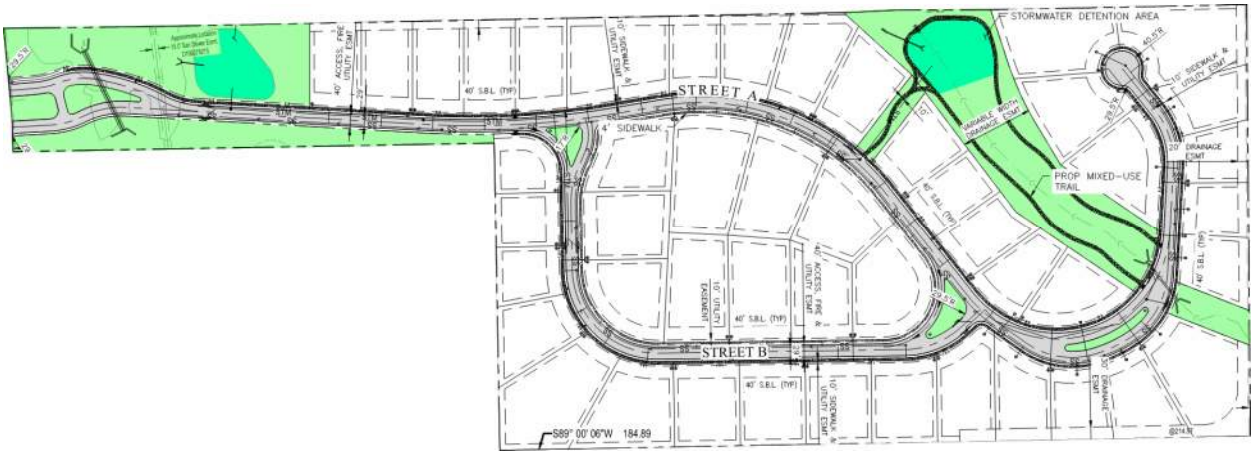
Armstrong Hills

Traffic Impact Analysis

December 2024



Prepared for:

Holmes Builders

Prepared by:

QUIDDITY

Texas Board of Professional Engineers Registration No. F-23290
6330 West Loop South, Suite 150 Bellaire, Texas 77401 (713) 777-5337

Armstrong Hills

Traffic Impact Analysis

December 2024

STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED
PROFESSIONAL ENGINEER

Tyler Cowser P.E., PTOE
12/9/2024

Prepared for:
Holmes Builders

Prepared by:

QUIDDITY

Texas Board of Professional Engineers Registration No. F-23290
6330 West Loop South, Suite 150 Bellaire, Texas 77401 (713) 777-5337

Executive Summary

Quiddity Engineering, LLC conducted a Traffic Impact Analysis (TIA) for the Armstrong Hills Development in City of Keller, Texas. Traffic impacts were analyzed for the proposed build out year, 2027, and considered AM and PM peak period traffic operations.

Project Background and Location

The Armstrong Hills Development is proposed on the east side of Davis Blvd (FM 1938) between Lyndhurst Way/Creek Rd and Rolling Wood Ln in City of Keller, Texas. The proposed development will include 49 single-family homes and is assumed to be completed in 2027. Access to the proposed development will be provided by one full-access roadway on Davis Blvd (FM 1938), Street A.

Intersections

The intersection included in the study area are:

- Davis Blvd (FM 1938) at Lyndhurst Way/Creek Rd
- Davis Blvd (FM 1938) at (Proposed) Street A
- Davis Blvd (FM 1938) at Rolling Wood Ln

Project Location

Site Plan

Data Collection

A site visit was conducted to document the existing conditions of the study area roadways and site. Peak Hour counts (6-9 AM and 4-7 PM) were collected at existing study intersections. Peak hours were reached during the weekday between 7:30 – 8:30 AM for the AM peak hour and 4:45 – 5:45 PM for the PM peak hour.

Growth Rate

A 2.2% annual compound growth rate for background traffic was calculated based on available historical traffic data in the site vicinity provided by TxDOT's *Traffic Count Database System* (TCDS).

Background Construction:

The FM 1938 (Davis Boulevard) Raised Median Project is proposed by the Texas Department of Transportation (TxDOT). The project is proposing improvements to Davis Boulevard (FM 1938) from FM 1709 to Emerald Hills Way in Tarrant County, Texas. The proposed improvement will convert the two-way left-turn lane into a 14-foot-wide raised median. Per the project schematic and in coordination with TxDOT, median openings will be provided along David Boulevard (FM 1938) at Lyndhurst Way/Creek Road and at Rolling Wood Lane, but will not be provided at (proposed) Street A. Upon project completion, Street A will operate as a right-in right-out driveway. Project construction is anticipated to begin in the year 2026. The completion date for this improvement project is unknown; therefore, was not included in the analysis.

Trip Generation and Distribution

The *Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition,* was used to estimate the traffic that will be generated by the proposed development by using *Online Traffic Impact Study Software (OTISS)*. The development is estimated to generate 40 AM Peak Hour trips, 52 PM Peak Hour trips and 534 Weekday trips.

The directional distribution of the site generated trips was determined based on existing and expected travel patterns in the area. Trip origins and destinations for the proposed development are expected to be 55% to/from the north via Davis Blvd (FM 1938) and 45% to/from east via Davis Blvd (FM 1938).

Capacity Analysis

Capacity Analysis was performed at the study intersections for 2024 Existing Conditions, 2027 Background Conditions, and 2027 Projected Conditions using *Synchro 12*, a traffic modeling and capacity analysis software. Seconds of Delay for each approach at the study intersections were used to determine a Level of Service (LOS). All approaches are projected to operate at an acceptable LOS except for the following:

For 2027 Background Conditions, at the intersection of Davis Blvd (FM 1938) and Lyndhurst Way, the eastbound, westbound, and southbound approaches are failing with a LOS E or F for the AM Peak Hour, and the eastbound, westbound, and northbound approaches are failing with a LOS E or F for the PM Peak Hour. Although the LOS is failing, LOS E or F is maintained from 2027 Background Conditions to 2027 Projected Conditions for each approach; therefore, no mitigations are recommended.

For 2027 Background Conditions, at the intersection of Davis Blvd (FM 1938) and Rolling Wood Ln, the westbound and southbound approaches are failing with a LOS E or F for the AM Peak Hour, and the westbound approach is failing with a LOS E for the PM Peak Hour. Although the LOS is failing, LOS E or F is maintained from 2027 Background Conditions to 2027 Projected Conditions for each approach; therefore, no mitigations are recommended.

For 2027 Projected Conditions, at the intersection of Davis Blvd (FM 1938) and Street A, the westbound and southbound approaches are failing with a LOS E or F in the AM Peak Hour and the westbound approach is failing with a LOS E in the PM Peak Hour. For the westbound approach, LOS E-F on the minor driveway approach is not uncommon at an unsignalized intersection where traffic volumes on the major roadways are high, such as Davis Blvd (FM 1938). LOS E-F is for the minor roadway approaches only, not the overall intersections, and minimal volumes from the development will be traveling westbound through the intersection (1% of overall traffic at Street A in AM Peak Hour / 0.5% of overall traffic at Street A in PM Peak Hour); therefore, no mitigations are recommended. For the southbound approach, although the LOS is failing in the AM Peak Hour, minimal volumes from the development will be making southbound left turn movements (0.2% of overall traffic at Street A in AM Peak Hour). Additionally, the TxDOT FM 1938 Raised Median Project will eventually restrict the failing southbound left turn movement. Minimal volumes from the development will be making southbound left turn movements, and future background construction will restrict the southbound left turn movement; therefore, no mitigations are recommended.

Access Management

For 2027 Projected Conditions, right turn lane analysis was performed in accordance with Table 2-3 of the *TxDOT Access Management Manual* at the intersection of Davis Blvd (FM 1938) and Street A. The northbound approach of the intersection did not meet the threshold for a right turn lane. Although a right turn lane is required in accordance with TxDOT District Requirements, a northbound right turn lane may not be feasible due to the existing super elevation on Davis Blvd (FM 1938) and the location of (proposed) Street A is at the southern boundary of the development where any right-of-way necessary would be on an adjacent property; therefore, a northbound right turn lane is not recommended.

Table 3-1 of the *American Association of State Highway and Transportation Officials' (AASHTO) Green Book* provides a Stopping Sight Distance of 425 feet based on a speed limit of 50 mph and a level roadway. The northbound and southbound movements on Davis Blvd (FM 1938) are unobstructed and on a level roadway which meets the minimum 425 foot Stopping Sight Distance.

Table 9-6 and Table 9-8 of the *AASHTO Green Book* provide Intersection Sight Distances for Case B1, Left Turn from Stop, and Case B2, Right Turn from Stop, respectively. The minimum Intersection Sight Distance for Case B1, Left Turn from Stop, is 670 feet. The minimum Intersection Sight Distance for Case B2, Right Turn from Stop, is 480 feet. Both turning movements at the proposed roadway, Street A, are unobstructed.

Driveway Spacing

Table 2-2 of the *TxDOT Access Management Manual* provides a minimum State Highway Connection Spacing (Driveway Spacing) of 425 feet based on speed limits greater than 50 mph. On Davis Blvd (FM 1938), the distance from proposed Street A to the nearest roadway to the north, Creek Road, is 270 feet and 140 feet to the nearest roadway to the south, Rolling Wood Lane**.** Minimum driveway spacing requirements are not met because Street A is proposed to align between Rolling Wood Lane and Creek Road. The only available access to the proposed site is along Davis Blvd (FM 1938) between Rolling Wood Lane and Creek Road, and the driveway spacing between Rolling Wood Lane and Creek Road is approximately 525 feet, which does not allow Street A to meet driveway spacing requirements; therefore, a variance is requested for Street A.

Recommendations

Traffic impacts to the surrounding roadway are minimal and approval is recommended with the following recommendations:

1. Request a variance for driveway spacing for proposed Street A as part of the permit process.

Table of Contents

Executive Summary i
Introduction 1
Existing Conditions 2
Projected Traffic 4
Capacity Analysis 6
Access Management 9
Recommendations 10

List of Tables

Table 1 – Growth Rate Data 4
Table 2 – Trip Generation Volumes 4
Table 3 – Level of Service Measurement and Qualitative Descriptions 6
Table 4 – Capacity Analysis – AM Peak Hour 7
Table 5 – Capacity Analysis – PM Peak Hour 7
Table 6 – 2027 Projected Conditions Right Turn Lane Analysis 9

List of Figures

Figure 1 – Project Location 1
Figure 2 – City of Keller Major Thoroughfare Plan 2
Figure 3 – Site Plan 5

Introduction

The Armstrong Hills Development is proposed on the east side of Davis Blvd (FM 1938) between Lyndhurst Way/Creek Rd and Rolling Wood Ln in City of Keller, Texas, as shown in **Figure 1**. The proposed development will include 49 single-family homes and is assumed to be completed in 2027. Access to the proposed development will be provided by one full-access roadway on Davis Blvd (FM 1938), Street A. The purpose of this study is to determine the potential traffic impacts of the proposed development on the surrounding roadways and intersections.

Figure 1 – Project Location

Existing Conditions

A site visit was conducted to document the existing conditions of the study area roadways and site. Existing lane assignments and traffic control at the study area intersections can be found in **Appendix A**.

Roadways

Davis Blvd (FM 1938) is a north-south roadway and is classified as a 6 Lane Divided Arterial per the 2022 City of Keller Major Thoroughfare Plan (MTP). It is an asphalt roadway and approximately 80' in width with a 14' two-way left turn lane. It has three travel lanes in each direction and a posted speed limit of 50 mph.

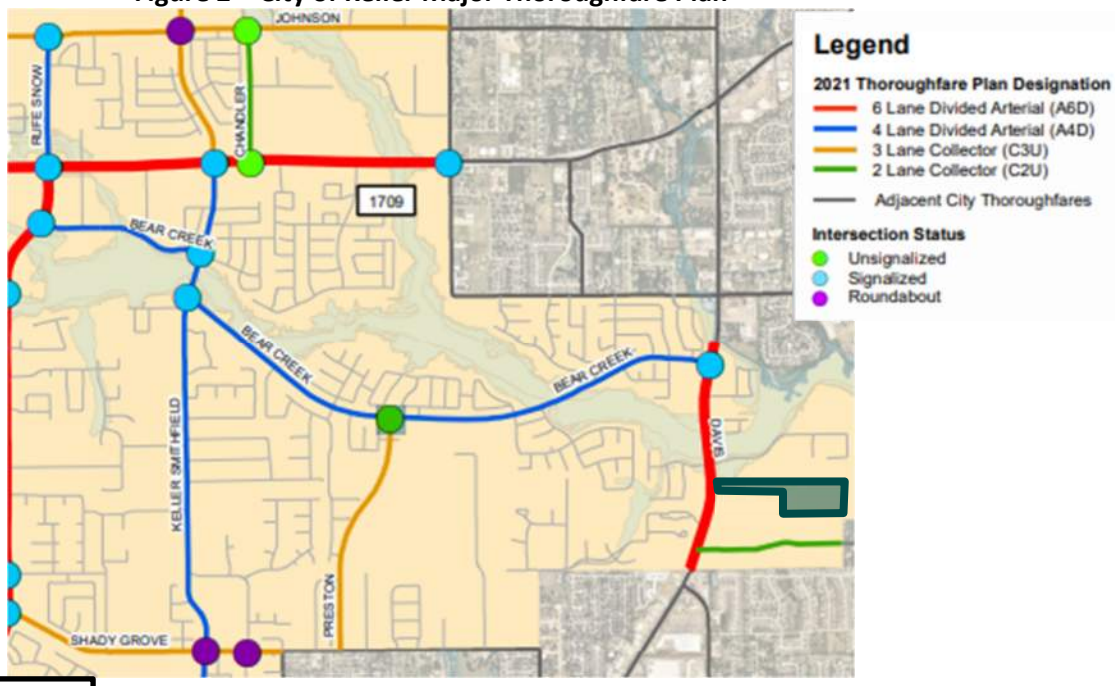
Lyndhurst Way is an east-west roadway and is not classified per the 2022 City of Keller MTP. It is a concrete roadway and approximately 30' in width. It has one travel lane in each direction and a posted speed limit of 30 mph.

Creek Rd is an east-west roadway and is not classified per the 2022 City of Keller MTP. It is an asphalt roadway and approximately 20' in width. It has one travel lane in each direction and a posted speed limit of 30 mph.

Rolling Wood Ln is an east-west roadway and is not classified per the 2022 City of Keller MTP. It is a gated concrete roadway and approximately 30' in width. It has one travel lane in each direction and an assumed speed limit of 30 mph.

An excerpt of the 2022 City of Keller Major Thoroughfare Plan is provided in **Figure 2**.

Figure 2 – City of Keller Major Thoroughfare Plan



Legend
Project Location

Intersections

The intersection included in the study area are:

- Davis Blvd (FM 1938) at Lyndhurst Way/Creek Rd
- Davis Blvd (FM 1938) at (Proposed) Street A
- Davis Blvd (FM 1938) at Rolling Wood Ln

Site

The existing site is vacant.

Background Construction

The FM 1938 (Davis Boulevard) Raised Median Project is proposed by the Texas Department of Transportation (TxDOT). The project is proposing improvements to Davis Boulevard (FM 1938) from FM 1709 to Emerald Hills Way in Tarrant County, Texas. The proposed improvement will convert the two-way left-turn lane into a 14-foot-wide raised median. Per the project schematic and in coordination with TxDOT, median openings will be provided along David Boulevard (FM 1938) at Lyndhurst Way/Creek Road and at Rolling Wood Lane, but will not be provided at (proposed) Street A. Upon project completion, Street A will operate as a right-in right-out driveway. Project construction is anticipated to begin in the year 2026. The completion date for this improvement project is unknown; therefore, was not included in the analysis. The FM 1938 (Davis Boulevard) Raised Median Project Fact Sheet and Schematic are provided in **Appendix G**.

Traffic Data

Turning movement counts were taken by CJ Hensch & Associates, Inc. on Wednesday, October 23rd, 2024. Peak hour counts were collected from 6 AM - 9 AM and 4 PM – 7 PM. Peak hours were reached during the weekday between 7:30-8:30 AM for the AM peak hour and 4:45-5:45 PM for the PM peak hour. The AM and PM Peak Hour Factor (PHF) and heavy vehicle percentage was determined for each existing intersection from collected traffic counts. The heavy vehicle percentage utilized is the percent of Articulated Trucks, Buses, and Single-Unit Trucks. A PHF of 0.92 and heavy vehicle percentage of 2% was utilized at proposed intersections.

The existing traffic volumes can be found in **Appendix A** and raw traffic count data can be found in **Appendix B.**

Projected Traffic

Growth Rate

A 2.2% average compound annual growth rate was calculated based on available traffic data in the site vicinity provided by TxDOT's *Traffic Count Database System* (TCDS) using the Compound Annual Growth Rate formula noted below. A summary of data provided by TCDS is provided in **Table 1** and raw data is provided in **Appendix B.**

$$\boldsymbol{Compound\ Annual\ Growth\ Rate} = \left(\frac{V_{Final}}{V_{Begin}}\right)^{\frac{1}{t}} - 1$$

Table 1 – Growth Rate Data

Location	Year	TxDOT AADT (vpd)	Compound Annual Growth Rate
Davis Blvd (South of Rolling Wood Ln)	2014	29,463	4.8%
	2019	37,239	
Davis Blvd (North of Lyndhurst Way/Creek Rd)	2009	33,860	-0.4%
	2022	32,186	
Average Growth Rate:			**2.2%**

Trip Generation

The *Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition,* was used to estimate the traffic that will be generated by the proposed development by using *Online Traffic Impact Study Software (OTISS)*. The following analysis periods were utilized:

- Weekday
- Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 AM
- Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 PM

Table 2 provides a summary of the estimated trips generated for the proposed development and the Trip Generation Reports can be found in **Appendix F.** No trip reductions were applied.

Table 2 – Trip Generation Volumes

Proposed Land Use (ITE code)	Size	24-Hour Two-Way	AM Peak			PM Peak		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Detached Housing (210)	50 Homes*	534	10	30	40	33	19	52

* - 50 was used for trip generation to conservatively account for changes in land plan or lot count

The directional distribution of the site generated trips was determined based on existing and expected travel patterns in the area. Trip origins and destinations for the proposed development are expected to be 55% to/from the north via Davis Blvd (FM 1938) and 45% to/from east via Davis Blvd (FM 1938). Access to the proposed development will be provided by one full-access roadway on Davis Blvd (FM 1938), Street A. The proposed site plan is shown in **Figure 3**. Future lane assignments and traffic control are shown in **Appendix A**.

The Trip Distribution Percentages and Site Generated Traffic Volumes are shown in **Appendix A.** The projected traffic volumes for 2027 Background Conditions and 2027 Projected Conditions are shown in **Appendix A.**

Figure 3 – Site Plan

Capacity Analysis

Capacity Analysis was performed using the computer program *Synchro 12*, which is based on the procedures in the *Highway Capacity Manual (HCM).* Capacity Analysis provides information regarding traffic operations at an intersection and is expressed in terms of the level of service (LOS). The LOS indicates the average seconds of delay experienced by a motorist at a signalized intersection, at stop sign controlled approaches and left turn movements at an unsignalized intersection. Intersection LOS range from A to F, with LOS A representing free flow conditions and LOS F representing highly congested conditions. An intersection operating at or above LOS D is typically characterized by acceptable delays. The Level of Service Measurement and Qualitative Descriptions for Signalized and Unsignalized intersections are shown in **Table 3.**

Table 3 – Level of Service Measurement and Qualitative Descriptions

Level Of Service	Unsignalized	Signalized	
	Control Delay Per Vehicle (Sec)	Control Delay Per Vehicle (Sec)	Description
A	≤ 10	≤ 10	Good progression and short cycle lengths
B	> 10 and ≤ 15	> 10 and ≤ 20	Good progression or short cycle lengths, more vehicle stops
C	> 15 and ≤ 25	> 20 and ≤ 35	Fair progression and/or longer cycle lengths, some cycle failures
D	> 25 and ≤ 35	> 35 and ≤ 55	Congestion becomes noticeable, high volume to capacity ratio
E	> 35 and ≤ 50	> 55 and ≤ 80	Limit of acceptable delay, poor progression, long cycles, and/or high volume
F	> 50	> 80	Unacceptable to drivers, volume greater than capacity

The impact of the proposed development at the study area intersections was analyzed using Capacity Analysis for the following scenarios and the *Synchro 12* capacity analysis reports can be found in **Appendix C-E.**

2024 Existing Conditions

- Existing traffic volumes

2027 Background Conditions

- 2024 Existing Conditions + 2.2% annual background growth rate for three years

2027 Projected Conditions

- 2027 Background Conditions + Full Build Out

Table 4 & 5 summarize the capacity analysis results for the AM and PM Peak Hours, respectively. All signalized intersections and unsignalized approaches are projected to operate at an acceptable LOS during the Peak Hours except for those in red.

Table 4 – Capacity Analysis – AM Peak Hour

Intersection	2024 Existing Conditions		2027 Background Conditions		2027 Projected Conditions	
	LOS	Sec. of Delay	LOS	Sec. of Delay	LOS	Sec. of Delay
1. Davis Blvd at Lyndhurst Way/Creek Rd						
Eastbound	E	37.6	E	42.8	E	43.6
Westbound	F	85.3	F	110.0	F	114.7
Northbound	C	16.1*	C	17.2*	C	17.3*
Southbound	D	32.5*	E	37.4*	E	38.1*
2. Davis Blvd at Street A						
Westbound					F	68.2
Northbound					A	0.0
Southbound					E	39.0*
3. Davis Blvd at Rolling Wood Ln						
Westbound	F	60.4	F	74.0	F	74.8
Northbound	A	0.0	A	0.0	A	0.0
Southbound	D	32.2*	E	36.9*	E	37.1*

*indicates left turn LOS

Table 5 – Capacity Analysis – PM Peak Hour

Intersection	2024 Existing Conditions		2027 Background Conditions		2027 Projected Conditions	
	LOS	Sec. of Delay	LOS	Sec. of Delay	LOS	Sec. of Delay
1. Davis Blvd at Lyndhurst Way/Creek Rd						
Eastbound	F	179.5	F	278.0	F	291.0
Westbound	F	97.9	F	149.0	F	154.7
Northbound	E	42.6*	F	52.1*	F	53.4*
Southbound	D	25.1*	D	28.0*	D	28.3*
2. Davis Blvd at Street A						
Westbound					E	49.7
Northbound					A	0.0
Southbound					D	33.9*
3. Davis Blvd at Rolling Wood Ln						
Westbound	E	37.2	E	42.5	E	43.3
Northbound	A	0.0	A	0.0	A	0.0
Southbound	C	24.4*	D	27.1*	D	27.6*

*indicates left turn LOS

For 2027 Background Conditions, at the intersection of Davis Blvd (FM 1938) and Lyndhurst Way, the eastbound, westbound, and southbound approaches are failing with a LOS E or F for the AM Peak Hour, and the eastbound, westbound, and northbound approaches are failing with a LOS E or F for the PM Peak Hour. Although the LOS is failing, LOS E or F is maintained from 2027 Background Conditions to 2027 Projected Conditions for each approach; therefore, no mitigations are recommended.

For 2027 Background Conditions, at the intersection of Davis Blvd (FM 1938) and Rolling Wood Ln, the westbound and southbound approaches are failing with a LOS E or F for the AM Peak Hour, and the westbound approach is failing with a LOS E for the PM Peak Hour. Although the LOS is failing, LOS E or F is maintained from 2027 Background Conditions to 2027 Projected Conditions for each approach; therefore, no mitigations are recommended.

For 2027 Projected Conditions, at the intersection of Davis Blvd (FM 1938) and Street A, the westbound and southbound approaches are failing with a LOS E or F in the AM Peak Hour and the westbound approach is failing with a LOS E in the PM Peak Hour. For the westbound approach, LOS E-F on the minor driveway approach is not uncommon at an unsignalized intersection where traffic volumes on the major roadways are high, such as Davis Blvd (FM 1938). LOS E-F is for the minor roadway approaches only, not the overall intersections, and minimal volumes from the development will be traveling westbound through the intersection (1% of overall traffic at Street A in AM Peak Hour / 0.5% of overall traffic at Street A in PM Peak Hour); therefore, no mitigations are recommended. For the southbound approach, although the LOS is failing in the AM Peak Hour, minimal volumes from the development will be making southbound left turn movements (0.2% of overall traffic at Street A in AM Peak Hour). Additionally, the TxDOT FM 1938 Raised Median Project will eventually restrict the failing southbound left turn movement. Minimal volumes from the development will be making southbound left turn movements, and future background construction will restrict the southbound left turn movement; therefore, no mitigations are recommended.

Right Turn Lane Analysis

Table 2-3 of the *Texas Department of Transportation's (TxDOT) Access Management Manual* provides an Auxiliary Lane Threshold of 60 vehicles per hour for a right turn lane based on a speed limit less than or equal to 45 mph and 50 vehicles per hour based on a speed limit greater than 45 mph. Right turn lane analysis for 2027 Projected Conditions is presented in **Table 6**.

Table 6 – 2027 Projected Conditions Right Turn Lane Analysis

Location (Direction)	Speed Limit	TxDOT Auxiliary Lane Threshold	Right Turn Volume		Minimum Volume Met
			AM Peak Hour	PM Peak Hour	
Davis Blvd at Street A (Northbound)	**50 mph**	**50 vehicles**	**5**	**15**	**NO**

The northbound approach at the intersection did not meet the threshold for a right turn lane. Although a right turn lane is required in accordance with TxDOT District Requirements, a northbound right turn lane may not be feasible due to the existing super elevation on Davis Road (FM 1938) and the location of (proposed) Street A is at the southern boundary of the development where any right-of-way necessary would be on an adjacent property; therefore, a northbound right turn lane is not recommended.

Driveway Spacing

Table 2-2 of the *TxDOT Access Management Manual* provides a minimum State Highway Connection Spacing (Driveway Spacing) of 425 feet based on speed limits greater than 50 mph. On Davis Blvd (FM 1938), the distance from proposed Street A to the nearest roadway to the north, Creek Road, is 270 feet and 140 feet to the nearest roadway to the south, Rolling Wood Lane. The driveway spacing diagram is shown in **Appendix H.** Minimum driveway spacing requirements are not met because Street A is proposed to align between Rolling Wood Lane and Creek Road. The only available access to the proposed site is along Davis Blvd (FM 1938) between Rolling Wood Lane and Creek Road, and the driveway spacing between Rolling Wood Lane and Creek Road is approximately 525 feet, which does not allow Street A to meet driveway spacing requirements; therefore, a variance is requested for Street A.

Stopping Sight Distance

Table 3-1 of the *American Association of State Highway and Transportation Officials' (AASHTO) Green Book* provides a Stopping Sight Distance of 425 feet based on a speed limit of 50 mph and a level roadway. The northbound and southbound movements on Davis Blvd (FM 1938) are unobstructed and on a level roadway which meets the minimum 425 foot Stopping Sight Distance. The roadway has been field verified and site visit photos are located in **Appendix I**.

Intersection Sight Distance

Table 9-6 and Table 9-8 of the *AASHTO Green Book* provide Intersection Sight Distances for Case B1, Left Turn from Stop, and Case B2, Right Turn from Stop, respectively. The minimum Intersection Sight Distance for Case B1, Left Turn from Stop, is 670 feet. The minimum Intersection Sight Distance for Case B2, Right Turn from Stop, is 480 feet. Both turning movements at the proposed roadway, Street A, are unobstructed. The Sight Distance Triangles Diagram and site visit photos are located in **Appendix J.**

Recommendations

Recommendations

Traffic impacts to the surrounding roadway are minimal and approval is recommended with the following recommendations:

1. Request a variance for driveway spacing for proposed Street A as part of the permit process.

Appendix

Contents

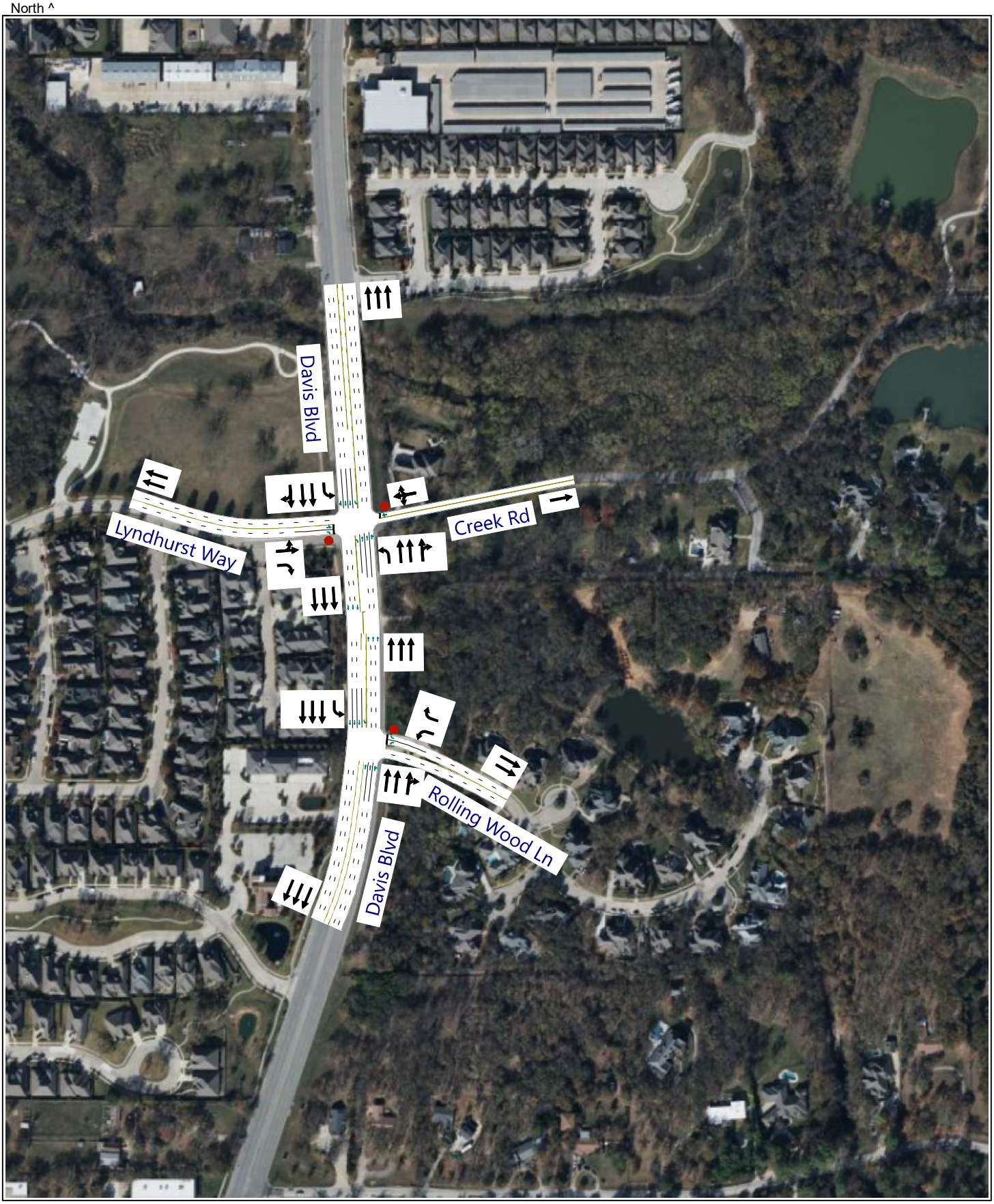
Appendix A Lane Assignment and Traffic Volumes
Appendix B Traffic Data
Appendix C Capacity Analysis – 2024 Existing Conditions
Appendix D Capacity Analysis – 2027 Background Conditions
Appendix E Capacity Analysis – 2027 Projected Conditions
Appendix F Trip Generation Reports
Appendix G FM 1938 Raised Median Project Fact Sheet and Schematic
Appendix H Driveway Spacing Diagram
Appendix I Stopping Sight Distance Photos
Appendix J Intersection Sight Distance Triangle Diagram and Photos

Appendix A
Lane Assignment and Traffic Volumes

Armstrong Hills

Existing Lane Assignments

North ^



12/05/2024

Quiddity Engineering

Armstrong Hills

Proposed Lane Assignments

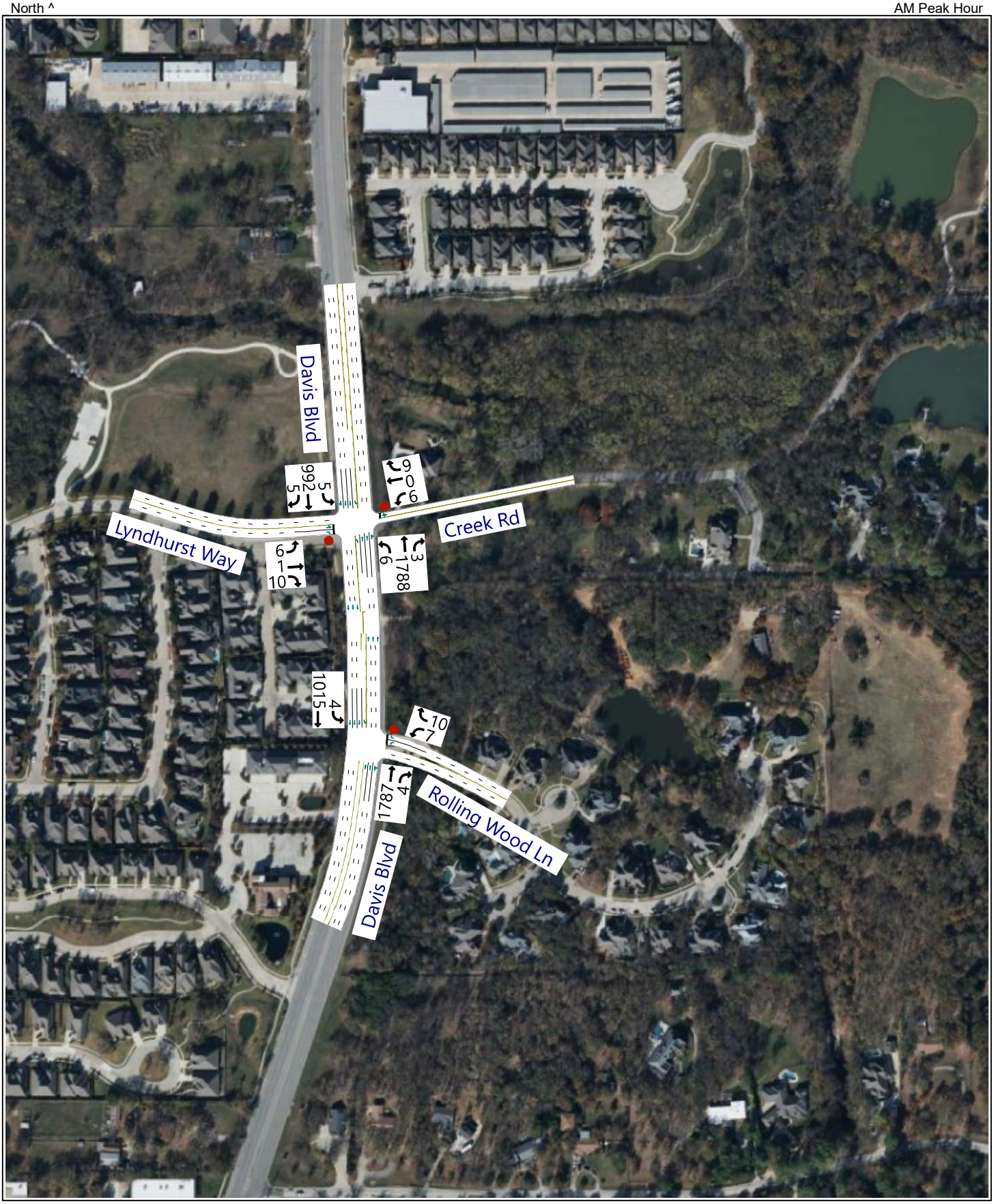
North ^

12/05/2024

Quiddity Engineering

Armstrong Hills
North ^

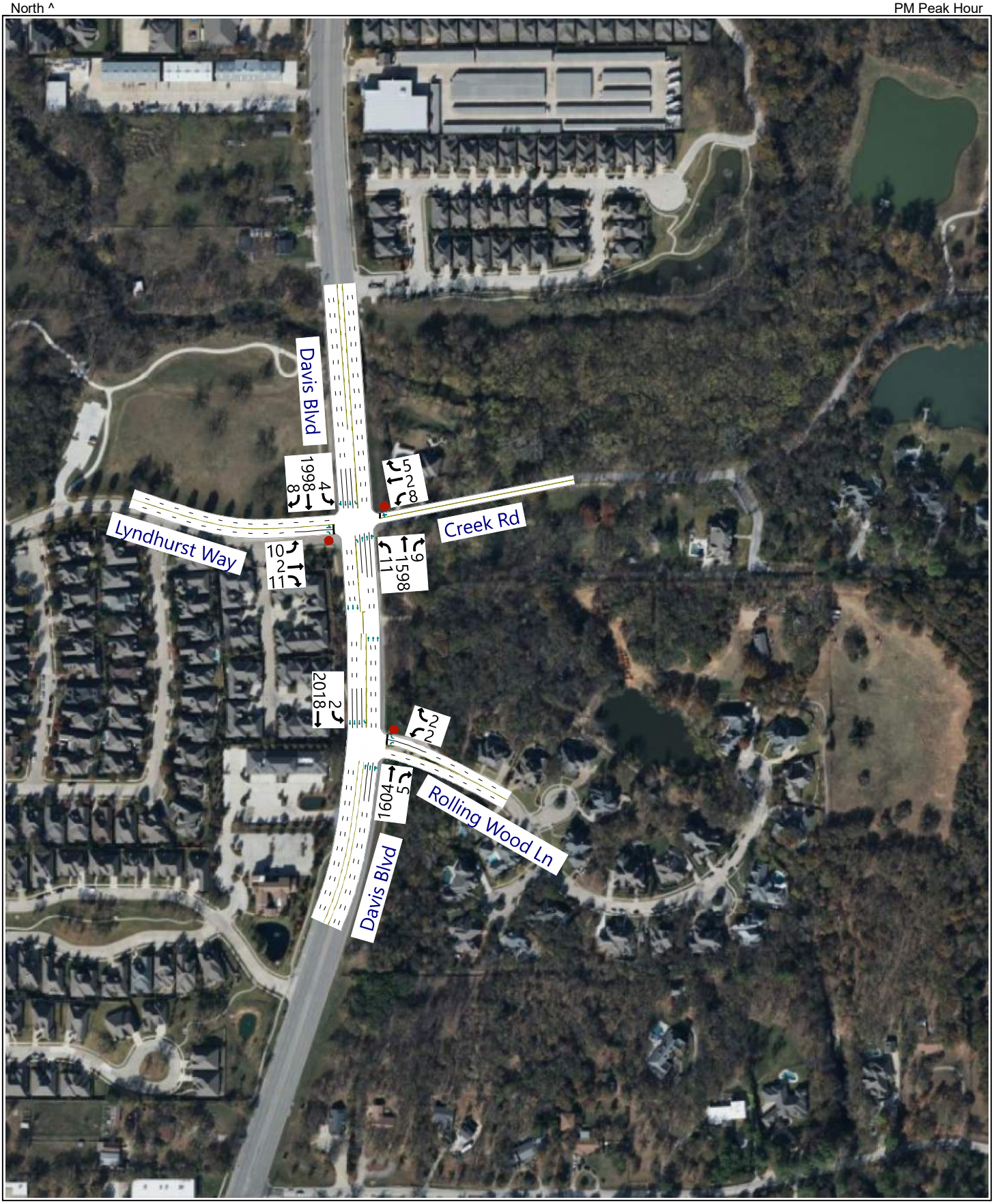
2024 Existing Conditions
AM Peak Hour



12/05/2024
Quiddity Engineering

Armstrong Hills
North ^

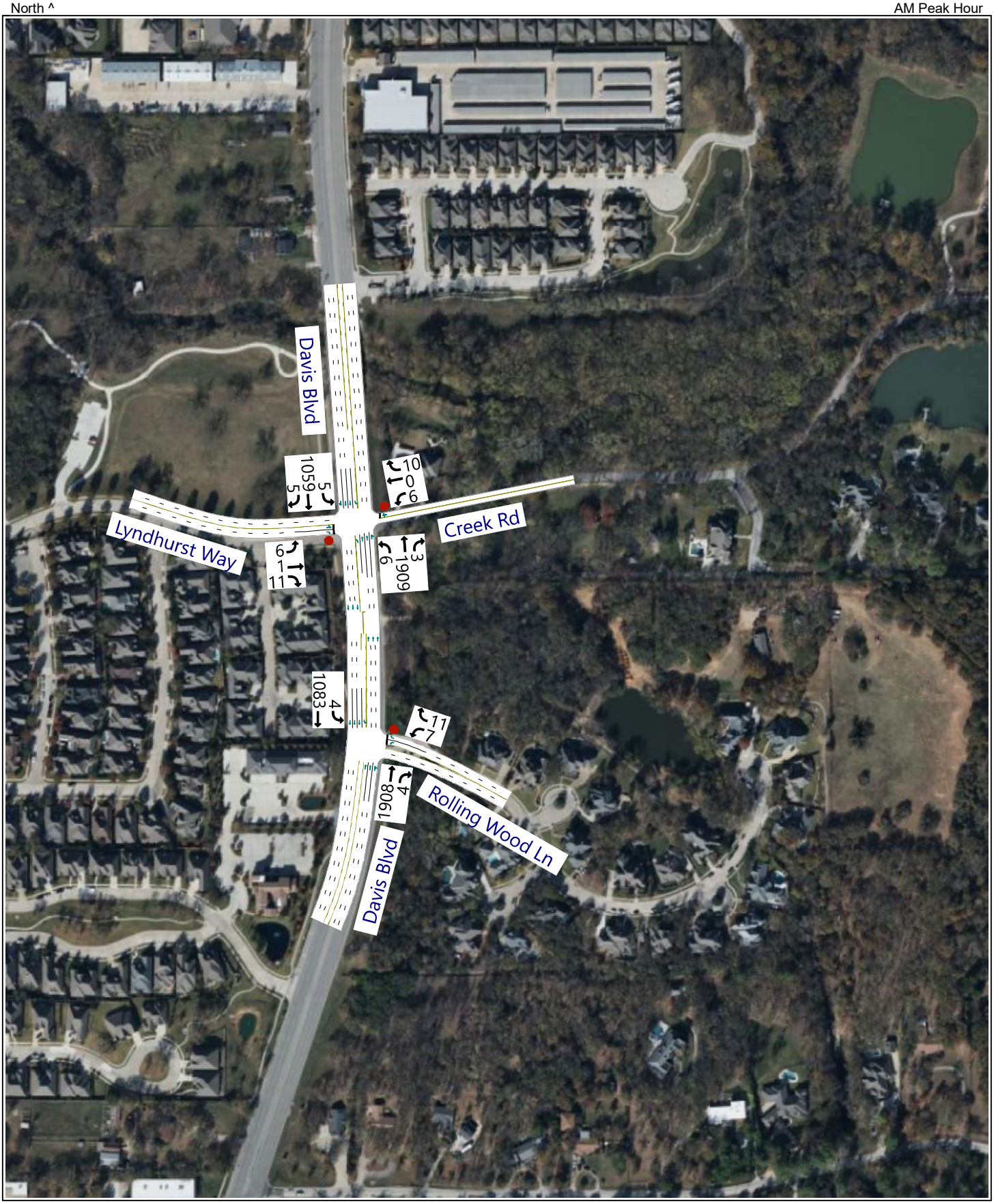
2024 Existing Conditions
PM Peak Hour



12/05/2024
Quiddity Engineering

Armstrong Hills
North ^

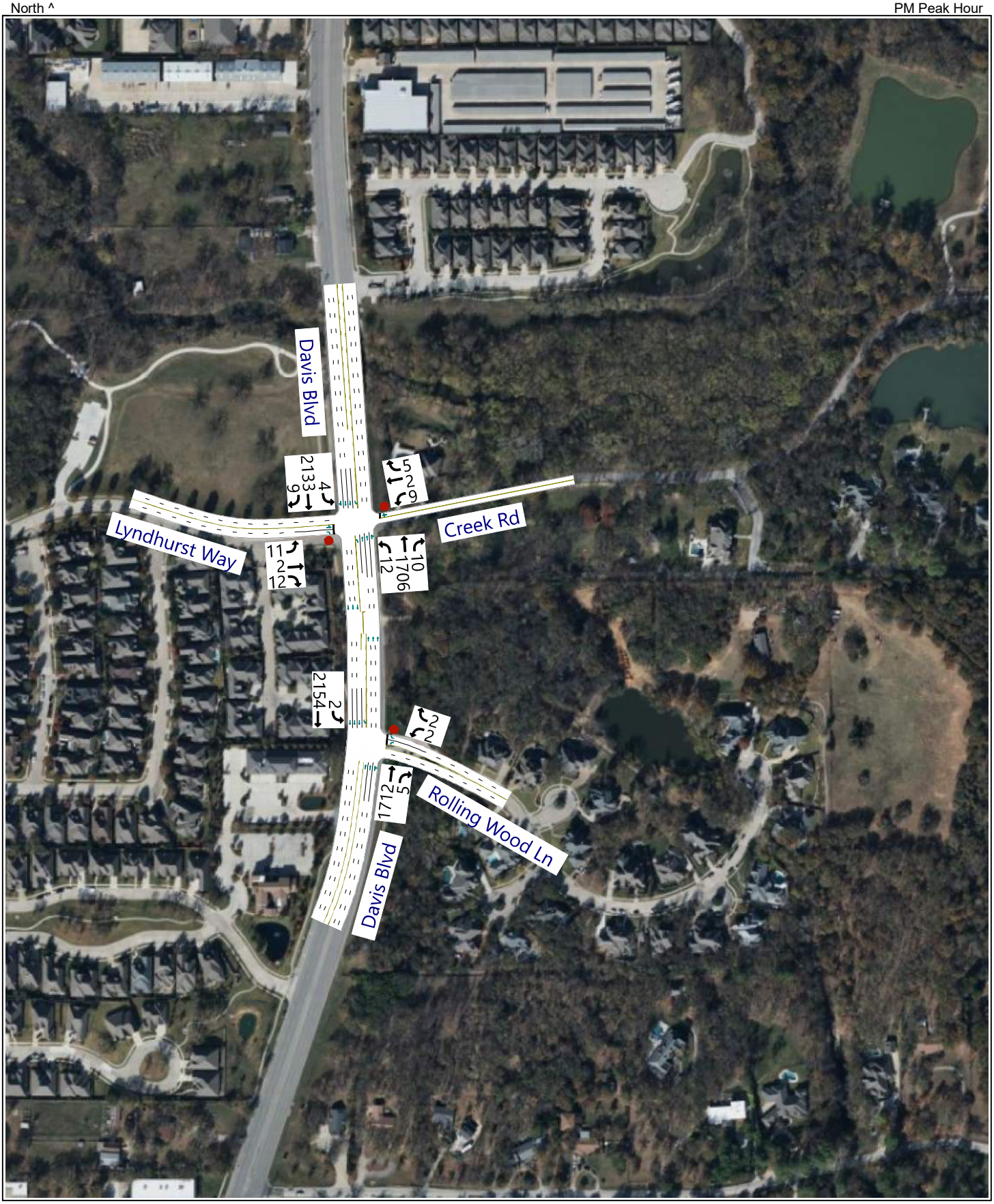
2027 Background Conditions
AM Peak Hour



12/05/2024
Quiddity Engineering

Armstrong Hills
North ^

2027 Background Conditions
PM Peak Hour

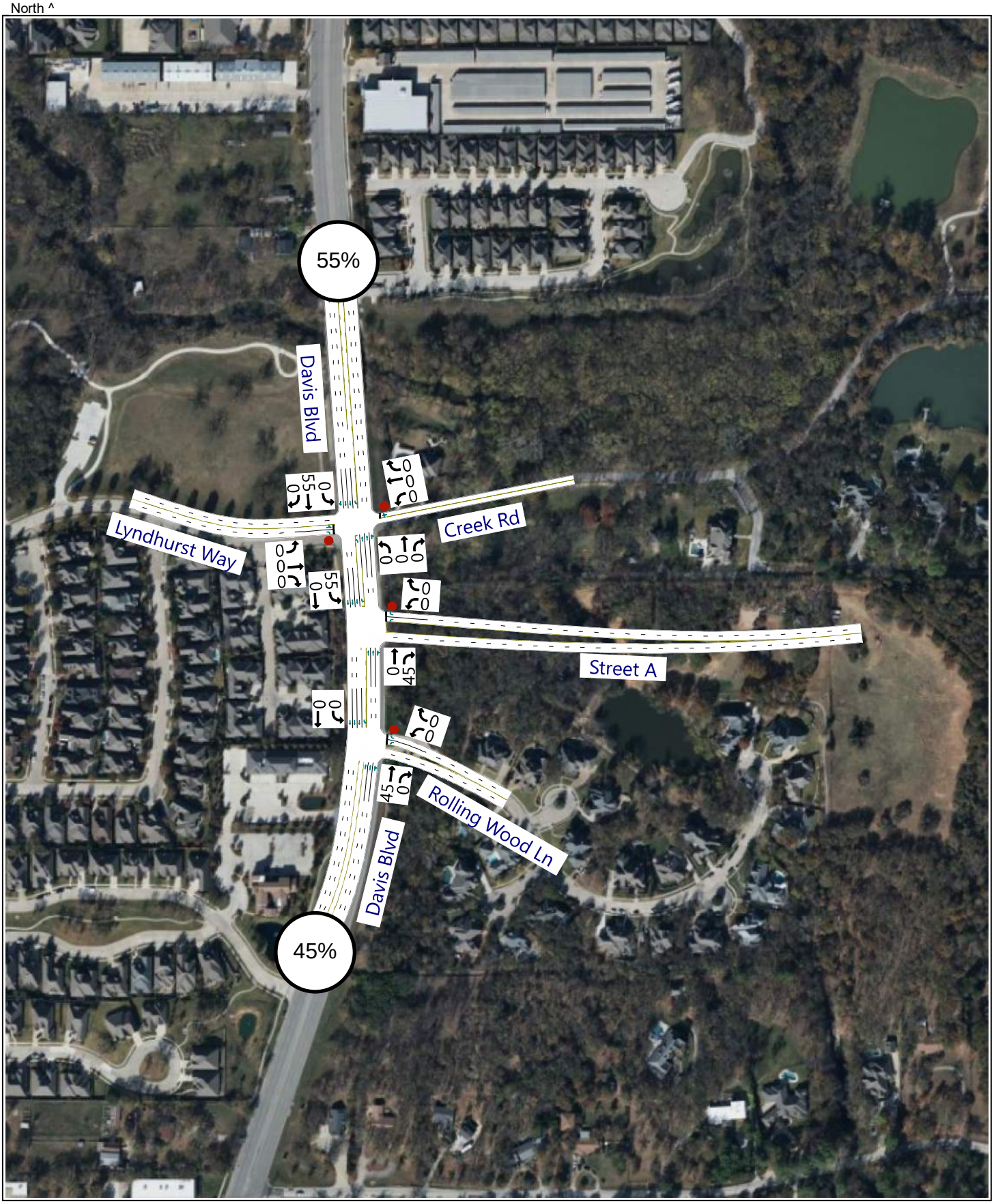


12/05/2024
Quiddity Engineering

Armstrong Hills

Inbound Trip Distribution

North ^



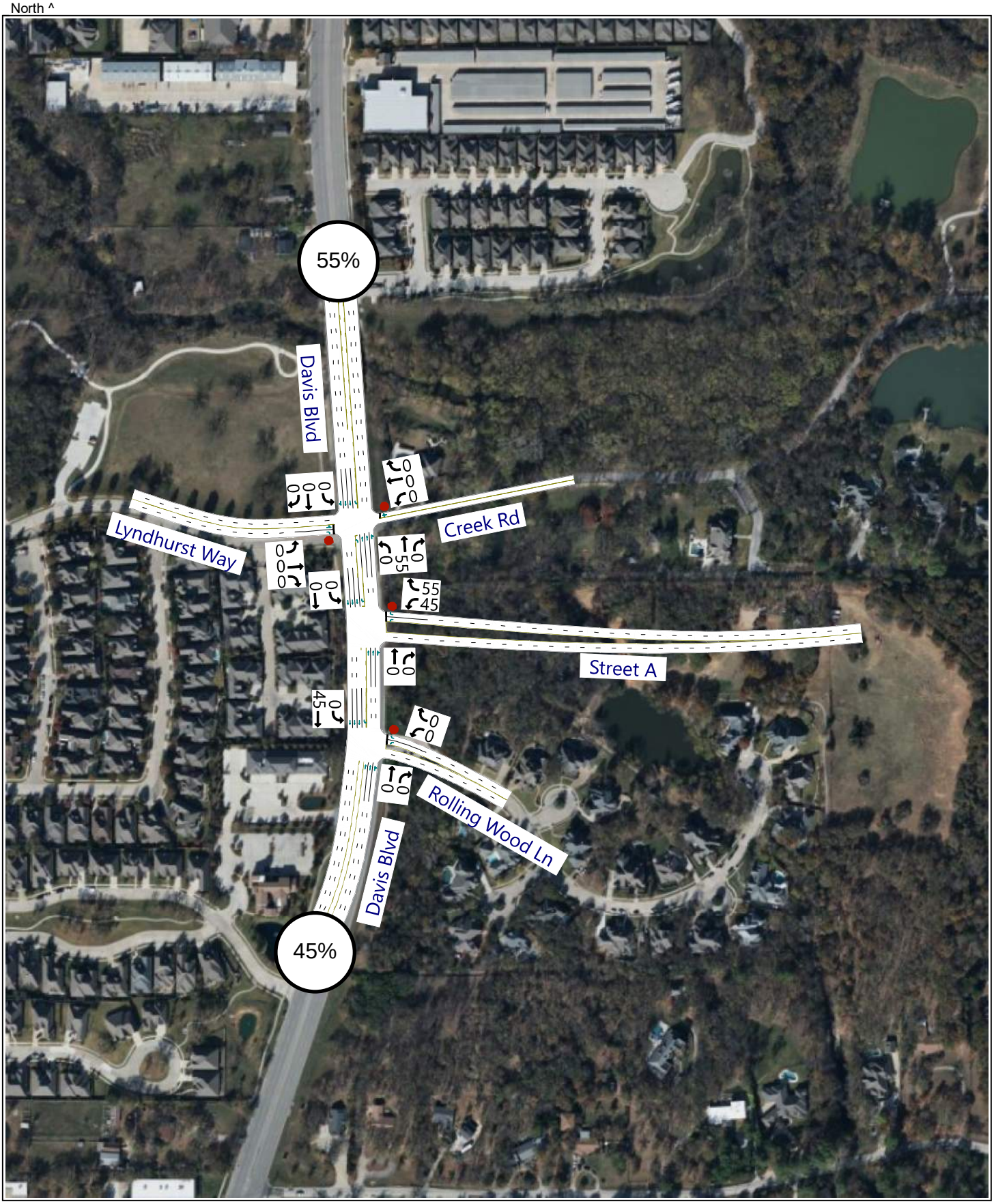
12/05/2024

Quiddity Engineering

Armstrong Hills

Outbound Trip Distribution

North ^



12/05/2024

Quiddity Engineering

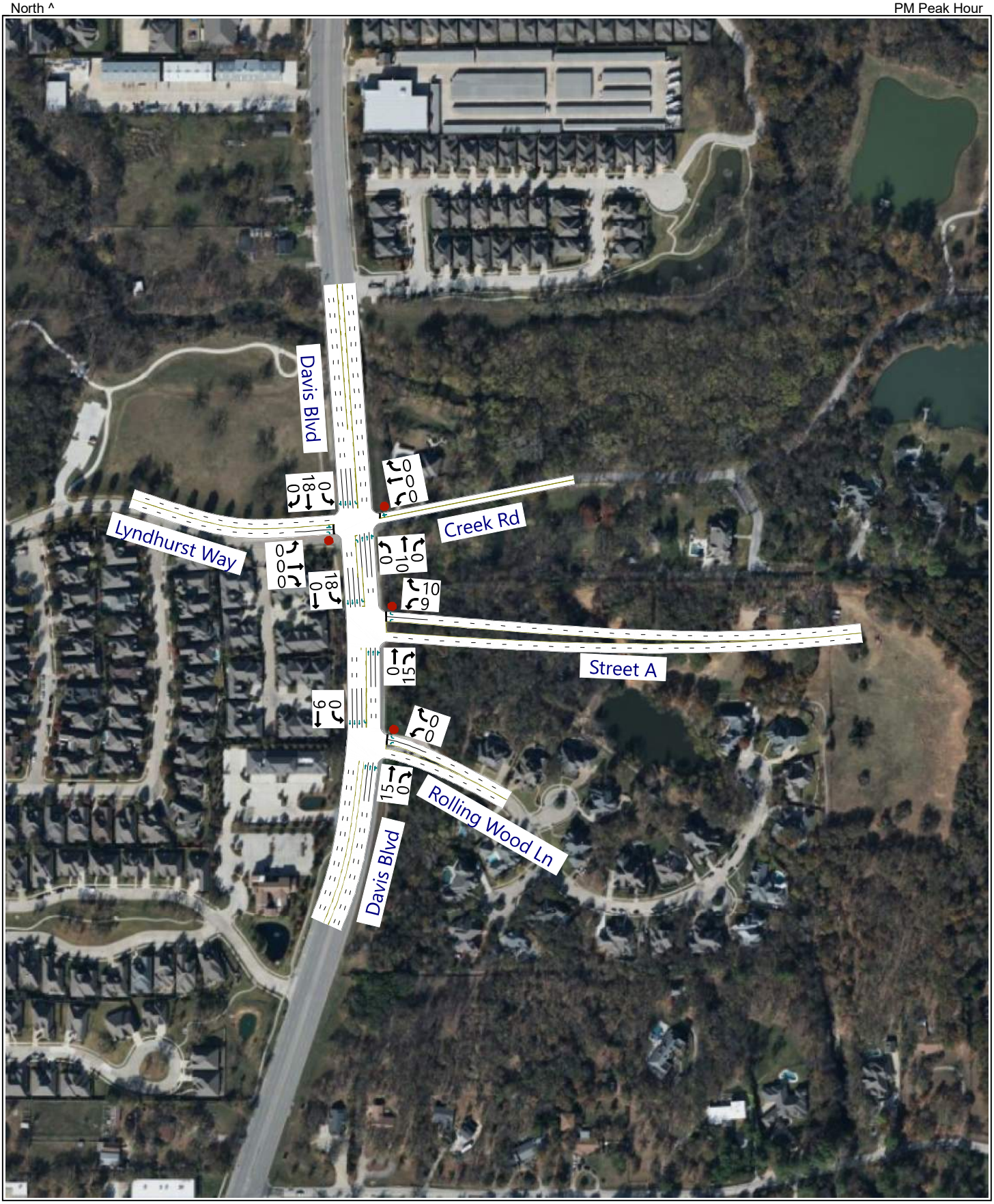
Armstrong Hills
North ^

Site Generated Volumes
AM Peak Hour

12/05/2024
Quiddity Engineering

Armstrong Hills
North ^

Site Generated Volumes
PM Peak Hour



12/05/2024
Quiddity Engineering

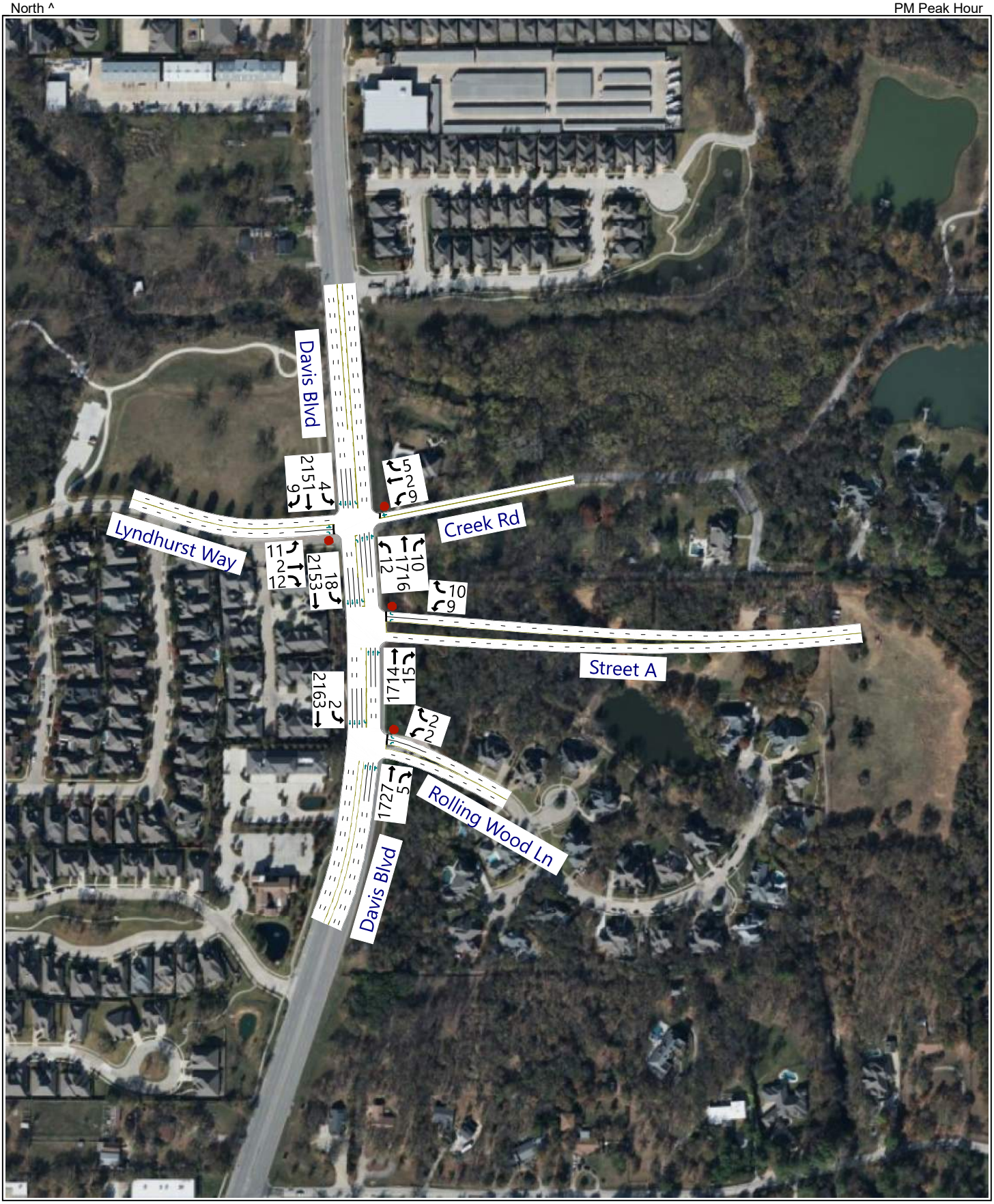
Armstrong Hills
North ^

2027 Projected Conditions
AM Peak Hour

12/05/2024
Quiddity Engineering

Armstrong Hills
North ^

2027 Projected Conditions
PM Peak Hour



12/05/2024
Quiddity Engineering

Appendix B
Traffic Data

1. FM 1938 at Lyndhurst Way/Creek Road - TMC

Wed Oct 23, 2024
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239614, Location: 32.917463, -97.186597

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg	FM 1938						FM 1938						Lyndhurst Way						Creek Road						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2024-10-23 6:00AM	0	143	0	0	**143**	0	1	80	0	0	**81**	0	2	0	0	0	**2**	0	1	1	0	0	**2**	0	**228**
6:15AM	0	197	0	0	**197**	0	0	89	0	0	**89**	0	0	0	1	0	**1**	0	0	0	2	0	**2**	0	**289**
6:30AM	2	271	0	0	**273**	0	1	112	0	0	**113**	0	3	0	2	0	**5**	0	0	0	0	0	**0**	0	**391**
6:45AM	0	346	0	0	**346**	0	0	148	2	0	**150**	0	6	0	1	0	**7**	0	0	0	0	0	**0**	0	**503**
Hourly Total	2	957	0	0	**959**	0	2	429	2	0	**433**	0	11	0	4	0	**15**	0	1	1	2	0	**4**	0	**1411**
7:00AM	3	352	0	0	**355**	0	1	185	1	0	**187**	0	1	0	3	0	**4**	0	0	0	1	0	**1**	0	**547**
7:15AM	1	404	1	0	**406**	0	0	215	4	0	**219**	0	2	0	2	0	**4**	0	1	1	1	0	**3**	0	**632**
7:30AM	1	472	1	0	**474**	0	2	255	0	0	**257**	0	2	0	3	0	**5**	0	0	0	3	0	**3**	0	**739**
7:45AM	1	478	1	0	**480**	0	0	287	3	0	**290**	0	0	0	3	0	**3**	0	1	0	3	0	**4**	0	**777**
Hourly Total	6	1706	3	0	**1715**	0	3	942	8	0	**953**	0	5	0	11	0	**16**	0	2	1	8	0	**11**	0	**2695**
8:00AM	2	426	0	0	**428**	0	3	238	1	0	**242**	0	0	0	2	0	**2**	0	2	0	2	0	**4**	0	**676**
8:15AM	2	412	1	0	**415**	0	0	212	1	0	**213**	0	4	1	2	0	**7**	0	3	0	1	0	**4**	0	**639**
8:30AM	1	408	0	0	**409**	0	0	231	2	0	**233**	0	7	0	2	0	**9**	0	4	0	1	0	**5**	0	**656**
8:45AM	3	411	2	0	**416**	0	0	238	4	0	**242**	0	1	0	2	0	**3**	0	1	0	0	0	**1**	0	**662**
Hourly Total	8	1657	3	0	**1668**	0	3	919	8	0	**930**	0	12	1	8	0	**21**	0	10	0	4	0	**14**	0	**2633**
4:00PM	3	319	2	0	**324**	0	0	439	4	0	**443**	0	4	0	3	0	**7**	0	0	1	2	0	**3**	0	**777**
4:15PM	0	333	2	0	**335**	0	1	467	5	0	**473**	0	5	0	4	0	**9**	0	2	0	1	0	**3**	0	**820**
4:30PM	2	350	2	0	**354**	0	4	459	4	0	**467**	0	1	0	4	0	**5**	0	0	0	3	0	**3**	0	**829**
4:45PM	4	397	1	0	**402**	0	0	492	2	0	**494**	0	3	0	5	0	**8**	0	3	0	1	0	**4**	0	**908**
Hourly Total	9	1399	7	0	**1415**	0	5	1857	15	0	**1877**	0	13	0	16	0	**29**	0	5	1	7	0	**13**	0	**3334**
5:00PM	2	408	5	1	**416**	0	1	472	0	0	**473**	0	0	0	1	0	**1**	0	3	1	2	0	**6**	0	**896**
5:15PM	2	400	1	0	**403**	0	0	518	3	0	**521**	0	5	1	3	0	**9**	0	0	0	1	0	**1**	0	**934**
5:30PM	1	393	2	1	**397**	0	3	516	3	0	**522**	0	2	1	2	0	**5**	0	2	1	1	0	**4**	0	**928**
5:45PM	6	329	2	0	**337**	0	2	496	3	0	**501**	0	3	0	5	0	**8**	0	2	0	1	0	**3**	0	**849**
Hourly Total	11	1530	10	2	**1553**	0	6	2002	9	0	**2017**	0	10	2	11	0	**23**	0	7	2	5	0	**14**	0	**3607**
6:00PM	5	330	0	0	**335**	0	2	380	3	0	**385**	0	2	0	6	1	**9**	0	1	1	2	0	**4**	0	**733**
6:15PM	2	314	1	0	**317**	0	1	416	2	0	**419**	0	3	0	2	0	**5**	0	1	0	0	0	**1**	0	**742**
6:30PM	3	307	2	0	**312**	0	1	344	4	0	**349**	0	5	0	2	0	**7**	0	0	1	1	0	**2**	0	**670**
6:45PM	5	270	0	0	**275**	0	1	322	2	0	**325**	0	1	0	1	0	**2**	0	1	0	4	0	**5**	0	**607**
Hourly Total	15	1221	3	0	**1239**	0	5	1462	11	0	**1478**	0	11	0	11	1	**23**	0	3	2	7	0	**12**	0	**2752**
Total	51	8470	26	2	**8549**	0	24	7611	53	0	**7688**	0	62	3	61	1	**127**	0	28	7	33	0	**68**	0	**16432**
% Approach	0.6%	99.1%	0.3%	0%	**-**	-	0.3%	99.0%	0.7%	0%	**-**	-	48.8%	2.4%	48.0%	0.8%	**-**	-	41.2%	10.3%	48.5%	0%	**-**	-	-
% Total	0.3%	51.5%	0.2%	0%	**52.0%**	-	0.1%	46.3%	0.3%	0%	**46.8%**	-	0.4%	0%	0.4%	0%	**0.8%**	-	0.2%	0%	0.2%	0%	**0.4%**	-	-
Lights	50	8364	24	2	**8440**	-	23	7516	52	0	**7591**	-	62	3	59	1	**125**	-	28	6	30	0	**64**	-	16220
% Lights	98.0%	98.7%	92.3%	100%	**98.7%**	-	95.8%	98.8%	98.1%	0%	**98.7%**	-	100%	100%	96.7%	100%	**98.4%**	-	100%	85.7%	90.9%	0%	**94.1%**	-	98.7%
Articulated Trucks	0	17	0	0	**17**	-	0	14	0	0	**14**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	31
% Articulated Trucks	0%	0.2%	0%	0%	**0.2%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.2%
Buses and Single-Unit Trucks	1	89	2	0	**92**	-	1	81	1	0	**83**	-	0	0	2	0	**2**	-	0	1	3	0	**4**	-	181
% Buses and Single-Unit Trucks	2.0%	1.1%	7.7%	0%	**1.1%**	-	4.2%	1.1%	1.9%	0%	**1.1%**	-	0%	0%	3.3%	0%	**1.6%**	-	0%	14.3%	9.1%	0%	**5.9%**	-	1.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1. FM 1938 at Lyndhurst Way/Creek Road - TMC

Wed Oct 23, 2024
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239614, Location: 32.917463, -97.186597

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg	FM 1938						FM 1938						Lyndhurst Way						Creek Road						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2024-10-23 7:30AM	1	472	1	0	**474**	0	2	255	0	0	**257**	0	2	0	3	0	**5**	0	0	0	3	0	**3**	0	**739**
7:45AM	1	478	1	0	**480**	0	0	287	3	0	**290**	0	0	0	3	0	**3**	0	1	0	3	0	**4**	0	**777**
8:00AM	2	426	0	0	**428**	0	3	238	1	0	**242**	0	0	0	2	0	**2**	0	2	0	2	0	**4**	0	**676**
8:15AM	2	412	1	0	**415**	0	0	212	1	0	**213**	0	4	1	2	0	**7**	0	3	0	1	0	**4**	0	**639**
Total	6	1788	3	0	**1797**	0	5	992	5	0	**1002**	0	6	1	10	0	**17**	0	6	0	9	0	**15**	0	**2831**
% Approach	0.3%	99.5%	0.2%	0%	**-**	-	0.5%	99.0%	0.5%	0%	**-**	-	35.3%	5.9%	58.8%	0%	**-**	-	40.0%	0%	60.0%	0%	**-**	-	**-**
% Total	0.2%	63.2%	0.1%	0%	**63.5%**	-	0.2%	35.0%	0.2%	0%	**35.4%**	-	0.2%	0%	0.4%	0%	**0.6%**	-	0.2%	0%	0.3%	0%	**0.5%**	-	**-**
PHF	0.750	0.935	0.750	-	**0.936**	-	0.417	0.864	0.417	-	**0.864**	-	0.375	0.250	0.833	-	**0.607**	-	0.500	-	0.750	-	**0.938**	-	0.911
Lights	6	1751	3	0	**1760**	-	5	978	5	0	**988**	-	6	1	10	0	**17**	-	6	0	9	0	**15**	-	2780
% Lights	100%	97.9%	100%	0%	**97.9%**	-	100%	98.6%	100%	0%	**98.6%**	-	100%	100%	100%	0%	**100%**	-	100%	0%	100%	0%	**100%**	-	98.2%
Articulated Trucks	0	9	0	0	**9**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	10
% Articulated Trucks	0%	0.5%	0%	0%	**0.5%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.4%
Buses and Single-Unit Trucks	0	28	0	0	**28**	-	0	13	0	0	**13**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	41
% Buses and Single-Unit Trucks	0%	1.6%	0%	0%	**1.6%**	-	0%	1.3%	0%	0%	**1.3%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.4%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1. FM 1938 at Lyndhurst Way/Creek Road - TMC

Wed Oct 23, 2024
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239614, Location: 32.917463, -97.186597

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg	FM 1938						FM 1938						Lyndhurst Way						Creek Road						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2024-10-23 4:45PM	4	397	1	0	**402**	0	0	492	2	0	**494**	0	3	0	5	0	**8**	0	3	0	1	0	**4**	0	**908**
5:00PM	2	408	5	1	**416**	0	1	472	0	0	**473**	0	0	0	1	0	**1**	0	3	1	2	0	**6**	0	**896**
5:15PM	2	400	1	0	**403**	0	0	518	3	0	**521**	0	5	1	3	0	**9**	0	0	0	1	0	**1**	0	**934**
5:30PM	1	393	2	1	**397**	0	3	516	3	0	**522**	0	2	1	2	0	**5**	0	2	1	1	0	**4**	0	**928**
Total	9	1598	9	2	**1618**	0	4	1998	8	0	**2010**	0	10	2	11	0	**23**	0	8	2	5	0	**15**	0	**3666**
% Approach	0.6%	98.8%	0.6%	0.1%	**-**	-	0.2%	99.4%	0.4%	0%	**-**	-	43.5%	8.7%	47.8%	0%	**-**	-	53.3%	13.3%	33.3%	0%	**-**	-	**-**
% Total	0.2%	43.6%	0.2%	0.1%	**44.1%**	-	0.1%	54.5%	0.2%	0%	**54.8%**	-	0.3%	0.1%	0.3%	0%	**0.6%**	-	0.2%	0.1%	0.1%	0%	**0.4%**	-	**-**
PHF	0.563	0.979	0.450	0.500	**0.972**	-	0.333	0.964	0.667	-	**0.963**	-	0.500	0.500	0.550	-	**0.639**	-	0.667	0.500	0.625	-	**0.625**	-	0.981
Lights	9	1585	8	2	**1604**	-	4	1972	8	0	**1984**	-	10	2	11	0	**23**	-	8	2	4	0	**14**	-	3625
% Lights	100%	99.2%	88.9%	100%	**99.1%**	-	100%	98.7%	100%	0%	**98.7%**	-	100%	100%	100%	0%	**100%**	-	100%	100%	80.0%	0%	**93.3%**	-	98.9%
Articulated Trucks	0	2	0	0	**2**	-	0	4	0	0	**4**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	6
% Articulated Trucks	0%	0.1%	0%	0%	**0.1%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.2%
Buses and Single-Unit Trucks	0	11	1	0	**12**	-	0	22	0	0	**22**	-	0	0	0	0	**0**	-	0	0	1	0	**1**	-	35
% Buses and Single-Unit Trucks	0%	0.7%	11.1%	0%	**0.7%**	-	0%	1.1%	0%	0%	**1.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	20.0%	0%	**6.7%**	-	1.0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2. FM 1938 at Rolling Wood Lane - TMC

Wed Oct 23, 2024
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239615, Location: 32.91594, -97.186481

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg	FM 1938					FM 1938					Rolling Wood Lane					
Direction	Northbound					Southbound					Westbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2024-10-23 6:00AM	141	0	0	**141**	0	0	82	0	**82**	0	0	1	0	**1**	0	**224**
6:15AM	187	0	0	**187**	0	0	99	0	**99**	0	0	0	0	**0**	0	**286**
6:30AM	267	1	0	**268**	0	0	109	0	**109**	0	0	2	0	**2**	0	**379**
6:45AM	357	1	0	**358**	0	0	141	0	**141**	0	1	0	0	**1**	0	**500**
Hourly Total	952	2	0	**954**	0	0	431	0	**431**	0	1	3	0	**4**	0	**1389**
7:00AM	345	0	0	**345**	0	0	203	0	**203**	0	0	2	0	**2**	0	**550**
7:15AM	392	0	0	**392**	0	0	200	0	**200**	0	0	0	0	**0**	0	**592**
7:30AM	478	1	0	**479**	0	1	252	1	**254**	0	5	4	0	**9**	0	**742**
7:45AM	465	1	0	**466**	0	0	303	0	**303**	0	1	0	0	**1**	0	**770**
Hourly Total	1680	2	0	**1682**	0	1	958	1	**960**	0	6	6	0	**12**	0	**2654**
8:00AM	435	1	0	**436**	0	2	230	0	**232**	0	1	4	0	**5**	0	**673**
8:15AM	409	1	0	**410**	0	0	230	0	**230**	0	0	2	0	**2**	0	**642**
8:30AM	400	1	0	**401**	0	0	245	0	**245**	0	1	0	0	**1**	0	**647**
8:45AM	409	0	0	**409**	0	0	239	0	**239**	0	1	0	0	**1**	0	**649**
Hourly Total	1653	3	0	**1656**	0	2	944	0	**946**	0	3	6	0	**9**	0	**2611**
4:00PM	327	2	0	**329**	0	0	433	0	**433**	0	1	1	0	**2**	0	**764**
4:15PM	317	3	0	**320**	0	1	493	0	**494**	0	2	1	0	**3**	0	**817**
4:30PM	360	0	0	**360**	0	1	466	0	**467**	0	2	1	0	**3**	0	**830**
4:45PM	404	2	0	**406**	0	0	501	0	**501**	0	1	1	0	**2**	0	**909**
Hourly Total	1408	7	0	**1415**	0	2	1893	0	**1895**	0	6	4	0	**10**	0	**3320**
5:00PM	414	0	1	**415**	0	1	488	0	**489**	0	0	1	0	**1**	0	**905**
5:15PM	396	1	0	**397**	0	1	505	0	**506**	0	1	0	0	**1**	0	**904**
5:30PM	390	2	0	**392**	0	0	524	0	**524**	0	0	0	0	**0**	0	**916**
5:45PM	341	0	1	**342**	0	1	507	0	**508**	0	0	1	0	**1**	0	**851**
Hourly Total	1541	3	2	**1546**	0	3	2024	0	**2027**	0	1	2	0	**3**	0	**3576**
6:00PM	317	2	1	**320**	0	0	400	0	**400**	0	0	0	0	**0**	0	**720**
6:15PM	320	2	0	**322**	0	1	413	0	**414**	0	0	0	0	**0**	0	**736**
6:30PM	318	1	0	**319**	0	1	352	1	**354**	0	1	0	0	**1**	0	**674**
6:45PM	259	0	0	**259**	0	0	320	0	**320**	0	2	0	0	**2**	0	**581**
Hourly Total	1214	5	1	**1220**	0	2	1485	1	**1488**	0	3	0	0	**3**	0	**2711**
Total	8448	22	3	**8473**	0	10	7735	2	**7747**	0	20	21	0	**41**	0	**16261**
% Approach	99.7%	0.3%	0%	**-**	-	0.1%	99.8%	0%	**-**	-	48.8%	51.2%	0%	**-**	-	-
% Total	52.0%	0.1%	0%	**52.1%**	-	0.1%	47.6%	0%	**47.6%**	-	0.1%	0.1%	0%	**0.3%**	-	-
Lights	8337	21	3	**8361**	-	10	7657	2	**7669**	-	20	20	0	**40**	-	16070
% Lights	98.7%	95.5%	100%	**98.7%**	-	100%	99.0%	100%	**99.0%**	-	100%	95.2%	0%	**97.6%**	-	98.8%
Articulated Trucks	23	0	0	**23**	-	0	13	0	**13**	-	0	0	0	**0**	-	36
% Articulated Trucks	0.3%	0%	0%	**0.3%**	-	0%	0.2%	0%	**0.2%**	-	0%	0%	0%	**0%**	-	0.2%
Buses and Single-Unit Trucks	88	1	0	**89**	-	0	65	0	**65**	-	0	1	0	**1**	-	155
% Buses and Single-Unit Trucks	1.0%	4.5%	0%	**1.1%**	-	0%	0.8%	0%	**0.8%**	-	0%	4.8%	0%	**2.4%**	-	1.0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2. FM 1938 at Rolling Wood Lane - TMC

Wed Oct 23, 2024
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239615, Location: 32.91594, -97.186481

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	FM 1938 Northbound					FM 1938 Southbound					Rolling Wood Lane Westbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2024-10-23 7:30AM	478	1	0	**479**	0	1	252	1	**254**	0	5	4	0	**9**	0	**742**
7:45AM	465	1	0	**466**	0	0	303	0	**303**	0	1	0	0	**1**	0	**770**
8:00AM	435	1	0	**436**	0	2	230	0	**232**	0	1	4	0	**5**	0	**673**
8:15AM	409	1	0	**410**	0	0	230	0	**230**	0	0	2	0	**2**	0	**642**
Total	1787	4	0	**1791**	0	3	1015	1	**1019**	0	7	10	0	**17**	0	**2827**
% Approach	99.8%	0.2%	0%	**-**	-	0.3%	99.6%	0.1%	**-**	-	41.2%	58.8%	0%	**-**	-	-
% Total	63.2%	0.1%	0%	**63.4%**	-	0.1%	35.9%	0%	**36.0%**	-	0.2%	0.4%	0%	**0.6%**	-	-
PHF	0.935	1.000	-	**0.935**	-	0.375	0.837	0.250	**0.841**	-	0.350	0.625	-	**0.472**	-	0.918
Lights	1746	4	0	**1750**	-	3	1003	1	**1007**	-	7	10	0	**17**	-	2774
% Lights	97.7%	100%	0%	**97.7%**	-	100%	98.8%	100%	**98.8%**	-	100%	100%	0%	**100%**	-	98.1%
Articulated Trucks	8	0	0	**8**	-	0	1	0	**1**	-	0	0	0	**0**	-	9
% Articulated Trucks	0.4%	0%	0%	**0.4%**	-	0%	0.1%	0%	**0.1%**	-	0%	0%	0%	**0%**	-	0.3%
Buses and Single-Unit Trucks	33	0	0	**33**	-	0	11	0	**11**	-	0	0	0	**0**	-	44
% Buses and Single-Unit Trucks	1.8%	0%	0%	**1.8%**	-	0%	1.1%	0%	**1.1%**	-	0%	0%	0%	**0%**	-	1.6%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2. FM 1938 at Rolling Wood Lane - TMC

Wed Oct 23, 2024
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1239615, Location: 32.91594, -97.186481

Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	FM 1938 Northbound					FM 1938 Southbound					Rolling Wood Lane Westbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2024-10-23 4:45PM	404	2	0	**406**	0	0	501	0	**501**	0	1	1	0	**2**	0	**909**
5:00PM	414	0	1	**415**	0	1	488	0	**489**	0	0	1	0	**1**	0	**905**
5:15PM	396	1	0	**397**	0	1	505	0	**506**	0	1	0	0	**1**	0	**904**
5:30PM	390	2	0	**392**	0	0	524	0	**524**	0	0	0	0	**0**	0	**916**
Total	1604	5	1	**1610**	0	2	2018	0	**2020**	0	2	2	0	**4**	0	**3634**
% Approach	99.6%	0.3%	0.1%	**-**	-	0.1%	99.9%	0%	**-**	-	50.0%	50.0%	0%	**-**	-	**-**
% Total	44.1%	0.1%	0%	**44.3%**	-	0.1%	55.5%	0%	**55.6%**	-	0.1%	0.1%	0%	**0.1%**	-	**-**
PHF	0.969	0.625	0.250	**0.970**	-	0.500	0.963	-	**0.964**	-	0.500	0.500	-	**0.500**	-	0.992
Lights	1589	4	1	**1594**	-	2	2002	0	**2004**	-	2	1	0	**3**	-	3601
% Lights	99.1%	80.0%	100%	**99.0%**	-	100%	99.2%	0%	**99.2%**	-	100%	50.0%	0%	**75.0%**	-	99.1%
Articulated Trucks	2	0	0	**2**	-	0	3	0	**3**	-	0	0	0	**0**	-	5
% Articulated Trucks	0.1%	0%	0%	**0.1%**	-	0%	0.1%	0%	**0.1%**	-	0%	0%	0%	**0%**	-	0.1%
Buses and Single-Unit Trucks	13	1	0	**14**	-	0	13	0	**13**	-	0	1	0	**1**	-	28
% Buses and Single-Unit Trucks	0.8%	20.0%	0%	**0.9%**	-	0%	0.6%	0%	**0.6%**	-	0%	50.0%	0%	**25.0%**	-	0.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Traffic Count (TCDS)

Home | Locate | Locate All | Email This | Auto-Locate: ☑

List View | All DIRs | Report Center

Record 1 of 1 Goto Record go

Location ID	220U3748	MPO ID	282
Type	SPOT	HPMS ID	UNASSIGNED
SF Group	FORT WORTH FC 3 (2024)	Route Type	FM
AF Group	HP897 (2024)	Route	1938
GF Group	- FC - (2014)	Active	Yes
Class Dist Grp		Category	URBAN ACR
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	(3)Principal Arterial-Other		
Located On	FM1938		
Loc On Alias	FM1938-KG		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2019	37,239	3,527	9	58	36,825 (99%)	414 (1%)	
2014	29,463	3,436	12	57			

Travel Demand Model

Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

Date	Int	Total
Mon 4/22/2019	15	38,729
Mon 4/14/2014	15	38,365

VOLUME TREND

Year	Annual Growth
2024	-1%
2019	5%

SPEED

Date	Int	Pace	85th	Total
No Data				

CLASSIFICATION

Date	Int	Total
No Data		

WEIGH-IN-MOTION

Date	Axles	Avg GVW	Total
No Data			

PER VEHICLE

Date	Axles	85th	Total
No Data			

GAP

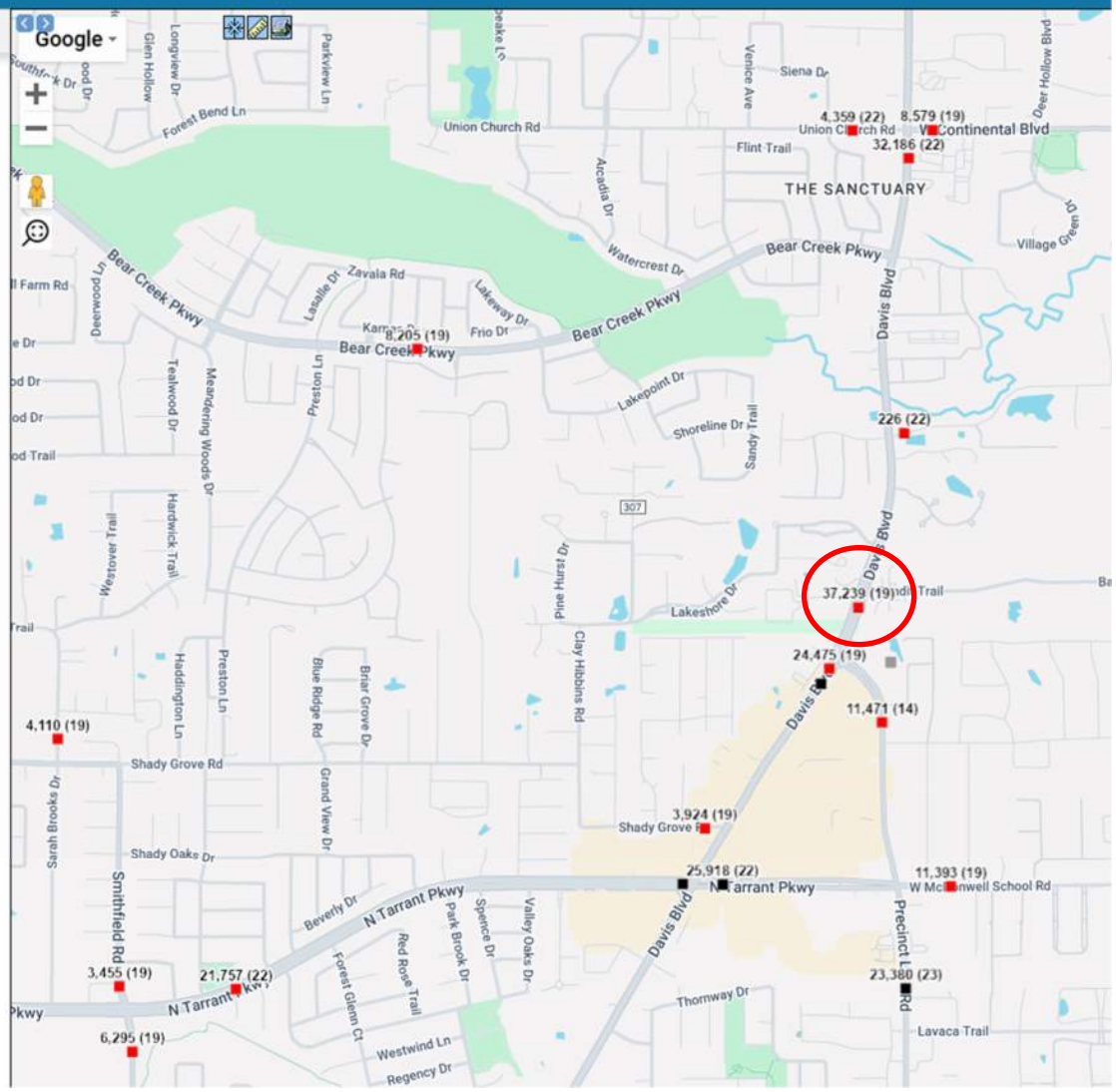
Date	Int	Total
No Data		

PARTIAL COUNT

Date	Int	24-Hr Total

NOTES/FILES

Note	Date



List View | All DIRs | Report Center

Record 1 of 1 Goto Record go

Location ID	220U206	MPO ID	282
Type	SPOT	HPMS ID	UNASSIGNED
SF Group	FORT WORTH FC 3 (2024)	Route Type	
AF Group	HP897 (2024)	Route	
GF Group	FORT WORTH FC - (2015)	Active	Yes
Class Dist Grp		Category	URBAN ACR
Seas Clss Grp	FORT WORTH (2016)		
WIM Group			
QC Group	Volume Group 4		
Fnct'l Class	(3)Principal Arterial-Other		
Located On	-		
Loc On Alias			
More Detail			

STATION DATA

Directions: 2-WAY NB SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2022	32,186[3]						PBV
2019	33,154	3,021	9	61	32,763 (99%)	391 (1%)	
2014	36,464	3,286	9	58			
2009	33,860						

Travel Demand Model

Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

Date	Int	Total
Mon 4/22/2019	15	34,486
Tue 4/1/2014	15	37,983

VOLUME TREND

Year	Annual Growth
2024	6%
2022	-1%
2019	-2%
2014	1%

SPEED

Date	Int	Pace	85th	Total
No Data				

CLASSIFICATION

Date	Int	Total
No Data		

WEIGH-IN-MOTION

Date	Axles	Avg GVW	Total
No Data			

PER VEHICLE

Date	Axles	85th	Total
No Data			

GAP

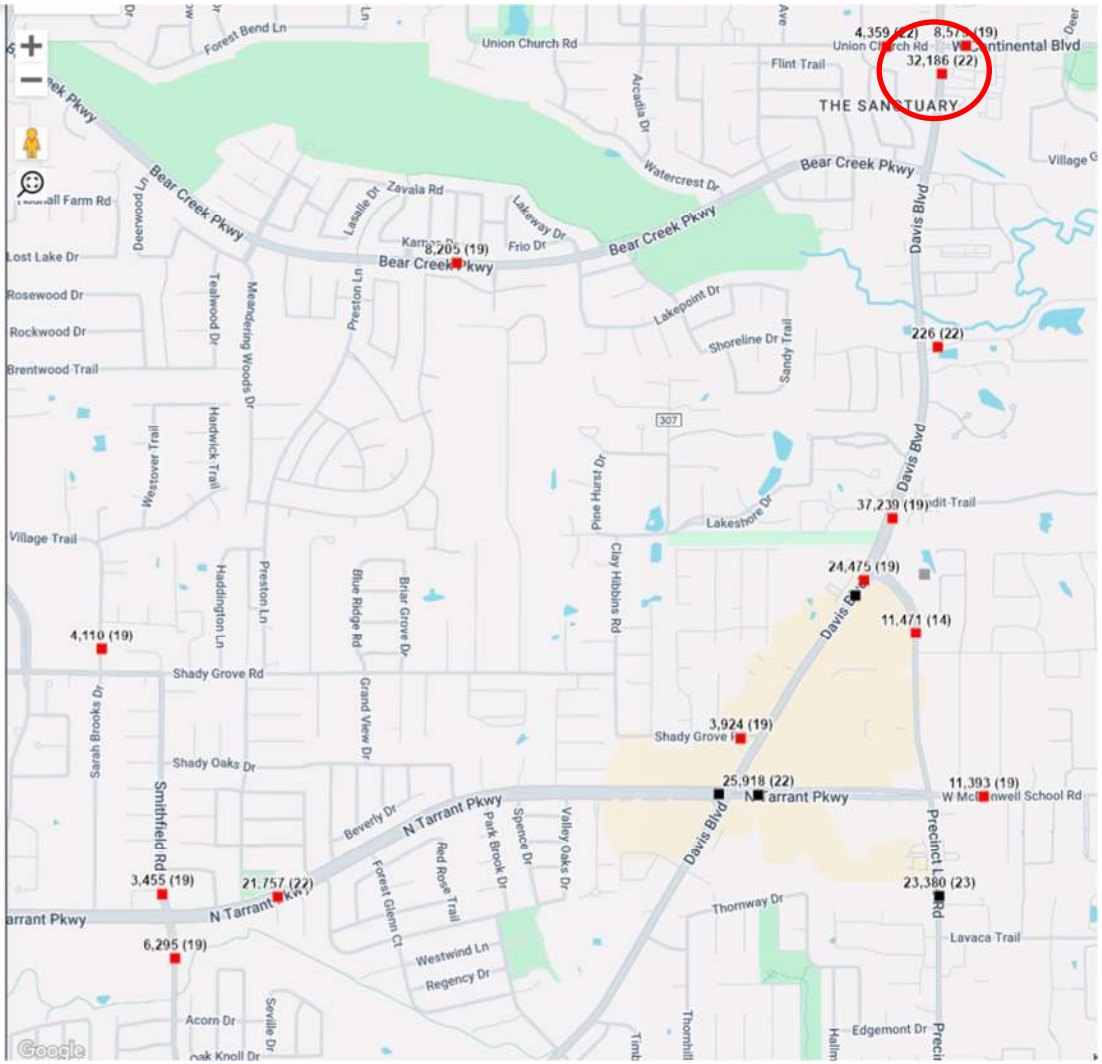
Date	Int	Total
No Data		

PARTIAL COUNT

Date	Int	24-Hr Total

NOTES/FILES

Note	Date



Appendix C
Capacity Analysis – 2024 Existing Conditions

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	10	6	0	9	6	1788	3	5	992	5
Future Vol, veh/h	6	1	10	6	0	9	6	1788	3	5	992	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	25	83	50	92	75	75	94	75	42	86	42
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	16	4	12	12	0	12	8	1902	4	12	1153	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1960	3105	583	2407	3109	953	1165	0	0	1906	0	0
Stage 1	1183	1183	-	1920	1920	-	-	-	-	-	-	-
Stage 2	777	1922	-	487	1189	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	69	12	394	36	12	226	331	-	-	143	-	-
Stage 1	151	265	-	45	116	-	-	-	-	-	-	-
Stage 2	327	116	-	489	264	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	58	11	394	30	10	226	331	-	-	143	-	-
Mov Cap-2 Maneuver	107	69	-	40	74	-	-	-	-	-	-	-
Stage 1	138	243	-	44	113	-	-	-	-	-	-	-
Stage 2	302	113	-	428	242	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	37.56	85.27	0.07	0.33
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	331	-	-	97	394	67	143	-	-
HCM Lane V/C Ratio	0.024	-	-	0.205	0.031	0.356	0.083	-	-
HCM Ctrl Dly (s/v)	16.1	-	-	51.7	14.4	85.3	32.5	-	-
HCM Lane LOS	C	-	-	F	B	F	D	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.1	1.3	0.3	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	10	1787	4	4	1015
Future Vol, veh/h	7	10	1787	4	4	1015
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	35	63	94	100	38	84
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	20	16	1901	4	11	1208

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2407	953	0	0	1905	0
Stage 1	1903	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	5.7	7.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	3.9	-	-	3.1	-
Pot Cap-1 Maneuver	58	226	-	-	143	-
Stage 1	67	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	54	226	-	-	143	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	67	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	60.37	0	0.28
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	61	226	143	-
HCM Lane V/C Ratio	-	-	0.329	0.07	0.074	-
HCM Ctrl Dly (s/v)	-	-	90.7	22.1	32.2	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	1.2	0.2	0.2	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	2	11	8	2	5	11	1598	9	4	1998	8
Future Vol, veh/h	10	2	11	8	2	5	11	1598	9	4	1998	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	55	67	50	63	56	98	45	33	96	67
Heavy Vehicles, %	0	0	0	0	0	20	0	1	11	0	1	0
Mvmt Flow	20	4	20	12	4	8	20	1631	20	12	2081	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2805	3801	1047	2539	3797	825	2093	0	0	1651	0	0
Stage 1	2111	2111	-	1680	1680	-	-	-	-	-	-	-
Stage 2	694	1690	-	859	2117	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.5	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	4.1	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	20	4	196	30	4	243	115	-	-	192	-	-
Stage 1	33	93	-	67	153	-	-	-	-	-	-	-
Stage 2	368	151	-	291	92	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 14	~ 3	196	19	~ 3	243	115	-	-	192	-	-
Mov Cap-2 Maneuver	27	46	-	46	41	-	-	-	-	-	-	-
Stage 1	31	87	-	56	127	-	-	-	-	-	-	-
Stage 2	285	125	-	234	86	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	179.5	97.94	0.5	0.14
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	115	-	-	29	196	61	192	-	-
HCM Lane V/C Ratio	0.171	-	-	0.826	0.102	0.392	0.063	-	-
HCM Ctrl Dly (s/v)	42.6	-	-	$ 307.9	25.5	97.9	25.1	-	-
HCM Lane LOS	E	-	-	F	D	F	D	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.7	0.3	1.5	0.2	-	-

Notes

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

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	1604	5	2	2018
Future Vol, veh/h	2	2	1604	5	2	2018
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	97	63	50	96
Heavy Vehicles, %	0	50	1	20	0	1
Mvmt Flow	4	4	1654	8	4	2102

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2506	831	0	0	1662	0
Stage 1	1658	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Critical Hdwy	5.7	8.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	4.4	-	-	3.1	-
Pot Cap-1 Maneuver	51	201	-	-	189	-
Stage 1	96	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	50	201	-	-	189	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	96	-	-	-	-	-
Stage 2	341	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	37.23	0	0.05
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	82	201	189	-
HCM Lane V/C Ratio	-	-	0.049	0.02	0.021	-
HCM Ctrl Dly (s/v)	-	-	51.2	23.3	24.4	-
HCM Lane LOS	-	-	F	C	C	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

Appendix D
Capacity Analysis – 2027 Background Conditions

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	11	6	0	10	6	1909	3	5	1059	5
Future Vol, veh/h	6	1	11	6	0	10	6	1909	3	5	1059	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	25	83	50	92	75	75	94	75	42	86	42
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	16	4	13	12	0	13	8	2031	4	12	1231	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2089	3312	622	2567	3316	1017	1243	0	0	2035	0	0
Stage 1	1261	1261	-	2049	2049	-	-	-	-	-	-	-
Stage 2	828	2051	-	518	1267	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	57	9	372	29	9	205	303	-	-	123	-	-
Stage 1	133	244	-	36	100	-	-	-	-	-	-	-
Stage 2	304	100	-	469	242	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	47	8	372	23	8	205	303	-	-	123	-	-
Mov Cap-2 Maneuver	93	59	-	32	64	-	-	-	-	-	-	-
Stage 1	120	220	-	35	97	-	-	-	-	-	-	-
Stage 2	277	97	-	401	219	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	42.79	110.04	0.07	0.35
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	303	-	-	83	372	57	123	-	-
HCM Lane V/C Ratio	0.026	-	-	0.238	0.036	0.441	0.097	-	-
HCM Ctrl Dly (s/v)	17.2	-	-	61.4	15	110	37.4	-	-
HCM Lane LOS	C	-	-	F	C	F	E	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.1	1.7	0.3	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	11	1908	4	4	1083
Future Vol, veh/h	7	11	1908	4	4	1083
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	35	63	94	100	38	84
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	20	17	2030	4	11	1289

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2569	1017	0	0	2034	0
Stage 1	2032	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Critical Hdwy	5.7	7.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	3.9	-	-	3.1	-
Pot Cap-1 Maneuver	47	205	-	-	123	-
Stage 1	55	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	43	205	-	-	123	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	55	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	74.01	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	50	205	123	-
HCM Lane V/C Ratio	-	-	0.397	0.085	0.085	-
HCM Ctrl Dly (s/v)	-	-	117.5	24.2	36.9	-
HCM Lane LOS	-	-	F	C	E	-
HCM 95th %tile Q(veh)	-	-	1.4	0.3	0.3	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	2	12	9	2	5	12	1706	10	4	2133	9
Future Vol, veh/h	11	2	12	9	2	5	12	1706	10	4	2133	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	55	67	50	63	56	98	45	33	96	67
Heavy Vehicles, %	0	0	0	0	0	20	0	1	11	0	1	0
Mvmt Flow	22	4	22	13	4	8	21	1741	22	12	2222	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2994	4059	1118	2710	4054	882	2235	0	0	1763	0	0
Stage 1	2253	2253	-	1795	1795	-	-	-	-	-	-	-
Stage 2	741	1806	-	915	2260	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.5	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	4.1	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	~ 15	~ 3	176	23	~ 3	222	97	-	-	168	-	-
Stage 1	26	79	-	55	134	-	-	-	-	-	-	-
Stage 2	344	132	-	269	78	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 10	~ 2	176	14	~ 2	222	97	-	-	168	-	-
Mov Cap-2 Maneuver	~ 21	38	-	36	32	-	-	-	-	-	-	-
Stage 1	24	73	-	43	104	-	-	-	-	-	-	-
Stage 2	249	103	-	207	72	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	277.96	148.98	0.63	0.15
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	97	-	-	23	176	47	168	-	-
HCM Lane V/C Ratio	0.22	-	-	1.151	0.124	0.539	0.072	-	-
HCM Ctrl Dly (s/v)	52.1	-	-	$ 487.4	28.4	149	28	-	-
HCM Lane LOS	F	-	-	F	D	F	D	-	-
HCM 95th %tile Q(veh)	0.8	-	-	3.3	0.4	2	0.2	-	-

Notes

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

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	1712	5	2	2154
Future Vol, veh/h	2	2	1712	5	2	2154
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	97	63	50	96
Heavy Vehicles, %	0	50	1	20	0	1
Mvmt Flow	4	4	1765	8	4	2244

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2674	886	0	0	1773	0
Stage 1	1769	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Critical Hdwy	5.7	8.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	4.4	-	-	3.1	-
Pot Cap-1 Maneuver	41	182	-	-	167	-
Stage 1	82	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	182	-	-	167	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	82	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	42.5	0	0.05
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	70	182	167	-
HCM Lane V/C Ratio	-	-	0.057	0.022	0.024	-
HCM Ctrl Dly (s/v)	-	-	59.8	25.2	27.1	-
HCM Lane LOS	-	-	F	D	D	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

Appendix E
Capacity Analysis – 2027 Projected Conditions

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	11	6	0	10	6	1926	3	5	1065	5
Future Vol, veh/h	6	1	11	6	0	10	6	1926	3	5	1065	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	25	83	50	92	75	75	94	75	42	86	42
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	16	4	13	12	0	13	8	2049	4	12	1238	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2104	3337	625	2588	3341	1026	1250	0	0	2053	0	0
Stage 1	1268	1268	-	2067	2067	-	-	-	-	-	-	-
Stage 2	836	2069	-	521	1274	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.1	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	3.9	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	56	8	370	28	8	202	301	-	-	121	-	-
Stage 1	131	242	-	35	98	-	-	-	-	-	-	-
Stage 2	301	97	-	467	240	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	46	7	370	22	7	202	301	-	-	121	-	-
Mov Cap-2 Maneuver	91	57	-	31	62	-	-	-	-	-	-	-
Stage 1	118	218	-	34	95	-	-	-	-	-	-	-
Stage 2	274	95	-	398	216	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	43.56	114.69	0.07	0.36
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	301	-	-	82	370	56	121	-	-
HCM Lane V/C Ratio	0.027	-	-	0.242	0.036	0.454	0.099	-	-
HCM Ctrl Dly (s/v)	17.3	-	-	62.6	15.1	114.7	38.1	-	-
HCM Lane LOS	C	-	-	F	C	F	E	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.1	1.7	0.3	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	17	1918	5	6	1076
Future Vol, veh/h	14	17	1918	5	6	1076
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	18	2085	5	7	1170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2568	1045	0	0	2090	0
Stage 1	2088	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	46	194	-	-	112	-
Stage 1	50	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	43	194	-	-	112	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	50	-	-	-	-	-
Stage 2	506	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	68.19	0	0.22
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	45	194	112	-
HCM Lane V/C Ratio	-	-	0.335	0.095	0.058	-
HCM Ctrl Dly (s/v)	-	-	120	25.6	39	-
HCM Lane LOS	-	-	F	D	E	-
HCM 95th %tile Q(veh)	-	-	1.2	0.3	0.2	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	11	1913	4	4	1097
Future Vol, veh/h	7	11	1913	4	4	1097
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	35	63	94	100	38	84
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	20	17	2035	4	11	1306

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2581	1020	0	0	2039	0
Stage 1	2037	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Critical Hdwy	5.7	7.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	3.9	-	-	3.1	-
Pot Cap-1 Maneuver	46	204	-	-	122	-
Stage 1	55	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %	1	1	-	-		-
Mov Cap-1 Maneuver	42	204	-	-	122	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	55	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	74.78	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	50	204	122	-
HCM Lane V/C Ratio	-	-	0.401	0.086	0.086	-
HCM Ctrl Dly (s/v)	-	-	118.9	24.3	37.1	-
HCM Lane LOS	-	-	F	C	E	-
HCM 95th %tile Q(veh)	-	-	1.4	0.3	0.3	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	2	12	9	2	5	12	1716	10	4	2151	9
Future Vol, veh/h	11	2	12	9	2	5	12	1716	10	4	2151	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	55	67	50	63	56	98	45	33	96	67
Heavy Vehicles, %	0	0	0	0	0	20	0	1	11	0	1	0
Mvmt Flow	22	4	22	13	4	8	21	1751	22	12	2241	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3017	4088	1127	2727	4083	887	2254	0	0	1773	0	0
Stage 1	2272	2272	-	1805	1805	-	-	-	-	-	-	-
Stage 2	745	1816	-	922	2278	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	7.1	6.4	6.5	7.5	5.3	-	-	5.3	-	-
Critical Hdwy Stg 1	7.3	5.5	-	7.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.7	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4	3.9	3.8	4	4.1	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	~ 15	~ 3	173	23	~ 3	220	95	-	-	166	-	-
Stage 1	25	77	-	55	132	-	-	-	-	-	-	-
Stage 2	342	131	-	266	76	-	-	-	-	-	-	-
Platoon blocked, %	1							-	-		-	-
Mov Cap-1 Maneuver	~ 9	~ 2	173	~ 13	~ 2	220	95	-	-	166	-	-
Mov Cap-2 Maneuver	~ 20	37	-	35	31	-	-	-	-	-	-	-
Stage 1	23	71	-	42	103	-	-	-	-	-	-	-
Stage 2	245	101	-	204	71	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	290.99	154.66	0.64	0.15
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	95	-	-	22	173	46	166	-	-
HCM Lane V/C Ratio	0.225	-	-	1.188	0.126	0.552	0.073	-	-
HCM Ctrl Dly (s/v)	53.4	-	-	$ 511	28.8	154.7	28.3	-	-
HCM Lane LOS	F	-	-	F	D	F	D	-	-
HCM 95th %tile Q(veh)	0.8	-	-	3.4	0.4	2.1	0.2	-	-

Notes

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

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	10	1714	15	18	2153
Future Vol, veh/h	9	10	1714	15	18	2153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	11	1863	16	20	2340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2846	940	0	0	1879	0
Stage 1	1871	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	32	228	-	-	144	-
Stage 1	69	-	-	-	-	-
Stage 2	295	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	28	228	-	-	144	-
Mov Cap-2 Maneuver	57	-	-	-	-	-
Stage 1	69	-	-	-	-	-
Stage 2	255	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	49.65	0	0.28
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	57	228	144	-
HCM Lane V/C Ratio	-	-	0.172	0.048	0.136	-
HCM Ctrl Dly (s/v)	-	-	80.8	21.6	33.9	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	0.5	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	1727	5	2	2163
Future Vol, veh/h	2	2	1727	5	2	2163
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	97	63	50	96
Heavy Vehicles, %	0	50	1	20	0	1
Mvmt Flow	4	4	1780	8	4	2253

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2694	894	0	0	1788	0
Stage 1	1784	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Critical Hdwy	5.7	8.1	-	-	5.3	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.8	4.4	-	-	3.1	-
Pot Cap-1 Maneuver	40	180	-	-	164	-
Stage 1	80	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	39	180	-	-	164	-
Mov Cap-2 Maneuver	68	-	-	-	-	-
Stage 1	80	-	-	-	-	-
Stage 2	316	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	43.28	0	0.05
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	68	180	164	-
HCM Lane V/C Ratio	-	-	0.059	0.022	0.024	-
HCM Ctrl Dly (s/v)	-	-	61.1	25.5	27.6	-
HCM Lane LOS	-	-	F	D	D	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.1	-

Appendix F
Trip Generation Reports

PROJECT DETAILS

Project Name:	Armstrong Hills	Type of Project:	
Project No:		City:	
Country:		Built-up Area(Sq.ft):	
Analyst Name:	Colby Wright	Clients Name:	
Date:	11/6/2024	ZIP/Postal Code:	
State/Province:		No. of Scenarios:	3
Analysis Region:			

SCENARIO SUMMARY

Scenarios	Name	No. of Land Uses	Phases of Development	No. of Years to Project Traffic	User Group	Estimated New Vehicle Trips		
						Entry	Exit	Total
Scenario - 1	AM Peak Hour	1	1	0		10	30	40
Scenario - 2	PM Peak Hour	1	1	0		33	19	52
Scenario - 3	Weekday	1	1	0		267	267	534

Scenario - 1

Scenario Name: AM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project Traffic : 0

Analyst Note:

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	10	30	40
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	25%	75%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	25	75

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	10	30	0	0	10	30
	40		0		40	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	10	30	40

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	10	30	40
External Vehicle Trips	10	30	40
New Vehicle Trips	10	30	40

Scenario - 2

Scenario Name: PM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project Traffic : 0

Analyst Note:

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	33	19	52
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	63	37

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	33	19	0	0	33	19
	52		0		52	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	33	19	52

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	33	19	52
External Vehicle Trips	33	19	52
New Vehicle Trips	33	19	52

Scenario - 3

Scenario Name: Weekday

User Group:

Dev. phase: 1

No. of Years to Project Traffic : 0

Analyst Note:

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday	Best Fit (LOG)	267	267	534
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	50	50

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	267	267	0	0	267	267
	534		0		534	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	267	267	534

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	267	267	534
External Vehicle Trips	267	267	534
New Vehicle Trips	267	267	534

Appendix G
FM 1938 Raised Median Project Fact Sheet and Schematic

FM 1938 (Davis Boulevard) Raised Median Project

Project Overview

The Texas Department of Transportation (TxDOT) is proposing improvements to FM 1938 (Davis Boulevard) from FM 1709 (Southlake Boulevard) to Emerald Hills Way in Tarrant County, Texas. The proposed project would convert the two-way left turn lane into a 14-foot-wide raised median.

At intersections with median breaks, the median would be reduced to three-foot-wide, and an 11-foot-wide left turn lane would be provided. Lane configuration would not change and would still provide three 11.5-foot-wide travel lanes in each direction. The purpose of the proposed project is to improve safety, connectivity, and mobility by accommodating traffic growth and controlling turning movements to reduce crashes.

Project Goals

Need

- High crash rates due to uncontrolled turning movements
- Increasing traffic volumes
- Increased congestion

How to Submit Comments

You may submit comments in any language in the following ways:

- Place the comment card in the comment box at the in-person meeting.
- Send your comment via U.S. Mail postmarked by Monday, December 2, 2024.

  TxDOT For Worth District Office
  Attn: Mohammad Faysal, P.E.
  2501 SW Loop 820
  Fort Worth, Texas 76133

- Send your comment via email to:
  md.faysal@txdot.gov

All comments must be received or postmarked by **Monday, December 2, 2024,** to be a part of the official public meeting record.

Anticipated Project Timeline*

September 2024	Fall 2024	November 2024	Fall 2025	Early 2026
•Stakeholder meeting	•Refine preliminary design based on stakeholder input	•Public meeting	•Finalize design and environmental documentation based on public input	•Begin construction

***This timeline is approximate and subject to change.**

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

Texas Department of Transportation

FORT WORTH DISTRICT

DAVID M. SALAZAR JR., P.E. - DISTRICT ENGINEER

PUBLIC MEETING EXHIBIT

FM 1938 (DAVIS BLVD)
TARRANT COUNTY

FROM FM 1709 (SOUTHLAKE BLVD) TO STARNES RD

CSJ: 1976-01-058

PROJECT LENGTH = 3.977 MILES

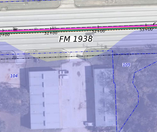
DESIGN SPEED: 45 MPH & 50 MPH

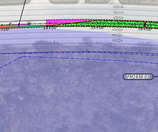
AADT 2024: 23,729

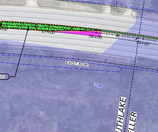
AADT 2041: 34,131

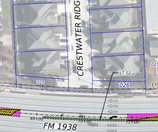
HIGHWAY CLASSIFICATION

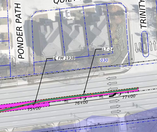
URBAN PRINCIPAL ARTERIAL

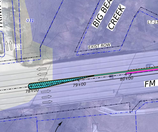


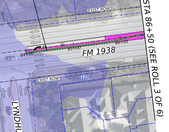


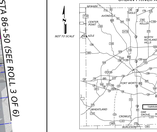












Texas Department of Transportation

FORT WORTH DISTRICT

DAVID M. SALAZAR JR., P.E. - DISTRICT ENGINEER

PUBLIC MEETING EXHIBIT

FM 1938 (DAVIS BLVD)
TARRANT COUNTY

FROM FM 1709 (SOUTHLAKE BLVD) TO STARNES RD

CSJ: 1976-01-058

PROJECT LENGTH = 3.977 MILES

DESIGN SPEED: 45 MPH & 50 MPH

AADT 2024: 23,729

AADT 2041: 34,131

HIGHWAY CLASSIFICATION

URBAN PRINCIPAL ARTERIAL

TARRANT COUNTY, TEXAS

PRELIMINARY INTERIM REVIEW ONLY

THESE DOCUMENTS ARE PRELIMINARY AND ARE NOT INTENDED FOR REGULATION APPROVAL, PERMIT, BIDDING OR CONSTRUCTION PURPOSES AT THIS TIME

THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:

NAME(S) DESIGNATION DATE SIGNATURE

PLAN SUBMITTED

PLAN REVISED

TXDOT FORT WORTH DISTRICT

0 50 100

SCALE: 1" = 50'

ROLL 2 OF 6

HNTB Corporation

The HNTB Companies

817 735-7300 TBPE Firm No. F-2018

Texas Department of Transportation

Fort Worth District

Texas Department of Transportation

FORT WORTH DISTRICT

DAVID M. SALAZAR JR., P.E. - DISTRICT ENGINEER

PUBLIC MEETING EXHIBIT

FM 1938 (DAVIS BLVD)
TARRANT COUNTY

FROM FM 1709 (SOUTHLAKE BLVD) TO STARNES RD

CSJ: 1976-01-058

PROJECT LENGTH = 3.977 MILES

DESIGN SPEED: 45 MPH & 50 MPH

AADT 2024: 23,729

AADT 2041: 34,231

HIGHWAY CLASSIFICATION:
URBAN PRINCIPAL ARTERIAL

PRELIMINARY INTERIM REVIEW ONLY
THESE PLANS ARE PRELIMINARY AND ARE NOT INTENDED FOR REVOLUTION APPROVAL, RIGHT-WAYING OR CONSTRUCTION PURPOSES

THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:
NAME(S) - CORPORATION - DATE - SIGNATURE

PUBLIC INFORMATION
PUBLIC SUBMITTAL
PUBLIC REVISED

0 100 200
SCALE: 1" = 100'

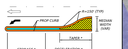
SHEET 1 OF 5

HNTB Corporation
THE NEW CORPORATION
817 884 2474 - 801 Cherry St., Suite 2300, Fort Worth, TX 76102

Texas Department of Transportation

LEGEND

- PROP TRAFFIC FLOW
- EXIST TRAFFIC FLOW
- FLOW DIRECTION
- PROP 100 YR FLOODPLAIN
- PROP CONCRETE PAVEMENT
- PROP CONCRETE CURB TYPE D
- PROP CONCRETE MEDIAN
- PROP LANDSCAPE MEDIAN
- PROP COLORED TEXTURED PAVEMENT
- EXIST CENTERLINE
- PROP BASELINE
- PROP RW
- EXIST PROPERTY LINE
- CURVE NUMBER
- EXIST TRAFFIC SIGNAL

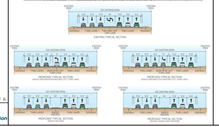


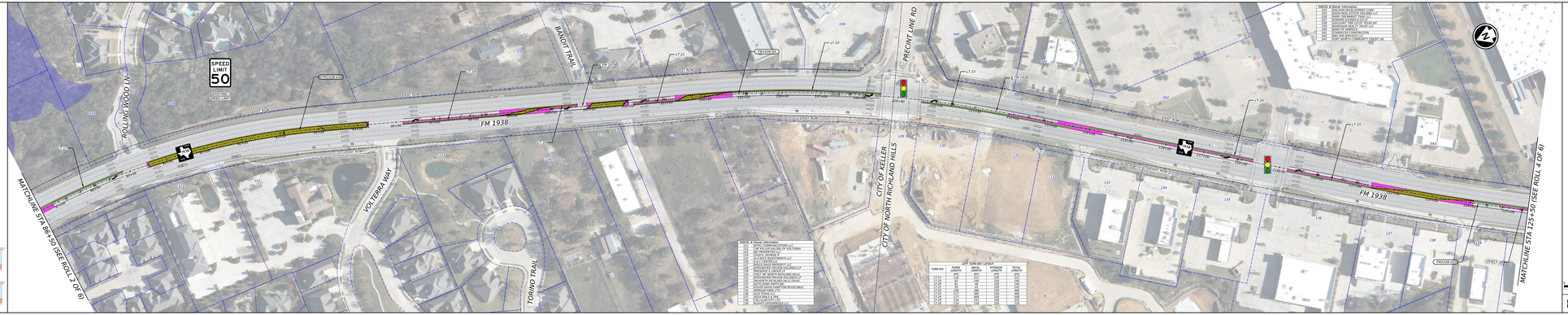
* VALUES ARE BASED ON AVERAGE SPEED AND ARE SHOWN ON PLAN VIEW. SEE TABLE 2-4 FOR LEFT TURN BAY LATOUTS, TABLE 2-5 AND TABLE 2-6 IN THE TxDOT RDM (DEC 2022) FOR MORE INFORMATION.

NOTES:

1. AERIAL IMAGERY, EXISTING ROW INFORMATION, AND PROPERTY LINES SHOWN ARE APPROXIMATE AND FOR REFERENCE PURPOSES ONLY.
2. ALL DIMENSIONS ARE BASED ON GRID BASED SURVEYING.
3. LIMITS OF MEDIAN CONSTRUCTION AND PROPOSED WORK SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE.
4. TYPICAL SECTIONS NOT TO SCALE. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

CURVE DATA								
CURVE NO.	STATION	NORTHING (Y)	EASTING (X)	BEARING / DELTA	LENGTH (L)	TANGENT (T)	RADIUS (R)
FM 1938 (1)	PC 1+11.01	7012908.7124	2121375.3443	S00°09'37.0"E			
	PT 15+61.01	7012546.4483	2121359.4000	S00°09'37.0"E	1450.00	726.49	2864.79
	PT 15+61.01	7012546.4483	2121359.4000	S00°09'37.0"E			
FM 1938 (2)	PC 15+61.01	7012546.4483	2121359.4000	S00°09'37.0"E			
	PT 20+06.76	7012546.2706	2121178.5996	S00°09'37.0"E	445.76	447.52	2864.79
	PT 20+06.76	7012546.2706	2121178.5996	S00°09'37.0"E			
FM 1938 (3)	PC 20+06.76	7012546.2706	2121178.5996	S00°09'37.0"E			
	PT 23+61.01	7012546.0932	2121003.0932	S00°09'37.0"E	354.24	355.18	2000.00
	PT 23+61.01	7012546.0932	2121003.0932	S00°09'37.0"E			
FM 1938 (4)	PC 23+61.01	7012546.0932	2121003.0932	S00°09'37.0"E			
	PT 31+43.44	7012545.4457	2120328.9570	S00°09'37.0"E	782.43	403.76	2864.79
	PT 31+43.44	7012545.4457	2120328.9570	S00°09'37.0"E			
FM 1938 (5)	PC 31+43.44	7012545.4457	2120328.9570	S00°09'37.0"E			
	PT 37+58.44	7012545.3104	2120066.1045	S00°09'37.0"E	644.87	323.28	3729.58
	PT 37+58.44	7012545.3104	2120066.1045	S00°09'37.0"E			
FM 1938 (6)	PC 37+58.44	7012545.3104	2120066.1045	S00°09'37.0"E			
	PT 42+91.44	7012545.2017	2119839.0925	S00°09'37.0"E	633.15	316.82	2000.00
	PT 42+91.44	7012545.2017	2119839.0925	S00°09'37.0"E			
FM 1938 (7)	PC 42+91.44	7012545.2017	2119839.0925	S00°09'37.0"E			
	PT 50+74.19	7012545.0698	2119504.5000	S00°09'37.0"E	1682.67	842.34	2000.00
	PT 50+74.19	7012545.0698	2119504.5000	S00°09'37.0"E			





MATCH LINE DATA	
1	MATCHLINE STA 88+50
2	CITY OF NORTH RICHLAND HILLS
3	CITY OF KELLER
4	CITY OF NORTH RICHLAND HILLS
5	DONAHOO STREET & 1ST ST
6	DONAHOO STREET & 1ST ST
7	DONAHOO STREET & 1ST ST
8	BANK OF AMERICA
9	BANK OF AMERICA
10	BANK OF AMERICA
11	FORT WORTH TRANSIT CENTER
12	FORT WORTH TRANSIT CENTER
13	MATCHLINE STA 124+50

MATCH LINE DATA	
1	MATCHLINE STA 88+50
2	CITY OF NORTH RICHLAND HILLS
3	CITY OF KELLER
4	CITY OF NORTH RICHLAND HILLS
5	DONAHOO STREET & 1ST ST
6	DONAHOO STREET & 1ST ST
7	DONAHOO STREET & 1ST ST
8	BANK OF AMERICA
9	BANK OF AMERICA
10	BANK OF AMERICA
11	FORT WORTH TRANSIT CENTER
12	FORT WORTH TRANSIT CENTER
13	MATCHLINE STA 124+50

LEFT TURN BAY LENGTH				
TURN NO.	TAPER LENGTH	DECEL. LENGTH	STORAGE LENGTH	TOTAL LENGTH
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0

Texas Department of Transportation

FORT WORTH DISTRICT

DAVID M. SALAZAR JR., P.E. - DISTRICT ENGINEER

PUBLIC MEETING EXHIBIT

FM 1938 (DAVIS BLVD)
TARRANT COUNTY

FROM FM 1709 (SOUTHLAKE BLVD) TO STARNES RD

CSJ: 1976-01-058

PROJECT LENGTH = 3.977 MILES

DESIGN SPEED: 45 MPH & 50 MPH

AADT 2024: 23,729

AADT 2041: 34,231

HIGHWAY CLASSIFICATION:
URBAN PRINCIPAL ARTERIAL

PRELIMINARY INTERIM REVIEW ONLY
THESE PLANS ARE PRELIMINARY AND ARE NOT INTENDED FOR REVOLUTION APPROVAL, RIGHT-WAYING OR CONSTRUCTION PURPOSES

THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:
NAME(S) - CORPORATION - DATE - SIGNATURE

PUBLIC INFORMATION
PUBLIC SUBMITTAL
PUBLIC REVISED

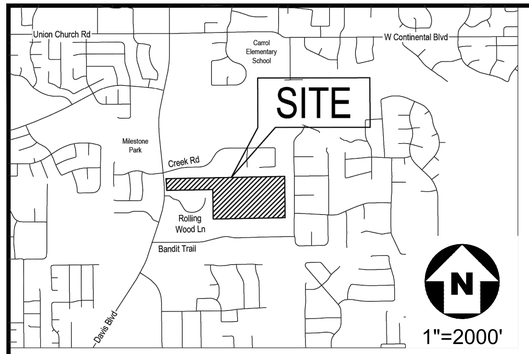
0 100 200
SCALE: 1" = 100'

SHEET 1 OF 5

HNTB Corporation
THE NEW CORPORATION
817 884 2474 - 801 Cherry St., Suite 2300, Fort Worth, TX 76102

Texas Department of Transportation

Appendix H
Driveway Spacing Diagram



Lots 1 Thru 49, & 51X Thru 61X, Block 1
ARMSTRONG HILLS ADDITION
8740 DAVIS BLVD
48.34 ACRES

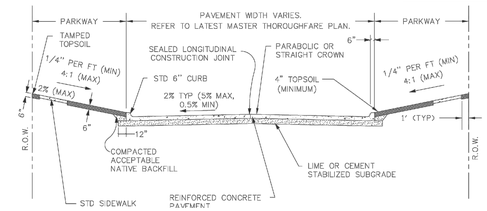
OWNER/DEVELOPER:
Holmes Builders
225 E Hwy 121, Suite 120
Coppell Texas 75019
(817) 504-7416

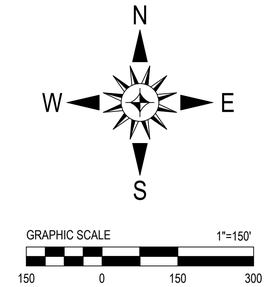
ENGINEER:
Barron-Stark Engineers, LP
6221 Southwest Blvd Ste 100,
Benbrook, TX 76132
(877) 909-6104

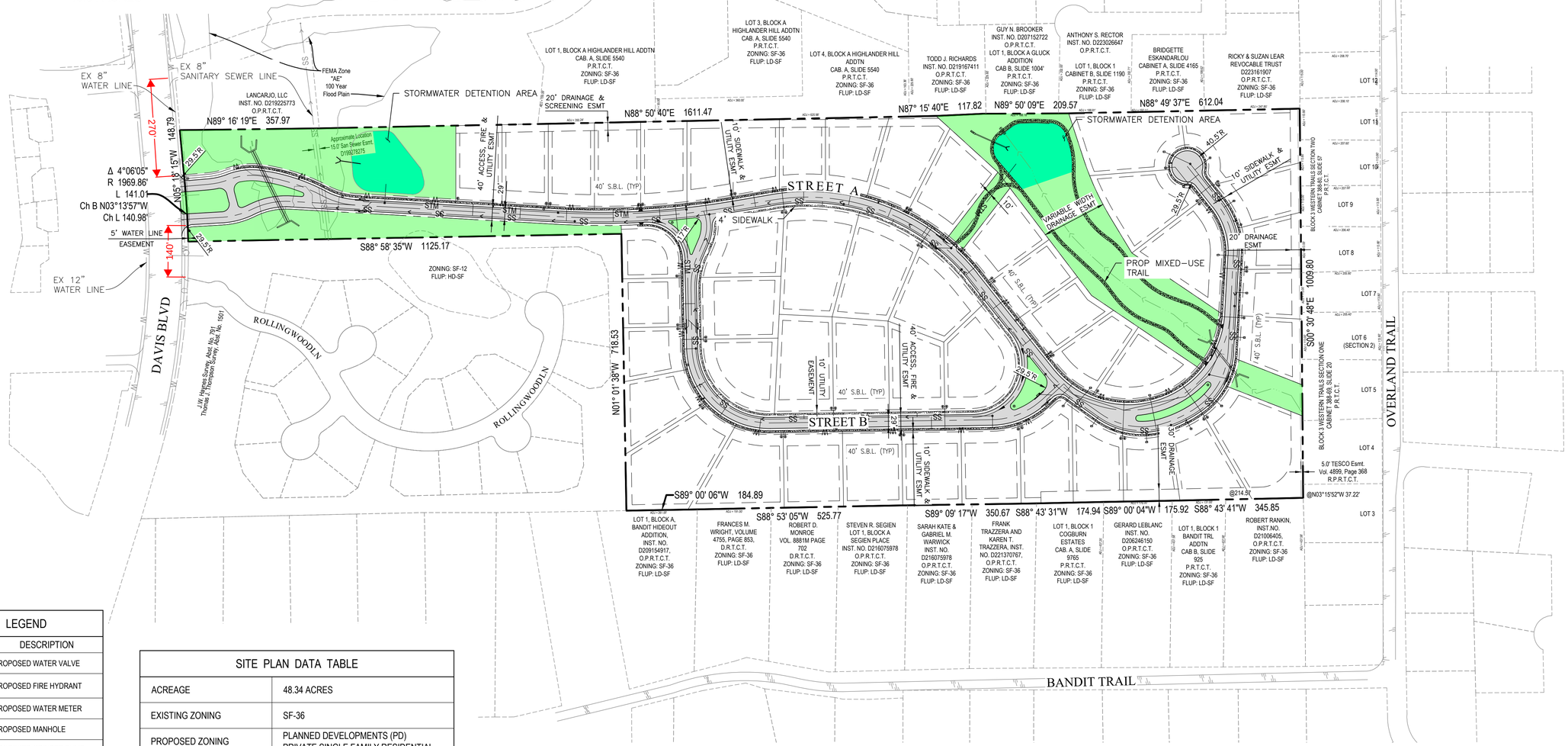
GENERAL NOTES:

1. ALL RADII SHOWN ARE TO THE BACK OF CURB.
2. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS NOTED OTHERWISE ON PLAN.
3. THIS DEVELOPMENT SHALL BE ZONED "PLANNED DEVELOPMENT (PD).
4. TxDOT ACCESS PERMITTING IN PROCESS FOR CONNECTION AT DAVIS BOULEVARD. PERMITTING PLAN SUBMITTED TO TxDOT ON 8/15/24.
5. STREET LIGHT SHALL BE ONCOR STANDARDS AS FOLLOWS:
   - DECORATIVE LUMINAIRE (LED HD 55)
   - STANDARD PILE (SLPA 14AL)
   - STANDARD PEDESTAL (SLFPII)
6. REFERENCE EXISTING CONDITIONS EXHIBIT FOR DETAILED INFORMATION REGARDING EXISTING FACILITIES.
7. PROPOSED 8" SANITARY SEWER LINE & PROPOSED 8" WATER LINE SHALL BE PUBLIC UTILITIES.

**********CAUTION**********
EXISTING UTILITIES AND UNDERGROUND FACILITIES OF THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION AND AS-BUILT PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR ANY DAMAGE TO SAID UTILITIES. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION.







LEGEND

SYMBOL	DESCRIPTION
	PROPOSED WATER VALVE
FH	PROPOSED FIRE HYDRANT
W	PROPOSED WATER METER
	PROPOSED MANHOLE
GP	PROPOSED GRINDER PUMP
	PROPOSED LIGHT POLE
	PROPOSED USEABLE GREENSPACE
	PROPOSED SIDEWALK/TRAIL
	PROPOSED CONCRETE PAVING

SITE PLAN DATA TABLE

ACREAGE	48.34 ACRES
EXISTING ZONING	SF-36
PROPOSED ZONING	PLANNED DEVELOPMENTS (PD) PRIVATE SINGLE FAMILY RESIDENTIAL
PROPOSED STRUCTURES	LARGE CUSTOM-BUILT HOMES
TOTAL PROPOSED HABITABLE LOTS	49
PERCENT IMPERVIOUS	11.12%
USEABLE OPEN SPACE	16.58%

USER: DREW GUTHRIE
PLOTTED ON: 10/9/2024 8:17 AM
FILE NAME: N:\BARRON STARK SWIFT ENG\551 - HOLMES BUILDERS\10387 - ARMSTRONG HILLS, KELLER\00 CAD\00 DWG\551-10387 C2.0 SITE PLAN.DWG

REVISIONS

NO.	DESCRIPTION	DATE

6221 Southwest Boulevard, Suite 100
Fort Worth, Texas 76132
(O) 817.231.8100 (F) 817.231.8144
Texas Registered Engineering Firm F-10998
Texas Registered Survey Firm F-10158800
www.barronstark.com

Barron•Stark Engineers

FOR INTERIM REVIEW ONLY

NOT FOR BIDDING, PERMIT OR CONSTRUCTION PURPOSES, PLANS PREPARED BY CHARLES F. STARK, P.E. REGISTRATION No. 57357,

10-01-2024

CIVIL SITE PLAN
ARMSTRONG HILLS
CITY OF KELLER
TARRANT COUNTY, TEXAS

CLIENT No.	551
PROJECT No.	10387
DESIGN:	DRG
DRAWN:	DRG
CHECKED:	WWS
DATE:	JULY 2024

SHEET
C2.0

Appendix I
Stopping Sight Distance Photos

Northbound Davis Blvd (FM 1938) (425’ south of Street A)

Southbound Davis Blvd (FM 1938) (425’ north of Street A)

Appendix J
Intersection Sight Distance Triangle Diagram and Photos

LEGEND:

- PASSENGER CAR
- SIGHT TRIANGLE
- PROPOSED DRIVEWAY

DAVIS BLVD (FM 1938) AT STREET A
SIGHT DISTANCE TRIANGLES

QUIDDITY

Westbound Right onto Davis Blvd (FM 1938) from Street A

Westbound Left onto Davis Blvd (FM 1938) from Street A