Volume 1 – Traffic Impact Analysis

6060 North Central Expressway Mixed-Use Site

Dallas, Texas

April 30, 2018

Kimley-Horn and Associates, Inc.
Dallas, Texas

Project #063238300
Registered Firm F-928

Kimley»Horn

Traffic Impact Analysis

6060 North Central Expressway
Mixed-Use Site
Dallas, Texas

Prepared by:

Kimley-Horn and Associates, Inc.
13455 Noel Road, Two Galleria Tower, Suite 700
Dallas, Texas 75240
Registered Firm F-928

Contact:
Scot Johnson, P.E., PTOE
Jake Halter, EIT
972-770-1300
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EXECUTIVE SUMMARY

The proposed 6060 North Central Expressway mixed-use development is located at the northeast corner of the intersection of the US 75 northbound frontage road and Twin Sixties Drive in Dallas, Texas. Open areas on the site will be redeveloped to provide an additional 56,636 SF retail and 620 multifamily units. The currently unoccupied 40,000 SF of office space on the site was considered new development for the purposes of this study and was included in the proposed trip generation for the site. 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 following existing intersections were selected to be part of this study:

- Twin Sixties Drive at US 75 Northbound Frontage Road (US 75 NBFR)
- Twin Sixties Drive at 6060 North Central Driveway (Drive 3)
- US 75 NBFR at 6060/Hotel Driveway (Drive 1)

The analysis also included the following proposed driveways:

- Drive 1, which is a right-in/right-out driveway to the US 75 NBFR;
- Drive 2, which is a full-access driveway to Twin Sixties Drive;
- Drive 3, which is a full-access driveway to Twin Sixties Drive; and
- Drive 4, which is a full-access driveway to Twin Sixties Drive.

Special analyses were performed for the Katy Trail crossing and for the US 75-Mockingbird Lane interchange.

Traffic operations were analyzed at the study intersections for existing volumes, 2021 and 2026 background traffic volumes, and 2021 and 2026 background plus site-generated traffic volumes. The future years correspond to the expected buildout year of the site and a key future study year. Conditions were analyzed for the weekday AM and PM peak hours.

After internal capture reductions and a 10% transit/trail mode share, the proposed 6060 North Central Expressway mixed-use development additions are expected to generate approximately 257 new weekday AM peak hour one-way vehicle trips and 336 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.

Based on the analysis presented in this report, the proposed 6060 North Central Expressway mixed-use development can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development. The site-generated traffic does not significantly affect the existing vehicle traffic operations. No improvements to the external roadway network are recommended for the site.

The site impact on the Katy Trail crossing does not require any additional pedestrian treatment. While it is advised to remove the stop-signs controlling the pedestrian approaches, the current crossing configuration can adequately handle the pedestrian traffic at buildout. This analysis accounted for additional pedestrian trips generated by the site.

Due to the similarity in existing traffic volumes, distribution assumptions, and trip generation of the current development plan to the 2007 study for the 6060 NCX site, the conclusion for the Mockingbird Lane – US 75 interchange still stands: no improvements to the intersection of Mockingbird Lane and the US 75 northbound frontage road are recommended due to the construction of the 6060 NCX site as proposed.

I. INTRODUCTION

A. Purpose

Kimley-Horn was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the development of the 6060 North Central Expressway (NCX) mixed-use site located at the northeast corner of the intersection of the US 75 northbound frontage road and Twin Sixties Drive 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, identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts.

B. Methodology

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

- 2018 existing traffic
- 2021 background traffic
- 2021 background plus site traffic
- 2026 background traffic
- 2026 background plus site traffic

The capacity analyses were conducted using the *Synchro*™ software package. The *Highway Capacity Manual* reports were used to analyze the unsignalized intersections.

LEGEND:
= Study Intersection

North

Not To Scale

EXHIBIT 1

Vicinity Map

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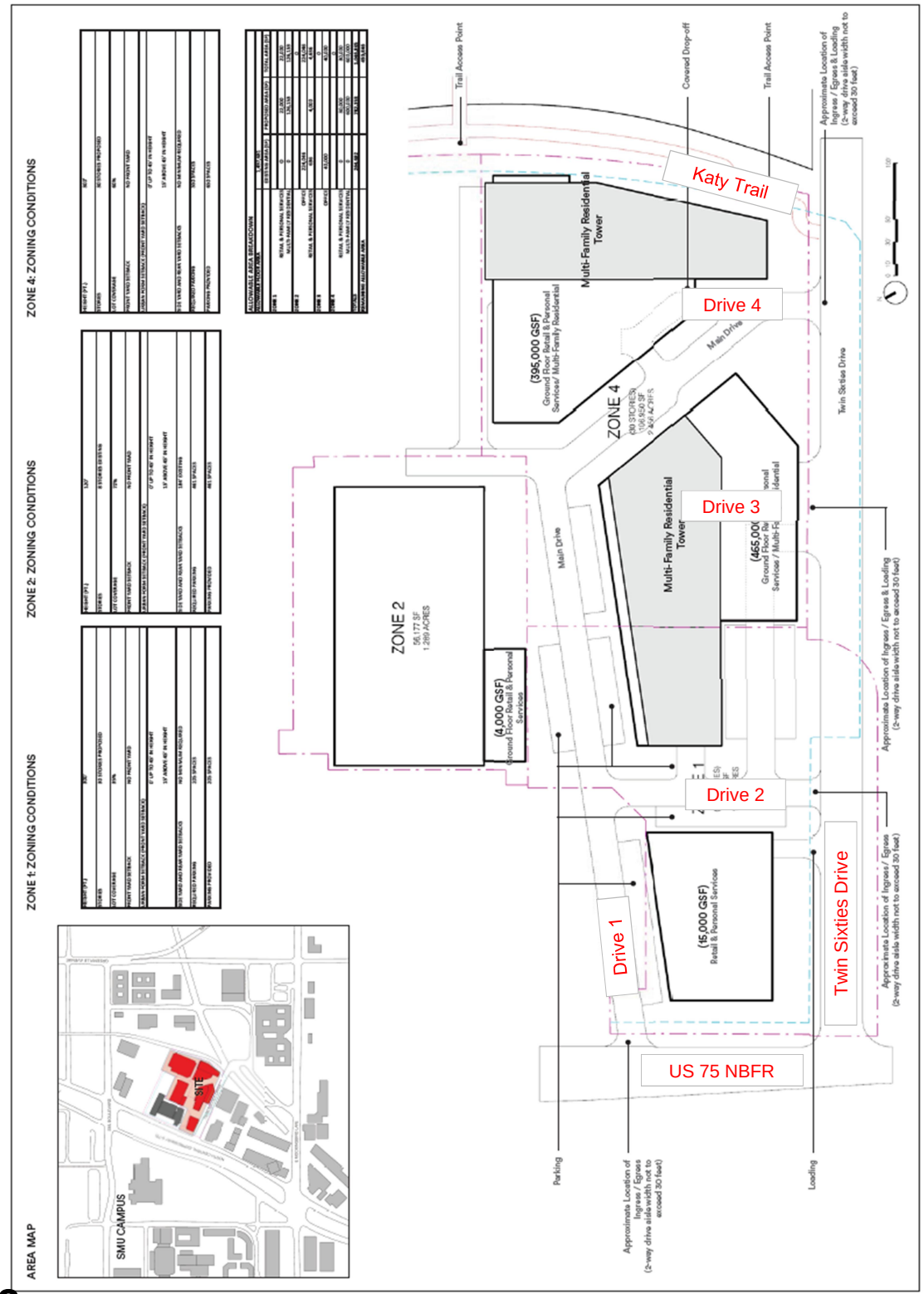

EXHIBIT 2

Conceptual Site Plan

North

Not To Scale

Kimley»Horn

II. EXISTING AND FUTURE AREA CONDITIONS

A. Roadway Characteristics

There were no signalized intersections included in the main analysis portion of this study. The following unsignalized intersections were evaluated as part of this study:

- Twin Sixties Drive at US 75 Northbound Frontage Road (US 75 NBFR)
- Twin Sixties Drive at 6060 North Central Driveway (heretofore known as Drive 3)
- US 75 NBFR at 6060/Hotel Driveway (heretofore known as Drive 1)
- Twin Sixties Drive at the Katy Trail

The major study area roadways are described in **Appendix A**.

Exhibit 3 illustrates the existing intersection geometry used for the traffic analysis.

B. Existing Study Area

The property currently occupies the entirety of PD 834. PD 834 is broken up into four zones. Zone 2 and 3 contain the existing office buildings and structured parking. Zone 2 has 126,153 SF office that is currently occupied. Zone 3 has 40,000 SF office that is currently vacant. Zones 1 and 4 are currently occupied with surface parking.

C. Proposed Site Improvements

The site additions as proposed will include 56,636 SF retail and 620 multifamily units. The 40,000 SF of unoccupied office in Zone 3 is modelled in this analysis as a site addition and was included in the trip generation.

The site would have access via a total of four driveways. The driveways to be modeled in this analysis are as follows:

Drive 1 – would be a right-in/right-out driveway to the US 75 northbound frontage road 160 feet north of the intersection of Twin Sixties Drive and the US 75 northbound frontage road. One lane will be constructed for the inbound movement, and one lane will be constructed for the outbound movement. Drive 1 serve the same function as the current hotel driveway but will be reconstructed slightly to the south of the current driveway. Due to the on-ramp gore configuration, for a conservative analysis, outbound right-turning traffic from Drive 1 is assumed to join the US 75 NBFR, not the on-ramp.

Drive 2 – would be a full-access driveway to Twin Sixties Drive 175 feet east of the intersection of Twin Sixties Drive and the US 75 northbound frontage road. One lane will be constructed for the inbound movement, and one lane will be constructed for the outbound movement.

Drive 3 – is a full-access driveway to Twin Sixties Drive 250 feet east of the intersection of Twin Sixties Drive and Drive 2. One lane exists for the inbound movement, and one

exists for the outbound movement. Drive 3 is currently the only access point for the existing 6060 NCX site from Twin Sixties Drive.

Drive 4 – would be a full-access driveway to Twin Sixties Drive 185 feet east of the intersection of Twin Sixties Drive and Drive 3. One lane will be constructed for the inbound movement, and one lane will be constructed for the outbound movement.

Intersection sight distance at the proposed driveways is acceptable, with each on relatively flat and straight segments of their respective roadway.

D. Existing Traffic Volumes

24-hour machine counts were collected near to the site on Twin Sixties Drive, the US 75 northbound frontage road, and the US 75 northbound on-ramp north of Mockingbird Lane. **Exhibit 4** shows the existing weekday AM and PM peak hour traffic volumes. 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 24-hour count showed the daily volume on the roadway link as follows:

- Twin Sixties Drive: 4,006 vehicles per day (vpd)
- US 75 northbound frontage road: 10,820 vpd
- US 75 northbound on-ramp: 15,418 vpd

EXHIBIT 3

Lane Assignment and Intersection Control

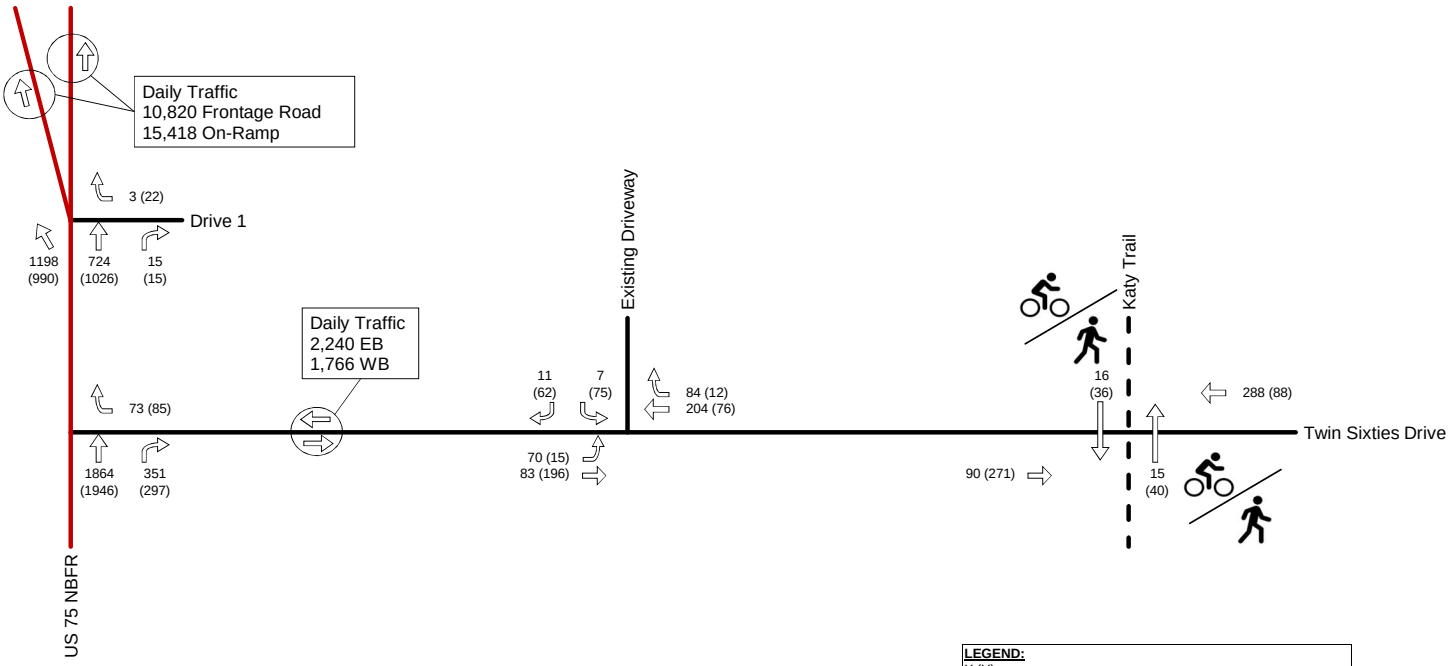

EXHIBIT 4

2018 Existing Traffic Volumes

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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 10th 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, and office developments are isolated. Internal capture reductions are applied based on the procedures in the 2014 3rd edition of the *Trip Generation Handbook*, a companion manual to *Trip Generation Manual* also published by ITE. The internal capture worksheets are included in **Volume 2** of this report. Internal capture reduces the number of trips leaving the site, and results in a projection of internal trips and external trips.

The internal capture considered only the proposed additions to the site and the 40,000 SF office. The existing hotel and office building were excluded from the procedure, as are the significant retail, restaurant, and residential uses within Mockingbird Station which means the internal capture reductions are conservatively low.

Due to the site's adjacency to the Mockingbird Lane DART station and the Katy Trail, a 10% multimodal reduction was applied to the external trips.

No reductions were taken for pass-by trips.

Table 1 shows the resulting daily and weekday AM and PM peak hour trip generation for the proposed development, showing new external trips.

Table 1 – 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
General Office Building	40,000	SF	710	436	55	9	64	8	40	48
Retail/Shopping Center	56,636	SF	820	2,418	33	21	54	101	109	210
Multifamily Housing (High-Rise)	620	Units	222	2,655	45	141	186	134	85	219
Development Totals										
Raw Trip Generation Total:				5,509	133	171	304	243	234	477
Internal Capture Total:				1,076	9	9	18	52	52	104
External Trips:				4,433	124	162	286	191	182	373
10% Multimodal Reduction				443	12	16	29	19	18	37
Total Net New External Vehicle Trips:				**3,990**	**112**	**146**	**257**	**172**	**164**	**336**

Trip Generation rates based on *ITE's Trip Generation Manual*, 10th Edition.
Internal Capture procedure from *ITE Trip Generation Handbook*, 3rd Edition (2014).

B. Trip Distribution and Assignment

The distribution of the site-generated traffic volumes into 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 **Exhibit 5**. **Exhibit 6** shows the resulting site-generated weekday AM and weekday PM peak hour turning movements after multiplying the new external trip generation for each phase by the respective traffic assignment percentages.

In the 2021 and 2026 scenarios, the existing traffic utilizing Drive 3 (the existing 6060 Central Drive) was redistributed to Drives 2 and 4 according to their relative attractiveness for the proposed development.

The multimodal trips were converted to person-trips by multiplying each vehicle trip by 1.5. The person-trips were then assigned to the Katy Trail crossing as pedestrian trips. All person-trips were assumed to use the Katy Trail crossing in the appropriate direction towards or away from the site.

C. Development of 2021 Background Traffic

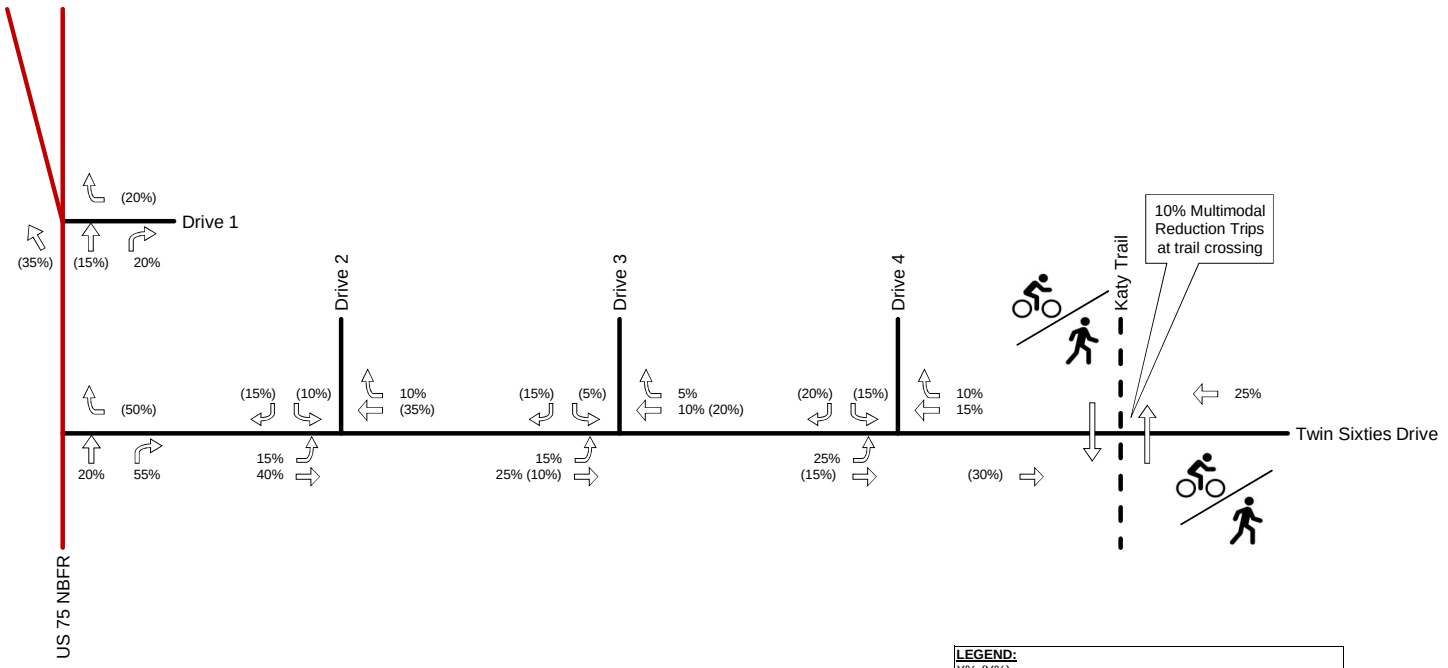
In order to obtain 2021 background traffic, the existing traffic counts and historic counts near the site were compared to find expected growth trends within the study area. Based on the recent growth in the area, an annual growth rate of 1% was assumed for the background traffic through 2021. To calculate the 2021 background traffic, the existing 2018 traffic counts were grown by 1% annually for three years. The resulting 2021 background weekday AM and PM peak hour traffic volumes are shown in **Exhibit 7**.

D. Development of 2021 Total Traffic

Site traffic volumes were added to the background volumes to represent the estimated total (background plus site-generated) traffic conditions for the 2021 study year after completion of the proposed development. **Exhibit 8** shows the resulting 2021 weekday AM and PM peak hour total traffic volumes.

E. Development of 2026 Background and Total Traffic

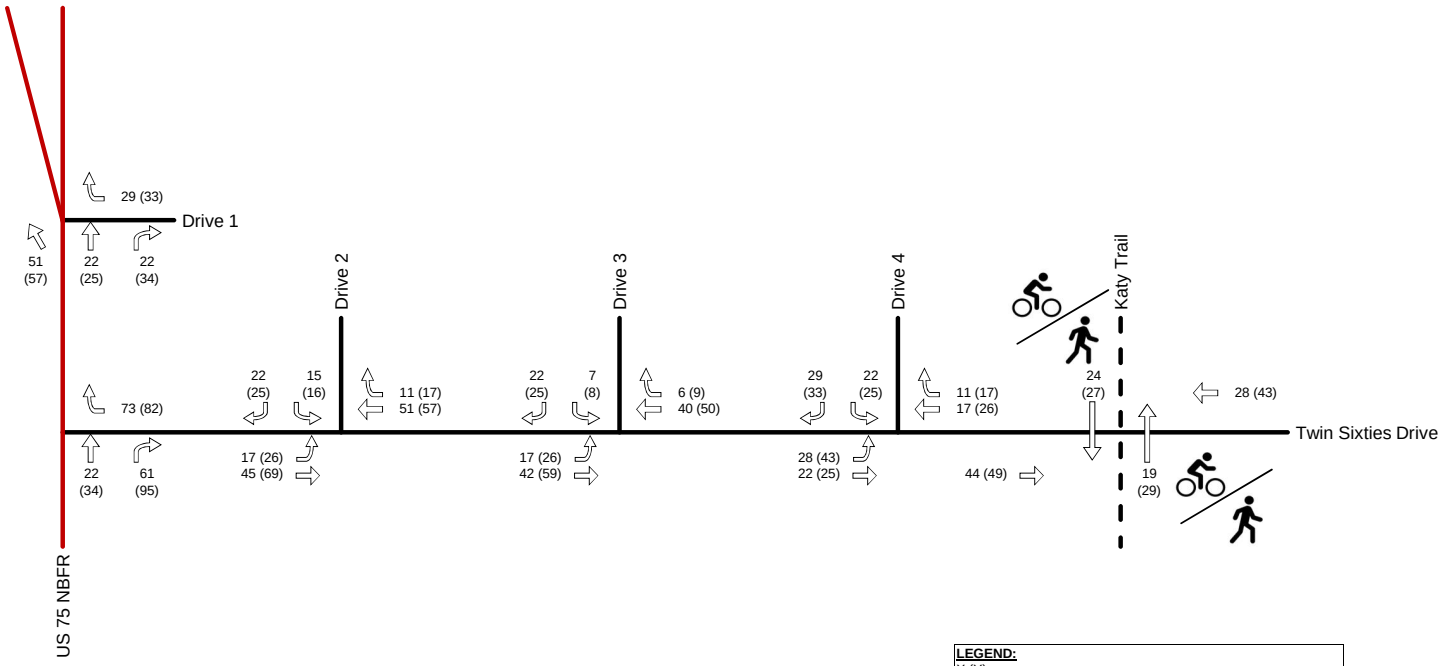
The background and total traffic volumes in the 2026 study year were calculated in a similar manner to the 2021 traffic volumes by adding five years of 1% growth over the 2021 background volumes. The background development traffic was then added into the traffic volumes. **Exhibit 9** shows the resulting 2026 weekday AM and PM peak hour background traffic volumes, and **Exhibit 10** shows the resulting 2026 weekday AM and PM peak hour total traffic volumes after the addition of the site-generated traffic.



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

North
Not To Scale

EXHIBIT 5
Trip Distribution and Traffic Assignment



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 6
Site-Generated Traffic Volumes

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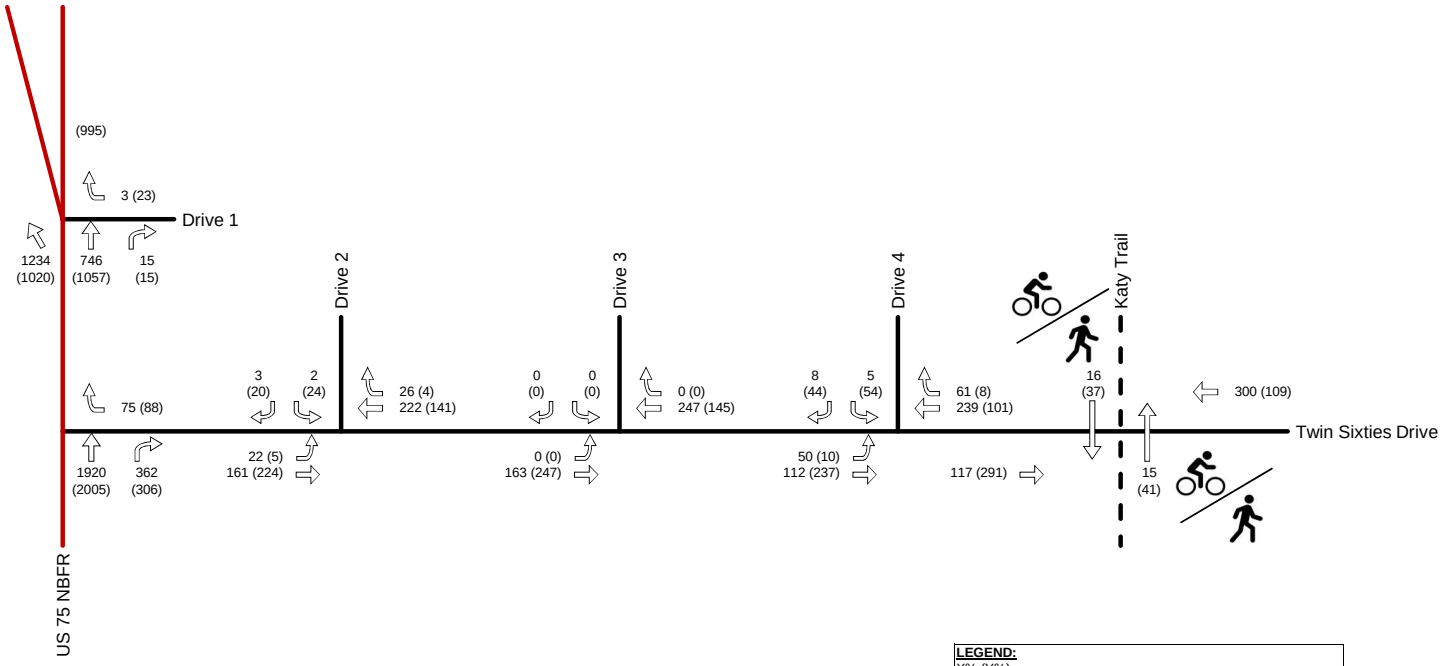


EXHIBIT 7

2021 Background Traffic Volumes

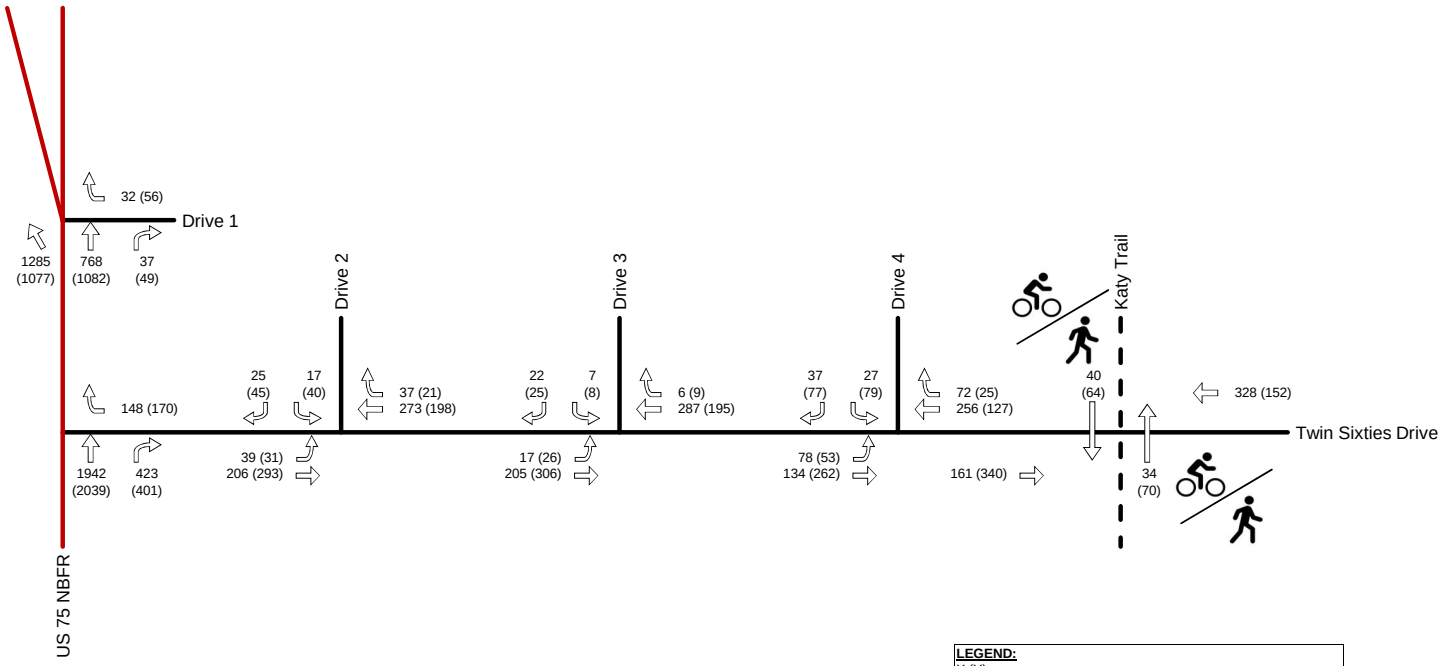
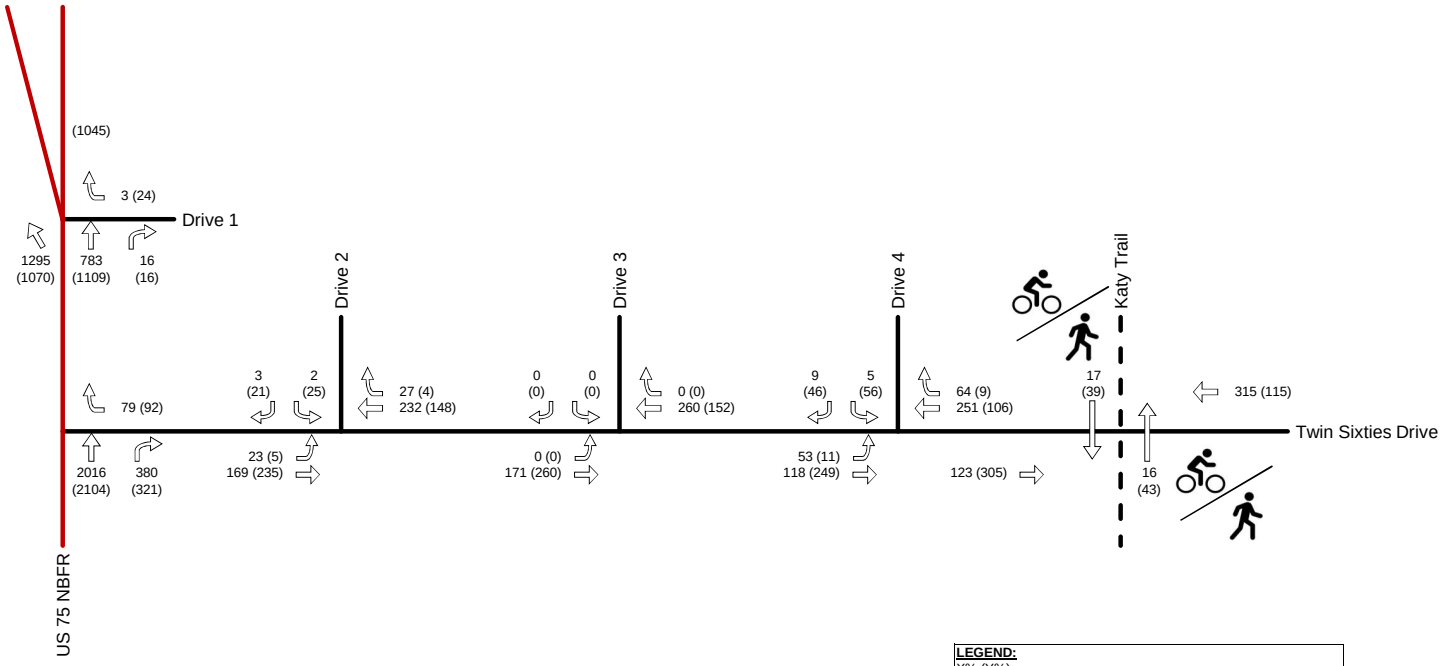


EXHIBIT 8

2021 Background Plus Site-Generated Traffic Volumes

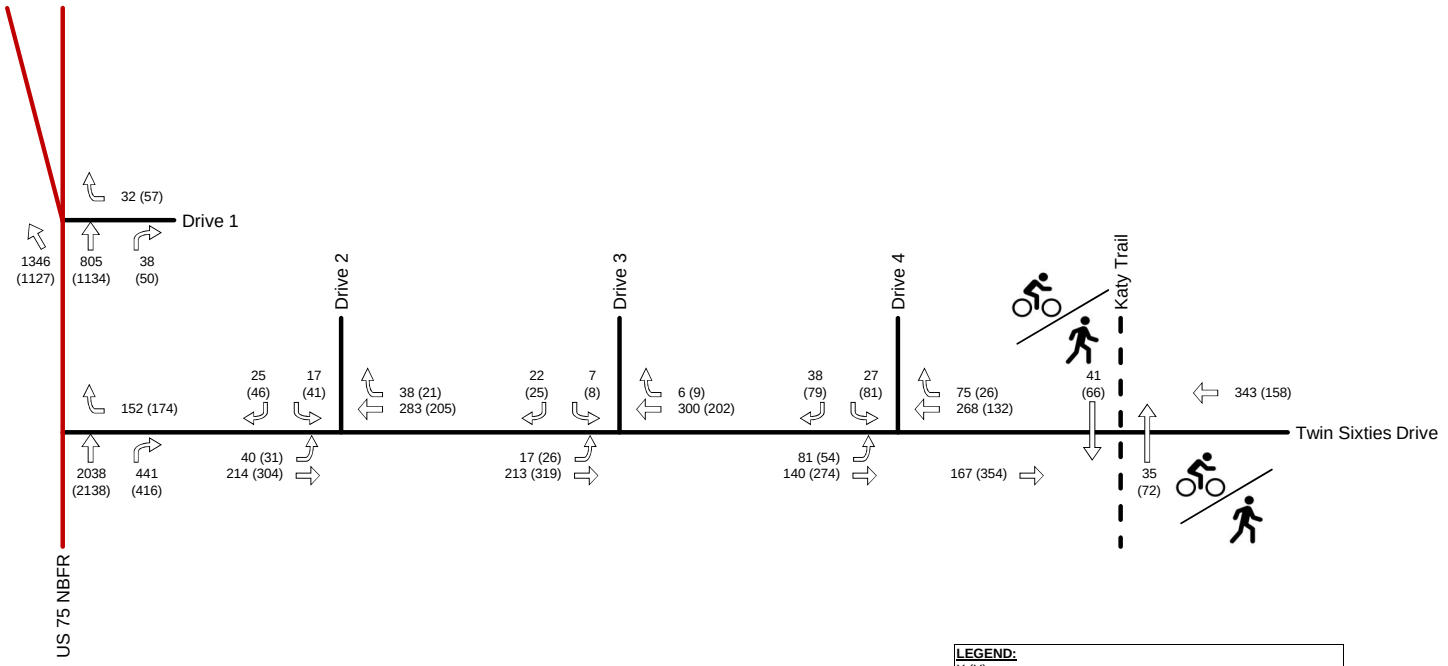
Kimley»Horn



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

North
Not To Scale

EXHIBIT 9
2026 Background Traffic Volumes



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 Plus Site-Generated Traffic Volumes

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IV. TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in the 2018, 2021 and 2026 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 B**.

Signal timings for the signalized intersections are taken site observations were taken from the City of Dallas "As-Built" Synchro™ files. Although there were no signalized intersections analyzed in this report, the surrounding network was used to create a more realistic simulation environment for the study intersections. The adjacent signals provide useful gaps for turning movements at unsignalized intersections.

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**.

B. Analysis Results

Table 2 and **Table 3** show the intersection operational results for the weekday AM and PM peak hours, respectively.

Table 2 – Traffic Operational Results – Weekday AM Peak Hour

INTERSECTION	APPROACH	2018 Existing Traffic AM Peak Hour		2021 Background Traffic AM Peak Hour		2021 Background plus Site Traffic AM Peak Hour		2026 Background Traffic AM Peak Hour		2026 Background plus Site Traffic AM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Drive 1 @ US 75 NBFR	WB*	10.8	B	10.9	B	11.4	B	11.0	B	11.6	B
Twin Sixties Drive @ US 75 NBFR	WBR*	13.8	B	13.9	B	16.5	C	14.5	B	17.6	C
Twin Sixties Drive @ Drive 2	EBL	-	-	7.8	A	8.0	A	7.8	A	8.0	A
	SB*	-	-	10.3	B	11.5	B	10.4	B	11.6	B
Twin Sixties Drive @ Drive 3	EBL	8.0	A	-	-	7.9	A	-	-	7.9	A
	SB*	10.6	B	-	-	10.6	B	-	-	10.7	B
Twin Sixties Drive @ Drive 4	EBL	-	-	8.0	A	8.1	A	8.0	A	8.2	A
	SB*	-	-	10.7	B	12.0	B	10.8	B	12.2	B

* Stop-Controlled Approach
- No movements in Time Period

Table 3 – Traffic Operational Results – Weekday PM Peak Hour

INTERSECTION	APPROACH	2018 Existing Traffic PM Peak Hour		2021 Background Traffic PM Peak Hour		2021 Background plus Site Traffic PM Peak Hour		2026 Background Traffic PM Peak Hour		2026 Background plus Site Traffic PM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Drive 1 @ US 75 NBFR	WB*	12.5	B	12.7	B	13.8	B	13.1	B	14.2	B
Twin Sixties Drive @ US 75 NBFR	WBR*	14.5	B	15.1	C	18.0	C	15.7	C	20.2	C
Twin Sixties Drive @ Drive 2	EBL	-	-	7.5	A	7.7	A	7.5	A	7.7	A
	SB*	-	-	10.3	B	11.8	B	10.4	B	12.0	B
Twin Sixties Drive @ Drive 3	EBL	7.4	A	-	-	7.7	A	-	-	7.7	A
	SB*	10.5	B	-	-	10.3	B	-	-	10.4	B
Twin Sixties Drive @ Drive 4	EBL	-	-	7.4	A	7.6	A	7.5	A	7.6	A
	SB*	-	-	10.6	B	12.4	B	10.7	B	12.6	B

* Stop-Controlled Approach
- No movements in Time Period

C. 2018 Existing Traffic Operations

The analysis of the 2018 existing traffic operations shows the study intersections – all of which are unsignalized – operating with moderate delay in both peak hours. All unsignalized approaches operate favorably at LOS B or better. Even though there is a relatively large vehicular volume on the US 75 northbound frontage road (US 75 NBFR), the westbound right-turning movement from Twin Sixties Drive to the US 75 NBFR operates at LOS B during both peak hours. This is due, in large part, to the gaps in the traffic flow created by the traffic signal at the intersection of Mockingbird Lane and the US 75 NBFR.

D. 2021 Background Traffic Operations

The study intersections experience more delay with three years of background growth added to the network, and there is one change in level of service at the study approaches. During the PM peak hour, the westbound approach of Twin Sixties Drive at its intersection with the US 75 NBFR changes from LOS B to C, which is still a very low amount of delay. This and the other approaches continue to operate well.

Due to the proposed additions to the site, as previously mentioned, the background traffic using Drive 3 was redistributed to Drives 2 and 4. Therefore, Drive 3 has no activity during the 2021 background scenario. However, the approaches of Drives 2 and 4 each operate favorably at LOS B or better.

E. 2021 Background Plus Site-Generated Traffic Operations

The addition of the site-generated traffic to the 2021 background traffic results in some additional delay at the existing unsignalized intersections, and there is one change in level of service. The westbound approach of Twin Sixties Drive at its intersection with the US 75 NBFR changes from LOS B to C during the AM peak hour. LOS C is very favorable for an unsignalized approach onto a busy frontage road such as the US 75 NBFR.

All approaches to the site driveways all operate at LOS B or better during both peak hours, providing appropriate access to and from the site.

F. 2026 Background Traffic Operations

The analysis of the 2026 Background Traffic operations shows that, when compared to the 2021 background traffic operations, the study intersections experience no changes in level of service with the addition of five more years of background traffic growth. All approaches continue to operate favorably.

G. 2026 Background Plus Site-Generated Traffic Operations

The addition of the site-generated traffic to the 2026 background traffic results in some additional delay at the study intersections, and there is one change in level of service. Similar to the 2021 scenario, the westbound approach of Twin Sixties Drive at its intersection with the US 75 NBFR changes from LOS B to C during the AM peak hour. LOS C is very favorable for an unsignalized approach onto a busy frontage road such as the US 75 NBFR.

All approaches to the site driveways operate favorably at LOS B or better during both peak hours at buildout.

H. Link Volume Analysis

The link capacity analysis examines the operating conditions of roadway links rather than intersections, using the daily volumes passing a fixed point. The operating condition is defined by the ratio of link volume to link capacity, or V/C. The V/C of the different roadway links that would be impacted by the proposed development's traffic was calculated for the 2018 existing traffic, 2021 background and background plus site traffic, and 2026 background and background plus site traffic scenarios. The daily link capacity for each roadway is taken from the NCTCOG model capacity volumes assuming the urban residential area type. Twin Sixties Drive, as an undivided collector street, has a very conservative capacity of 475 vehicles per lane per hour (vphpl). The US 75 northbound frontage road north of Twin Sixties Drive has a capacity of 850 vphpl for the two frontage road lanes and 1,425 for the on-ramp lane.

The link analyses, displayed below in **Table 4**, show that Twin Sixties Drive currently operates at LOS A/B, utilizing less than half of its total capacity. With the addition of background traffic, Twin Sixties Drive remains at LOS A/B for the 2021 scenario but changes to LOS C during the 2026 background traffic scenario. After site-generated traffic is added to the network, Twin Sixties Drive changes to LOS D during both total traffic scenarios. At the full buildout of the site, 32% of the capacity of Twin Sixties Drive remains unutilized.

The US 75 northbound frontage road currently operates at LOS E and does so through the 2026 background plus site-generated traffic scenario.

The site as proposed does not have a significant negative impact on the link capacities of the study roadways.

Table 4 – Link Operational Results

Roadway Link		2018 Existing			2021 Background			2021 Site-Generated		2021 Background+Site		
From	To	Volume	V/C Ratio	LOS	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Volume	V/C Ratio	LOS
Twin Sixties Drive												
US 75 NBFR	**Worcola Street**	4,006	0.42	A/B	4,127	0.43	A/B	52.5%	2,095	6,222	0.65	D
Volume Limit 2 Lanes = 9,500					1% growth for 3 years							
US 75 NBFR												
Mockingbird Lane	**NB On-Ramp**	26,238	0.84	E	27,033	0.87	E	37.5%	1,496	28,529	0.91	E
Volume Limit 3 Lanes = 31,250					1% growth for 3 years							

Roadway Link			2026 Background			2026 Site-Generated		2026 Background+Site		
From	To		Volume	V/C Ratio	LOS	Assignment	Daily Volume	Volume	V/C Ratio	LOS
Twin Sixties Drive										
US 75 NBFR	**Worcola Street**		4,338	0.46	C	52.5%	2,095	6,433	0.68	D
Volume Limit 2 Lanes = 9,500			1% growth for 5 additional years							
US 75 NBFR										
Mockingbird Lane	**NB On-Ramp**		28,412	0.91	E	37.5%	1,496	29,908	0.96	E
Volume Limit 3 Lanes = 31,250			1% growth for 5 additional years							

Volume Limit Based on NCTCOG DFWRTM Hourly Capacity Per Lane

I. 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. TxDOT and the City have identified right-turning volume thresholds where right-turn lanes are justified. **Table 5** shows the driveway locations with right-turn driveway access to the site, and how they compare with TxDOT standards. The high inbound volume occurs in the AM peak hour for Drives 2 and 4. For Drives 1 and 3, the PM peak volume is higher. None of the projected maximum peak hour right-turn volumes meet the City criterion, so a right-turn lane is not recommended for any of the site driveways.

Table 5 – Driveway Right-Turn Lane Analysis

Right-Turn Location	Projected Maximum 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 from US 75 NBFR	50 vph	60 vph	120 vph	No
Drive 2 from Twin Sixties Drive	38 vph	60 vph	120 vph	No
Drive 3 from Twin Sixties Drive	9 vph	60 vph	120 vph	No
Drive 4 from Twin Sixties Drive	75 vph	60 vph	120 vph	No

V. KATY TRAIL

The Katy Trail runs along the eastern edge of the property and crosses Twin Sixties Drive just past the southeastern corner of the site. NCHRP 562 was used to analyze the crossing. Worksheet 1 from Appendix A of the NCHRP 562 report provides a framework to determine if a pedestrian signal, active/enhanced pedestrian indications, or simply a crosswalk is necessary for a given pedestrian crossing.

Worksheet 1 is available in **Volume 2** of this report. Using the 2026 background plus site-generated buildout volumes, the NCHRP 562 analysis indicates that there is not a need for the installation of active/enhanced detection or a pedestrian signal for the crosswalk. For the given conditions on Twin Sixties Drive, at least 224 pedestrians using the trail would be necessary to require “active or enhanced” crosswalk treatment, which is nearly double the number of pedestrians utilizing the trail in the 2026 buildout scenario.

Drivers generally yielded to pedestrians as instructed. Compliance should increase as drivers get used to more pedestrians crossing and more higher speed cyclists using the trail.

Currently, the trail crossing approaches are posted with stop-signs, and the vehicle approaches of Twin Sixties Drive are instructed to yield. This creates confusion between pedestrians, cyclists, and motorists. During site observations, there was an observed conflict in which a cyclist, “Cyclist A,” stopped for oncoming traffic and was waved on by a vehicle, “Vehicle A,” who was yielding at the intersection. A second cyclist, “Cyclist B,” followed the first cyclist at a distance of approximately 40 yards. Observing Vehicle A yielding to Cyclist A, Cyclist B did not stop at the intersection but continued across Twin Sixties Drive. Vehicle A, upon allowing Cyclist A to cross, began to accelerate. Cyclist B did not stop, and Vehicle A was forced to stop suddenly to prevent a crash from occurring.

The Twin Sixties Drive vehicular approaches go above and beyond the recommendations from the “Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations,” (FHWA, 2017) which recommends only “High-visibility crosswalk markings, parking restriction on crosswalk approach, [and] adequate nighttime lighting levels.” The approaches also provide an “Advance Yield Here To…Pedestrians” sign and yield line, further increasing the safety of the crossing. It is recommended that the stop signs be removed from the pedestrian approaches to remove the assumption that each pedestrian is required to stop.

VI. MOCKINGBIRD LANE IMPACTS

A 2007 study done by Kimley-Horn analyzed the 6060 North Central site when PD 834 was established. Excerpts from the 2007 study can be found in **Volume 2** of this report. Even after a larger multimodal reduction was applied (20% compared to 10% used in this current report), the 2007 study predicted a larger number of generated trips for the site additions than does the current report. The existing traffic volumes, trip generation, and assignment data are summarized below:

Existing Peak Hour Traffic Volumes for the US 75 NBFR:

- 2007 Study – 2,004 AM; 1,560 PM
- 2007 Study (grown by 1% for 11 years) – 2,236 AM; 1,740 PM
- 2018 Report – 2,215 AM; 2,243 PM

Net New Daily External Trips Produced for site additions:

- 2007 Study – 4,133
- 2018 Report – 3,990

Net New Peak Hour External Trips assigned to the intersection of Mockingbird Lane and the US 75 northbound frontage road:

- 2007 Study – 117 AM, 62 PM
- 2018 Report – 45 AM, 69 PM (not shown in exhibits)

The observed traffic counts are roughly equal after considering background regional growth, local redevelopment, and the addition of the President George W. Bush Presidential Center.

The 2007 study predicted more daily trips, more AM peak hour trips using Mockingbird Lane, and nearly the same amount of PM peak hour trips using Mockingbird Lane. Therefore, the impact to the intersection by the current site plan is either equal to or more favorable than the impact caused by the 2007 proposed site plan. Due to the similarity of existing traffic counts and the comparable site traffic distributions, the 2007 study's finding of required mitigation to the intersection of Mockingbird Lane and the US 75 northbound frontage road applies:

No improvements to the intersection of Mockingbird Lane and the US 75 northbound frontage road are recommended due to the construction of the 6060 NCX site as proposed.

VII. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, the proposed 6060 North Central Expressway mixed-use development, located at the northeast corner of the intersection of the US 75 northbound frontage road and Twin Sixties Drive in Dallas, Texas, can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development. The site-generated traffic does not significantly affect the existing vehicle traffic operations. No improvements to the external roadway network are recommended for the site.

The site impact on the Katy Trail crossing does not require any additional pedestrian treatment. While it is advised to remove the stop-signs controlling the pedestrian approaches, the current crossing configuration can adequately handle the pedestrian traffic at buildout. This analysis accounted for additional pedestrian trips generated by the site.

Due to the similarity in existing traffic volumes, distribution assumptions, and trip generation of the current development plan to the 2007 study for the 6060 NCX site, the conclusion for the Mockingbird Lane – US 75 interchange still stands: no improvements to the intersection of Mockingbird Lane and the US 75 northbound frontage road are recommended due to the construction of the 6060 NCX site as proposed.

Kimley»Horn

APPENDIX A

A. Roadway Characteristics

There were no signalized intersections included in this study. The following unsignalized intersections were evaluated as part of this study:

- Twin Sixties Drive at US 75 Northbound Frontage Road (US 75 NBFR)
- Twin Sixties Drive at 6060 North Central Driveway
- US 75 NBFR at 6060/Hotel Driveway
- Twin Sixties Drive at the Katy Trail

The major study area roadways are described below.

Twin Sixties Drive – is a two-lane undivided road that runs east-west from the US 75 northbound frontage road to Worcola Street. In the project vicinity, Twin Sixties Drive has intersections with the previously mentioned roads, the Katy Trail, and various commercial driveways, including the existing version of Drive 3. On the City of Dallas Thoroughfare Plan, Twin Sixties Drive is unclassified. The speed limit near the site is posted at 30 mph.

US 75 Northbound Frontage Road – is a three-lane frontage road that services US 75 throughout Dallas. In the project vicinity, the US 75 NBFR runs along the western edge of the site and has intersections with Twin Sixties Drive and various commercial driveways, including Drive 1. The speed limit near the site is 35 mph. North of Twin Sixties Drive, the left lane becomes the northbound on-ramp, with the center and right lanes remaining as the frontage road. The south tip of the painted gore extends into the intersection with Twin Sixties Drive. Following the existing driver behavior, vehicles turning right from Twin Sixties Drive can reach either the on-ramp or the frontage road.

Exhibit 3 illustrates the existing intersection geometry used for the traffic analysis.

Kimley»Horn

APPENDIX B

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 6** shows the definition of level of service for signalized and unsignalized intersections.

Table 6 – 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 taken site observations were taken from the City of Dallas "As-Built" Synchro™ files. Although there were no signalized intersections analyzed in this report, the surrounding network was used to create a more realistic simulation environment for the study intersections. The adjacent signals provide useful gaps for turning movements at unsignalized intersections.

Calculations for the level of service at the key intersections identified for study are provided in the **Volume 2** of this report. The analyses assumed the lane geometry and intersection control shown in **Exhibit 3**.