100.2	F	129.4	F
	EB*	59.3	F	101.7	F	108.0	F	137.1	F	200.0+	F	200.0+	F	200.0+	F
	WB*	200.0+	F	200.0+	F	200.0+	F	200.0+	F	137.5	F	200.0+	F	200.0+	F
	WBL*	-	-	-	-	-	-	-	-	200.0+	F	-	-	200.0+	F
	WBR*	-	-	-	-	-	-	-	-	61.9	F	-	-	74.1	F
Drive 1 @ Preston Road	WBR*	29.0	D	31.1	D	31.3	D	32.3	D	33.4	D	36.3	E	38.4	E
Ladera Drive @ Belt Line Road	EBL	25.9	D	31.6	D	32.6	D	38.4	E	42.2	E	88.8	F	108.7	F
	WBL	10.8	B	11.0	B	11.0	B	11.0	B	11.2	B	11.5	B	11.7	B
	NBL*	41.9	E	62.4	F	66.2	F	142.2	F	96.5	F	118.3	F	200.0+	F
	NBR*	12.1	B	12.3	B	12.3	B	12.3	B	12.6	B	12.9	B	13.2	B
	SBL*	172.4	F	200.0+	F	200.0+	F	200.0+	F	200.0+	F	200.0+	F	200.0+	F
	SBR*	17.6	C	19.1	C	19.4	C	20.4	C	21.2	C	26.2	D	28.0	D

C. Belt Line Road at Preston Road

Belt Line Road and Preston Road are two of the largest arterials in the City of Dallas. The intersection serves as a funnel point for many converging traffic flows. There are the two natural traffic flows along both arterials, but there is also a third traffic flow to and from the Dallas North Tollway to the west of the site. This is evidenced in the 24-hour counts collected along Belt Line Road to the east and west of Preston Road, where the traffic volumes to the west are 50% higher than those to the east.

Without changing the traffic signal timings, the intersection of Belt Line Road can operate at LOS C overall during AM peak with the addition of Phase 1 site-generated traffic. After the addition of Phase P site-generated traffic, the intersection changes to LOS D overall during the AM peak hour and maintains LOS D through the addition of Phase N traffic. The PM peak hour maintains LOS D overall through the addition of the traffic from Phases 1 and P but changes to LOS E with the 2033 background traffic. Simply put, if background traffic levels continue to rise at a given rate, this intersection will operate at LOS E by the 2033 buildout year of Phase N. After Phase N traffic is added, the intersection maintains LOS E.

The westbound approach is the smallest of the four approaches, with only a single left-turn lane and no right-turn lane, and consequently operates at LOS F during the PM peak hour. The very heavy eastbound left-turn is served twice during the cycle, each for longer than the westbound left-turning movement is served. If only 5 seconds of time were taken from one of the eastbound left-turning phases and given to the westbound through phase, the approach would cut its delay in half, and the eastbound approach delay would only increase by 5 seconds.

The intersection of Belt Line Road and Preston Road can accommodate the projected site-generated traffic volumes of the Pepper Square Redevelopment. A slight timing adjustment may be necessary, but this intersection is very likely to be retimed at some point before the 2033 opening year of Phase N.

There are a number of regional mitigations that can be employed at this intersection. The westbound approach would benefit from dual left-turn lanes and a right-turn lane, but the site does not own the Belt Line Road frontage where this improvement would be made and does not have the power to dedicate the right-of-way. Likewise, the southbound approach needs dual left-turn lanes, and the development does not own the right-of-way required to provide the space for the extra lane.

For the site-generated traffic, there are multiple routes to the east and south that have relatively low delays and can accommodate the site traffic that does not wish to use the intersection of Preston Road and Belt Line Road. The site's main contribution to alleviating the delays experienced at the intersection of Belt Line Road and Preston Road will be to ensure that the site drivers have well-functioning routes in the directions away from the intersection.

D. Belt Line Village Driveway at Preston Road

The Belt Line Village Driveway is a signalized access point that serves the western portion of the Pepper Square existing and proposed developments. When Phase P is constructed, a second westbound lane is added to accommodate the Pepper Square Redevelopment. The intersection timing naturally heavily favors the Preston Road traffic flow. The delays experienced by the Belt Line Village Driveway approaches are exactly as one would

expect – LOS D and E in both peak hours. The volume-to-capacity (v/c) ratios are below 1.0 for all approaches, and, besides the westbound approach expansion, no improvements are required for this intersection to accommodate the trips generated by Phases 1 and 2 of the Pepper Square Redevelopment.

As the Preston Road side of the Pepper Square Redevelopment is reconstructed, the westbound approach needs to be lengthened before it intersects a parking circulation aisle. It is recommended that a minimum of 50' of queue storage is provided before the approach interacts with the parking circulation.

E. Alexis Drive at Preston Road

The intersection of Alexis Drive at Preston Road serves as the access point to the southern portion of the Pepper Square area. It operates at LOS C or better overall and each of the approaches operates with a v/c ratio of less than 1.0, which is acceptable. No alterations are necessary to this intersection to accommodate the site-generated trips.

F. Berry Trail at Belt Line Road

The intersection of Belt Line Road and Berry Trail is currently unsignalized but meets the 8-hour traffic signal warrant with existing traffic volumes, so it was analyzed as a signalized intersection in each of the future scenarios of this report.

This intersection will serve as the main access point for the eastern half of the Pepper Square Redevelopment and needs no further improvements to accommodate the site-generated trips of the development.

G. Remaining Signalized Intersections

The remaining signalized intersections are included primarily to ensure that the traffic flows at the intersections adjacent to the site are properly coordinated. Each of these intersections experiences increases in delay with the growth in background and site-generated traffic, but in each case the growth is mainly due to background growth. No mitigations are needed at these intersections due to the site-generated traffic of the Pepper Square Redevelopment.

H. Unsignalized Development Intersections Along Belt Line Road

The unsignalized development intersection approaches and movements along Belt Line Road operate at LOS D or better after the site-generated trips are added to the network. The traffic volumes along Belt Line Road to the east of Preston Road are significantly lower than those along Belt line Road to the west and those along Preston Road, so the turning movements into and out of the site are able to be made. No mitigations are required for the site driveways.

I. Unsignalized Development Intersections Along Preston Road

The unsignalized development intersection approaches and movements along Preston Road operate at LOS E and F with background traffic and with background plus site-generated traffic. The Preston Road traffic volumes are among the highest arterial volumes in the DFW area and are near their saturation point. The corridor is well coordinated, so the site-generated volumes can access the network only when there are gaps in the coordinated traffic flow.

The site has two signalized access points to Preston Road, Belt Line Village Driveway and Alexis Drive, and if drivers are uncomfortable making an unsignalized turn onto Preston Road, they may elect to use these signalized access points.

J. Link Volume Analysis

The volume to capacity ratio (V/C) of the different roadway links that would be impacted by the proposed development's traffic was calculated for the 2021 existing traffic, 2026 background and background plus site traffic, 2028 background and background plus site traffic scenarios, and 2033 background and background plus site traffic scenarios. The daily link capacity for each roadway is taken from the NCTCOG model capacity volumes assuming the suburban residential area type. Belt Line Road and Preston Road, as Principal Arterials, have capacities of 925 vehicles per hour per lane (vphpl).

The daily volume link analyses, displayed below in **Table 13**, shows that Belt Line Road east of Preston Road currently operates with ample capacity at LOS A/B with current traffic volumes. This should be qualified by noting that the section of Belt Line Road west of Preston Road operates with over 50% more traffic than the analyzed segment to the east of Preston Road which is adjacent to the site. Furthermore, at its intersection with Preston Road, the peak hour turning movements are high even though the link volumes appear rather modest. After the traffic from the background growth, background sites, and the project site are added to the network, the roadway operates at LOS C through 2023 background plus site traffic. After the full buildout of the site, Belt Line Road is left with 41% of its capacity available in regard to daily traffic.

Preston Road currently operates at LOS E. Preston Road is known throughout the region as a very heavily traveled roadway. It serves as a crucial arterial and carries an additional burden of north-south drivers wishing to avoid the Dallas North Tollway fees due to its proximity to the facility. After the 2026 background growth and site generated traffic, it maintains its LOS E operation. Through 2030 background growth and the TerraCap and Alexis Tonti site traffic, Preston Road operates at LOS E, and performs at LOS F after the addition of site-generated traffic by the buildout of Phase N.

Table 13 – Link Operational Results – Daily Volumes

Roadway Link		2021 Existing			2026 Background					2026 Site-Generated		2026 Background+Site		
From	To	Volume	V/C Ratio	LOS	Volume	Daily Volume	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**	24,303	0.44	A/B	**TerraCap**	325	25,317	0.46	C	35.0%	766	26,083	0.47	C
					15.0%									
					Alexis Tonti	75								
Volume Limit 6 Lanes = 55,500					5.0%		0.5% growth for 5 years							
Preston Road														
Alexis Drive	**Belt Line Road**	50,325	0.91	E	**TerraCap**	542	52,665	0.95	E	15.0%	328	52,993	0.95	E
					25.0%									
					Alexis Tonti	528								
Volume Limit 6 Lanes = 55,500					35.0%		0.5% growth for 5 years							

Roadway Link					2028 Background					2028 Site-Generated		2028 Background+Site		
From	To				Volume	Daily Volume	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**				**TerraCap**	651	26,571	0.48	C	22.5%	2,262	28,833	0.52	C
					15.0%									
					Alexis Tonti	140								
Volume Limit 6 Lanes = 55,500					5.0%		0.5% growth for 2 additional years							
Preston Road														
Alexis Drive	**Belt Line Road**				**TerraCap**	1,085	55,446	1.00	E	22.5%	2,262	57,708	1.04	F
					25.0%									
					Alexis Tonti	978								
Volume Limit 6 Lanes = 55,500					35.0%		0.5% growth for 2 additional years							

Roadway Link					2033 Background					2033 Site-Generated		2033 Background+Site		
From	To				Volume	Daily Volume	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Volume	V/C Ratio	LOS
Belt Line Road														
Belt Line Road	**Berry Trail**				**TerraCap**	1,627	29,199	0.53	C	27.0%	3,587	32,786	0.59	C
					15.0%									
					Alexis Tonti	293								
Volume Limit 6 Lanes = 55,500					5.0%		0.5% growth for 5 additional years							
Preston Road														
Preston Road	**Belt Line Road**				**TerraCap**	2,712	61,251	1.10	F	25.0%	3,321	64,572	1.16	F
					25.0%									
					Alexis Tonti	2,052								
Volume Limit 6 Lanes = 55,500					35.0%		0.5% growth for 5 additional years							

Volume Limit Based on NCTCOG DFWRTM Hourly Capacity Per Lane

Volume to Service (Capacity) Ratio		LOS
Greater Than	Less Than / Equal To	Ranking
-	0.45	A or B
0.45	0.65	C
0.65	0.80	D
0.80	1.00	E
1.00	-	F

The link analysis is repeated for the AM and PM peak-hour volumes in **Table 14** and **Table 15**. As with the daily volumes, Belt Line Road operates at LOS C or better with the full background growth, background development traffic, and site-generated traffic.

Preston Road currently operates at LOS D in both peak hours. 7.9% of the daily traffic of Preston Road occurs during the PM peak hour (the overall peak hour of the day). The daily link analysis assumes that all the traffic for a roadway should be carried in the top 10 hours of the day, the overall daily roadway capacity is calculated by multiplying the hourly capacity by 10. If the peak hour contains less than 10% of the daily traffic, then the peak hour link operational analysis will register a lower volume-to-capacity ratio than will the daily link hour analysis. This is the case with Preston Road. After the full addition of background and site-generated traffic, the roadway operates at LOS E or better.

Table 14 – Link Operational Results – Daily Volumes

Roadway Link		2021 Existing			2026 Background					2026 Site-Generated		2026 Background+Site		
From	To	AM Volume	V/C Ratio	LOS	Assignment	Site Volume	AM Volume	V/C Ratio	LOS	Assignment	Site Volume	AM Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**	1,499	0.27	A/B	**TerraCap** 15.0%	20	1,564	0.28	A/B	35.0%	68	1,632	0.29	A/B
					Alexis Tonti 5.0%	7								
Volume Limit 6 Lanes = 5,550					0.5% growth for 5 years									
Preston Road														
Alexis Drive	**Belt Line Road**	3,696	0.67	D	**TerraCap** 25.0%	34	3,869	0.70	D	15.0%	29	3,898	0.70	D
					Alexis Tonti 35.0%	46								
Volume Limit 6 Lanes = 5,550					0.5% growth for 5 years									

Roadway Link					2028 Background					2028 Site-Generated		2028 Background+Site		
From	To				Assignment	Site Volume	AM Volume	V/C Ratio	LOS	Assignment	Site Volume	AM Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**				**TerraCap** 15.0%	40	1,642	0.30	A/B	22.5%	170	1,812	0.33	A/B
					Alexis Tonti 5.0%	12								
Volume Limit 6 Lanes = 5,550					0.5% growth for 2 additional years									
Preston Road														
Alexis Drive	**Belt Line Road**				**TerraCap** 25.0%	67	4,073	0.73	D	22.5%	170	4,243	0.76	D
					Alexis Tonti 35.0%	85								
Volume Limit 6 Lanes = 5,550					0.5% growth for 2 additional years									

Roadway Link					2033 Background					2033 Site-Generated		2033 Background+Site		
From	To				Assignment	Site Volume	AM Volume	V/C Ratio	LOS	Assignment	Site Volume	AM Volume	V/C Ratio	LOS
Belt Line Road														
Belt Line Road	**Berry Trail**				**TerraCap** 15.0%	101	1,810	0.33	A/B	27.0%	312	2,122	0.38	A/B
					Alexis Tonti 5.0%	26								
Volume Limit 6 Lanes = 5,550					0.5% growth for 5 additional years									
Preston Road														
Preston Road	**Belt Line Road**				**TerraCap** 25.0%	168	4,496	0.81	E	25.0%	289	4,785	0.86	E
					Alexis Tonti 35.0%	179								
Volume Limit 6 Lanes = 5,550					0.5% growth for 5 additional years									

Volume Limit Based on NCTCOG DFWRTM Hourly Capacity Per Lane

Volume to Service (Capacity) Ratio		LOS
Greater Than	Less Than / Equal To	Ranking
-	0.45	A or B
0.45	0.65	C
0.65	0.80	D
0.80	1.00	E
1.00	-	F

Table 15 – Link Operational Results – Daily Volumes

Roadway Link		2021 Existing			2026 Background					2026 Site-Generated		2026 Background+Site		
From	To	PM Volume	V/C Ratio	LOS	Assignment	Site Volume	PM Volume	V/C Ratio	LOS	Assignment	Site Volume	PM Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**	1,956	0.35	A/B	**TerraCap**	27	2,038	0.37	A/B	35.0%	51	2,089	0.38	A/B
					15.0%									
					Alexis Tonti	6								
Volume Limit 6 Lanes = 5,550					5.0%		0.5% growth for 5 years							
Preston Road														
Alexis Drive	**Belt Line Road**	4,025	0.73	D	**TerraCap**	45	4,216	0.76	D	15.0%	22	4,238	0.76	D
					25.0%									
					Alexis Tonti	44								
Volume Limit 6 Lanes = 5,550					35.0%		0.5% growth for 5 years							
Roadway Link					**2028 Background**					**2028 Site-Generated**		**2028 Background+Site**		
From	To				Assignment	Site Volume	PM Volume	V/C Ratio	LOS	Assignment	Site Volume	PM Volume	V/C Ratio	LOS
Belt Line Road														
Preston Road	**Berry Trail**				**TerraCap**	54	2,141	0.39	A/B	22.5%	132	2,273	0.41	A/B
					15.0%									
					Alexis Tonti	12								
Volume Limit 6 Lanes = 5,550					5.0%		0.5% growth for 2 additional years							
Preston Road														
Alexis Drive	**Belt Line Road**				**TerraCap**	91	4,444	0.80	E	22.5%	132	4,576	0.82	E
					25.0%									
					Alexis Tonti	83								
Volume Limit 6 Lanes = 5,550					35.0%		0.5% growth for 2 additional years							
Roadway Link					**2033 Background**					**2033 Site-Generated**		**2033 Background+Site**		
From	To				Assignment	Site Volume	PM Volume	V/C Ratio	LOS	Assignment	Site Volume	PM Volume	V/C Ratio	LOS
Belt Line Road														
Belt Line Road	**Berry Trail**				**TerraCap**	136	2,357	0.42	A/B	27.0%	301	2,658	0.48	C
					15.0%									
					Alexis Tonti	25								
Volume Limit 6 Lanes = 5,550					5.0%		0.5% growth for 5 additional years							
Preston Road														
Preston Road	**Belt Line Road**				**TerraCap**	226	4,917	0.89	E	25.0%	279	5,196	0.94	E
					25.0%									
					Alexis Tonti	173								
Volume Limit 6 Lanes = 5,550					35.0%		0.5% growth for 5 additional years							

Volume Limit Based on NCTCOG DFWRTM Hourly Capacity Per Lane

Volume to Service (Capacity) Ratio		LOS
Greater Than	Less Than / Equal To	Ranking
-	0.45	A or B
0.45	0.65	C
0.65	0.80	D
0.80	1.00	E
1.00	-	F

K. Right-Turn Lane Analysis

Where justified, the addition of right-turn deceleration lanes can help inbound turning vehicles separate from the through traffic, avoiding conflicts and smoothing traffic flow. Both TxDOT and the City has identified right-turning volume thresholds where right-turn lanes are justified. TxDOT has stated that a right-turn deceleration lane should be considered on roads with a posted speed limit greater than 45 MPH if the projected right-turn volume into a driveway is projected to be greater than 50 vph. The TxDOT threshold was applied to driveways located along Preston Road, a TxDOT facility. For the driveways along Belt Line Road, City of Dallas right-turn thresholds were applied. **Table 16** shows the driveway locations with right-turn driveway access to the site, and how they compare with the applicable threshold. A deceleration lane is recommended for the northbound right-turning movements from Preston Road to the Belt Line Village Driveway and to the Pepper Square Driveway after the Phase P traffic volumes are added to the network. Until Phase P, a deceleration lane is not required. No other driveways require a right-turn deceleration lane.

Table 16 – Right-Turn Lane Analysis

Right-Turn Location	Direction	Phase 1 and P Site-Generated Peak Hour Right-Turn Volume	Phase 1 and P Site-Generated Peak Hour Right-Turn Volume	Buildout Site-Generated Peak Hour Right-Turn Volume	TxDOT Threshold (Access Management Manual, Table 2-3)	City of Dallas Threshold (Off-Street Parking and Driveways Handbook, III.A.5)	Right-Turn Lane Recommended?
Drive 1 at Preston Rd	NBR	2 vph	2 vph	2 vph	50 vph	-	No
Pepper Square Driveway at Preston Rd	NBR	38 vph	66 vph	62 vph	50 vph	-	Yes
Drive 2 at Preston Rd	NBR	8 vph	40 vph	35 vph	50 vph	-	No
Belt Line Village at Preston Rd	NBR	12 vph	44 vph	59 vph	50 vph	-	Yes
Drive 3 at Preston Rd	NBR	17 vph	18 vph	45 vph	50 vph	-	No
Drive 4 at Preston Rd	NBR	9 vph	9 vph	34 vph	50 vph	-	No
Drive 5 at Belt Line Rd	EBR	0 vph	0 vph	26 vph	-	120 vph	No
Median opening east of Preston Rd at Belt Line Rd	EBR	12 vph	12 vph	37 vph	-	120 vph	No
Drive 6 at Belt Line Rd	EBR	8 vph	8 vph	32 vph	-	120 vph	No
Berry Trail at Belt Line Rd	EBR	31 vph	92 vph	71 vph	-	120 vph	No
Median Opening b/w Berry Tr and Alexis Dr at Belt Line Rd	EBR	11 vph	38 vph	26 vph	-	120 vph	No

VI. CRASH ANALYSIS – BELT LINE ROAD AT PRESTON ROAD

In response to a request by the City of Dallas, a crash analysis was prepared for the intersection of Belt Line Road and Preston Road using TxDOT's CRIS (Crash Records Information System) Query tool to obtain publicly available crash data. This data is summarized in **Figure 1** and can be found in total in **Volume 2** of this report.

The data shows that there were 206 crashes near the intersection from 2016 to 2022. 202 of the accidents involved either no reported injury or non-serious injury. The remaining 4 crashes involved serious injury. There were no documented fatal injury crashes in the CRIS database in the seven studied years and less than one serious injury crash per year.

While the 29-30 crashes per year may cause some to believe that the intersection is dangerous, the lack of serious or fatal injuries does not support this conclusion.

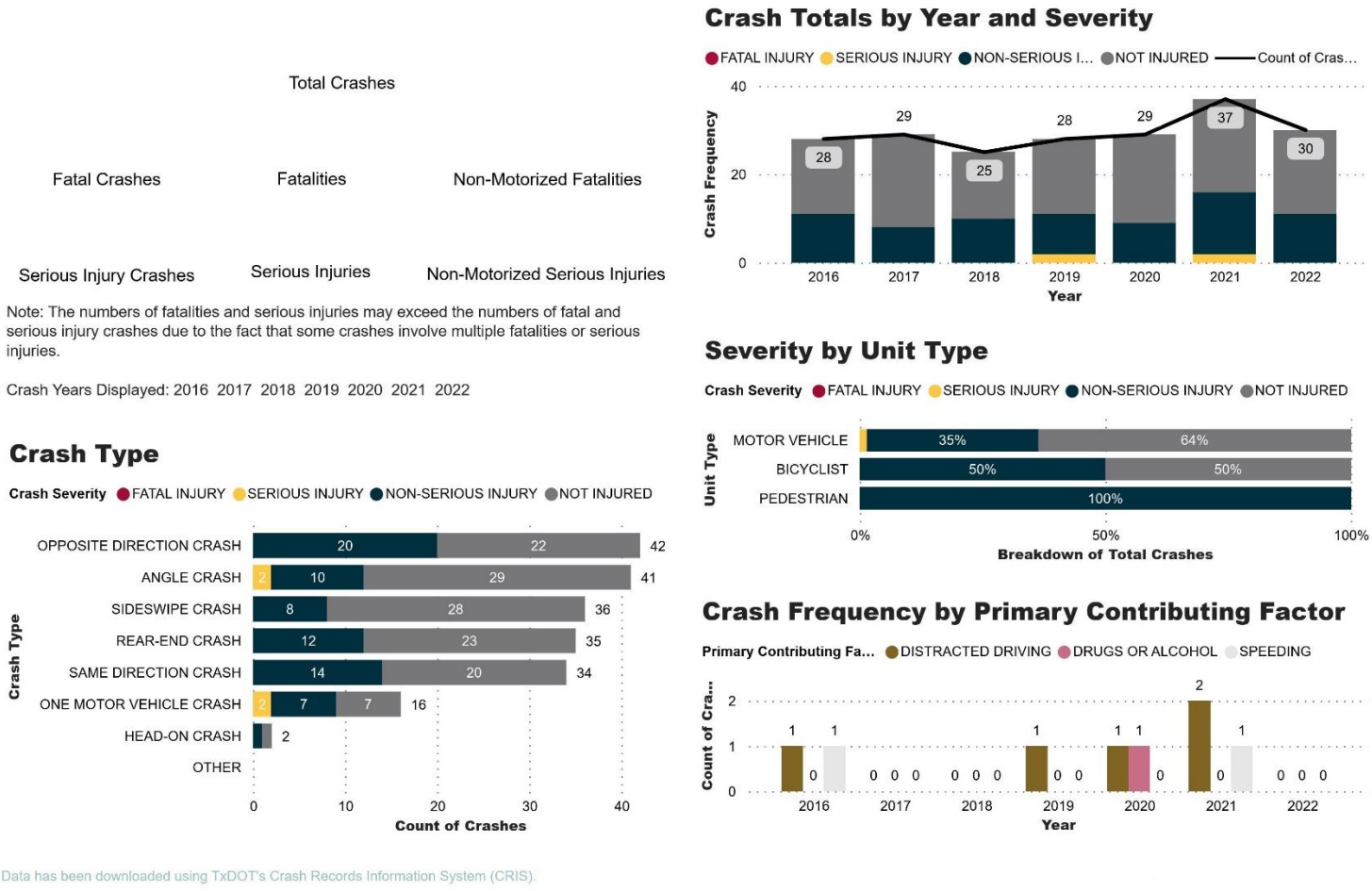

Figure 1 – Belt Line Road at Preston Road CRIS Data

VII. DRIVEWAY REMOVAL DISCUSSION

At the request of the City of Dallas, this section discusses the ramifications of removing a driveway to Preston Road. No driveways are currently proposed to be removed – this is a theoretical analysis of the consequences of removing a driveway.

In this hypothetical analysis, Drive 4, the closest to Belt Line Road, is removed and its existing, background, and proposed traffic is reassigned to Belt Line Village Driveway. The delays for the following intersections are calculated for the 2033 scenarios and compared to those calculated in the main analysis section of the report to quantify the theoretical ramifications of removing a driveway along Preston Road:

- Belt Line Road at Preston Road
- Drive 4 at Preston Road
- Drive 3 at Preston Road
- Belt Line Village Driveway at Preston Road

As shown in **Table 17**, the signalized intersection of Belt Line Village Drive and Preston Road can accommodate the volumes of any individual driveway along Preston Road (represented here by the removal of Drive 4) if one were to be removed. The delay at the intersection of Belt Line Road and Preston Road and Belt Line Village Driveway is essentially the same with or without the driveway. As previously mentioned, no driveways are proposed to be removed with the Pepper Square Redevelopment. The volumes used for this analysis can be found in **Volume 2** of this report.

Table 17 – Traffic Operations Analysis – Theoretical Removal of Drive 4

INTERSECTION	APPROACH	2033 Background + Site Traffic		2033 Background + Site Traffic - Drive 4 Removed		2033 Background + Site Traffic		2033 Background + Site Traffic - Drive 4 Removed	
		AM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		PM PEAK HOUR	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Signalized Intersection									
Belt Line Road @ Preston Road	EB	43.6	D	43.6	D	56.4	E	56.4	E
	WB	40.6	D	40.6	D	160.2	F	160.2	F
	NB	71.1	E	71.3	E	49.4	D	49.6	D
	SB	23.8	C	23.8	C	54.7	D	54.7	D
	Overall	**44.8**	**D**	**44.9**	**D**	**67.0**	**E**	**67.1**	**E**
Belt Line Village Driveway @ Preston Road	EB	33.1	C	33.3	C	37.9	D	38.4	D
	WB	63.1	E	55.7	E	63.9	E	56.1	E
	NB	11.4	B	11.5	B	4.7	A	4.7	A
	SB	4.3	A	4.3	A	13.9	B	13.9	B
	Overall	**10.7**	**B**	**10.7**	**B**	**11.8**	**B**	**11.8**	**B**
Unsignalized Intersection									
Drive 4 @ Preston Road	WBR*	34.9	D	0.0	A	51.0	F	0.0	A
Drive 3 @ Preston Road	WBR*	34.4	D	34.4	D	66.5	F	66.5	F

VIII. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, the proposed Pepper Square Redevelopment can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development.

The following improvements to the external roadway network are required for the site:

- Signalize the intersection of Berry Trail and Belt Line Road. According to a traffic signal warrant analysis performed by the City of Dallas, the intersection meets traffic signal warrants with existing traffic. This was confirmed with the traffic counts collected for this report.
- Construct the westbound approach of the Belt Line Village Driveway to Preston Road as a two-lane approach. This improvement is recommended to coincide with the opening of Phase P of the redevelopment, the western portion of the site.
- Construct a right-turn deceleration lane for the northbound right-turning movement from Preston Road to the Belt Line Village Driveway. This is recommended only at the opening of Phase N and is not required for Phase 1 or P.
- Construct a right-turn deceleration lane for the northbound right-turning movement from Preston Road to the Pepper Square Driveway. This is recommended only at the opening of Phase P and is not required for Phase 1.

Kimley»Horn

APPENDIX A
Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). **Table A-1** shows the definition of level of service for signalized and unsignalized intersections.

Table A-1 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. For the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is defined for each movement. Unlike signalized intersections which define LOS for each approach and for the intersection as a whole, LOS for two-way stop-controlled intersections is not defined as a whole.

Signal timings for the signalized intersections are based on Dallas signal timing sheets. The timing was held constant across different phases. The analyses assumed the lane geometry and intersection control shown in **Exhibit 3, Exhibit 4,** and **Exhibit 5** for Phase 1 (2026), Phase P (2028), and Phase N (2033, ultimate buildout), respectively.

The peak hour factors (PHF) for the existing traffic are known from the counts collected at the site. PHF for the future traffic and the site-generated traffic is unknown, so where this occurred the PHF was assumed to be 0.92.