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Freeman Road Logistics Traffic Impact Analysis

Jurisdiction: City of Puyallup

October 2022



KH #090222083

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1. INTRODUCTION

Gibson Traffic Consultants (GTC) has been retained to provide a Traffic Impact Analysis for the Freeman Road Logistics development. The proposed development is located on the east side Freeman Road E, north of 19th Avenue NW in the City of Puyallup. The Freeman Road Logistics development is proposed to consist of two buildings, Building A with 234,218 SF and Building B with 257,105 SF, both of which are anticipated be High-Cube Transload & Short-Term Storage. No tenants have been identified; however, these are the most likely uses given the building types. The site is comprised of fourteen existing residential units. A site vicinity map is included in Figure 1.

Matthew Palmer, responsible for this report, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of ITE.

2. SCOPING AND METHODOLOGY

The scope of the analysis for this report is based on City of Puyallup and guidelines and scoping comments received from City of Puyallup and City of Fife representatives.

2.1 Trip Generation

The trip generation for the Freeman Road Logistics development has been calculated using the Institute of Transportation Engineers (ITE) *Trip Generation, 11th Edition (2021)*. The average trip generation rates for ITE Land Use Codes (LUC) 154, High-Cube Transload Short-Term Storage and LUC 210, Single-Family Detached Housing, were used in the analysis. ITE truck specific rates were also used for the calculations for the truck trip generation.

2.2 Intersection Analysis

Intersections selected for off-site analysis were chosen based on feedback provided by representatives for the City of Puyallup and City of Fife. The year 2024 was selected for the future analysis year based on the anticipated opening and full occupancy year. The following off-site intersections are included in the analysis:

1. Freeman Road E at Valley Avenue E
2. Freeman Road E at 48th Street E
3. Freeman Road E at 22nd Avenue NW
4. Freeman Road E at 50th Street E
5. Freeman Road E at N Levee Road E
6. Freeman Road E at North Site Access

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FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND

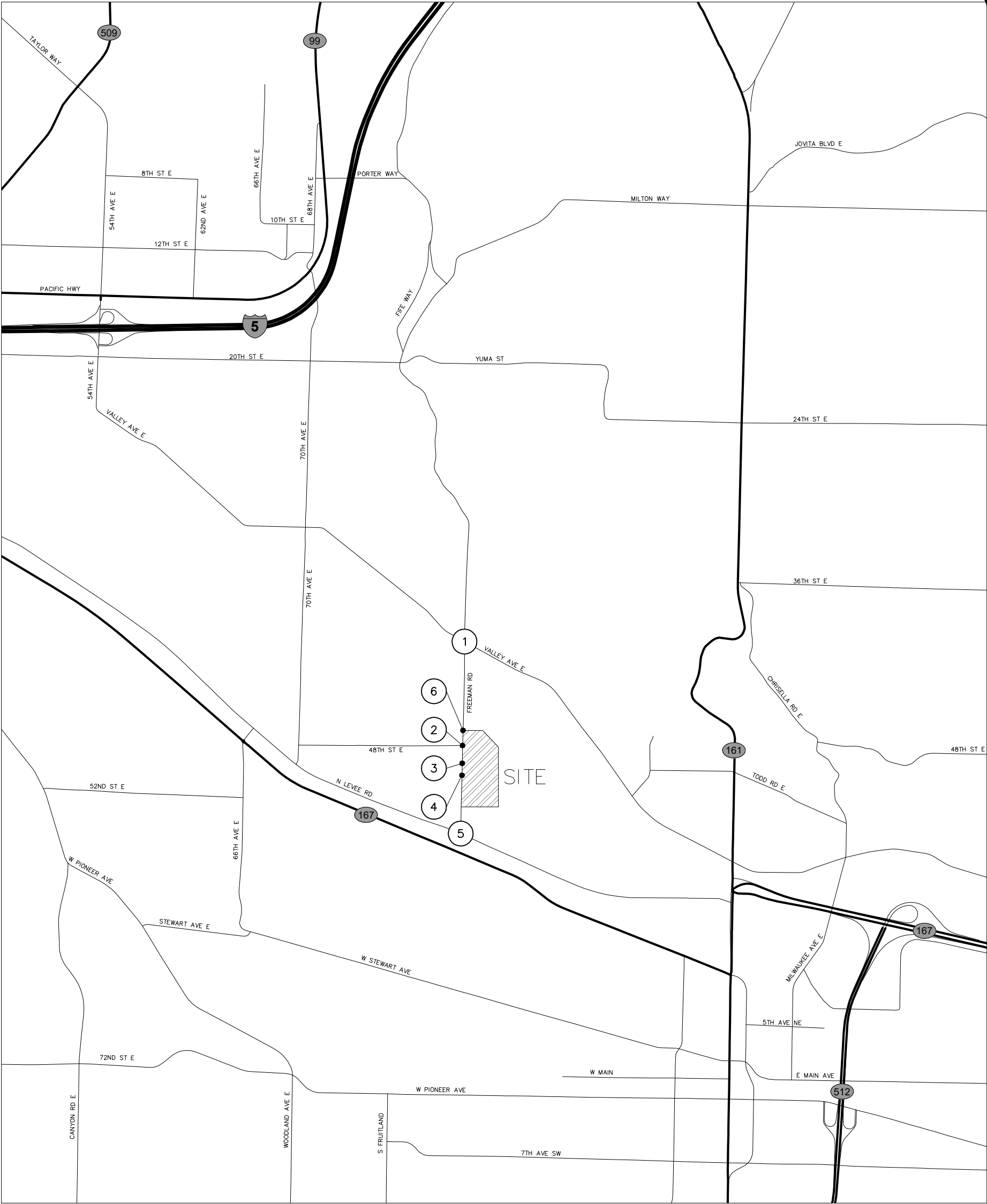


DEVELOPMENT SITE



STUDY INTERSECTION

FIGURE 1
VICINITY MAP



Congestion is generally measured in terms of level of service (LOS). The *Highway Capacity Manual 6th Edition* by the Transportation Research Board rates road facilities and intersections between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. A summary of the level of service criteria is included in Table 1. The level of service at signalized, all-way stop-controlled and roundabout intersections is based on the average delay of all approaches. The level of service for two-way stop-controlled intersections is based on the average delay for the critical stopped approach. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values. The level of service analysis for this report has been performed using the *Synchro 11.1, Build 0* software for signalized and unsignalized intersections.

Table 1: Level of Service Criteria for Intersections

Level of ¹ Service	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	Signalized Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays ²	>50	>80

Freeman Road and the off-site intersections are in City of Fife right-of-way. The City of Fife has a LOS standard of LOS D for intersections, however if an intersection is already forecasted to operate worse than LOS D before development trips are added then a development is allowed to proceed unless it degrades the LOS further with just the development trips. The City of Puyallup has adopted LOS D as the standard for City controlled streets.

¹ **Source:** *Highway Capacity Manual 6th Edition*.

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).

LOS B: Generally stable traffic flow conditions.

LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.

LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).

LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.

LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

² When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

3. SURROUNDING STREET SYSTEM

Freeman Road E is classified as a collector roadway located within the City of Fife with one lane of travel in each direction in the site vicinity. Valley Avenue E is classified as a major arterial roadway within the City of Puyallup and a principal arterial roadway within the City of Fife with two lanes of travel in each direction in the site vicinity. N Levee Road E is classified as a minor arterial roadway within the City of Puyallup and the City of Fife with one lane in each direction in the site vicinity.

4. TRIP GENERATION AND DISTRIBUTION

4.1 Trip Generation

Trip generation calculations for the Freeman Road Logistics development are based on national statistics contained in the Institute of Transportation Engineers' (ITE) *Trip Generation, 11th Edition (2021)*. The average trip generation rates for LUC 154, High-Cube Transload & Short-Term Storage Warehouse and LUC 210, Single-Family Detached Housing, have been used for the trip generation calculations of the development. The Freeman Road Logistics development is proposed to consist of two buildings, Building A with 234,218 SF and Building B with 257,105 SF, both of which are anticipated be High-Cube Transload & Short-Term Storage. There are currently 14 existing residential uses on-site. The Freeman Road Logistics development is anticipated to generate 555 new daily trips, 30 new AM peak-hour trips, and 36 PM peak-hour trips. The trip generation is summarized in Table 2.

Table 2: Total Vehicle Trip Generation Summary

Land Use	Size	Average Daily Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
LUC 154, High-Cube Transload and Short-Term Storage Warehouse	491,323 SF	687.86	30.27	9.04	39.31	13.76	35.37	49.13
LUC 210, Single-Family Detached Housing	-14 units	-132.02	-2.55	-7.25	-9.80	-8.29	-4.87	-13.16
Total		555.84	27.72	1.79	29.51	5.47	30.50	35.97

ITE provides specific trip generation rates for heavy trucks for industrial land uses. The expected truck trip generation rate for the Freeman Road Logistics development is summarized in Table 3. The trip generation calculations—including truck trip generation rates—are included in the attachments.

Table 3: Truck Trip Generation Summary

Land Use	Size	Average Daily Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
LUC 154, High-Cube Transload and Short-Term Storage Warehouse	491,323	108.09	4.81	5.01	9.82	2.31	2.60	4.91

From ITE LUC 154 High-Cube Transload and Short-Term Storage is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

A transload facility has the primary function of consolidation and distribution of pallet loads (or larger) for manufacturers, wholesalers, or retailers. A transload facility typically has little storage duration, high throughput, and its operations are high efficiency. A short-term HCW is a distribution facility often with custom/special features built into the structure for the movement of large volumes of freight with only short-term storage of products. There are over 90 data points for this land use with data points below the 491,323 SF being proposed.

From ITE LUC 155 Fulfillment Center Sort is a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. An example in the attachments shows a 628,000 SF building with 1,005 car parking spaces. In addition, per ITE there are only 2-3 data points for a sorting facility and they all have over 1,000,000 SF of floor area. As a sorting fulfillment center the development would generate over 575 PM peak-hour trips and would have impacted 24 intersections. This information is included in the attachments.

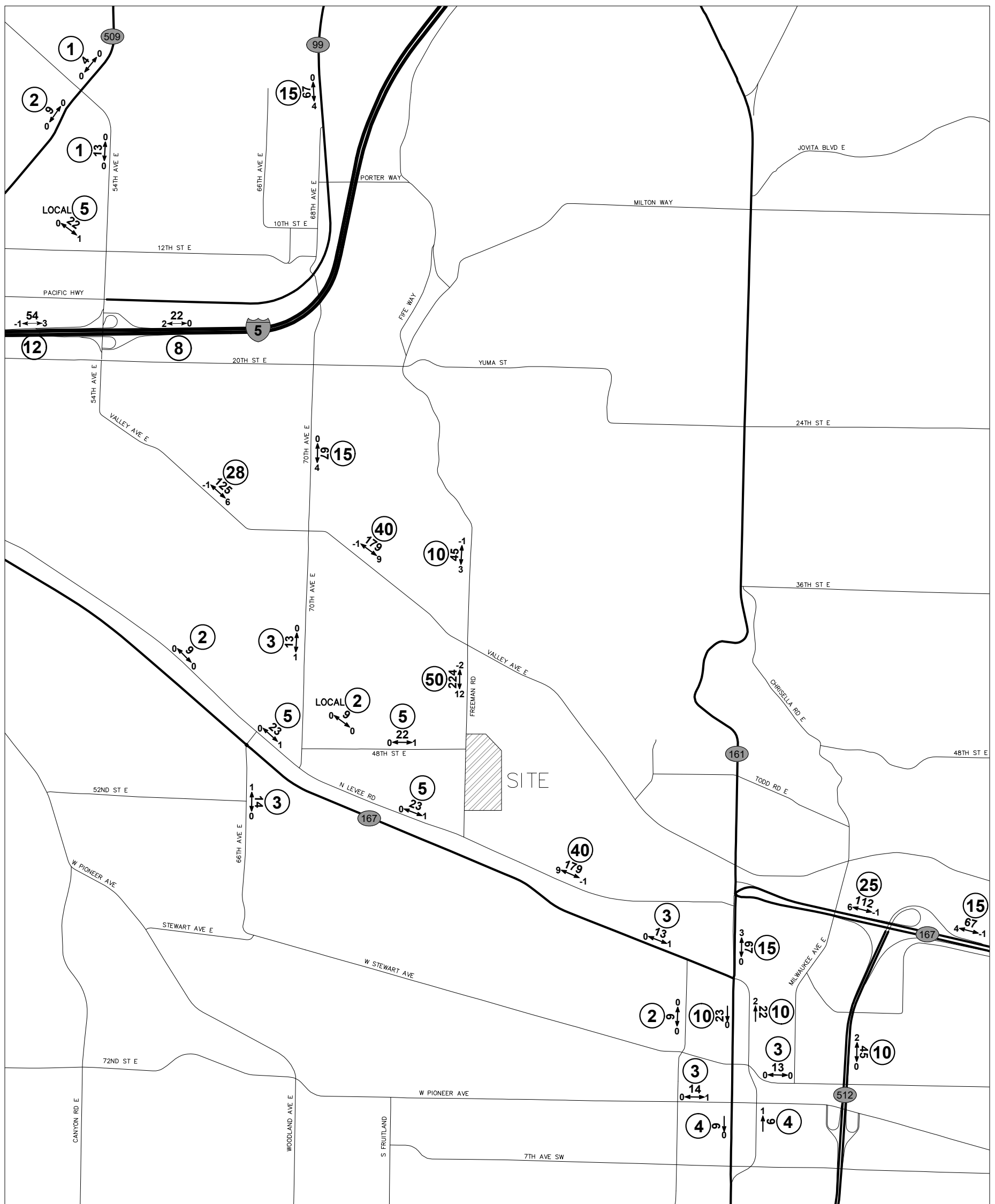
As the proposed development fits the building description of the High-Cube Transload and Short-Term Storage, the proposed square footage is within the range of ITE data points, and the site will not have enough vehicle parking spaces to be a sorting fulfillment center ITE LUC 154 was utilized for the development.

4.2 Trip Distribution

Trip distribution and traffic assignments for the development are based on anticipated truck routes and employee travel patterns for the site. The trip distributions have been reviewed by the City of Puyallup and City of Fife and changes have been made based on their comments. As trucks along Freeman Road E are restricted to local travel only and are directed to travel to and from the south, a separate distribution was created for car trips and truck trips. It is anticipated that 40% of the car site traffic would travel to and from the east on N Levee Road E. Approximately 10% of the car site traffic would travel to and from the west, five percent along 48th Street E and five percent along N Levee Road E. The remaining 50% of the development car trips are expected to travel to and from the north on Freeman Road E. The car trip distribution for the AM and PM peak-hours is included in Figure 2 and Figure 3, respectively.

As truck movement along Freeman Road E is restricted to local travel only and trucks are required to travel to and from the south, all the truck trips will travel to and from the south along Freeman Road E to N Levee Road E. Approximately 10% will utilize N Levee Road E to travel west and 90% will utilize N Levee Road E to travel east. The truck trip distribution for the AM and PM peak-hours is included in Figure 4 and Figure 5, respectively.

A summary of the total site traffic during the AM and PM peak-hours is included in Figure 6 and Figure 7, respectively.



FREEMAN ROAD LOGISTICS

CITY OF PUYALLUP

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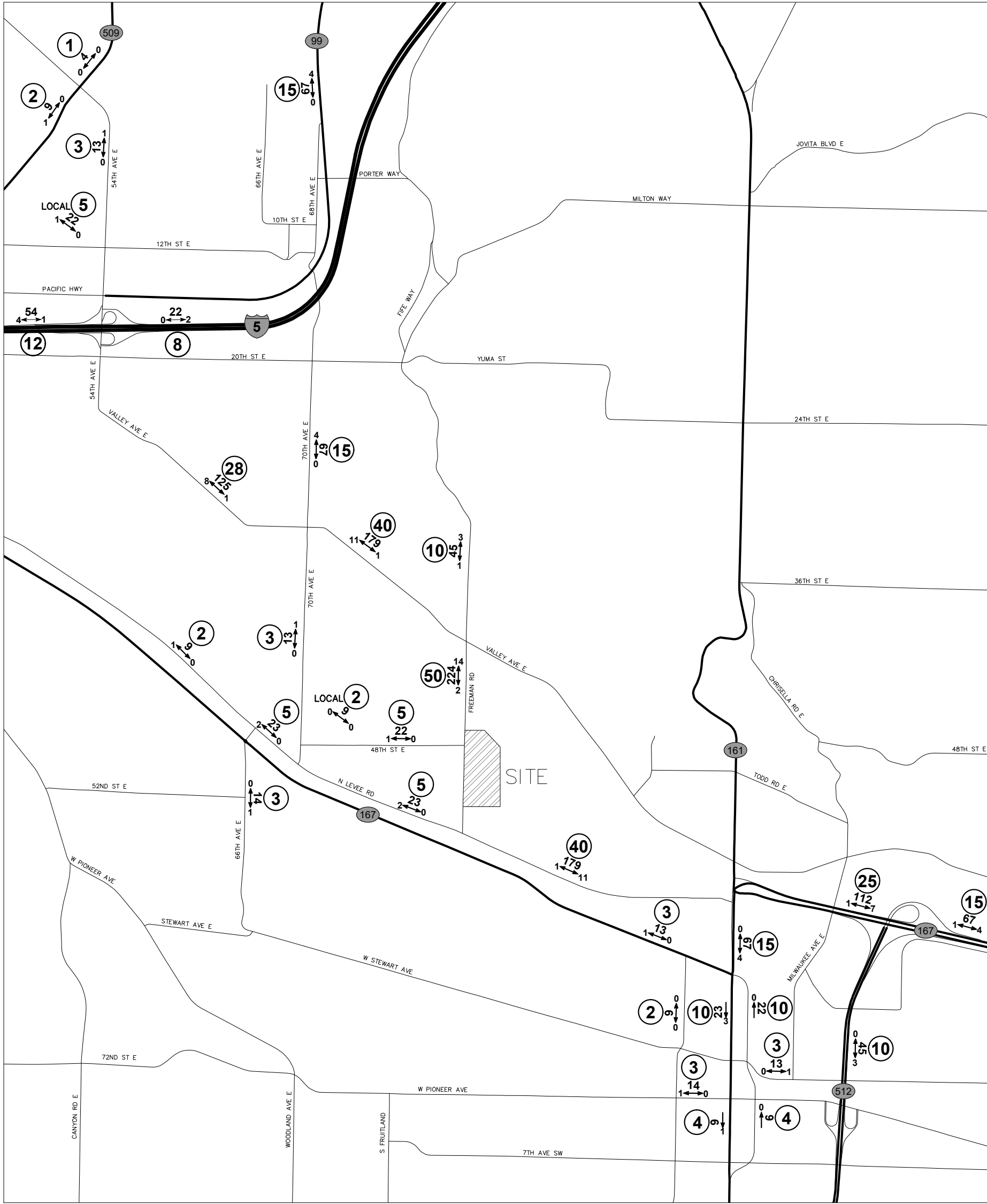
AWDT
AM ↔ PEAK



NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 2
DEVELOPMENT
TRIP DISTRIBUTION
AM PEAK-HOUR
CAR

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FREEMAN ROAD
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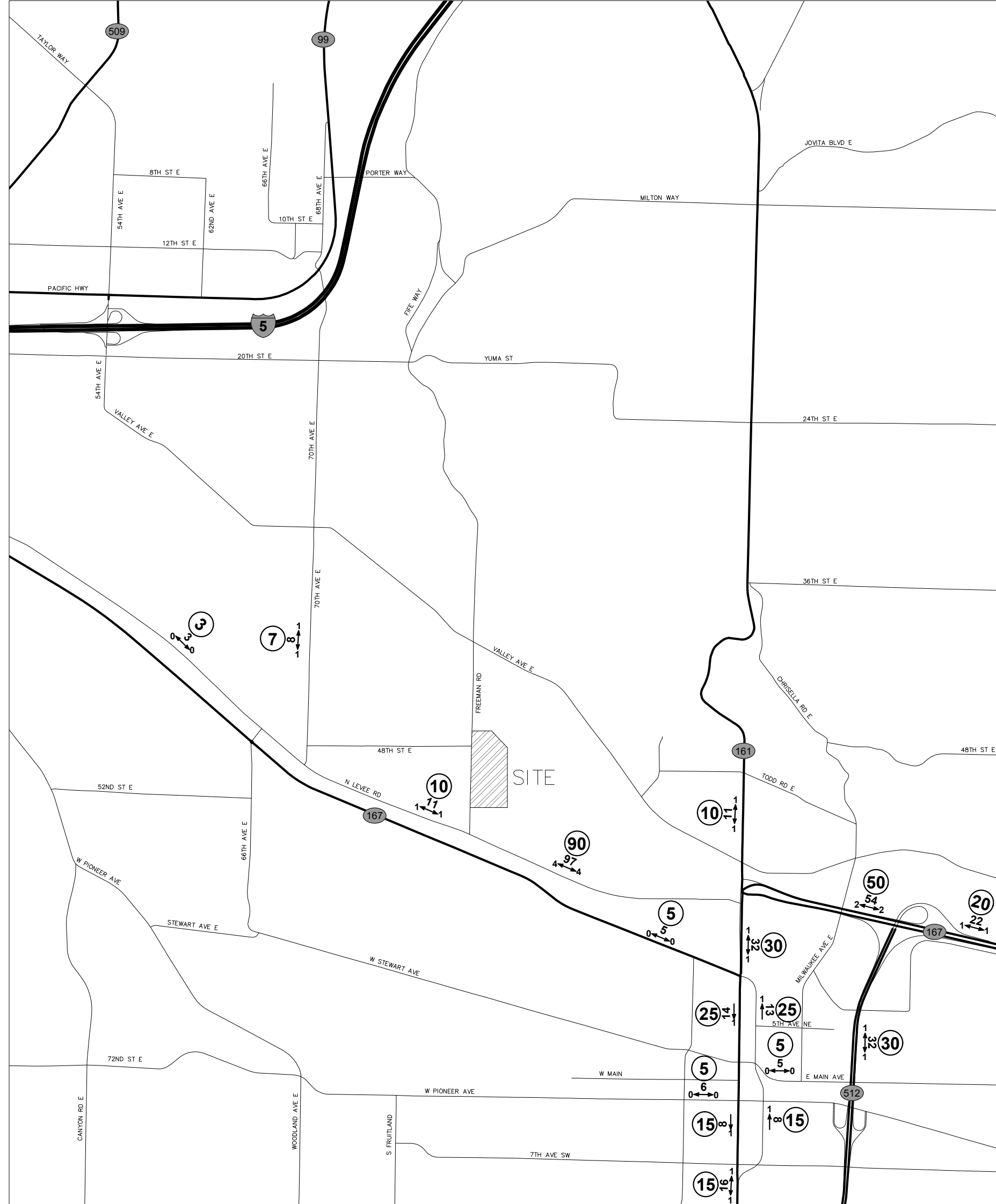
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NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 3
DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR
CAR

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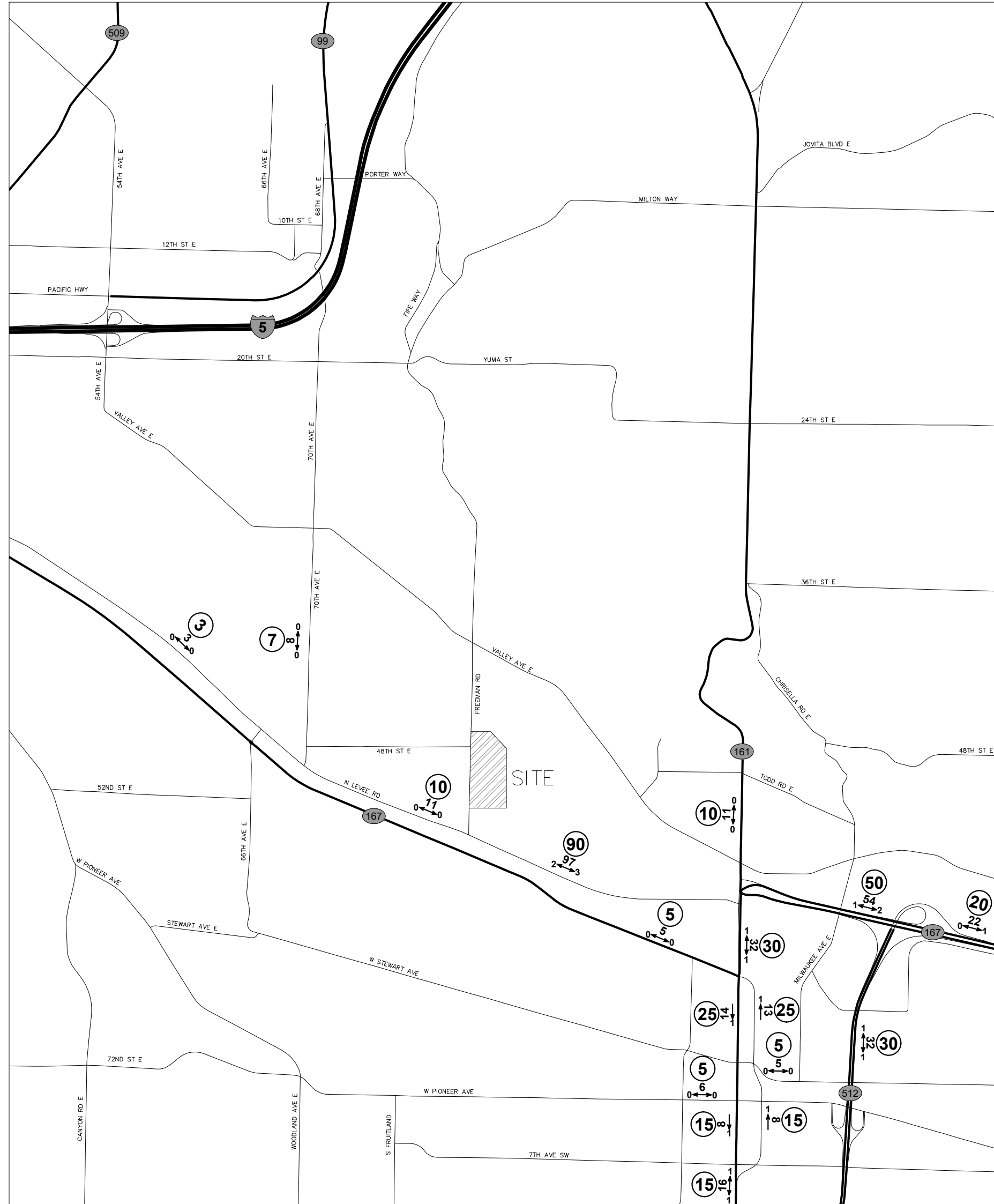
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NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 4
DEVELOPMENT
TRIP DISTRIBUTION
AM PEAK-HOUR
TRUCK

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FREEMAN ROAD
LOGISTICS

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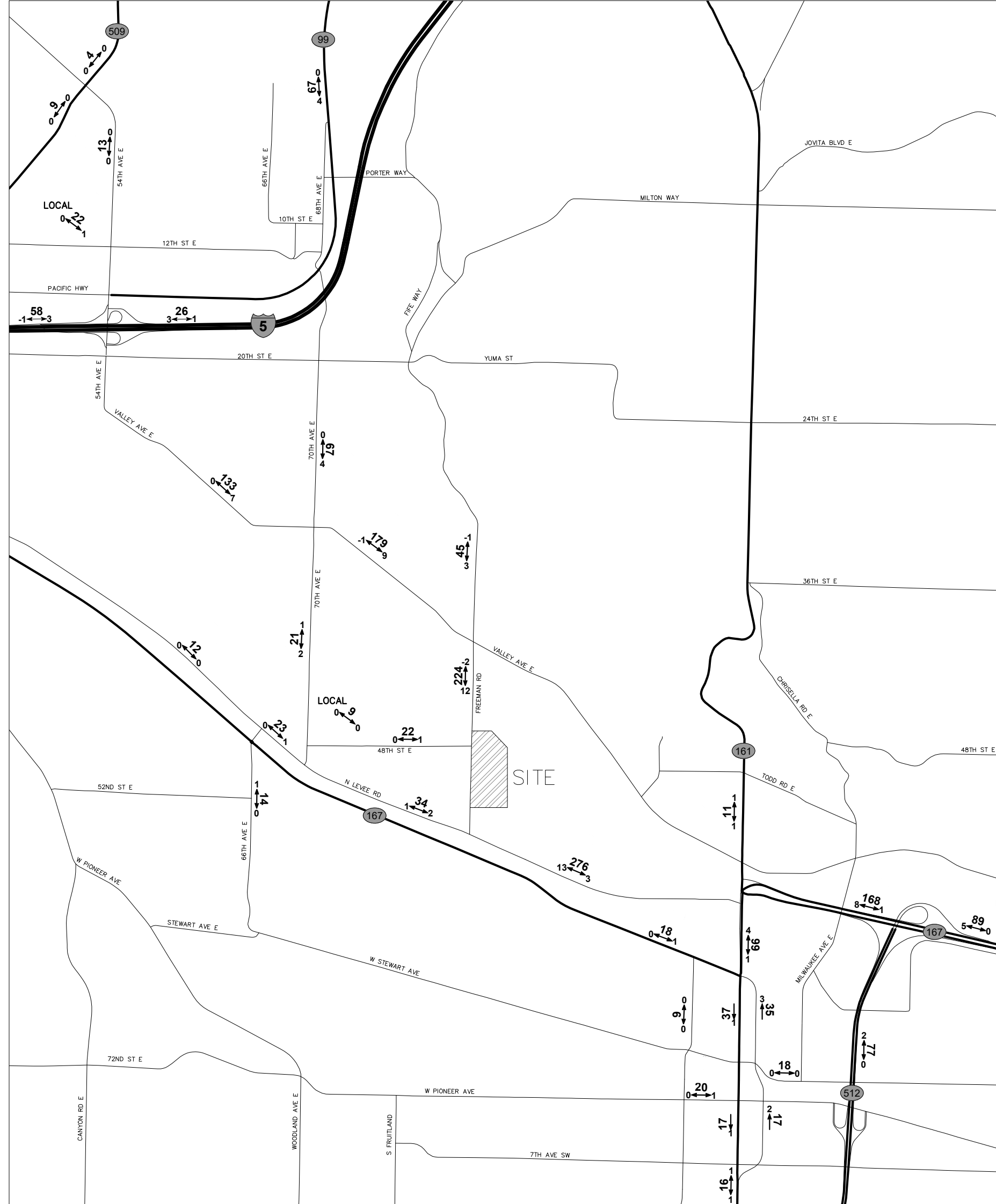
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NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 5
DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR
TRUCK

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FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

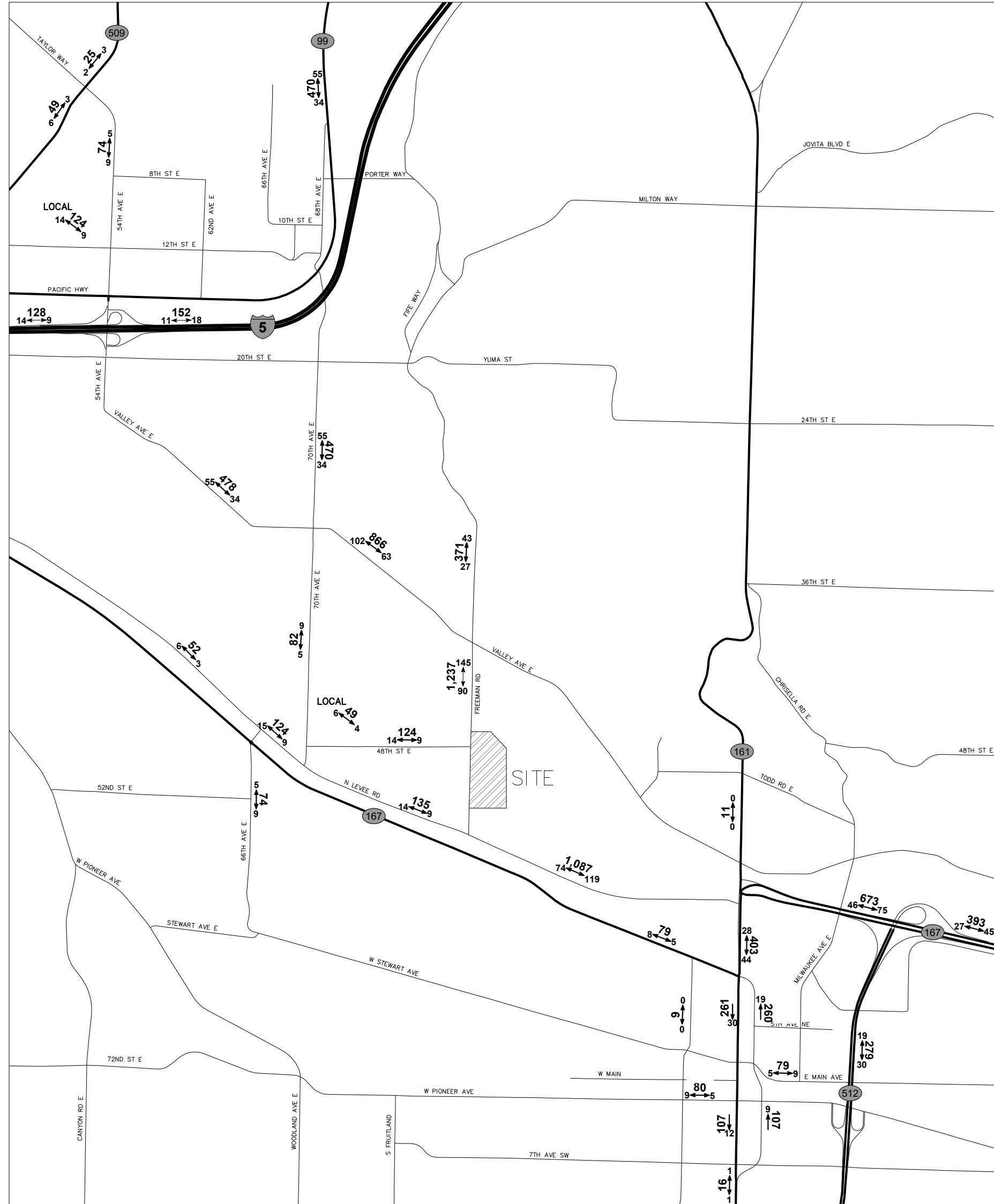
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NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 6
TOTAL DEVELOPMENT
TRIP DISTRIBUTION
AM PEAK-HOUR
CARS AND TRUCK

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FREEMAN ROAD
LOGISTICS

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LEGEND



NEW DAILY TRAFFIC
NEW PEAK-HOUR TRIPS
TRIP DISTRIBUTION

FIGURE 7
TOTAL DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR
CARS AND TRUCKS

5. INTERSECTION ANALYSIS

The scope of analysis for off-site intersections was developed after discussion with representatives for the City of Puyallup and City of Fife. The seven off-site intersections evaluated for future LOS operations are listed below:

1. Freeman Road E at Valley Avenue E
2. Freeman Road E at 48th Street E
3. Freeman Road E at 22nd Avenue NW
4. Freeman Road E at 50th Street E
5. Freeman Road E at N Levee Road E
6. Freeman Road E at North Site Access

5.1 2021 Existing Conditions

Existing turning movement count data was collected by the independent data collection firm Idax on October 6, 2021 and October 13, 2021. Existing peak-hour factors and heavy vehicle percentages were used in the analysis. Turning movements for the 2021 existing conditions are shown in Figure 8 and Figure 9 for the AM and PM peak hours, respectively.

5.2 2024 Baseline Conditions

The 2024 baseline intersection turning movement counts were calculated by applying a 3.0% annually compounding growth rate to all of the existing turning movement volumes out to 2024 and trips from one pipeline project, Prologis Park Edgewood. Staff indicated that future forecast volumes should account for the SR-167 Extension Project. The SR-167 Extension Project (part of the Gateway Program) is funded primarily through the Connecting Washington funding package and local contributions. Local street volumes included in the final EIS for the SR-167 Extension Project were reviewed as a basis for incorporating the impact of the extension in the future year analysis. Table 4 summarizes the percent reduction in daily trips on local roadways as documented in the EIS near the Freeman Road area as a result of the freeway extension.

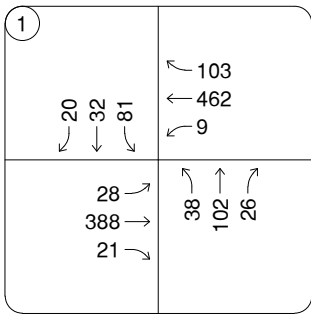
Table 4: Local Street Volume Reduction from SR-167 EIS

Roadway	Location	2030 No Build ADT	2030 Build ADT	Change	% Change
Freeman Road	North of Valley Ave	5,000	3,400	-1,600	-32%
Freeman Road	South of Valley Ave	4,200	3,000	-1,200	-29%
Valley Avenue	East of Freeman Rd	20,000	17,000	-3,000	-15%
N Levee Road	West of Freeman Rd	11,000	9,000	-2,000	-18%

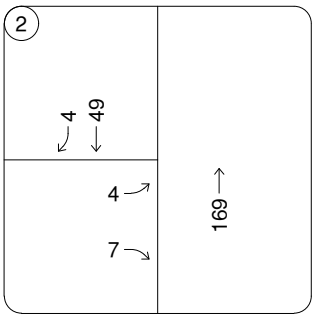
The percent reduction in daily volume was applied to the 2024 baseline turning movement forecasts to account for the funded SR-167 Extension. A comparison of the 2021 counts to the previous 2012 counts used as the basis for the Comprehensive Plan analysis showed significantly higher growth in the southbound left turn volume at Freeman Road and N Levee Road (+225 trips, +13.0% annual growth) than the other intersection turning movements (~0% to 4% annual growth). This likely shows the Freeman Road has become a popular commuter bypass route for other local roads in the area and will likely see a significant reduction in PM peak hour volume after the completion of the SR-167 Extension. The 2021 southbound left turn count volume is about 202 trips higher than what the typical background growth rate would otherwise have predicted using the 2012 counts as a baseline. These additional 202 trips are therefore an approximation of the additional cut-through commuter traffic that has occurred since 2012 and will likely use the new SR-167 Extension. Using the percent reduction in ADT from the EIS only reduces the southbound left turn volume by approximately 111 trips in the PM peak hour and does not remove the full amount of commuter trips likely to use the new SR-167 Extension. The 2024 baseline intersection volumes are therefore a conservatively high estimate of future intersection volumes after the extension is complete. Turning movements for the 2024 baseline conditions with the SR-167 Extension are shown in Figure 10 and Figure 11 for the AM and PM peak hours respectively.

5.3 2024 Future with Development

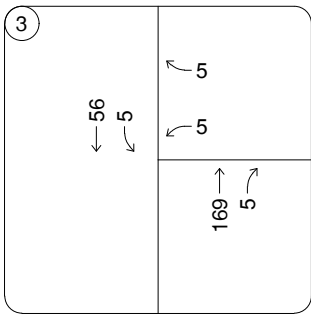
Future with development trip forecasts were calculated by adding development trips to the 2024 baseline turning movement forecasts. Approximately half of the 15% of trips expected to travel on SR-167 to and from the east were assigned to the planned Valley Avenue interchange as part of the SR-167 Extension. Trips from the existing single-family units that will be removed, credit for the removal of the existing units was taken from the north access where negative trips were zeroed out and from 22nd Avenue NW. Due to the low expected volume on 22nd Avenue NW, a conservative 5 trips were added to each movement onto and off 22nd Avenue NW. The trips on 50th Street E west of Freeman Road were estimated based on the number and type of dwelling units per the Pierce County parcel viewer and trip generation rates contained in ITE's trip generation manual. Turning movements for the 2024 future with development conditions are shown in Figure 12, Figure 13 for the AM and PM peak hours respectively.



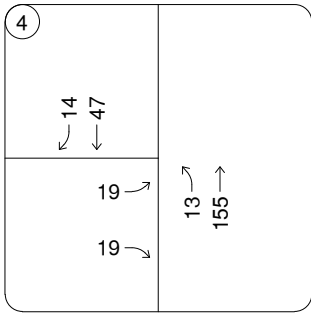
VALLEY AVENUE E @
FREEMAN ROAD E



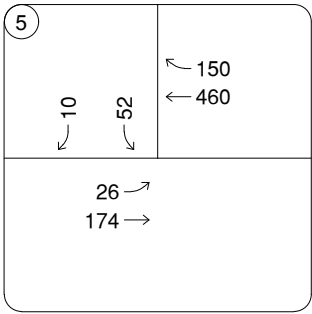
48TH STREET E @
FREEMAN ROAD E



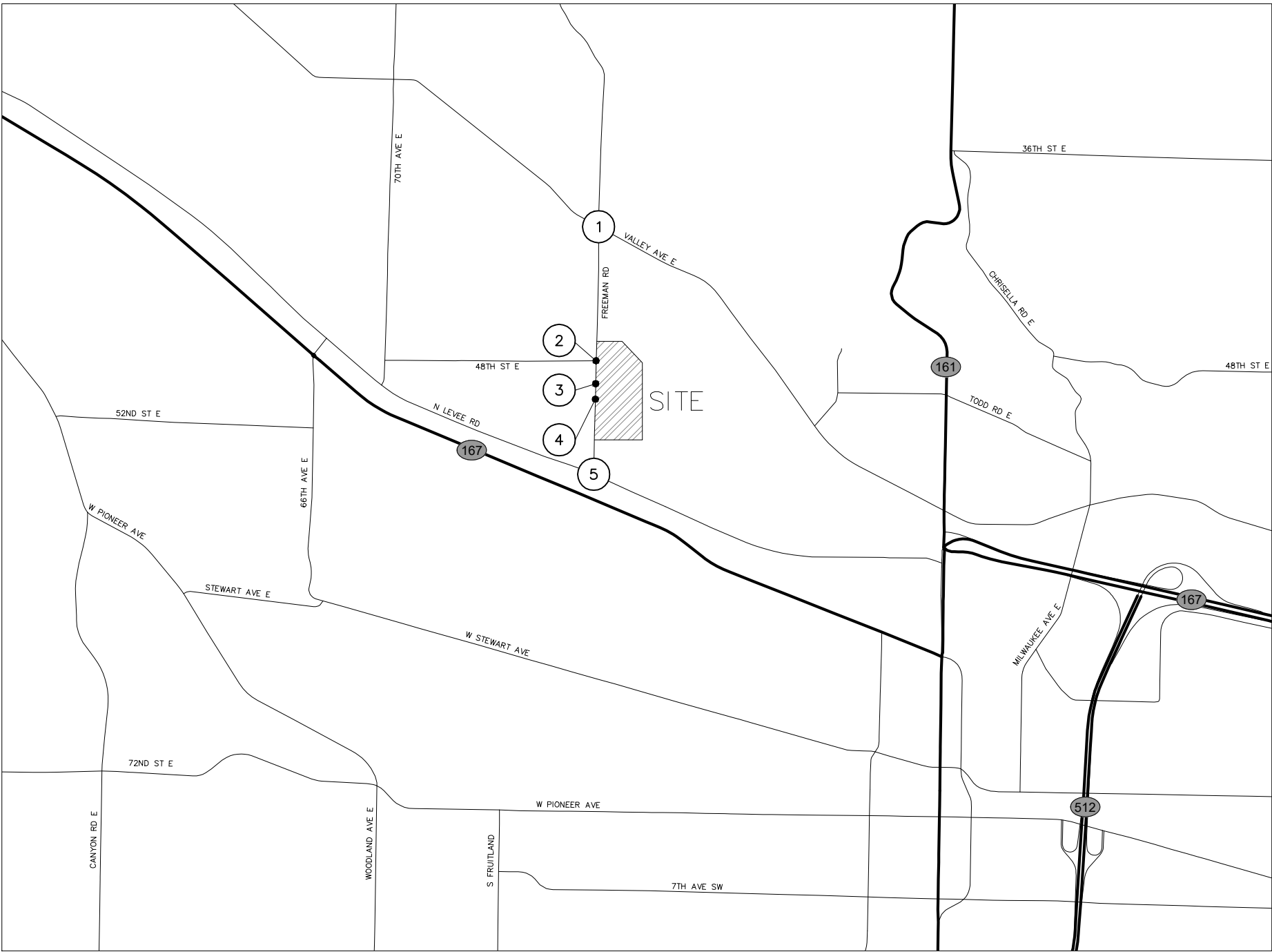
22ND AVENUE NW @
FREEMAN ROAD E



50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND

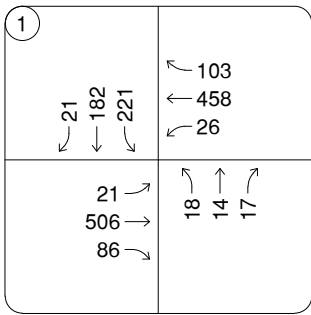


STUDY INTERSECTION

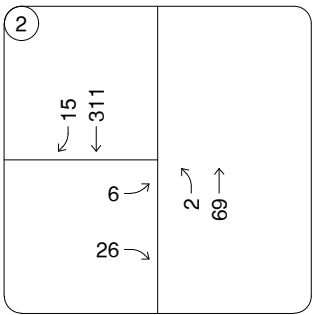


AM PEAK-HOUR TURNING
MOVEMENT VOLUMES

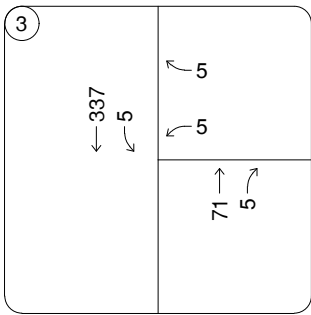
FIGURE 8
2021 EXISTING
TURNING MOVEMENTS
AM PEAK-HOUR
CARS AND TRUCKS



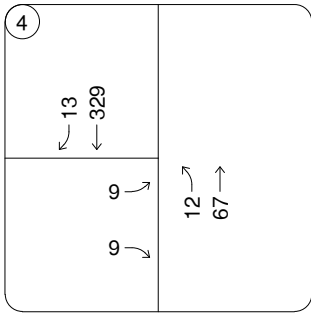
VALLEY AVENUE E @
FREEMAN ROAD E



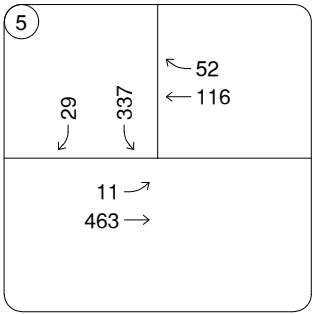
48TH STREET E @
FREEMAN ROAD E



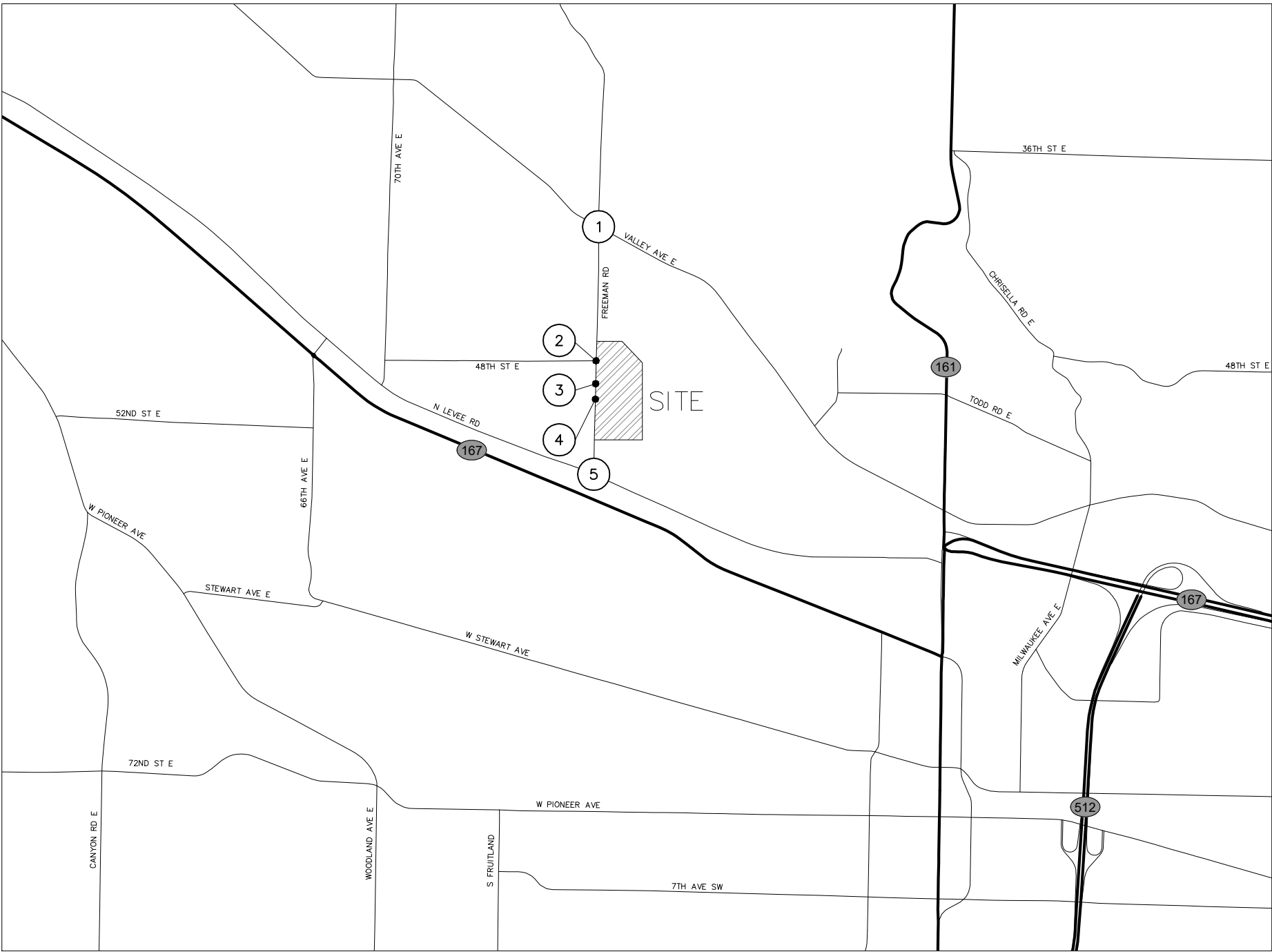
22ND AVENUE NW @
FREEMAN ROAD E



50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



FREEMAN ROAD
LOGISTICS

LEGEND



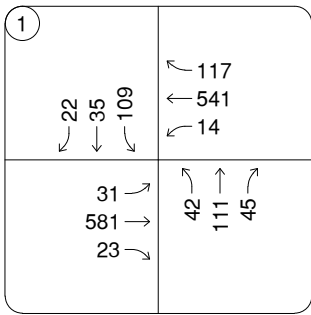
STUDY INTERSECTION



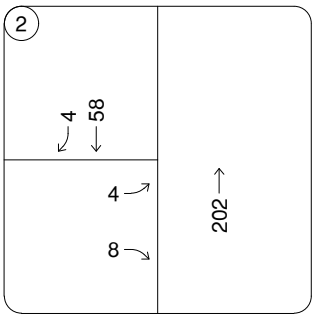
PM PEAK-HOUR TURNING
MOVEMENT VOLUMES

FIGURE 9
2021 EXISTING
TURNING MOVEMENTS
PM PEAK-HOUR
CARS AND TRUCKS

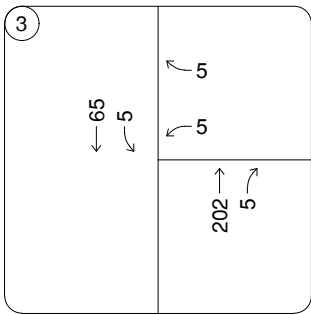
CITY OF PUYALLUP



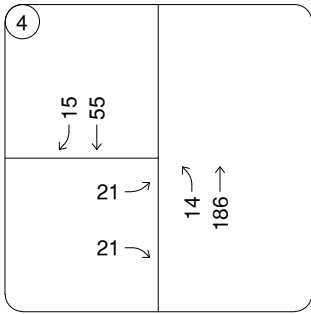
VALLEY AVENUE E @
FREEMAN ROAD E



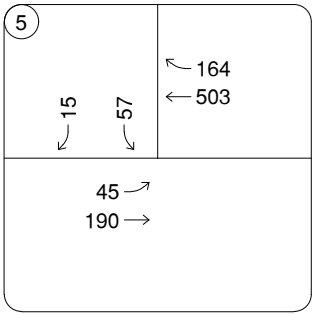
48TH STREET E @
FREEMAN ROAD E



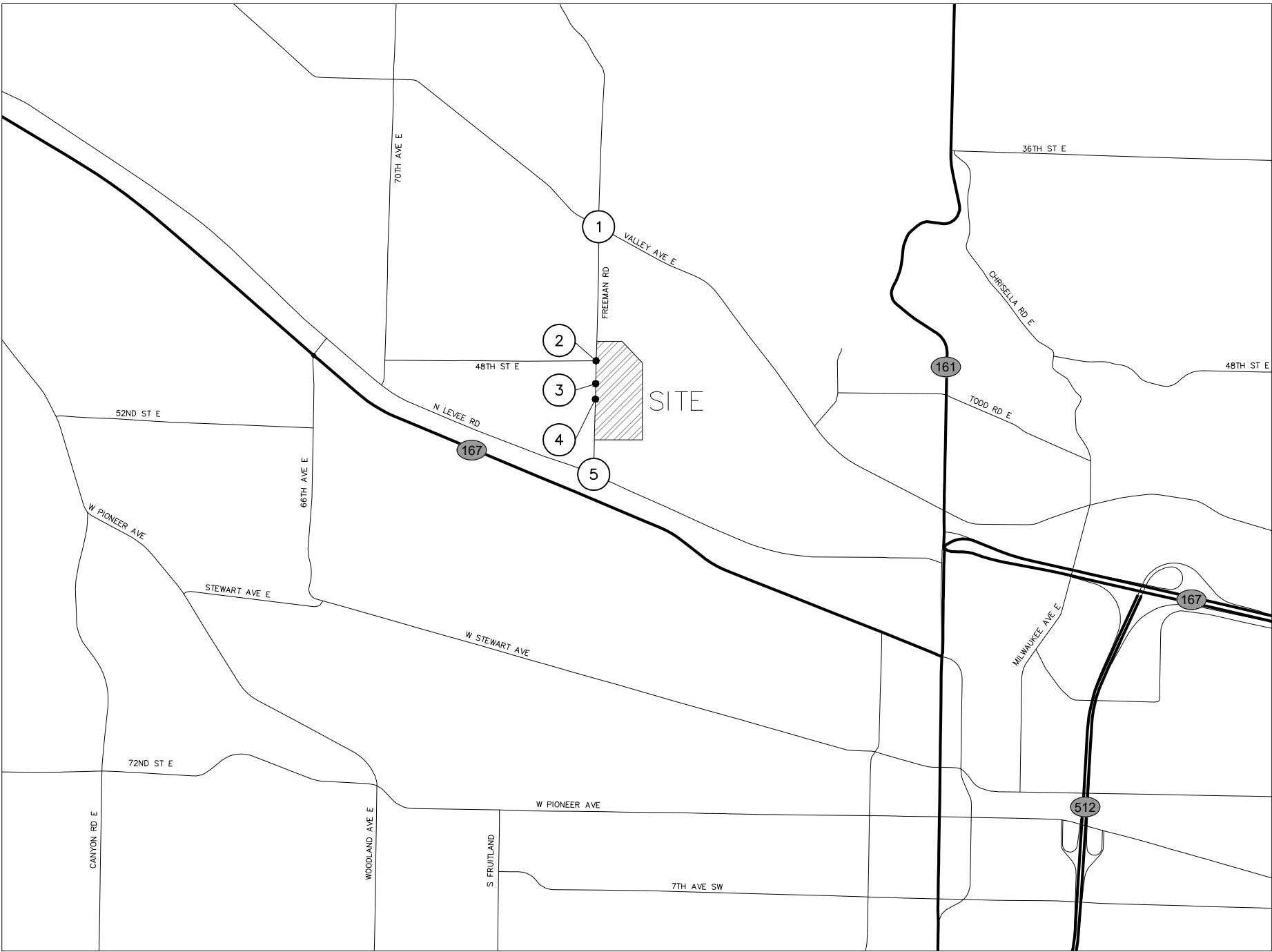
22ND AVENUE NW @
FREEMAN ROAD E



50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND

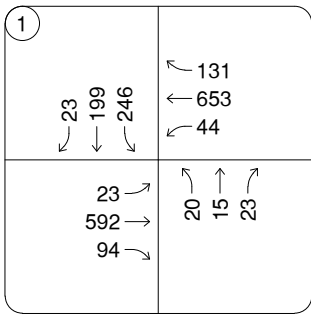


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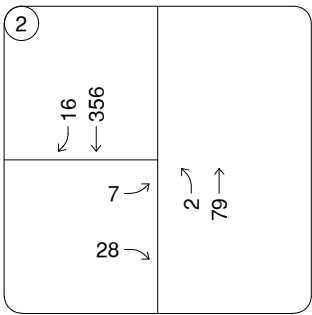


AM PEAK-HOUR TURNING
MOVEMENT VOLUMES

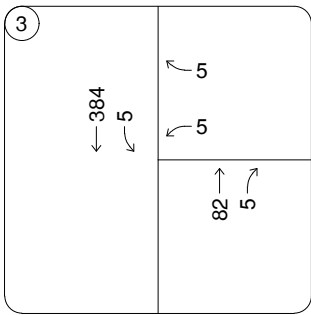
FIGURE 10
2024 BASELINE
TURNING MOVEMENTS
AM PEAK-HOUR
CARS AND TRUCKS



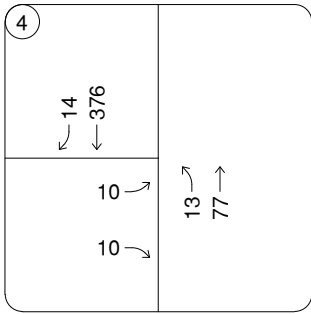
VALLEY AVENUE E @
FREEMAN ROAD E



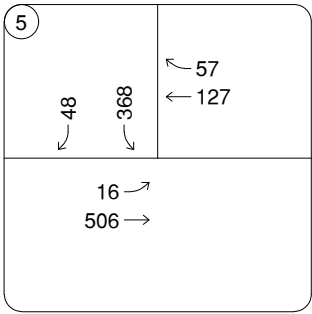
48TH STREET E @
FREEMAN ROAD E



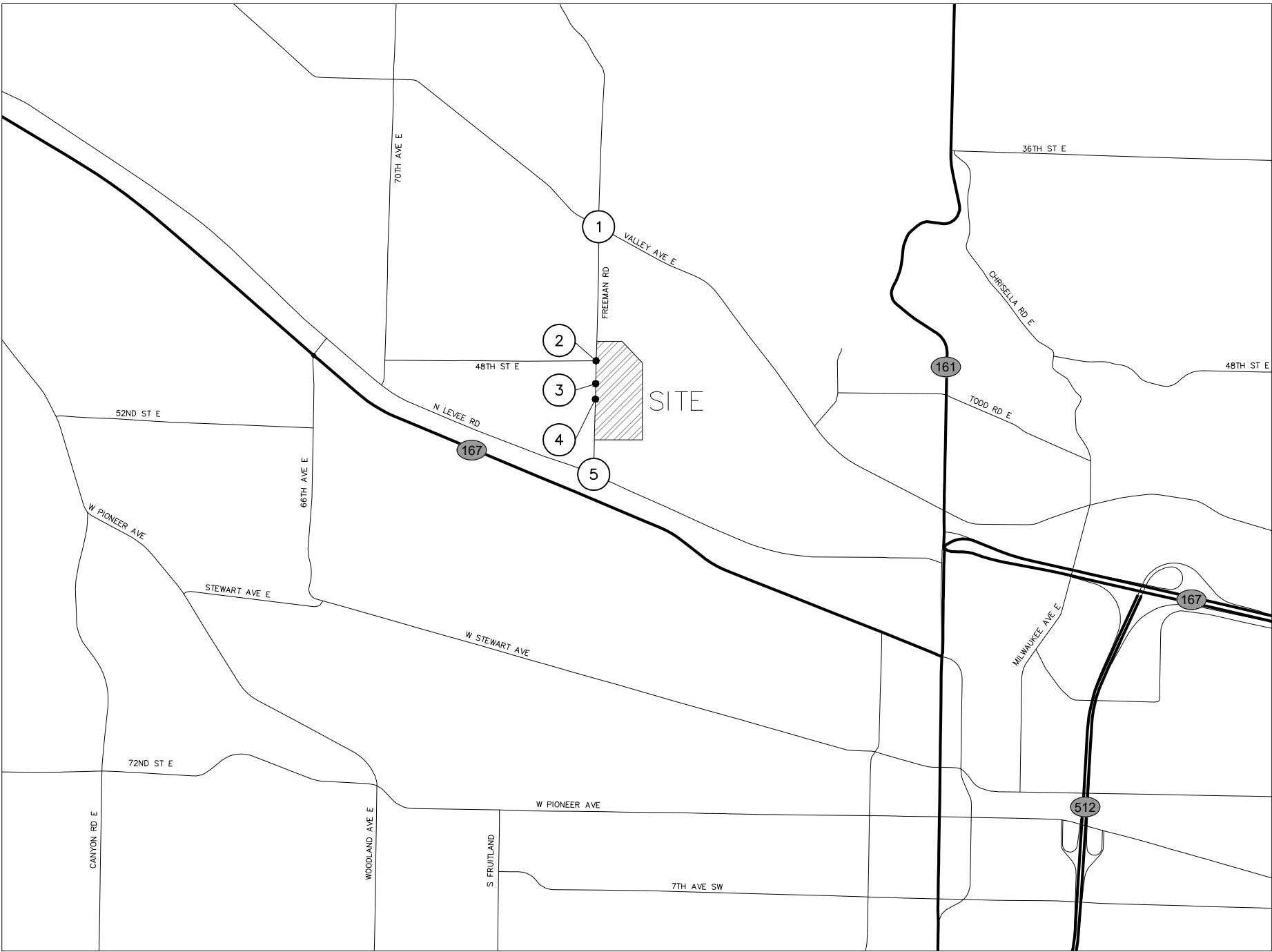
22ND AVENUE NW @
FREEMAN ROAD E



50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND

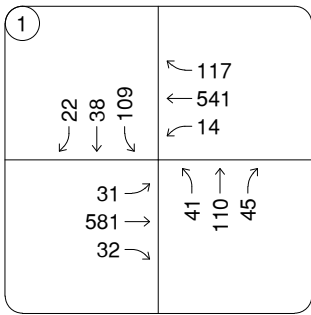


STUDY INTERSECTION

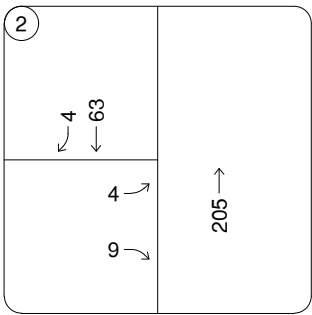


PM PEAK-HOUR TURNING
MOVEMENT VOLUMES

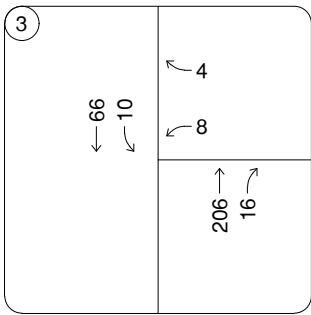
FIGURE 11
2024 BASELINE
TURNING MOVEMENTS
PM PEAK-HOUR
CARS AND TRUCKS



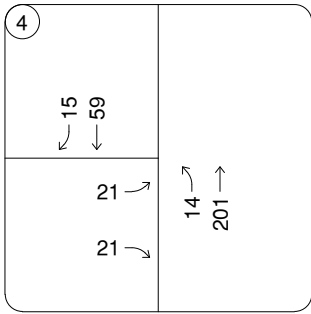
VALLEY AVENUE E @
FREEMAN ROAD E



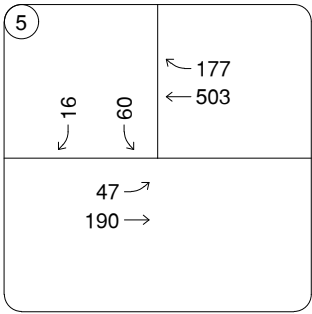
48TH STREET E @
FREEMAN ROAD E



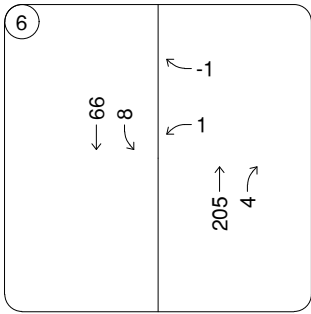
22ND AVENUE NW @
FREEMAN ROAD E



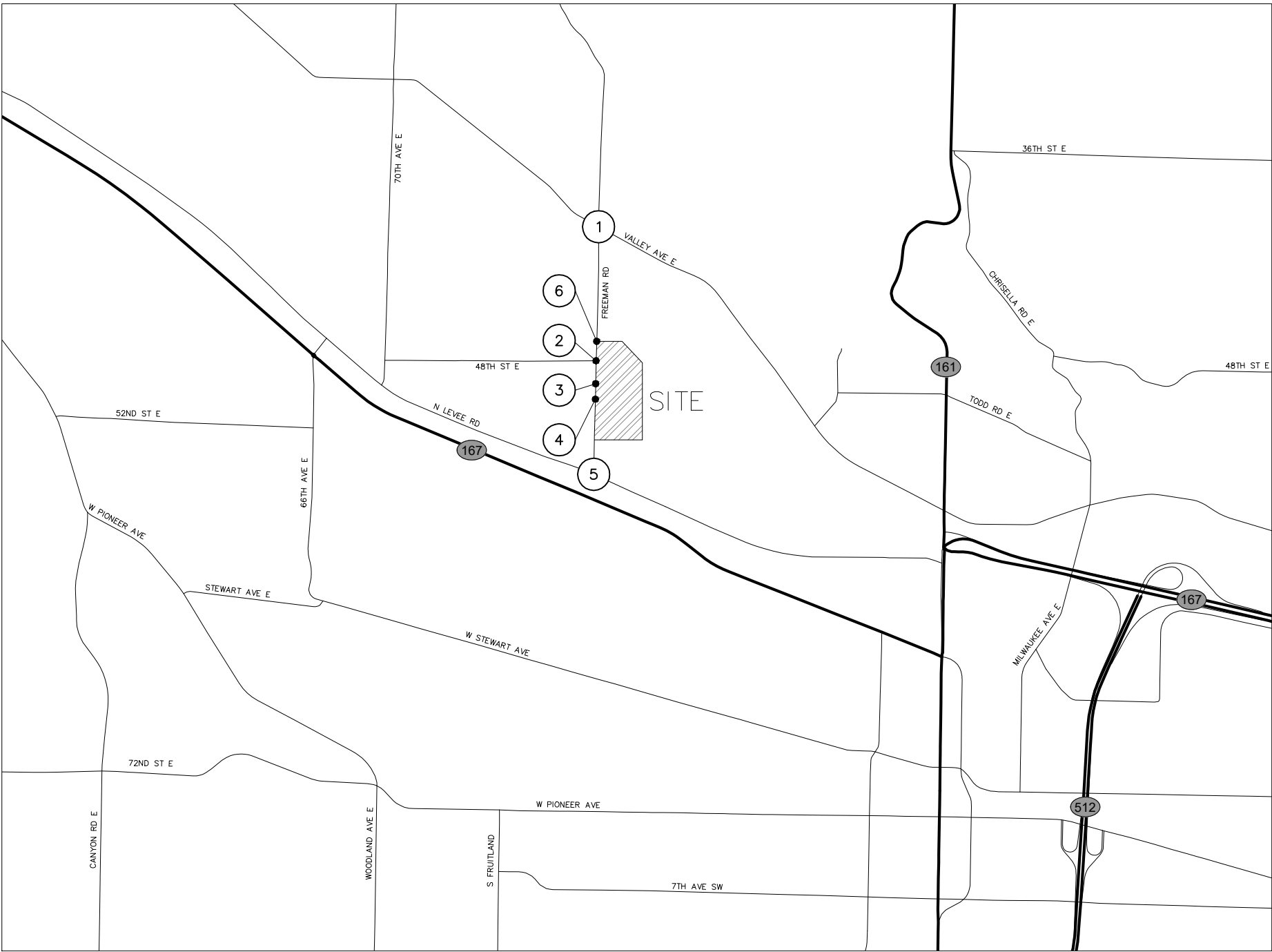
50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



SITE ACCESS @
FREEMAN ROAD E



FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND

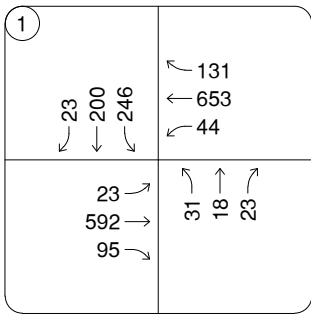


STUDY INTERSECTION

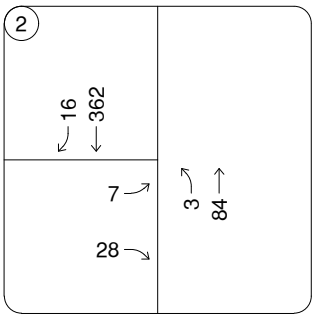


AM PEAK-HOUR TURNING
MOVEMENT VOLUMES

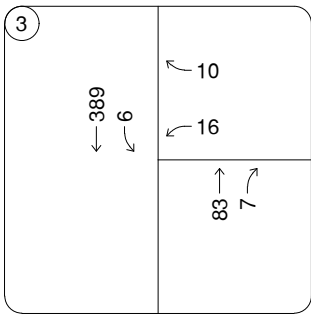
FIGURE 12
2024 FUTURE WITH
DEVELOPMENT
TURNING MOVEMENTS
AM PEAK-HOUR
CARS AND TRUCKS



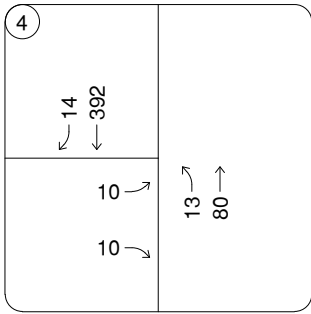
VALLEY AVENUE E @
FREEMAN ROAD E



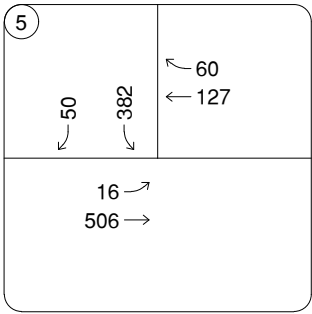
48TH STREET E @
FREEMAN ROAD E



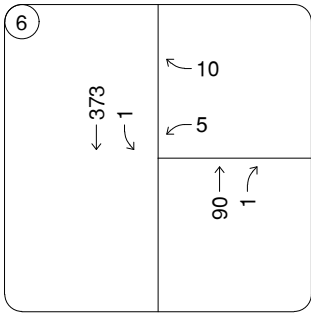
22ND AVENUE NW @
FREEMAN ROAD E



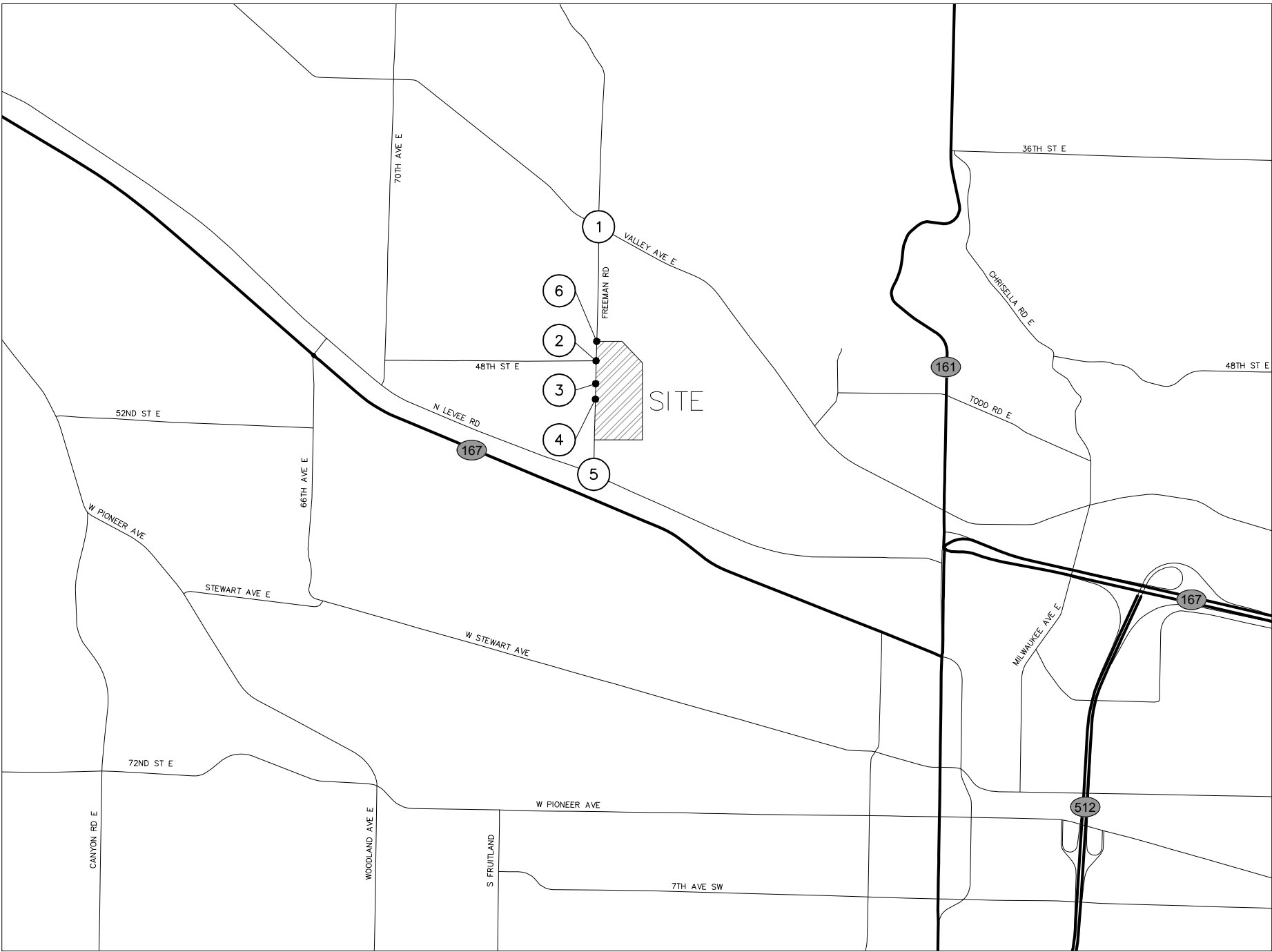
50TH STREET E @
FREEMAN ROAD E



FREEMAN ROAD E @ 1N
LEVEE ROAD E



SITE ACCESS @
FREEMAN ROAD E



FREEMAN ROAD
LOGISTICS

CITY OF PUYALLUP

LEGEND



STUDY INTERSECTION



PM PEAK-HOUR TURNING
MOVEMENT VOLUMES

FIGURE 13
2024 FUTURE WITH
DEVELOPMENT
TURNING MOVEMENTS
PM PEAK-HOUR
CARS AND TRUCKS

5.4 LOS Results

Intersection level of service was analyzed for each of the study intersections for the 2021 existing, 2024 baseline, and 2024 future with development scenarios. Intersections were analyzed with and without the SR-167 Extension Project. The standard for City of Fife and Puyallup intersections is LOS D. The level of service at the study intersections is summarized in Table 5 and Table 6 for the AM and PM peak-hours, respectively.

Table 5: Weekday AM Peak Hour LOS Summary

Intersection	Int. Control	2021 Existing		Without SR-167 Extension				With SR-167 Extension			
				2024 Baseline		2024 Future w/ Development		2024 Baseline		2024 Future w/ Development	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1. Freeman Road E @ Valley Avenue E	Signal	B	19.9 sec	C	23.8 sec	C	23.7 sec	B	18.6 sec	B	18.5 sec
	95 th % Queue	WBTR	184.0 ft	WBTR	230.0 ft	WBTR	230.0 ft	WBTR	191.0 ft	WBTR	191.0 ft
2. Freeman Road E @ 48 th Street E	TWSC (Eastbound)	A	9.1 sec	A	9.2 sec	A	9.2 sec	A	9.1 sec	A	9.1 sec
	95 th % Queue	N/A	0.0 ft	N/A	0.0 ft	EB	2.5 ft	EB	2.5 ft	EB	2.5 ft
3. Freeman Road E @ 22 nd Avenue NW	TWSC (Westbound)	A	9.6 sec	A	9.9 sec	B	10.2 sec	A	9.5 sec	A	9.7 sec
	95 th % Queue	N/A	0.0 ft	N/A	0.0 ft	WB	2.5 ft	N/A	0.0 ft	WB	2.5 ft
4. Freeman Road E @ 50 th Street E	TWSC (Eastbound)	A	9.5 sec	A	9.7 sec	A	9.8 sec	A	9.3 sec	A	9.4 sec
	95 th % Queue	EB	5.0 ft	EB	5.0 ft	EB	5.0 ft	EB	2.5 ft	EB	2.5 ft
5. Freeman Road E @ N Levee Road E	TWSC (Southbound)	C	17.5 sec	C	20.7 sec	C	21.3 sec	C	16.6 sec	C	17.0 sec
	95 th % Queue	SB	17.5 ft	SB	25.0 ft	SB	27.5 ft	SB	12.5 ft	SB	15.0 ft
6. Freeman Road E @ North Site Access	TWSC (Westbound)	---	---	---	---	B	10.4 sec	---	---	A	9.9 sec
	95 th % Queue	---	---	---	---	N/A	0.0 ft	---	---	N/A	0.0 ft

Table 6: Weekday PM Peak Hour LOS Summary

Intersection	Int. Control	2021 Existing		Without SR-167 Extension				With SR-167 Extension			
				2024 Baseline		2024 Future w/ Development		2024 Baseline		2024 Future w/ Development	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1. Freeman Road E @ Valley Avenue E	Signal	C	22.1 sec	C	25.6 sec	C	26.1 sec	C	20.3 sec	C	20.8 sec
	95 th % Queue	SBL	238.0 ft	SBL	279.0 ft	WBTR	281.0 ft	WBTR	215.0 ft	WBTR	217.0 ft
2. Freeman Road E @ 48 th Street E	TWSC (Eastbound)	B	10.9 sec	B	11.4 sec	B	11.5 sec	B	10.5 sec	B	10.6 sec
	95 th % Queue	EB	5.0 ft	EB	5.0 ft	EB	5.0 ft	EB	5.0 ft	EB	5.0 ft
3. Freeman Road E @ 22 nd Avenue NW	TWSC (Westbound)	B	10.1 sec	B	10.4 sec	B	11.1 sec	A	9.9 sec	B	10.3 sec
	95 th % Queue	N/A	0.0 ft	N/A	0.0 ft	WB	2.5 ft	WB	2.5 ft	WB	2.5 ft
4. Freeman Road E @ 50 th Street E	TWSC (Eastbound)	B	11.1 sec	B	11.7 sec	B	11.8 sec	B	10.8 sec	B	11.0 sec
	95 th % Queue	EB	2.5 ft	EB	2.5 ft	EB	2.5 ft	EB	5.0 ft	EB	5.0 ft
5. Freeman Road E @ N Levee Road E	TWSC (Southbound)	F	65.6 sec	F	136.4 sec	F	154.6 sec	D	33.1 sec	E	36.7 sec
	95 th % Queue	SB	280.0 ft	SB	455.0 ft	SB	500.0 ft	SB	157.5 ft	SB	177.5 ft
Separate southbound L and R	TWSC (Southbound)	---	---	---	---	F	119.5 sec	---	---	D	30.8 sec
	95 th % Queue	---	---	---	---	SBL	420.0 ft	---	---	SBL	147.5 ft
Separate SB L and R and AWSC	AWSC	---	---	---	---	E	42.9 sec	---	---	---	---
	95 th % Queue	---	---	---	---	EB	350.0 ft	---	---	---	---
6. Freeman Road E @ North Site Access	TWSC (Westbound)	---	---	---	---	A	9.9 sec	---	---	A	9.5 sec
	95 th % Queue	---	---	---	---	WB	2.5 ft	---	---	WB	2.5 ft

The level of service analysis shows all intersections would operate at an acceptable LOS D or better after funded improvements are included in the analysis (SR-167 Extension) and a separate southbound left and right turn channelization at the intersection of N Levee Road at Freeman Road is added. Prior to the SR-167 Extension improvements, the intersection of Levee Road at Freeman Road is expected to operate at a failing LOS F with 136.4 seconds of delay for the southbound approach during the baseline conditions before the development and LOS F with 154.6 seconds of delay with the development. If a separate southbound left and right channelization is added and the intersection is converted to an all-way stop-controlled intersection, it will operate at LOS E with 42.9 seconds of delay, thus bringing the intersection level of service to better than baseline conditions. After the SR-167 extension, the all-way stop-control can be removed from this intersection and it will operate at an acceptable LOS D with 30.8 seconds of delay if desired by the controlling jurisdiction. Level of service results are included in the attachments.

5.5 Union Pacific Railroad Crossing

Video of the Union Pacific Railroad crossing south of Valley Avenue was observed for 5 hours during peak travel periods (6-9 AM and 4-6 PM). During those 5 hours of video no trains were observed and no gate closings occurred. We also reached out to Union Pacific Railroad to determine if the railroad had additional information pertaining the crossing, such as the allowed speed along the segment, how many trains per day, actual data on the amount of times and length the crossings are down. At the time of the report no additional information was received. Based on observations during the peak-hours the rail crossing does not appear to significantly affect operations of the Freeman Road and Valley Avenue.

Northbound queues for the 2024 Future with Development conditions were reviewed at the Freeman Road and Valley Avenue intersection both with and without the SR-167 Extension. Table 7 summarizes the 50th and 95th percentile queue results.

Table 7: Northbound Freeman Road at Valley Avenue Queues

Scenario	Queue Capacity [ft]	2024 Baseline		2024 Future with Development	
		50 th -Percentile	95 th -Percentile	50 th -Percentile	95 th -Percentile
AM Peak					
Without SR-167 Extension	165 ft	75	164	75	164
With SR-167 Extension	165 ft	50	122	50	122
PM Peak					
Without SR-167 Extension	165 ft	9	42	11	44
With SR-167 Extension	165 ft	7	36	8	38

Queuing results from the intersection analysis show 2024 northbound 95th-percentile queues at the signal are expected to be contained within the existing striped storage during the critical AM peak hour. Due to the net change in trip generation between the existing residential uses and the proposed industrial uses, the Freeman Logistics development is not expected to add significant length to northbound queues during the AM peak hour. Queues would reduce after the SR-167 Extension is complete and commuter cut-through traffic begins using the new freeway extension. There is a marked stop bar on the south side of the rail crossing to indicate where vehicles should stop when the top 5% of northbound queues do extend past the rail crossing. No changes to the rail crossing should be required as a condition of approval for the Freeman Logistics development.

6. SAFETY ANALYSIS

Collision data from WSDOT was reviewed for the previous 5 years (January 2017 through December 2021) at the study intersection. The collision data is summarized in Table 8. Collisions rates and frequencies at the study intersection are summarized in Table 9.

Table 8: 5-Year Collision Data Summary

Intersection	Collision Type							Total Collisions
	Rear-End	Entering at Angle	Opp. Dir.	Sideswipe	Same Dir.	Ped. / Cyclist	Fixed Object/ Other	
1. Freeman Road E @ Valley Avenue E	6	3	0	0	0	0	0	9
2. Freeman Road E @ 48 th Street E	1	0	0	0	0	0	0	1
3. Freeman Road E @ 22 nd Avenue NW	0	0	0	0	0	0	0	0
4. Freeman Road E @ 50 th Street E	0	0	0	0	0	0	0	2
5. Freeman Road E @ N Levee Road E	3	1	0	0	0	0	2	6
6. Freeman Road E @ North Site Access	0	0	0	0	0	0	0	0

Table 9: Intersection Collision Data

	Intersection	PM Peak-Hr Int. Vol.	K-Factor	Total Collisions	Injury/Fatal Collisions	Collision Rate³	Collision Frequency⁴
1.	Freeman Road E @ Valley Avenue E	1,673	10	9	3/0	0.29	1.8
2.	Freeman Road E @ 48 th Street E	429	10	1	0/0	0.13	0.2
3.	Freeman Road E @ 22 nd Avenue NW	428	10	0	0/0	0.00	0
4.	Freeman Road E @ 50 th Street E	439	10	2	0/0	0.25	0.4
5.	Freeman Road E @ N Levee Road E	1,008	10	6	2/0	0.33	1.2
6.	Freeman Road E @ North Site Access	401	10	0	0/0	0.00	0.0

Of the three injury collisions at the intersection of Freeman Road E at Valley Avenue E, all three were possible injury collisions. Of the two injury collisions at the intersection of Freeman Road E at N Levee Road E, one was a possible injury collision and one was a suspected serious injury collision.

The collision data showed all study intersections had a collision rate below 1 collision per million entering vehicles and a collision frequency below 5 collisions per year. These are the typical thresholds to determine when additional safety analysis may be required. The collision data does not indicate there are any fatal or serious injury collision trends at the study intersections.

Additionally, collision data along the entire Freeman Road corridor was reviewed. The collision data along the corridor did not identify any existing collision trends. The development will be providing frontage improvements including dedicated pedestrian facilities. Build-out of the remainder of the Freeman Road corridor with full urban frontage improvements is on the City of Fife TIP.

No additional safety mitigation should be required by the development as a condition of approval. Collision data is included in the attachments.

³ The collision rate is based on Million Entering Vehicles.

⁴ Collisions per year

7. ACCESS ANALYSIS

The development is proposing three access points onto Freeman Road E, one located approximately 415 feet north of 48th Street E, one via the existing 22nd Avenue NW, and the third being an emergency fire access only just north of 19th Avenue NW. Freeman Road E is posted 25 mph along the site vicinity.

7.1 Sight Distance

For the proposed accesses on to Freeman Road E, AASHTO standards require a minimum of 155 feet of stopping sight distance and 280 feet of intersection sight distance for a 25-mph posted speed limit. The proposed access points are expected to meet these minimum requirements. Standard frontage improvements will be made based on city standards and code.

8. MITIGATION

8.1 City of Puyallup

The Freeman Road Logistics development will be subject to traffic impact fees. The City of Puyallup has a traffic impact fee of \$4,500 per PM peak hour trip. The Freeman Road Logistics development is expected to generate approximately 35.97 PM peak-hour trips. Therefore, the Freeman Logistics development would have a proportional traffic impact fee of \$161,865.

8.2 City of Fife

The Freeman Logistics development is not located in the City of Fife and is not subject to Fife mitigation fees without an interlocal agreement between Puyallup and Fife. However, Freeman Road is located within the City of Fife and will have half-street frontage improvements constructed by the applicant conforming to City of Fife standards. Portions of Freeman Road improved by the applicant will be done consistent with the ultimate build-out of the roadway as identified in Project #33 of the Fife TIP. Typically, the cost of improvements to roadways on a City's TIP are eligible for credit against standard traffic impact fees. Therefore, no additional mitigation to the City of Fife should be a condition of approval. The cost of improvements to Freeman Road in the City of Fife is not creditable against the City of Puyallup traffic impact fee.

9. CONCLUSIONS

The Freeman Road Logistics development is proposed to consist of 491,323 SF of high cube transload warehouse use. No tenants have been identified for the site; therefore, if a different type of user is proposed the development will have to do an updated Traffic Impact Analysis. There are currently fourteen residential units on site that will be removed with the proposed development and have been credited towards the development's net new trip generation calculations. The development is anticipated to generate 555.84 new daily trips, 29.51 new AM peak-hour trips, and 35.97 new PM peak-hour trips. The study intersections analyzed based on scoping discussions with City staff are expected to operate at an acceptable LOS D or better in the 2024 future with development conditions with completion of the SR-167 Extension Project and improvements to the intersection of N Levee Road E at Freeman Road E. The development should have a traffic impact fee of \$161,865 payable to the City of Puyallup after credit for the removal of the existing uses is taken. No mitigation to the City of Fife beyond improvements to Freeman Road to Fife standards should be required.

Trip Generation

Land Use: 154

High-Cube Transload and Short-Term Storage Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

The HCWs included in this land use include transload and short-term storage facilities. A transload facility has the primary function of consolidation and distribution of pallet loads (or larger) for manufacturers, wholesalers, or retailers. A transload facility typically has little storage duration, high throughput, and its operations are high efficiency. A short-term HCW is a distribution facility often with custom/special features built into the structure for the movement of large volumes of freight with only short-term storage of products.

Some limited assembly and repackaging may occur within the facility.

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

Warehousing (Land Use 150), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related land uses.

The number of dock doors at a HCW is a potential independent variable. Future data submissions should include that information.

Additional Data

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled “High-Cube Warehouse Vehicle Trip Generation Analysis,” published in October 2016. The results of this study are posted on the ITE website at <http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498>.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 2000s, and the 2010s in Alberta (CAN), California, Florida, Michigan, New Jersey, Texas, and Washington.

Source Numbers

331, 605, 619, 642, 645, 649, 739, 750, 752, 903, 904, 941, 942, 943, 969

High-Cube Transload and Short-Term Storage Warehouse (154)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 91

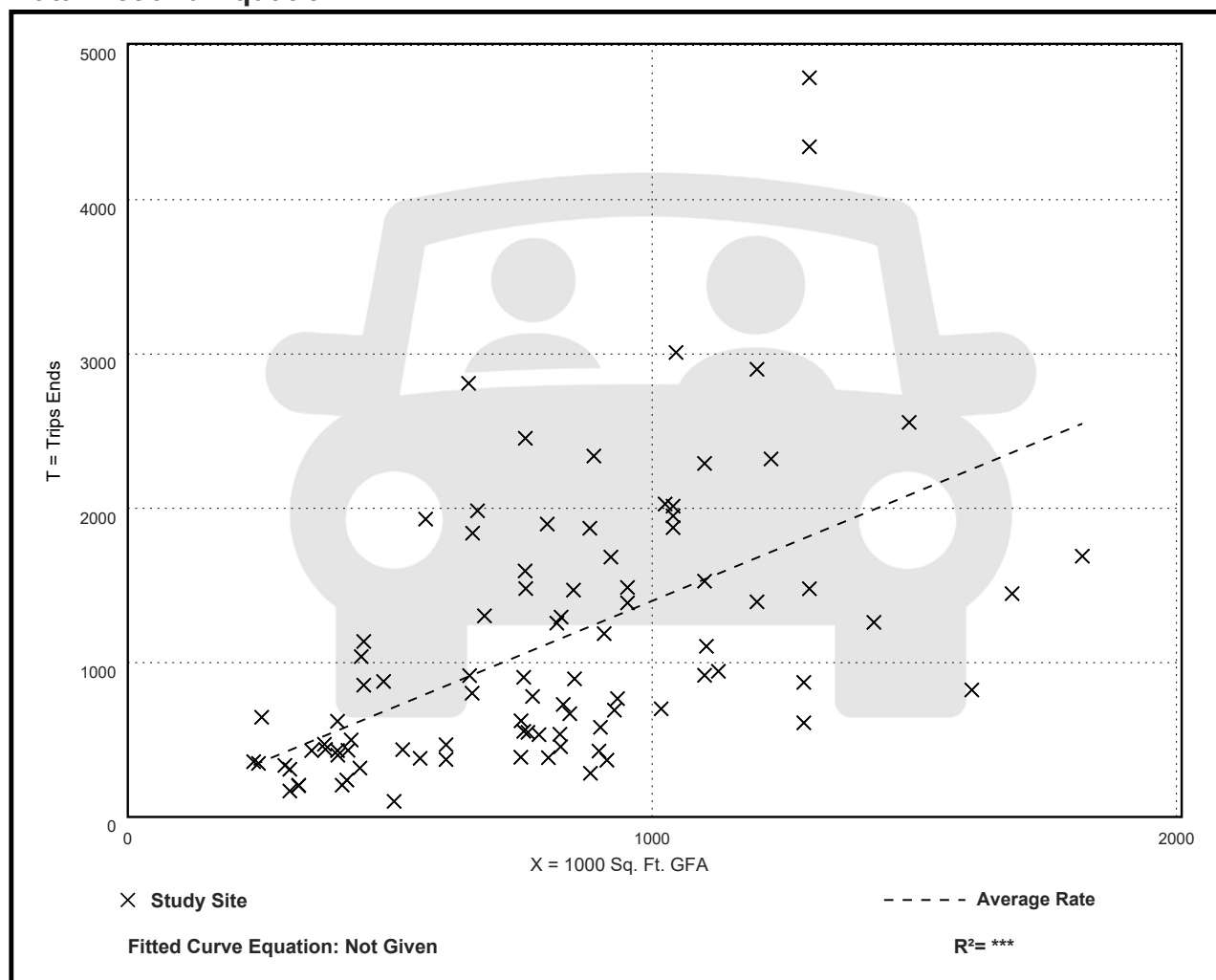
Avg. 1000 Sq. Ft. GFA: 798

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.40	0.20 - 4.32	0.86

Data Plot and Equation



High-Cube Transload and Short-Term Storage Warehouse (154)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 102

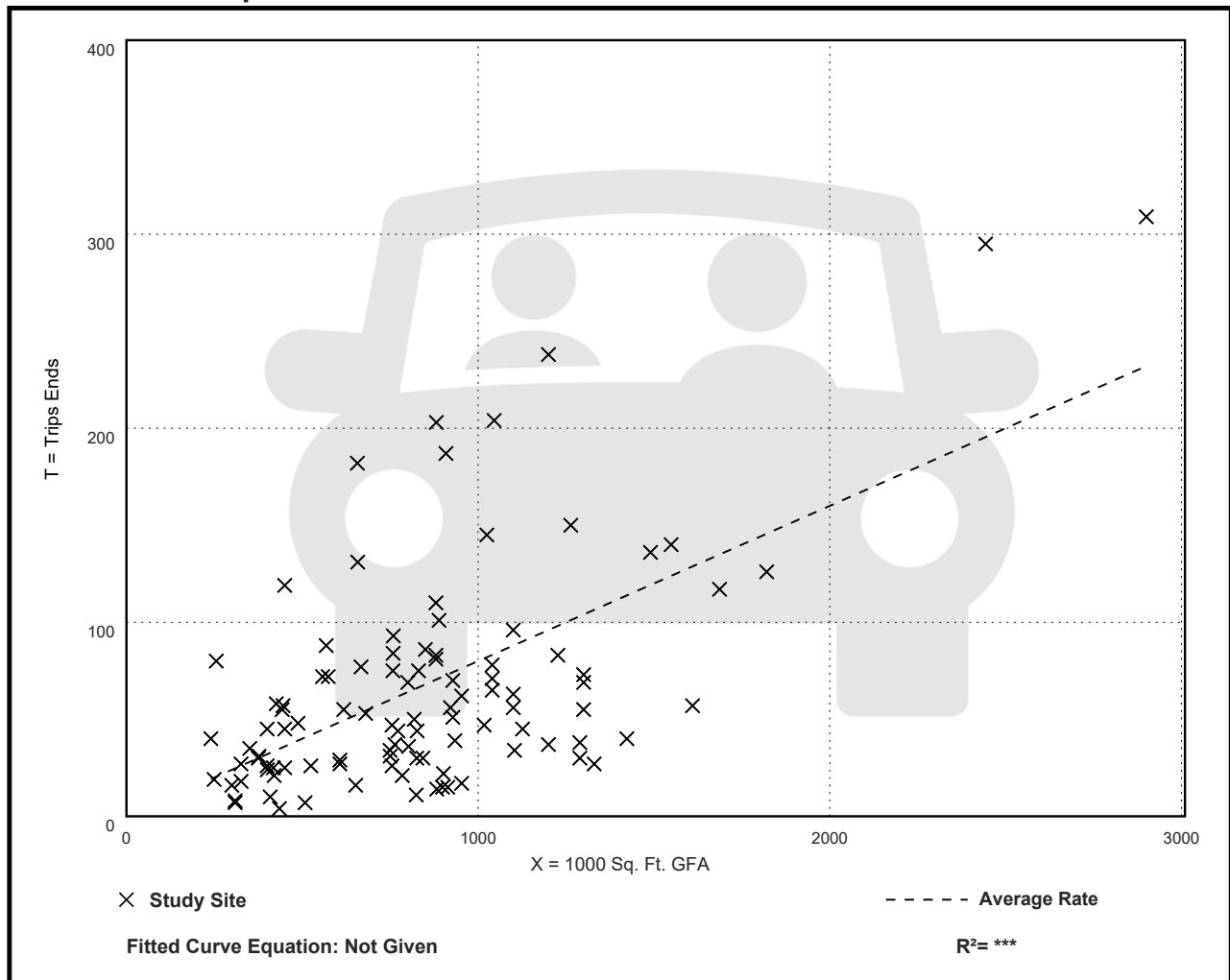
Avg. 1000 Sq. Ft. GFA: 846

Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.08	0.01 - 0.31	0.05

Data Plot and Equation



High-Cube Transload and Short-Term Storage Warehouse (154)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 103

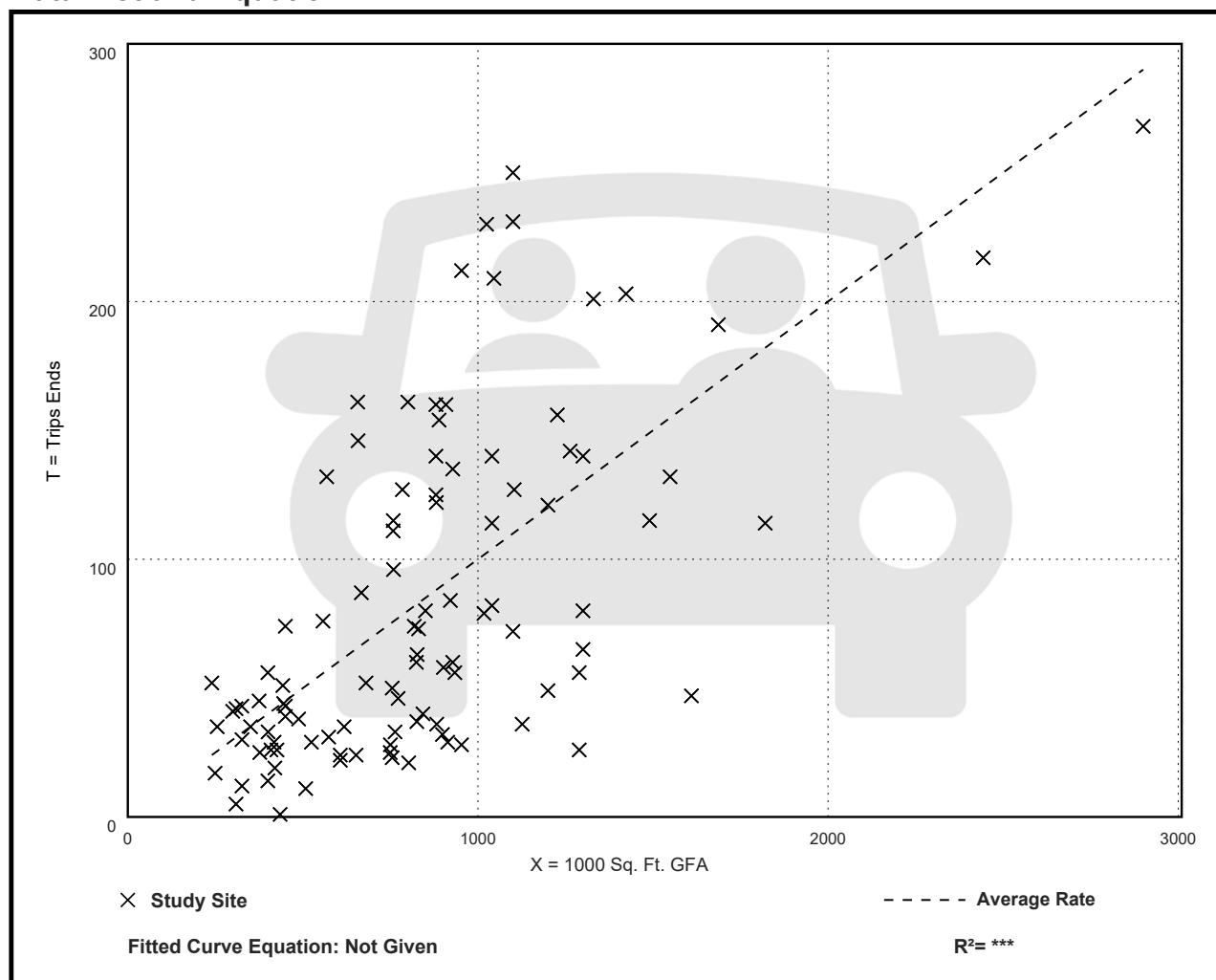
Avg. 1000 Sq. Ft. GFA: 840

Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.10	0.00 - 0.25	0.06

Data Plot and Equation



**Trip Generation for: Development Peak Weekday
(a.k.a.): Average Weekday Daily Trips (AWDT)**

NET EXTERNAL TRIPS BY TYPE														
IN BOTH DIRECTIONS										DIRECTIONAL ASSIGNMENTS				
LAND USES	VARIABLE	ITE LU code	Gross Trips			Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	
			Trip Rate	% IN	% OUT	% of Gross Trips	% of Trips In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	NEW
High-Cube Transload & Short-Term Storage Building A (Total)	234,218 KSF	154	1.40	50%	50%	0%	0.00	327.91	0%	0.00	0%	0.00	327.91	163.95
High-Cube Transload & Short-Term Storage Building B (Total)	257,105 KSF	154	1.40	50%	50%	0%	0.00	359.95	0%	0.00	0%	0.00	359.95	179.97
Single-Family Detached	-14 Units	210	9.43	50%	50%	0%	0.00	-132.02	0%	0.00	0%	0.00	-132.02	-66.01
Total Vehicle Trips							0.00	555.84		0.00		0.00	555.84	277.93

NET EXTERNAL TRIPS BY TYPE														
IN BOTH DIRECTIONS										DIRECTIONAL ASSIGNMENTS				
LAND USES	VARIABLE	ITE LU code	Gross Truck Trips			Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	
			Truck Trip Rate	% IN	% OUT	% of Gross Trips	% of Trips In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	NEW
High-Cube Transload & Short-Term Storage Building A (Truck)	234,218 KSF	154	0.22	50%	50%	0%	0.00	51.53	0%	0.00	0%	0.00	51.53	25.77
High-Cube Transload & Short-Term Storage Building B (Truck)	257,105 KSF	154	0.22	50%	50%	0%	0.00	56.56	0%	0.00	0%	0.00	56.56	28.28
Total Truck Trips							0.00	108.09		0.00		0.00	108.09	54.05

Total Passenger Car Trips: 447.75 223.88 223.87

**Trip Generation for: Development Peak Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM
(a.k.a.): Weekday AM Peak Hour**

NET EXTERNAL TRIPS BY TYPE																					
IN BOTH DIRECTIONS										DIRECTIONAL ASSIGNMENTS											
LAND USES	VARIABLE	ITE LU code	Gross Trips					Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	% of Trips In+Out (Total)	% of Ext. Trips		In+Out (Total)	% of Ext. Trips	In+Out (Total)	In		Out	In	Out			
High-Cube Transload & Short-Term Storage Building A (Total)	234.218 KSF	154	0.08	77%	23%	18.74	0%	0.00	0.00	18.74	0%	0.00	0%	0.00	0.00	18.74	0.00	0.00	0.00	14.43	4.31
High-Cube Transload & Short-Term Storage Building B (Total)	257.105 KSF	154	0.08	77%	23%	20.57	0%	0.00	0.00	20.57	0%	0.00	0%	0.00	0.00	20.57	0.00	0.00	0.00	15.84	4.73
Single-Family Detached	-14 Units	210	0.70	26%	74%	-9.80	0%	0.00	0.00	-9.80	0%	0.00	0%	0.00	0.00	-9.80	0.00	0.00	0.00	-2.55	-7.25
Total Vehicle Trips						29.51		0.00	0.00	29.51		0.00		0.00	0.00	29.51	0.00	0.00	0.00	27.72	1.79

NET EXTERNAL TRIPS BY TYPE																						
DIRECTIONAL ASSIGNMENTS																						
IN BOTH DIRECTIONS																						
LAND USES			ITE LU code	Gross Truck Trips					Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
				Truck Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	% of Trips In+Out (Total)	% of Ext. Trips		In+Out (Total)	% of Ext. Trips	In+Out (Total)	In		Out	In	Out	In	Out	
High-Cube Transload & Short-Term Storage Building A (Truck)			234,218 KSF	154	0.02	49%	51%	4.68	0%	0.00	4.68	0%	0.00	0%	0.00	0.00	4.68	0.00	0.00	2.29	2.39	
High-Cube Transload & Short-Term Storage Building B (Truck)			257,105 KSF	154	0.02	49%	51%	5.14	0%	0.00	5.14	0%	0.00	0%	0.00	0.00	5.14	0.00	0.00	2.52	2.62	
Total Truck Trips								9.82		0.00	9.82		0.00		0.00	0.00	9.82	0.00	0.00	4.81	5.01	

Total Passenger Car Trips:	19.69	22.91	-3.22
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**Trip Generation for: Development Peak Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
(a.k.a.): Weekday PM Peak Hour**

NET EXTERNAL TRIPS BY TYPE																
IN BOTH DIRECTIONS										DIRECTIONAL ASSIGNMENTS						
LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover			TOTAL	PASS-BY		DIVERTED LINK		NEW	
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	% of Trips	In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out
High-Cube Transload & Short-Term Storage Building A (Total)	234,218 KSF	154	0.10	28%	72%	23.42	0%	0.00	0.00	23.42	0%	0.00	0%	0.00	6.56	16.86
High-Cube Transload & Short-Term Storage Building B (Total)	257,105 KSF	154	0.10	28%	72%	25.71	0%	0.00	0.00	25.71	0%	0.00	0%	0.00	7.20	18.51
Single-Family Detached	-14 Units	210	0.94	63%	37%	-13.16	0%	0.00	0.00	-13.16	0%	0.00	0%	0.00	-8.29	-4.87
Total Vehicle Trips						35.97		0.00	0.00	35.97		0.00		0.00	5.47	30.50

NET EXTERNAL TRIPS BY TYPE																
IN BOTH DIRECTIONS										DIRECTIONAL ASSIGNMENTS						
LAND USES	VARIABLE	ITE LU code	Gross Truck Trips				Internal Crossover			TOTAL	PASS-BY		DIVERTED LINK		NEW	
			Truck Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	% of Trips	In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out
High-Cube Transload & Short-Term Storage Building A (Truck)	234,218 KSF	154	0.01	47%	53%	2.34	0%	0.00	0.00	2.34	0%	0.00	0%	0.00	1.10	1.24
High-Cube Transload & Short-Term Storage Building B (Truck)	257,105 KSF	154	0.01	47%	53%	2.57	0%	0.00	0.00	2.57	0%	0.00	0%	0.00	1.21	1.36
Total Truck Trips						4.91		0.00	0.00	4.91		0.00		0.00	2.31	2.60

Total Passenger Car Trips:	31.06	3.16	27.90
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Freeman Road Logistics
KH #090222083

ADT & AM Peak Hour (Truck)

AM Peak-Hour

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	108	5	5.01	10
1%	1.08	0.05	0.05	0.10
2%	2.16	0.10	0.10	0.20
3%	3.24	0.14	0.15	0.29
4%	4.32	0.19	0.20	0.39
5%	5.40	0.24	0.25	0.49
6%	6.49	0.29	0.30	0.59
7%	7.57	0.34	0.35	0.69
8%	8.65	0.38	0.40	0.79
9%	9.73	0.43	0.45	0.88
10%	10.81	0.48	0.50	0.98
11%	11.89	0.53	0.55	1.08
12%	12.97	0.58	0.60	1.18
13%	14.05	0.63	0.65	1.28
14%	15.13	0.67	0.70	1.37
15%	16.21	0.72	0.75	1.47
16%	17.29	0.77	0.80	1.57
17%	18.38	0.82	0.85	1.67
18%	19.46	0.87	0.90	1.77
19%	20.54	0.91	0.95	1.87
20%	21.62	0.96	1.00	1.96
21%	22.70	1.01	1.05	2.06
22%	23.78	1.06	1.10	2.16
23%	24.86	1.11	1.15	2.26
24%	25.94	1.15	1.20	2.36
25%	27.02	1.20	1.25	2.46
26%	28.10	1.25	1.30	2.55
27%	29.18	1.30	1.35	2.65
28%	30.27	1.35	1.40	2.75
29%	31.35	1.39	1.45	2.85
30%	32.43	1.44	1.50	2.95
31%	33.51	1.49	1.55	3.04
32%	34.59	1.54	1.60	3.14
33%	35.67	1.59	1.65	3.24
34%	36.75	1.64	1.70	3.34
35%	37.83	1.68	1.75	3.44
36%	38.91	1.73	1.80	3.54
37%	39.99	1.78	1.85	3.63
38%	41.07	1.83	1.90	3.73
39%	42.16	1.88	1.95	3.83
40%	43.24	1.92	2.00	3.93
41%	44.32	1.97	2.05	4.03
42%	45.40	2.02	2.10	4.12
43%	46.48	2.07	2.15	4.22
44%	47.56	2.12	2.20	4.32
45%	48.64	2.16	2.25	4.42
46%	49.72	2.21	2.30	4.52
47%	50.80	2.26	2.35	4.62
48%	51.88	2.31	2.40	4.71
49%	52.96	2.36	2.45	4.81
50%	54.05	2.41	2.51	4.91
%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	108	5	5	10
51%	55.13	2.45	2.56	5.01
52%	56.21	2.50	2.61	5.11
53%	57.29	2.55	2.66	5.20
54%	58.37	2.60	2.71	5.30
55%	59.45	2.65	2.76	5.40
56%	60.53	2.69	2.81	5.50
57%	61.61	2.74	2.86	5.60
58%	62.69	2.79	2.91	5.70
59%	63.77	2.84	2.96	5.79
60%	64.85	2.89	3.01	5.89
61%	65.93	2.93	3.06	5.99
62%	67.02	2.98	3.11	6.09
63%	68.10	3.03	3.16	6.19
64%	69.18	3.08	3.21	6.28
65%	70.26	3.13	3.26	6.38
66%	71.34	3.17	3.31	6.48
67%	72.42	3.22	3.36	6.58
68%	73.50	3.27	3.41	6.68
69%	74.58	3.32	3.46	6.78
70%	75.66	3.37	3.51	6.87
71%	76.74	3.42	3.56	6.97
72%	77.82	3.46	3.61	7.07
73%	78.91	3.51	3.66	7.17
74%	79.99	3.56	3.71	7.27
75%	81.07	3.61	3.76	7.37
76%	82.15	3.66	3.81	7.46
77%	83.23	3.70	3.86	7.56
78%	84.31	3.75	3.91	7.66
79%	85.39	3.80	3.96	7.76
80%	86.47	3.85	4.01	7.86
81%	87.55	3.90	4.06	7.95
82%	88.63	3.94	4.11	8.05
83%	89.71	3.99	4.16	8.15
84%	90.80	4.04	4.21	8.25
85%	91.88	4.09	4.26	8.35
86%	92.96	4.14	4.31	8.45
87%	94.04	4.18	4.36	8.54
88%	95.12	4.23	4.41	8.64
89%	96.20	4.28	4.46	8.74
90%	97.28	4.33	4.51	8.84
91%	98.36	4.38	4.56	8.94
92%	99.44	4.43	4.61	9.03
93%	100.52	4.47	4.66	9.13
94%	101.60	4.52	4.71	9.23
95%	102.69	4.57	4.76	9.33
96%	103.77	4.62	4.81	9.43
97%	104.85	4.67	4.86	9.53
98%	105.93	4.71	4.91	9.62
99%	107.01	4.76	4.96	9.72
100%	108.09	4.81	5.01	9.82

Freeman Road Logistics
KH #090222083

ADT & PM Peak Hour (Truck)

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	108	2	3	5
1%	1.08	0.02	0.03	0.05
2%	2.16	0.05	0.05	0.10
3%	3.24	0.07	0.08	0.15
4%	4.32	0.09	0.10	0.20
5%	5.40	0.12	0.13	0.25
6%	6.49	0.14	0.16	0.29
7%	7.57	0.16	0.18	0.34
8%	8.65	0.18	0.21	0.39
9%	9.73	0.21	0.23	0.44
10%	10.81	0.23	0.26	0.49
11%	11.89	0.25	0.29	0.54
12%	12.97	0.28	0.31	0.59
13%	14.05	0.30	0.34	0.64
14%	15.13	0.32	0.36	0.69
15%	16.21	0.35	0.39	0.74
16%	17.29	0.37	0.42	0.79
17%	18.38	0.39	0.44	0.83
18%	19.46	0.42	0.47	0.88
19%	20.54	0.44	0.49	0.93
20%	21.62	0.46	0.52	0.98
21%	22.70	0.49	0.55	1.03
22%	23.78	0.51	0.57	1.08
23%	24.86	0.53	0.60	1.13
24%	25.94	0.55	0.62	1.18
25%	27.02	0.58	0.65	1.23
26%	28.10	0.60	0.68	1.28
27%	29.18	0.62	0.70	1.33
28%	30.27	0.65	0.73	1.37
29%	31.35	0.67	0.75	1.42
30%	32.43	0.69	0.78	1.47
31%	33.51	0.72	0.81	1.52
32%	34.59	0.74	0.83	1.57
33%	35.67	0.76	0.86	1.62
34%	36.75	0.79	0.88	1.67
35%	37.83	0.81	0.91	1.72
36%	38.91	0.83	0.94	1.77
37%	39.99	0.85	0.96	1.82
38%	41.07	0.88	0.99	1.87
39%	42.16	0.90	1.01	1.91
40%	43.24	0.92	1.04	1.96
41%	44.32	0.95	1.07	2.01
42%	45.40	0.97	1.09	2.06
43%	46.48	0.99	1.12	2.11
44%	47.56	1.02	1.14	2.16
45%	48.64	1.04	1.17	2.21
46%	49.72	1.06	1.20	2.26
47%	50.80	1.09	1.22	2.31
48%	51.88	1.11	1.25	2.36
49%	52.96	1.13	1.27	2.41
50%	54.05	1.16	1.30	2.46
51%	55.13	1.18	1.33	2.50
52%	56.21	1.20	1.35	2.55
53%	57.29	1.22	1.38	2.60
54%	58.37	1.25	1.40	2.65
55%	59.45	1.27	1.43	2.70
56%	60.53	1.29	1.46	2.75
57%	61.61	1.32	1.48	2.80
58%	62.69	1.34	1.51	2.85
59%	63.77	1.36	1.53	2.90
60%	64.85	1.39	1.56	2.95
61%	65.93	1.41	1.59	3.00
62%	67.02	1.43	1.61	3.04
63%	68.10	1.46	1.64	3.09
64%	69.18	1.48	1.66	3.14
65%	70.26	1.50	1.69	3.19
66%	71.34	1.52	1.72	3.24
67%	72.42	1.55	1.74	3.29
68%	73.50	1.57	1.77	3.34
69%	74.58	1.59	1.79	3.39
70%	75.66	1.62	1.82	3.44
71%	76.74	1.64	1.85	3.49
72%	77.82	1.66	1.87	3.54
73%	78.91	1.69	1.90	3.58
74%	79.99	1.71	1.92	3.63
75%	81.07	1.73	1.95	3.68
76%	82.15	1.76	1.98	3.73
77%	83.23	1.78	2.00	3.78
78%	84.31	1.80	2.03	3.83
79%	85.39	1.82	2.05	3.88
80%	86.47	1.85	2.08	3.93
81%	87.55	1.87	2.11	3.98
82%	88.63	1.89	2.13	4.03
83%	89.71	1.92	2.16	4.08
84%	90.80	1.94	2.18	4.12
85%	91.88	1.96	2.21	4.17
86%	92.96	1.99	2.24	4.22
87%	94.04	2.01	2.26	4.27
88%	95.12	2.03	2.29	4.32
89%	96.20	2.06	2.31	4.37
90%	97.28	2.08	2.34	4.42
91%	98.36	2.10	2.37	4.47
92%	99.44	2.13	2.39	4.52
93%	100.52	2.15	2.42	4.57
94%	101.60	2.17	2.44	4.62
95%	102.69	2.19	2.47	4.66
96%	103.77	2.22	2.50	4.71
97%	104.85	2.24	2.52	4.76
98%	105.93	2.26	2.55	4.81
99%	107.01	2.29	2.57	4.86
100%	108.09	2.31	2.60	4.91

Freeman Road Logistics
KH #090222083

ADT & AM Peak Hour (Car)

AM Peak-Hour

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	448	23	-3	20
1%	4.48	0.23	-0.03	0.20
2%	8.96	0.46	-0.06	0.39
3%	13.43	0.69	-0.10	0.59
4%	17.91	0.92	-0.13	0.79
5%	22.39	1.15	-0.16	0.98
6%	26.87	1.37	-0.19	1.18
7%	31.34	1.60	-0.23	1.38
8%	35.82	1.83	-0.26	1.58
9%	40.30	2.06	-0.29	1.77
10%	44.78	2.29	-0.32	1.97
11%	49.25	2.52	-0.35	2.17
12%	53.73	2.75	-0.39	2.36
13%	58.21	2.98	-0.42	2.56
14%	62.69	3.21	-0.45	2.76
15%	67.16	3.44	-0.48	2.95
16%	71.64	3.67	-0.52	3.15
17%	76.12	3.89	-0.55	3.35
18%	80.60	4.12	-0.58	3.54
19%	85.07	4.35	-0.61	3.74
20%	89.55	4.58	-0.64	3.94
21%	94.03	4.81	-0.68	4.13
22%	98.51	5.04	-0.71	4.33
23%	102.98	5.27	-0.74	4.53
24%	107.46	5.50	-0.77	4.73
25%	111.94	5.73	-0.81	4.92
26%	116.42	5.96	-0.84	5.12
27%	120.89	6.19	-0.87	5.32
28%	125.37	6.41	-0.90	5.51
29%	129.85	6.64	-0.93	5.71
30%	134.33	6.87	-0.97	5.91
31%	138.80	7.10	-1.00	6.10
32%	143.28	7.33	-1.03	6.30
33%	147.76	7.56	-1.06	6.50
34%	152.24	7.79	-1.09	6.69
35%	156.71	8.02	-1.13	6.89
36%	161.19	8.25	-1.16	7.09
37%	165.67	8.48	-1.19	7.29
38%	170.15	8.71	-1.22	7.48
39%	174.62	8.93	-1.26	7.68
40%	179.10	9.16	-1.29	7.88
41%	183.58	9.39	-1.32	8.07
42%	188.06	9.62	-1.35	8.27
43%	192.53	9.85	-1.38	8.47
44%	197.01	10.08	-1.42	8.66
45%	201.49	10.31	-1.45	8.86
46%	205.97	10.54	-1.48	9.06
47%	210.44	10.77	-1.51	9.25
48%	214.92	11.00	-1.55	9.45
49%	219.40	11.23	-1.58	9.65
50%	223.88	11.46	-1.61	9.85
51%	228.35	11.68	-1.64	10.04
52%	232.83	11.91	-1.67	10.24
53%	237.31	12.14	-1.71	10.44
54%	241.79	12.37	-1.74	10.63
55%	246.26	12.60	-1.77	10.83
56%	250.74	12.83	-1.80	11.03
57%	255.22	13.06	-1.84	11.22
58%	259.70	13.29	-1.87	11.42
59%	264.17	13.52	-1.90	11.62
60%	268.65	13.75	-1.93	11.81
61%	273.13	13.98	-1.96	12.01
62%	277.61	14.20	-2.00	12.21
63%	282.08	14.43	-2.03	12.40
64%	286.56	14.66	-2.06	12.60
65%	291.04	14.89	-2.09	12.80
66%	295.52	15.12	-2.13	13.00
67%	299.99	15.35	-2.16	13.19
68%	304.47	15.58	-2.19	13.39
69%	308.95	15.81	-2.22	13.59
70%	313.43	16.04	-2.25	13.78
71%	317.90	16.27	-2.29	13.98
72%	322.38	16.50	-2.32	14.18
73%	326.86	16.72	-2.35	14.37
74%	331.34	16.95	-2.38	14.57
75%	335.81	17.18	-2.42	14.77
76%	340.29	17.41	-2.45	14.96
77%	344.77	17.64	-2.48	15.16
78%	349.25	17.87	-2.51	15.36
79%	353.72	18.10	-2.54	15.56
80%	358.20	18.33	-2.58	15.75
81%	362.68	18.56	-2.61	15.95
82%	367.16	18.79	-2.64	16.15
83%	371.63	19.02	-2.67	16.34
84%	376.11	19.24	-2.70	16.54
85%	380.59	19.47	-2.74	16.74
86%	385.07	19.70	-2.77	16.93
87%	389.54	19.93	-2.80	17.13
88%	394.02	20.16	-2.83	17.33
89%	398.50	20.39	-2.87	17.52
90%	402.98	20.62	-2.90	17.72
91%	407.45	20.85	-2.93	17.92
92%	411.93	21.08	-2.96	18.11
93%	416.41	21.31	-2.99	18.31
94%	420.89	21.54	-3.03	18.51
95%	425.36	21.76	-3.06	18.71
96%	429.84	21.99	-3.09	18.90
97%	434.32	22.22	-3.12	19.10
98%	438.80	22.45	-3.16	19.30
99%	443.27	22.68	-3.19	19.49
100%	447.75	22.91	-3.22	19.69

Freeman Road Logistics
KH #090222083

ADT & PM Peak Hour (Car)

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	448	3	27.9	31
1%	4.48	0.03	0.28	0.31
2%	8.96	0.06	0.56	0.62
3%	13.43	0.09	0.84	0.93
4%	17.91	0.13	1.12	1.24
5%	22.39	0.16	1.40	1.55
6%	26.87	0.19	1.67	1.86
7%	31.34	0.22	1.95	2.17
8%	35.82	0.25	2.23	2.48
9%	40.30	0.28	2.51	2.80
10%	44.78	0.32	2.79	3.11
11%	49.25	0.35	3.07	3.42
12%	53.73	0.38	3.35	3.73
13%	58.21	0.41	3.63	4.04
14%	62.69	0.44	3.91	4.35
15%	67.16	0.47	4.19	4.66
16%	71.64	0.51	4.46	4.97
17%	76.12	0.54	4.74	5.28
18%	80.60	0.57	5.02	5.59
19%	85.07	0.60	5.30	5.90
20%	89.55	0.63	5.58	6.21
21%	94.03	0.66	5.86	6.52
22%	98.51	0.70	6.14	6.83
23%	102.98	0.73	6.42	7.14
24%	107.46	0.76	6.70	7.45
25%	111.94	0.79	6.98	7.77
26%	116.42	0.82	7.25	8.08
27%	120.89	0.85	7.53	8.39
28%	125.37	0.88	7.81	8.70
29%	129.85	0.92	8.09	9.01
30%	134.33	0.95	8.37	9.32
31%	138.80	0.98	8.65	9.63
32%	143.28	1.01	8.93	9.94
33%	147.76	1.04	9.21	10.25
34%	152.24	1.07	9.49	10.56
35%	156.71	1.11	9.77	10.87
36%	161.19	1.14	10.04	11.18
37%	165.67	1.17	10.32	11.49
38%	170.15	1.20	10.60	11.80
39%	174.62	1.23	10.88	12.11
40%	179.10	1.26	11.16	12.42
41%	183.58	1.30	11.44	12.73
42%	188.06	1.33	11.72	13.05
43%	192.53	1.36	12.00	13.36
44%	197.01	1.39	12.28	13.67
45%	201.49	1.42	12.56	13.98
46%	205.97	1.45	12.83	14.29
47%	210.44	1.49	13.11	14.60
48%	214.92	1.52	13.39	14.91
49%	219.40	1.55	13.67	15.22
50%	223.88	1.58	13.95	15.53
51%	228.35	1.61	14.23	15.84
52%	232.83	1.64	14.51	16.15
53%	237.31	1.67	14.79	16.46
54%	241.79	1.71	15.07	16.77
55%	246.26	1.74	15.35	17.08
56%	250.74	1.77	15.62	17.39
57%	255.22	1.80	15.90	17.70
58%	259.70	1.83	16.18	18.01
59%	264.17	1.86	16.46	18.33
60%	268.65	1.90	16.74	18.64
61%	273.13	1.93	17.02	18.95
62%	277.61	1.96	17.30	19.26
63%	282.08	1.99	17.58	19.57
64%	286.56	2.02	17.86	19.88
65%	291.04	2.05	18.14	20.19
66%	295.52	2.09	18.41	20.50
67%	299.99	2.12	18.69	20.81
68%	304.47	2.15	18.97	21.12
69%	308.95	2.18	19.25	21.43
70%	313.43	2.21	19.53	21.74
71%	317.90	2.24	19.81	22.05
72%	322.38	2.28	20.09	22.36
73%	326.86	2.31	20.37	22.67
74%	331.34	2.34	20.65	22.98
75%	335.81	2.37	20.93	23.30
76%	340.29	2.40	21.20	23.61
77%	344.77	2.43	21.48	23.92
78%	349.25	2.46	21.76	24.23
79%	353.72	2.50	22.04	24.54
80%	358.20	2.53	22.32	24.85
81%	362.68	2.56	22.60	25.16
82%	367.16	2.59	22.88	25.47
83%	371.63	2.62	23.16	25.78
84%	376.11	2.65	23.44	26.09
85%	380.59	2.69	23.72	26.40
86%	385.07	2.72	23.99	26.71
87%	389.54	2.75	24.27	27.02
88%	394.02	2.78	24.55	27.33
89%	398.50	2.81	24.83	27.64
90%	402.98	2.84	25.11	27.95
91%	407.45	2.88	25.39	28.26
92%	411.93	2.91	25.67	28.58
93%	416.41	2.94	25.95	28.89
94%	420.89	2.97	26.23	29.20
95%	425.36	3.00	26.51	29.51
96%	429.84	3.03	26.78	29.82
97%	434.32	3.07	27.06	30.13
98%	438.80	3.10	27.34	30.44
99%	443.27	3.13	27.62	30.75
100%	447.75	3.16	27.90	31.06

Freeman Road Logistics
KH #090222083

ADT & AM Peak Hour (Total)

AM Peak-Hour

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	556	28	2	30
1%	5.56	0.28	0.02	0.30
2%	11.12	0.55	0.04	0.59
3%	16.68	0.83	0.05	0.89
4%	22.23	1.11	0.07	1.18
5%	27.79	1.39	0.09	1.48
6%	33.35	1.66	0.11	1.77
7%	38.91	1.94	0.13	2.07
8%	44.47	2.22	0.14	2.36
9%	50.03	2.49	0.16	2.66
10%	55.58	2.77	0.18	2.95
11%	61.14	3.05	0.20	3.25
12%	66.70	3.33	0.21	3.54
13%	72.26	3.60	0.23	3.84
14%	77.82	3.88	0.25	4.13
15%	83.38	4.16	0.27	4.43
16%	88.93	4.44	0.29	4.72
17%	94.49	4.71	0.30	5.02
18%	100.05	4.99	0.32	5.31
19%	105.61	5.27	0.34	5.61
20%	111.17	5.54	0.36	5.90
21%	116.73	5.82	0.38	6.20
22%	122.28	6.10	0.39	6.49
23%	127.84	6.38	0.41	6.79
24%	133.40	6.65	0.43	7.08
25%	138.96	6.93	0.45	7.38
26%	144.52	7.21	0.47	7.67
27%	150.08	7.48	0.48	7.97
28%	155.64	7.76	0.50	8.26
29%	161.19	8.04	0.52	8.56
30%	166.75	8.32	0.54	8.85
31%	172.31	8.59	0.55	9.15
32%	177.87	8.87	0.57	9.44
33%	183.43	9.15	0.59	9.74
34%	188.99	9.42	0.61	10.03
35%	194.54	9.70	0.63	10.33
36%	200.10	9.98	0.64	10.62
37%	205.66	10.26	0.66	10.92
38%	211.22	10.53	0.68	11.21
39%	216.78	10.81	0.70	11.51
40%	222.34	11.09	0.72	11.80
41%	227.89	11.37	0.73	12.10
42%	233.45	11.64	0.75	12.39
43%	239.01	11.92	0.77	12.69
44%	244.57	12.20	0.79	12.98
45%	250.13	12.47	0.81	13.28
46%	255.69	12.75	0.82	13.57
47%	261.24	13.03	0.84	13.87
48%	266.80	13.31	0.86	14.16
49%	272.36	13.58	0.88	14.46
50%	277.92	13.86	0.90	14.76
%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	556	28	2	30
51%	283.48	14.14	0.91	15.05
52%	289.04	14.41	0.93	15.35
53%	294.60	14.69	0.95	15.64
54%	300.15	14.97	0.97	15.94
55%	305.71	15.25	0.98	16.23
56%	311.27	15.52	1.00	16.53
57%	316.83	15.80	1.02	16.82
58%	322.39	16.08	1.04	17.12
59%	327.95	16.35	1.06	17.41
60%	333.50	16.63	1.07	17.71
61%	339.06	16.91	1.09	18.00
62%	344.62	17.19	1.11	18.30
63%	350.18	17.46	1.13	18.59
64%	355.74	17.74	1.15	18.89
65%	361.30	18.02	1.16	19.18
66%	366.85	18.30	1.18	19.48
67%	372.41	18.57	1.20	19.77
68%	377.97	18.85	1.22	20.07
69%	383.53	19.13	1.24	20.36
70%	389.09	19.40	1.25	20.66
71%	394.65	19.68	1.27	20.95
72%	400.20	19.96	1.29	21.25
73%	405.76	20.24	1.31	21.54
74%	411.32	20.51	1.32	21.84
75%	416.88	20.79	1.34	22.13
76%	422.44	21.07	1.36	22.43
77%	428.00	21.34	1.38	22.72
78%	433.56	21.62	1.40	23.02
79%	439.11	21.90	1.41	23.31
80%	444.67	22.18	1.43	23.61
81%	450.23	22.45	1.45	23.90
82%	455.79	22.73	1.47	24.20
83%	461.35	23.01	1.49	24.49
84%	466.91	23.28	1.50	24.79
85%	472.46	23.56	1.52	25.08
86%	478.02	23.84	1.54	25.38
87%	483.58	24.12	1.56	25.67
88%	489.14	24.39	1.58	25.97
89%	494.70	24.67	1.59	26.26
90%	500.26	24.95	1.61	26.56
91%	505.81	25.23	1.63	26.85
92%	511.37	25.50	1.65	27.15
93%	516.93	25.78	1.66	27.44
94%	522.49	26.06	1.68	27.74
95%	528.05	26.33	1.70	28.03
96%	533.61	26.61	1.72	28.33
97%	539.16	26.89	1.74	28.62
98%	544.72	27.17	1.75	28.92
99%	550.28	27.44	1.77	29.21
100%	555.84	27.72	1.79	29.51

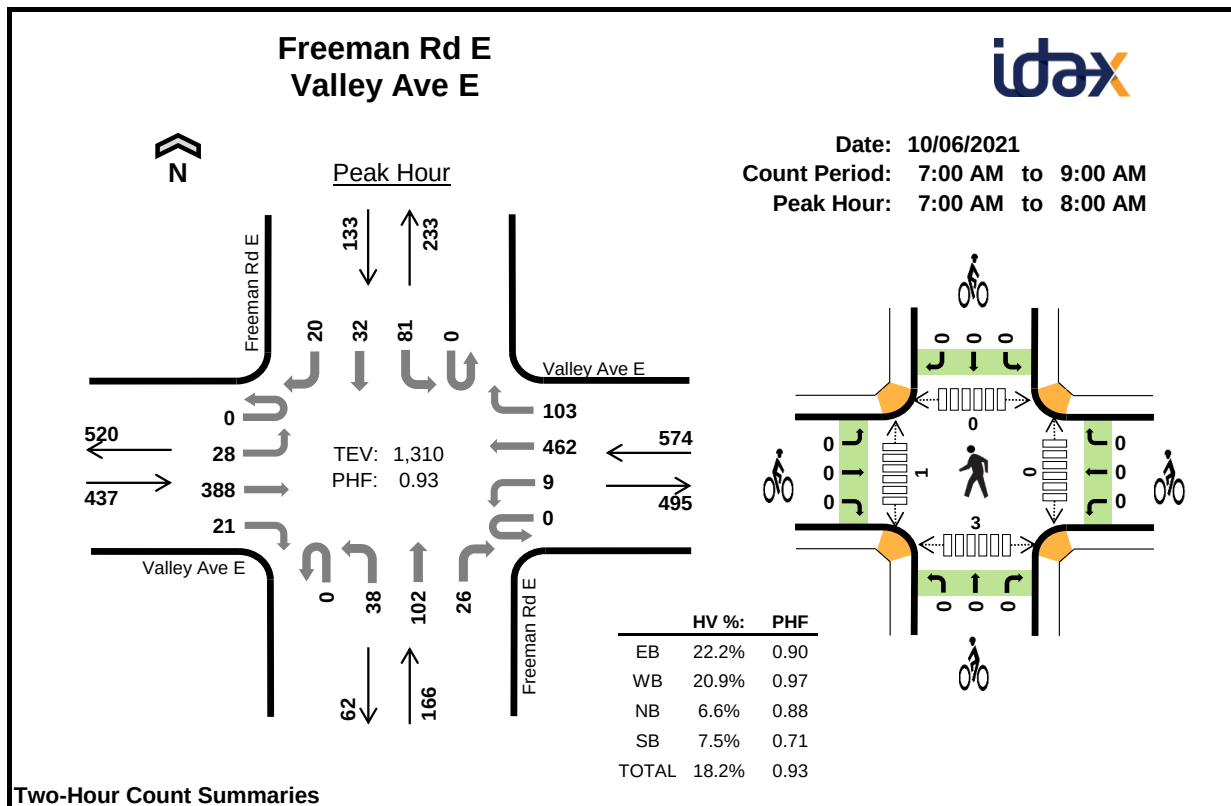
Freeman Road Logistics
KH #090222083

ADT & PM Peak Hour (Total)

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	556	5	31	36
1%	5.56	0.05	0.31	0.36
2%	11.12	0.11	0.61	0.72
3%	16.68	0.16	0.92	1.08
4%	22.23	0.22	1.22	1.44
5%	27.79	0.27	1.53	1.80
6%	33.35	0.33	1.83	2.16
7%	38.91	0.38	2.14	2.52
8%	44.47	0.44	2.44	2.88
9%	50.03	0.49	2.75	3.24
10%	55.58	0.55	3.05	3.60
11%	61.14	0.60	3.36	3.96
12%	66.70	0.66	3.66	4.32
13%	72.26	0.71	3.97	4.68
14%	77.82	0.77	4.27	5.04
15%	83.38	0.82	4.58	5.40
16%	88.93	0.88	4.88	5.76
17%	94.49	0.93	5.19	6.11
18%	100.05	0.98	5.49	6.47
19%	105.61	1.04	5.80	6.83
20%	111.17	1.09	6.10	7.19
21%	116.73	1.15	6.41	7.55
22%	122.28	1.20	6.71	7.91
23%	127.84	1.26	7.02	8.27
24%	133.40	1.31	7.32	8.63
25%	138.96	1.37	7.63	8.99
26%	144.52	1.42	7.93	9.35
27%	150.08	1.48	8.24	9.71
28%	155.64	1.53	8.54	10.07
29%	161.19	1.59	8.85	10.43
30%	166.75	1.64	9.15	10.79
31%	172.31	1.70	9.46	11.15
32%	177.87	1.75	9.76	11.51
33%	183.43	1.81	10.07	11.87
34%	188.99	1.86	10.37	12.23
35%	194.54	1.91	10.68	12.59
36%	200.10	1.97	10.98	12.95
37%	205.66	2.02	11.29	13.31
38%	211.22	2.08	11.59	13.67
39%	216.78	2.13	11.90	14.03
40%	222.34	2.19	12.20	14.39
41%	227.89	2.24	12.51	14.75
42%	233.45	2.30	12.81	15.11
43%	239.01	2.35	13.12	15.47
44%	244.57	2.41	13.42	15.83
45%	250.13	2.46	13.73	16.19
46%	255.69	2.52	14.03	16.55
47%	261.24	2.57	14.34	16.91
48%	266.80	2.63	14.64	17.27
49%	272.36	2.68	14.95	17.63
50%	277.92	2.74	15.25	17.99
51%	283.48	2.79	15.56	18.34
52%	289.04	2.84	15.86	18.70
53%	294.60	2.90	16.17	19.06
54%	300.15	2.95	16.47	19.42
55%	305.71	3.01	16.78	19.78
56%	311.27	3.06	17.08	20.14
57%	316.83	3.12	17.39	20.50
58%	322.39	3.17	17.69	20.86
59%	327.95	3.23	18.00	21.22
60%	333.50	3.28	18.30	21.58
61%	339.06	3.34	18.61	21.94
62%	344.62	3.39	18.91	22.30
63%	350.18	3.45	19.22	22.66
64%	355.74	3.50	19.52	23.02
65%	361.30	3.56	19.83	23.38
66%	366.85	3.61	20.13	23.74
67%	372.41	3.66	20.44	24.10
68%	377.97	3.72	20.74	24.46
69%	383.53	3.77	21.05	24.82
70%	389.09	3.83	21.35	25.18
71%	394.65	3.88	21.66	25.54
72%	400.20	3.94	21.96	25.90
73%	405.76	3.99	22.27	26.26
74%	411.32	4.05	22.57	26.62
75%	416.88	4.10	22.88	26.98
76%	422.44	4.16	23.18	27.34
77%	428.00	4.21	23.49	27.70
78%	433.56	4.27	23.79	28.06
79%	439.11	4.32	24.10	28.42
80%	444.67	4.38	24.40	28.78
81%	450.23	4.43	24.71	29.14
82%	455.79	4.49	25.01	29.50
83%	461.35	4.54	25.32	29.86
84%	466.91	4.59	25.62	30.21
85%	472.46	4.65	25.93	30.57
86%	478.02	4.70	26.23	30.93
87%	483.58	4.76	26.54	31.29
88%	489.14	4.81	26.84	31.65
89%	494.70	4.87	27.15	32.01
90%	500.26	4.92	27.45	32.37
91%	505.81	4.98	27.76	32.73
92%	511.37	5.03	28.06	33.09
93%	516.93	5.09	28.37	33.45
94%	522.49	5.14	28.67	33.81
95%	528.05	5.20	28.98	34.17
96%	533.61	5.25	29.28	34.53
97%	539.16	5.31	29.59	34.89
98%	544.72	5.36	29.89	35.25
99%	550.28	5.42	30.20	35.61
100%	555.84	5.47	30.50	35.97

AM Count Data & Turning Movements

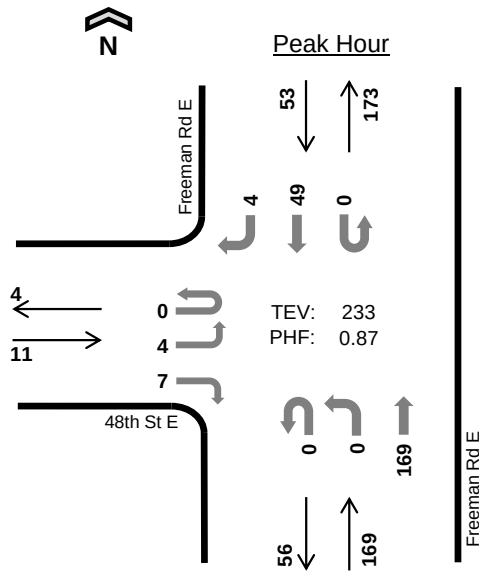


Interval Start		Valley Ave E				Valley Ave E				Freeman Rd E				Freeman Rd E				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	4	82	4	0	3	108	32	0	6	20	6	0	12	4	4	285	0
7:15 AM		0	10	97	7	0	3	106	27	0	9	21	11	0	22	7	10	330	0
7:30 AM		0	10	107	4	0	0	127	21	0	9	30	7	0	19	6	2	342	0
7:45 AM		0	4	102	6	0	3	121	23	0	14	31	2	0	28	15	4	353	1,310
8:00 AM		0	3	71	2	0	2	94	26	0	16	26	5	0	19	9	4	277	1,302
8:15 AM		0	4	69	1	0	0	108	25	0	8	11	3	0	28	8	4	269	1,241
8:30 AM		0	3	73	4	0	4	95	30	0	6	20	6	0	25	9	4	279	1,178
8:45 AM		0	4	73	5	0	0	87	27	0	2	10	4	0	23	7	5	247	1,072
Count Total		0	42	674	33	0	15	846	211	0	70	169	44	0	176	65	37	2,382	0
Peak Hour	All	0	28	388	21	0	9	462	103	0	38	102	26	0	81	32	20	1,310	0
	HV	0	6	89	2	0	0	111	9	0	5	2	4	0	6	1	3	238	0
	HV%	-	21%	23%	10%	-	0%	24%	9%	-	13%	2%	15%	-	7%	3%	15%	18%	0

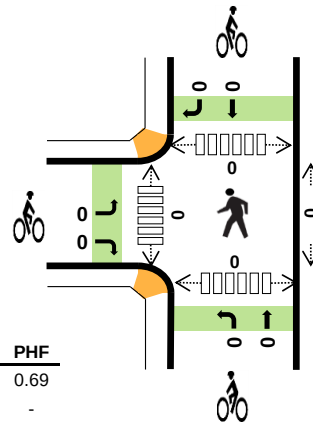
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	13	26	2	3	44	0	0	0	0	0	0	0	0	2	2
7:15 AM	30	34	4	2	70	0	0	0	0	0	0	1	0	1	2
7:30 AM	28	34	4	2	68	0	0	0	0	0	0	0	0	0	0
7:45 AM	26	26	1	3	56	0	0	0	0	0	0	0	0	0	0
8:00 AM	25	21	5	2	53	0	0	0	0	0	0	0	0	0	0
8:15 AM	21	30	0	8	59	0	0	0	0	0	0	0	0	1	1
8:30 AM	23	30	2	6	61	0	0	0	0	0	0	0	0	0	0
8:45 AM	24	25	1	5	55	0	0	0	0	0	0	1	0	0	1
Count Total	190	226	19	31	466	0	0	0	0	0	0	2	0	4	6
Peak Hour	97	120	11	10	238	0	0	0	0	0	0	1	0	3	4

Freeman Rd E 48th St E



Date: 10/13/2021
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



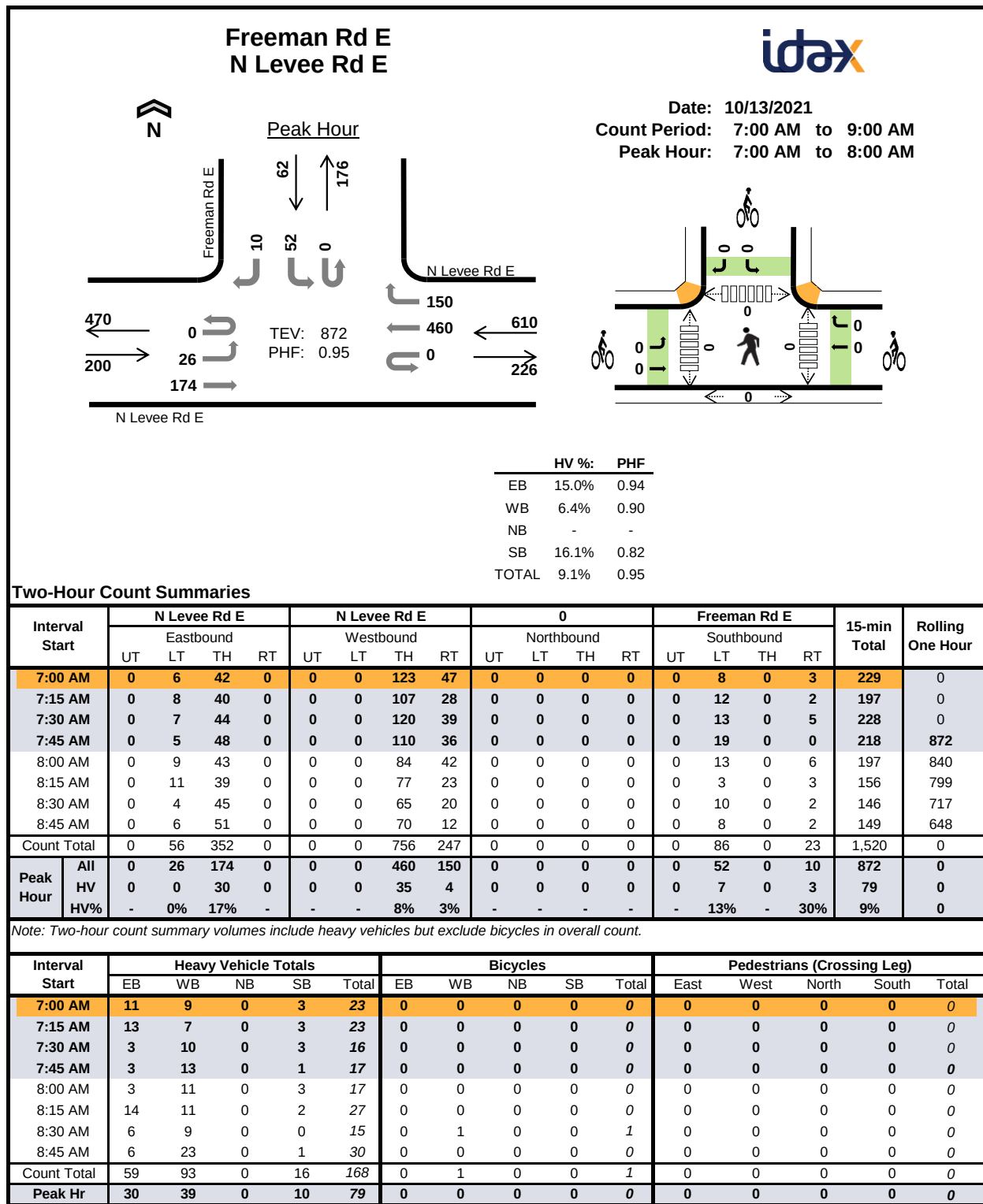
	HV %:	PHF
EB	9.1%	0.69
WB	-	-
NB	1.8%	0.90
SB	1.9%	0.78
TOTAL	2.1%	0.87

Two-Hour Count Summaries

Interval Start		48th St E				0				Freeman Rd E				Freeman Rd E				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	2	0	1	0	0	0	0	0	0	51	0	0	0	7	0	61	0
7:15 AM		0	1	0	1	0	0	0	0	0	0	37	0	0	0	8	0	47	0
7:30 AM		0	1	0	1	0	0	0	0	0	0	44	0	0	0	12	1	59	0
7:45 AM		0	2	0	2	0	0	0	0	0	0	41	0	0	0	14	1	60	227
8:00 AM		0	0	0	3	0	0	0	0	0	0	47	0	0	0	15	2	67	233
8:15 AM		0	2	0	1	0	0	0	0	0	0	30	0	0	0	5	0	38	224
8:30 AM		0	0	0	1	0	0	0	0	0	4	20	0	0	0	8	1	34	199
8:45 AM		1	0	0	2	0	0	0	0	0	1	16	0	0	0	7	1	28	167
Count Total		1	8	0	12	0	0	0	0	0	5	286	0	0	0	76	6	394	0
Peak Hour	All	0	4	0	7	0	0	0	0	0	0	169	0	0	0	49	4	233	0
	HV	0	0	0	1	0	0	0	0	0	0	3	0	0	0	1	0	5	0
	HV%	-	0%	-	14%	-	-	-	-	-	-	2%	-	-	-	2%	0%	2%	0

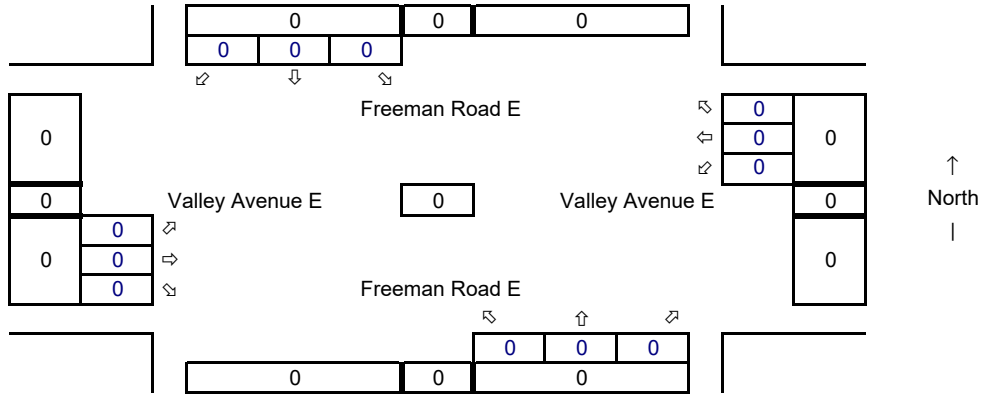
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	1	2	1	0	0	0	1	0	0	0	0	0
8:30 AM	0	0	1	1	2	0	0	1	0	1	0	0	0	0	0
8:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	5	5	11	1	0	1	0	2	0	0	0	0	0
Peak Hr	1	0	3	1	5	0	0	0	0	0	0	0	0	0	0

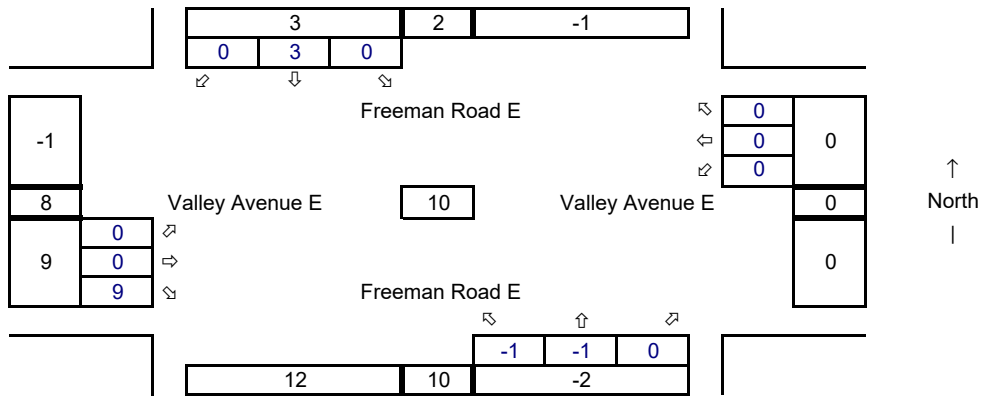


1 Freeman Rd E @ Valley Ave E

Development Truck Trips Average Weekday AM Peak Hour

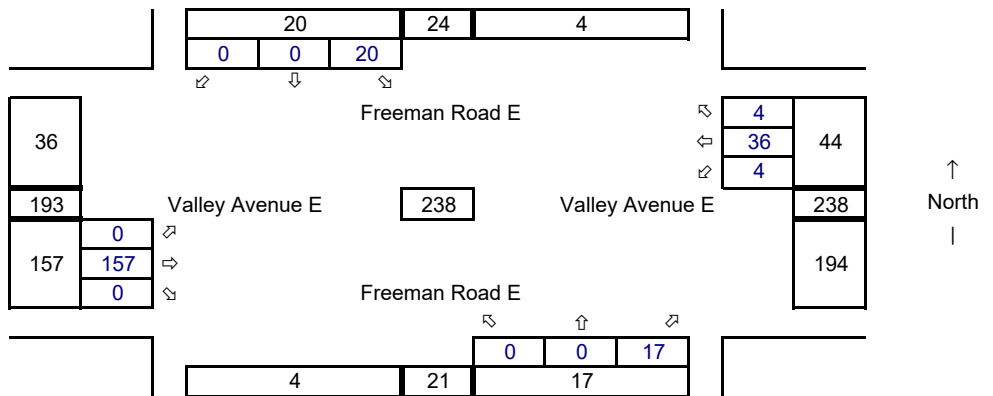


Development Car Trips Average Weekday AM Peak Hour



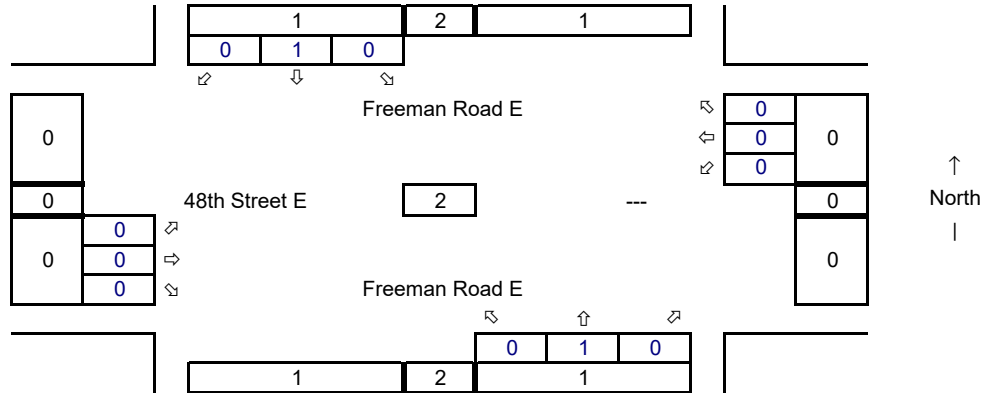
Total Pipeline Project Trips Average Weekday AM Peak Hour

Prologis Park Edgewood

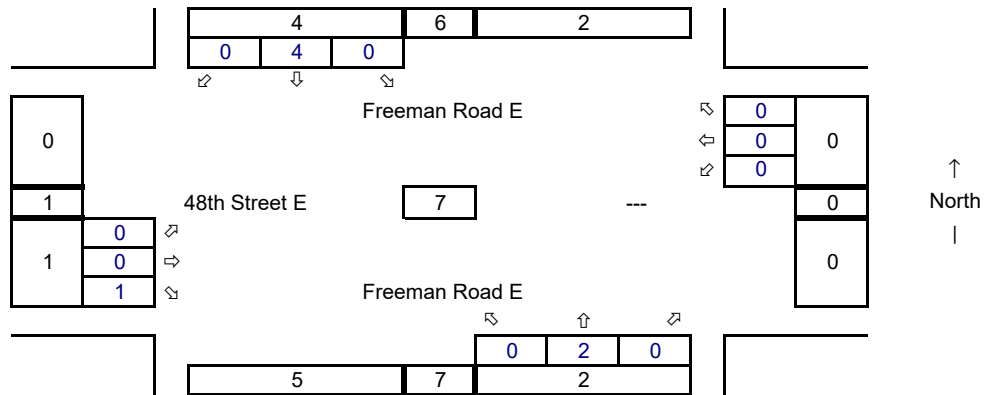


2 Freeman Rd E @ 48th St E

Development Truck Trips Average Weekday AM Peak Hour

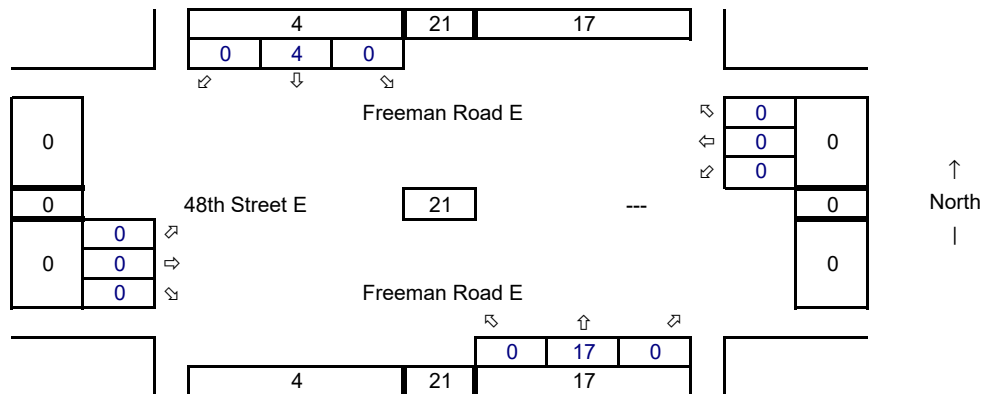


Development Car Trips Average Weekday AM Peak Hour



Total Pipeline Project Trips Average Weekday AM Peak Hour

Prologis Park Edgewood



3 Freeman Rd E @ 22nd Ave NW

Synchro ID: 3

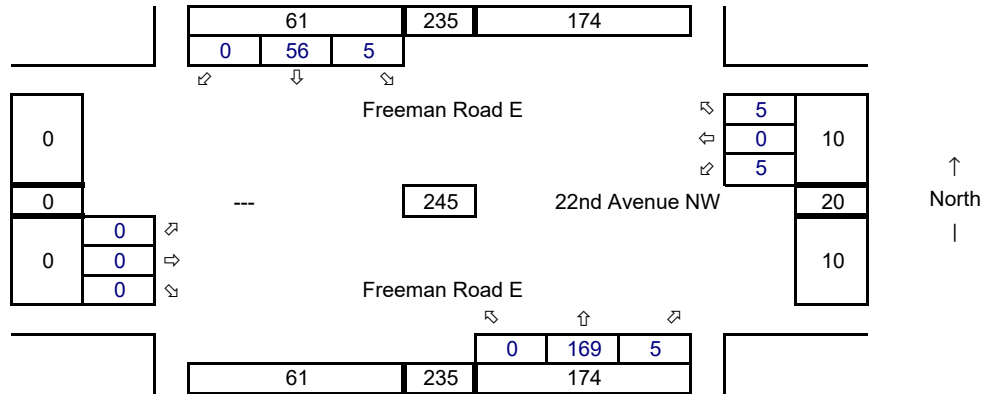
Existing

Average Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the south leg of Freeman Rd E at 48th St E. A conservative estimate of 5 trips was added to each approach for 22nd Ave NW.



Future without Project

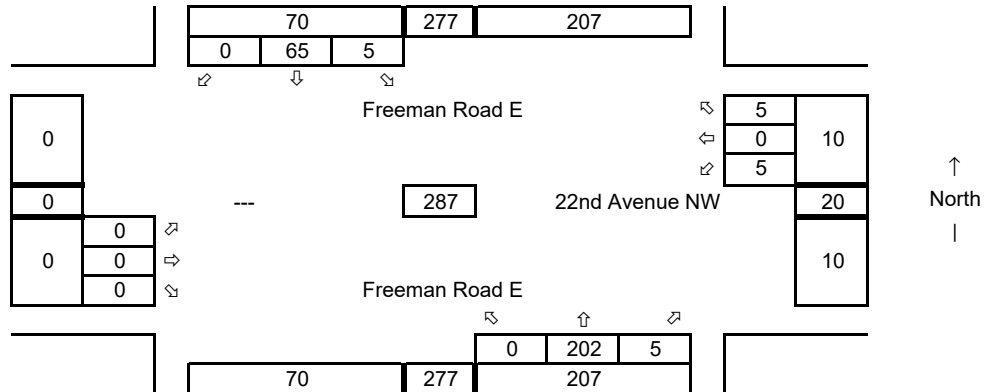
Average Weekday
AM Peak Hour

Year: 2024

Growth Rate = 3.0%

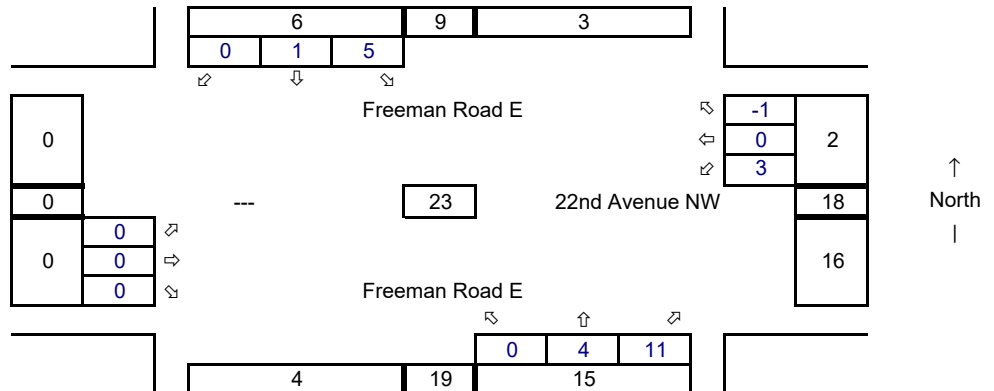
Years of Growth = 3

Total Growth = 1.0927



Total Development Trips

Average Weekday
AM Peak Hour



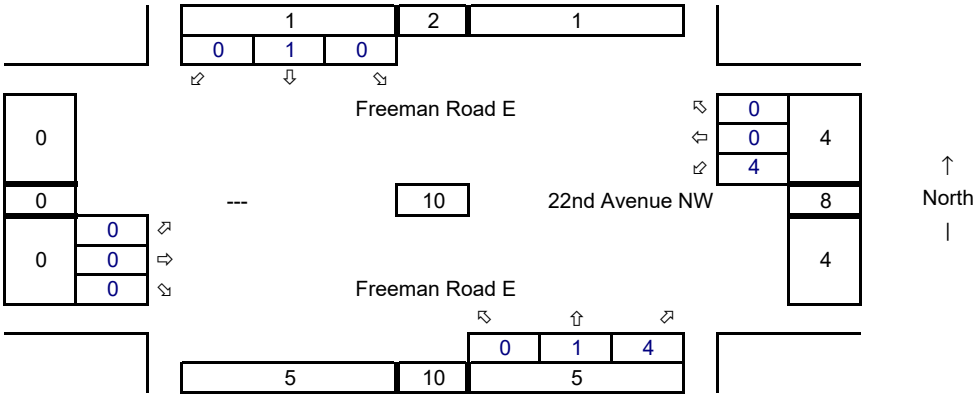
Future with Project

Average Weekday
AM Peak Hour

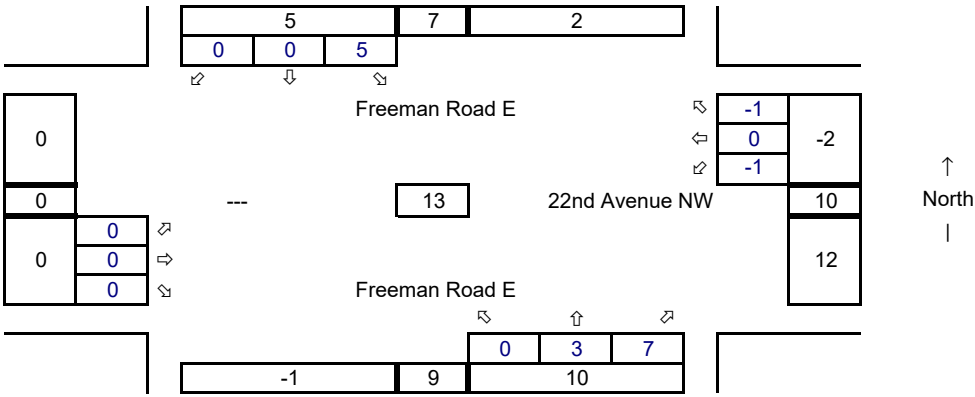


3 Freeman Rd E @ 22nd Ave NW

Development Truck Trips
Average Weekday
AM Peak Hour

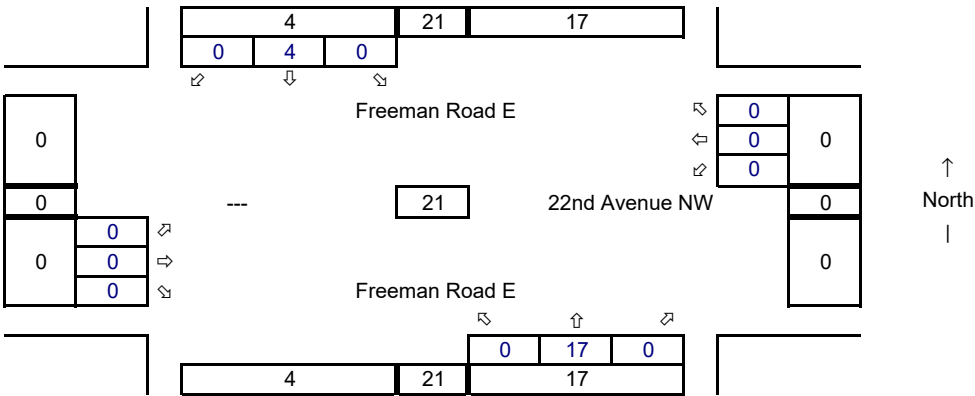


Development Car Trips
Average Weekday
AM Peak Hour



Total Pipeline Project Trips
Average Weekday
AM Peak Hour

Prologis Park Edgewood



4 Freemand Rd E @ 50th St E

Synchro ID: 4

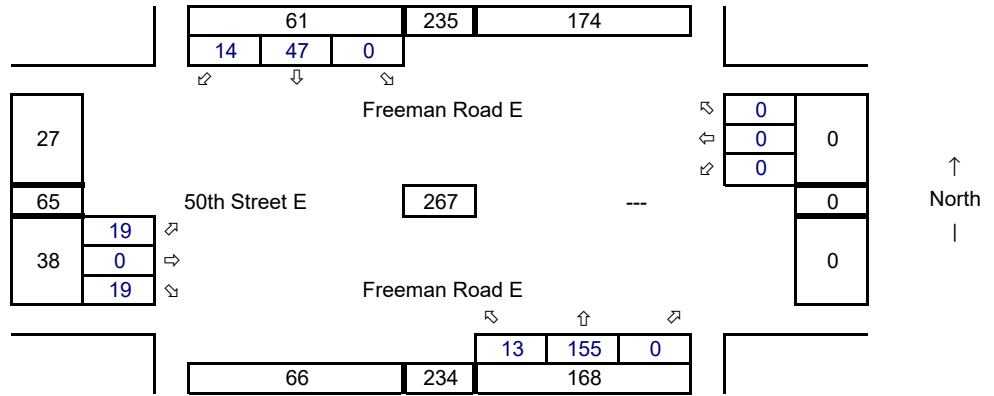
Existing

Average Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

N/S Volume extrapolated from
south leg of Freeman Rd E at
49th St E. Volume on 50th St E
based on ITE rates and 55 units
of Single-Family and 21
bedrooms of Assisted Living.



Future without Project

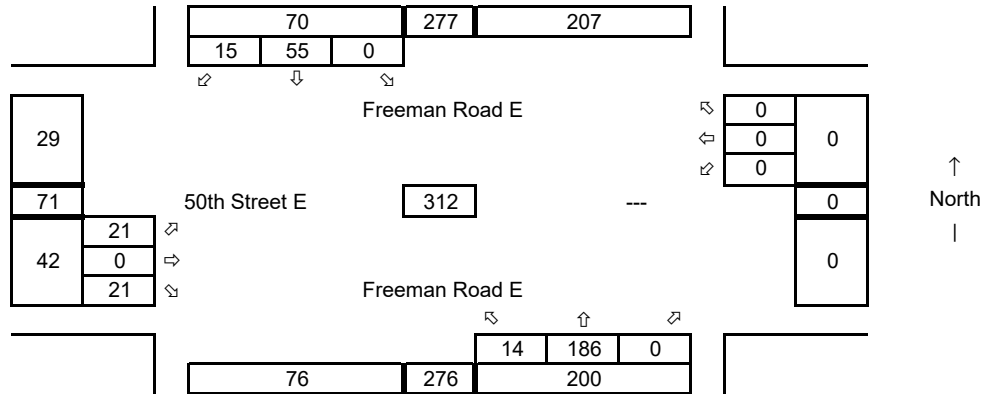
Average Weekday
AM Peak Hour

Year: 2024

Growth Rate = 3.0%

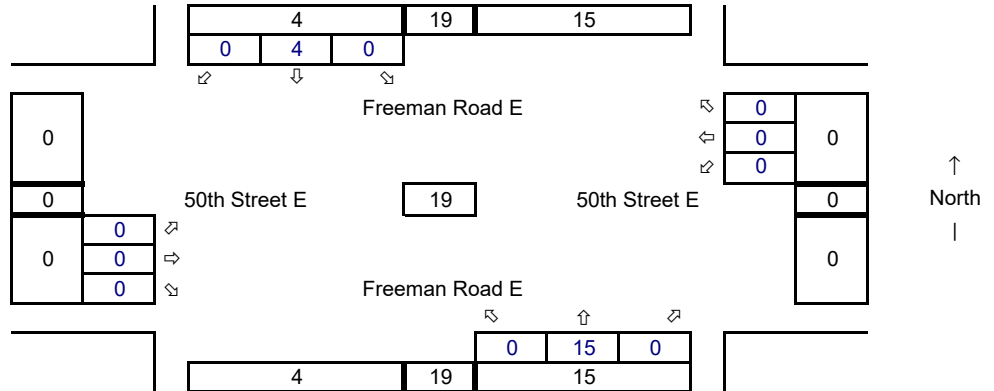
Years of Growth = 3

Total Growth = 1.0927



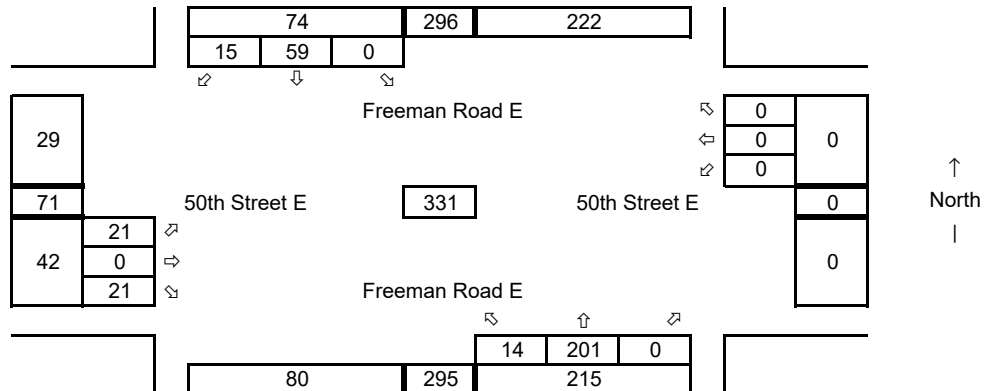
Total Development Trips

Average Weekday
AM Peak Hour



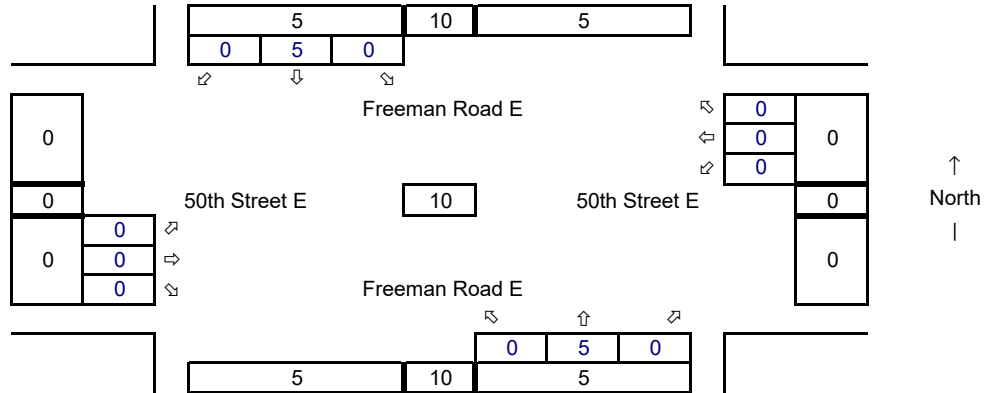
Future with Project

Average Weekday
AM Peak Hour

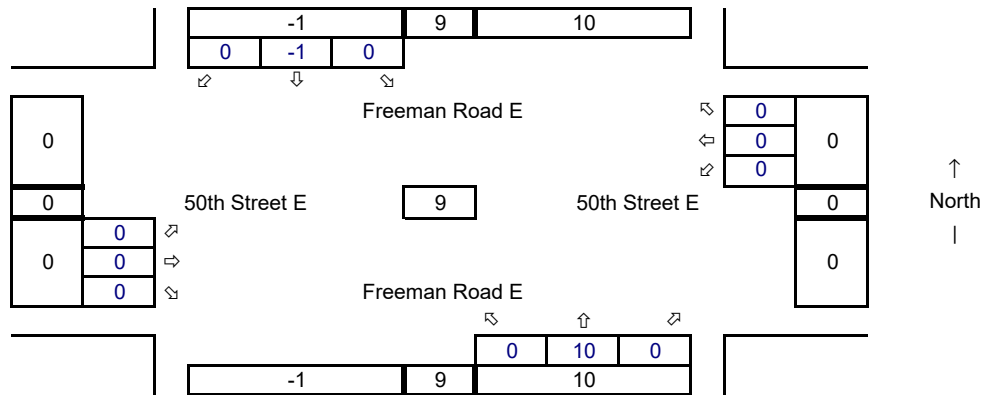


4 Freemond Rd E @ 50th St E

Development Truck Trips Average Weekday AM Peak Hour

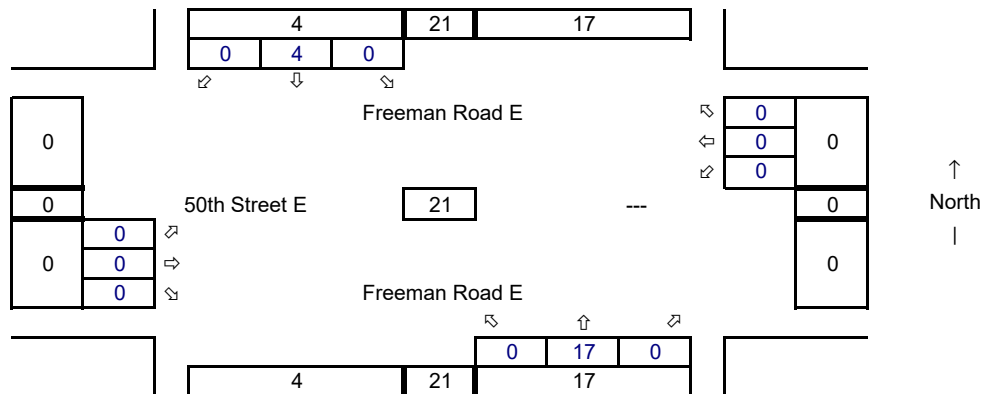


Development Car Trips Average Weekday AM Peak Hour



Total Pipeline Project Trips Average Weekday AM Peak Hour

Prologis Park Edgewood



5 Freeman Rd E @ N Levee Rd

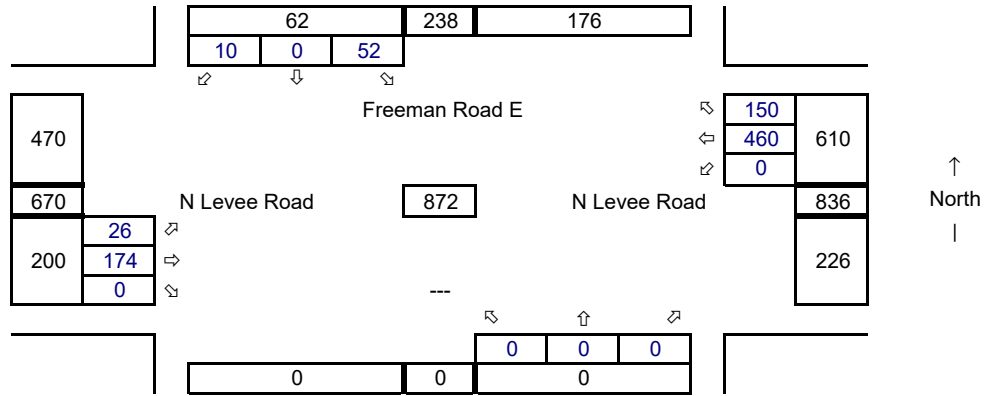
Synchro ID: 5

Existing

Average Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax



Future without Project

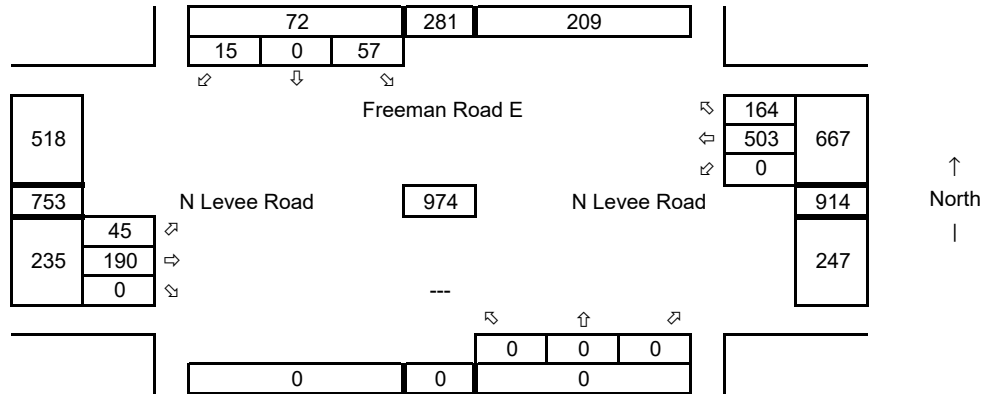
Average Weekday
AM Peak Hour

Year: 2024

Growth Rate = 3.0%

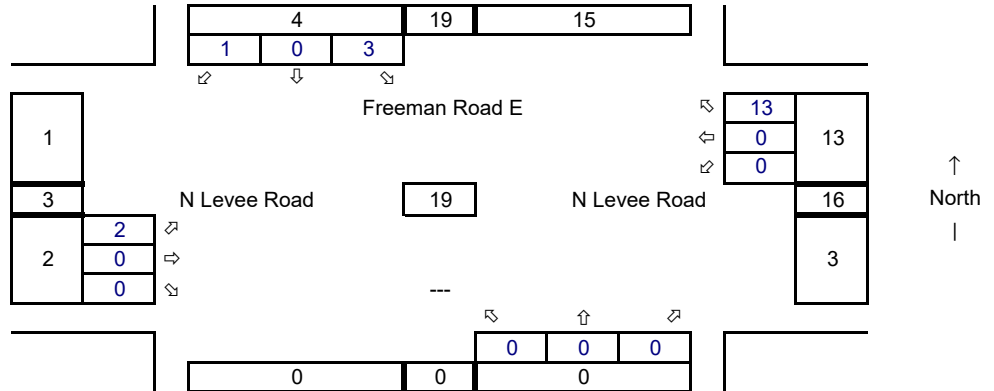
Years of Growth = 3

Total Growth = 1.0927



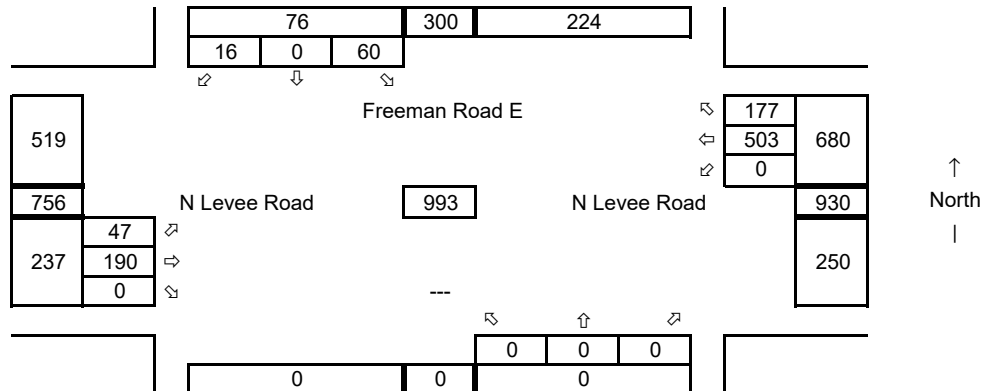
Total Development Trips

Average Weekday
AM Peak Hour



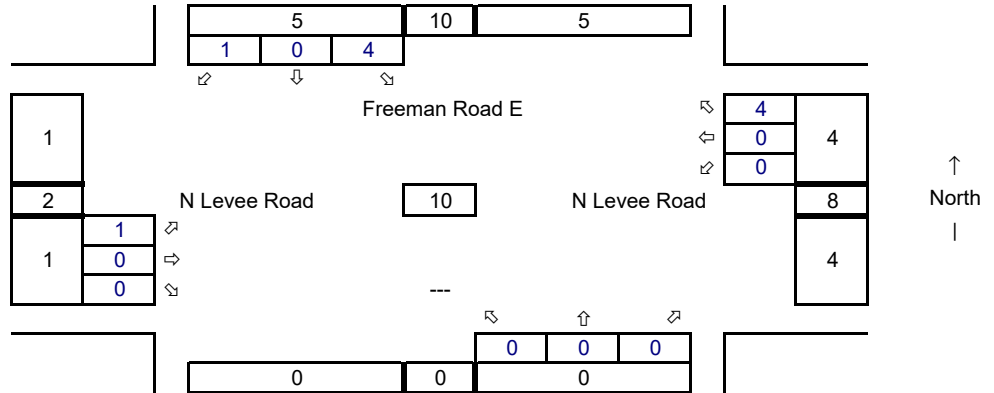
Future with Project

Average Weekday
AM Peak Hour

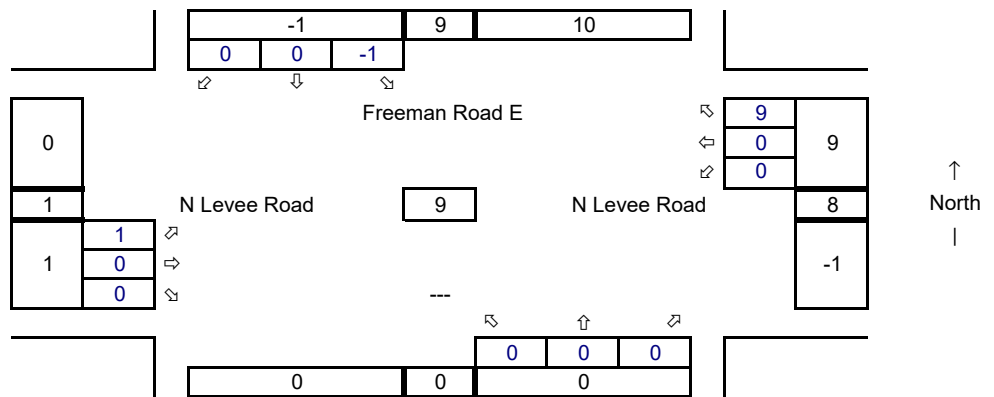


5 Freeman Rd E @ N Levee Rd

Development Truck Trips Average Weekday AM Peak Hour

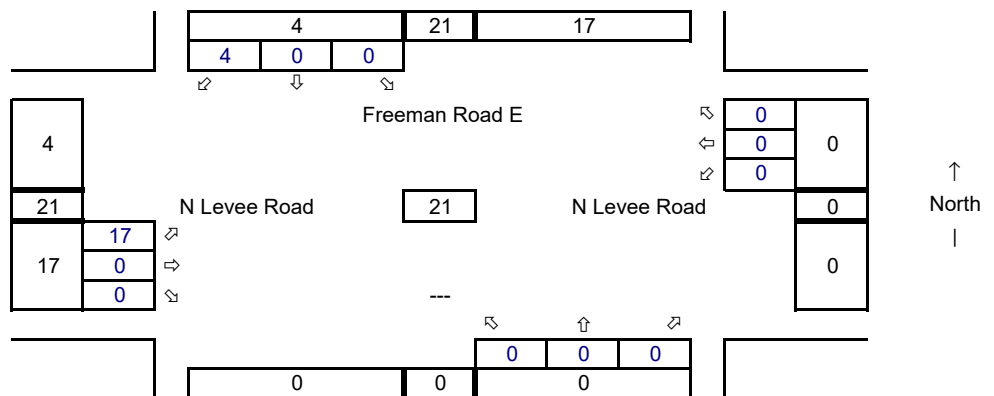


Development Car Trips Average Weekday AM Peak Hour



Total Pipeline Project Trips Average Weekday AM Peak Hour

Prologis Park Edgewood



6 Freeman Rd E @ N Site Access

Synchro ID: 6

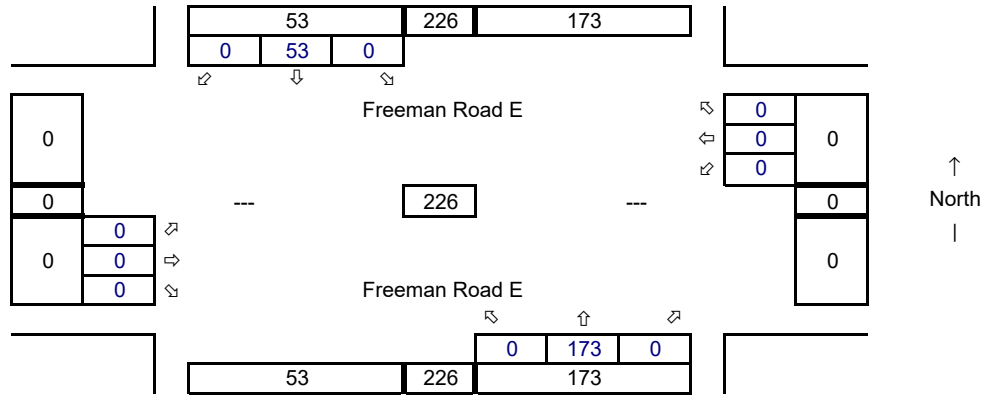
Existing

Average Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the
north leg of Freeman Road E at
48th Street E.



Future without Project

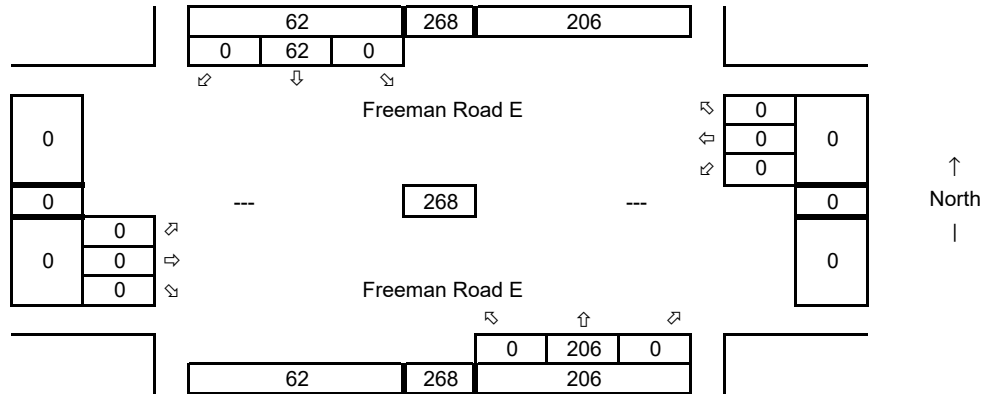
Average Weekday
AM Peak Hour

Year: 2024

Growth Rate = 3.0%

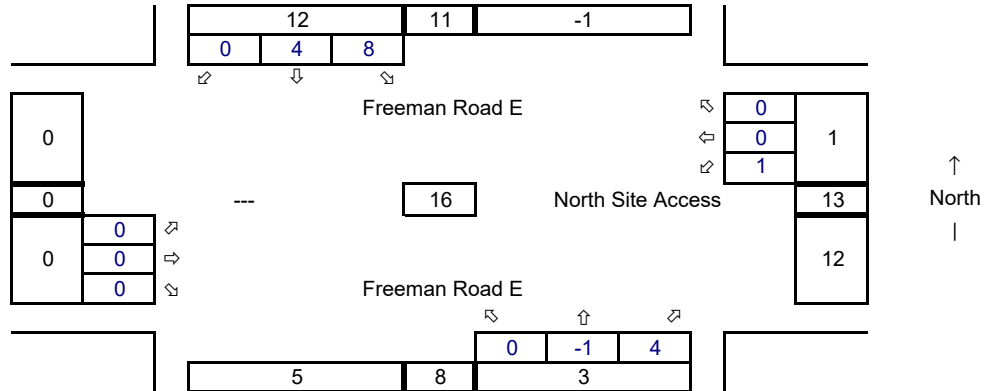
Years of Growth = 3

Total Growth = 1.0927



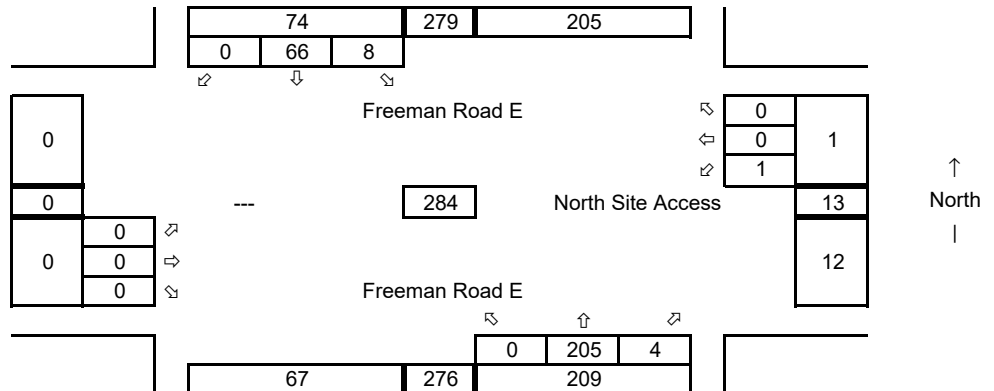
Total Development Trips

Average Weekday
AM Peak Hour



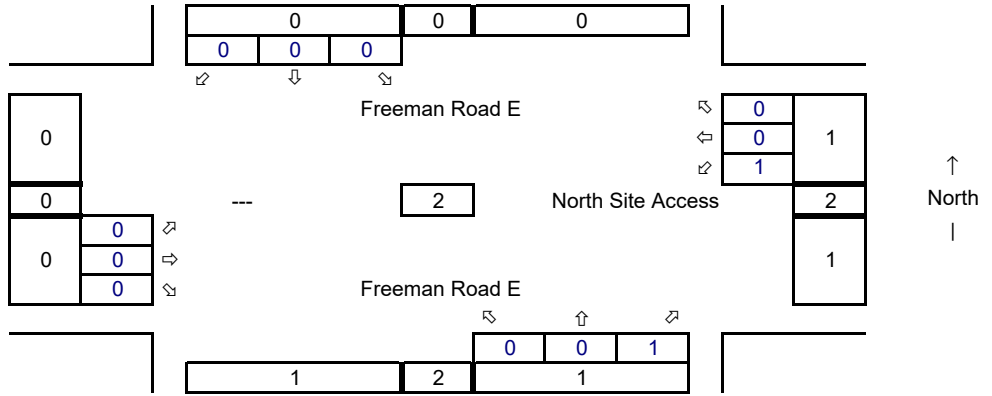
Future with Project

Average Weekday
AM Peak Hour

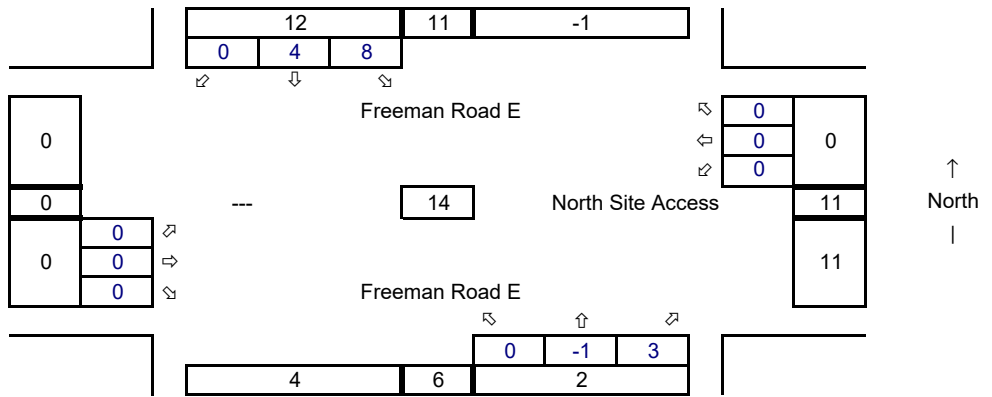


6 Freeman Rd E @ N Site Access

Development Truck Trips Average Weekday AM Peak Hour

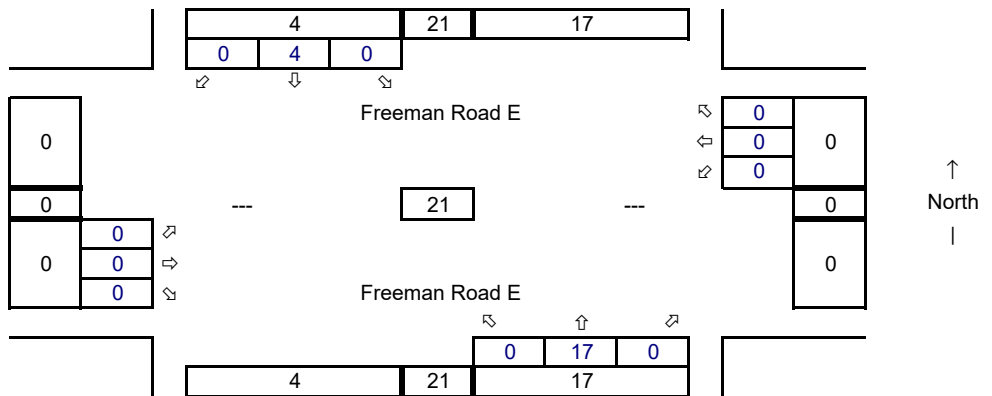


Development Car Trips Average Weekday AM Peak Hour

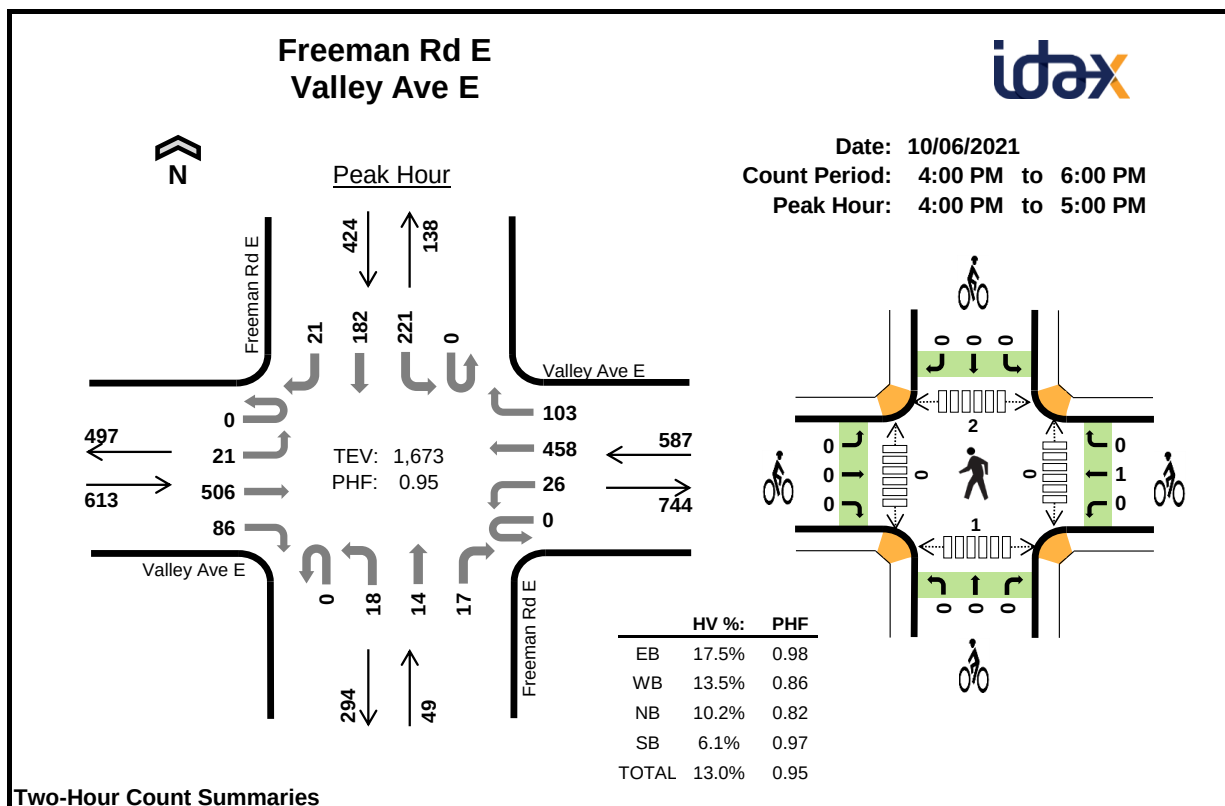


Total Pipeline Project Trips Average Weekday AM Peak Hour

Prologis Park Edgewood



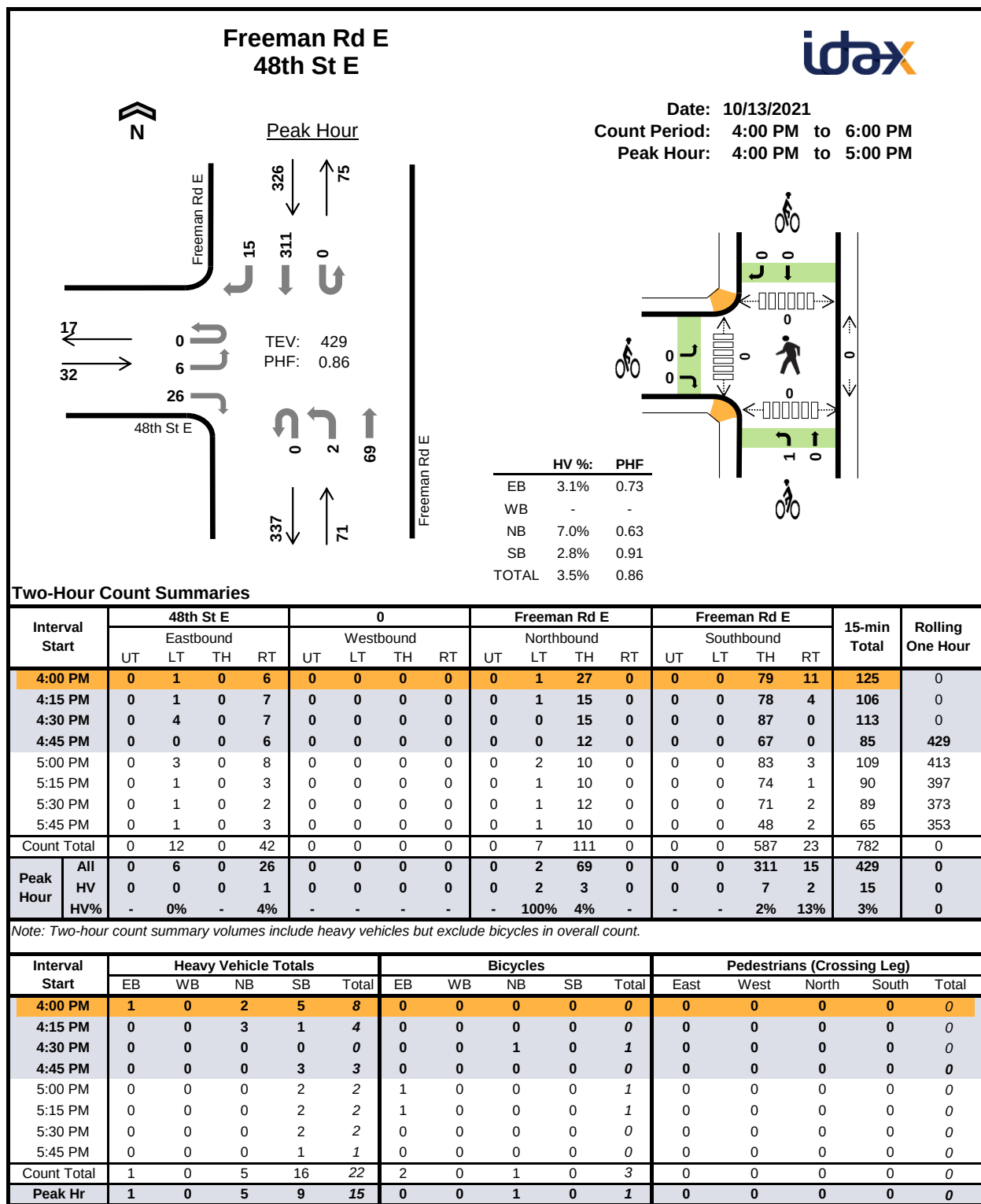
PM Count Data & Turning Movements

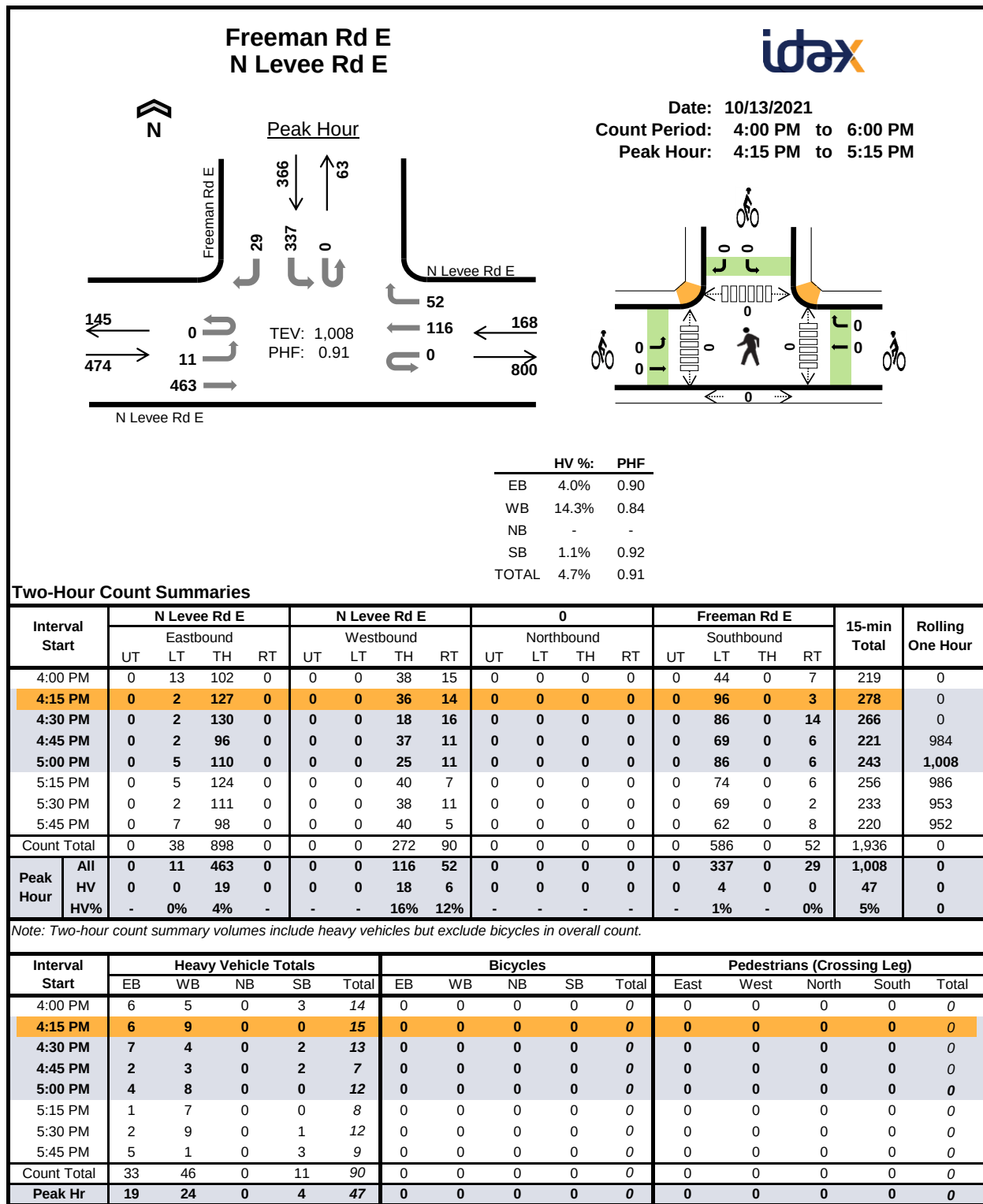


Interval Start		Valley Ave E				Valley Ave E				Freeman Rd E				Freeman Rd E				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	4	122	28	0	6	132	32	0	3	5	4	0	51	48	5	440	0
4:15 PM		0	9	124	23	0	8	116	29	0	3	1	11	0	49	49	6	428	0
4:30 PM		0	2	135	19	0	6	110	24	0	6	4	2	0	60	43	6	417	0
4:45 PM		0	6	125	16	0	6	100	18	0	6	4	0	0	61	42	4	388	1,673
5:00 PM		0	2	135	26	0	9	109	25	0	2	6	2	0	58	54	3	431	1,664
5:15 PM		0	3	118	26	0	9	118	18	0	8	8	1	0	47	51	5	412	1,648
5:30 PM		0	5	113	13	0	1	91	13	0	4	5	6	0	49	34	8	342	1,573
5:45 PM		1	4	100	10	0	4	94	9	0	2	8	4	0	53	33	6	328	1,513
Count Total		1	35	972	161	0	49	870	168	0	34	41	30	0	428	354	43	3,186	0
Peak Hour	All	0	21	506	86	0	26	458	103	0	18	14	17	0	221	182	21	1,673	0
	HV	0	5	99	3	0	1	69	9	0	2	2	1	0	16	7	3	217	0
	HV%	-	24%	20%	3%	-	4%	15%	9%	-	11%	14%	6%	-	7%	4%	14%	13%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

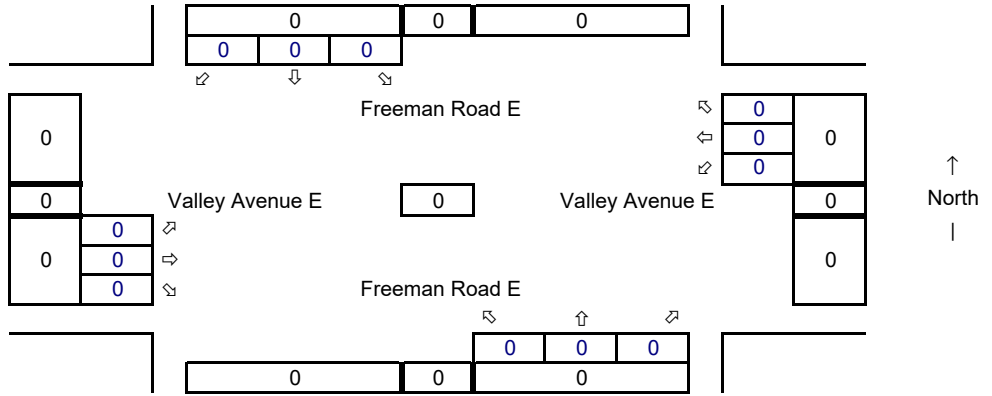
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	28	30	3	7	68	0	0	0	0	0	0	0	1	0	1
4:15 PM	32	17	0	3	52	0	0	0	0	0	0	0	0	1	1
4:30 PM	26	23	1	9	59	0	0	0	0	0	0	0	0	0	0
4:45 PM	21	9	1	7	38	0	1	0	0	1	0	0	1	0	1
5:00 PM	20	24	1	3	48	0	0	0	0	0	0	0	0	1	1
5:15 PM	12	23	0	4	39	0	0	0	0	0	0	0	0	0	0
5:30 PM	16	22	0	4	42	0	0	0	0	0	0	0	1	0	1
5:45 PM	9	23	2	2	36	0	0	0	0	0	0	0	0	0	0
Count Total	164	171	8	39	382	0	1	0	0	1	0	0	3	2	5
Peak Hour	107	79	5	26	217	0	1	0	0	1	0	0	2	1	3



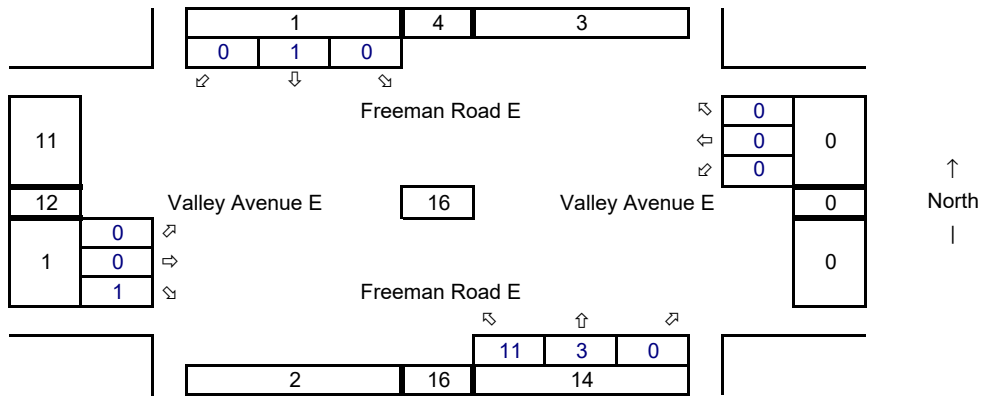


1 Freeman Rd E @ Valley Ave E

Development Truck Trips Average Weekday PM Peak Hour

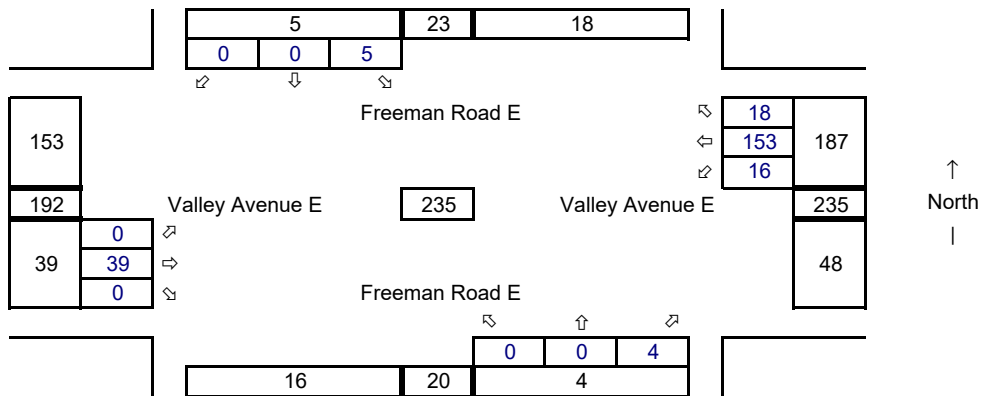


Development Car Trips Average Weekday PM Peak Hour



Total Pipeline Project Trips Average Weekday PM Peak Hour

Prologis Park Edgewood



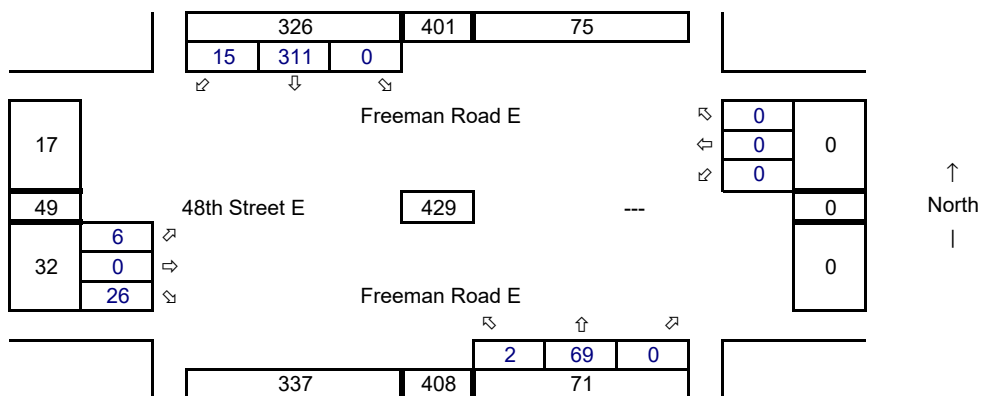
Synchro ID: 2

Existing

Average Weekday
PM Peak Hour

Year: **10/13/21**

Data Source: [Idax](#)



Future without Project

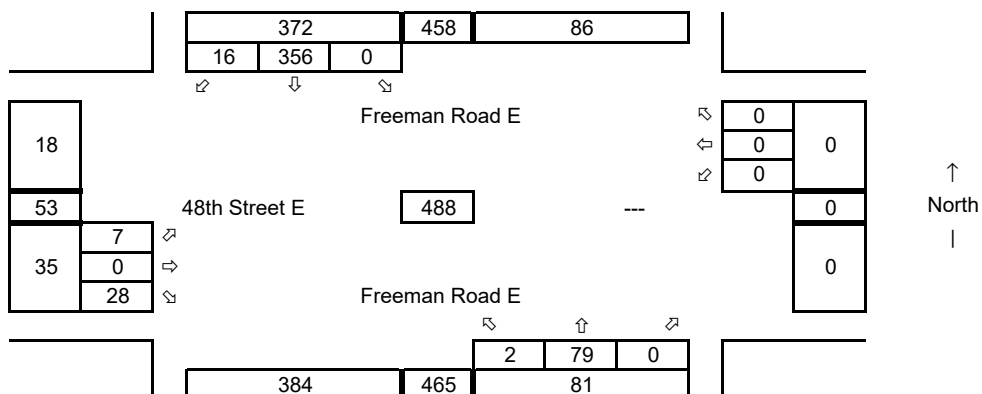
Average Weekday
PM Peak Hour

Year: 2024

Growth Rate = 3.0%

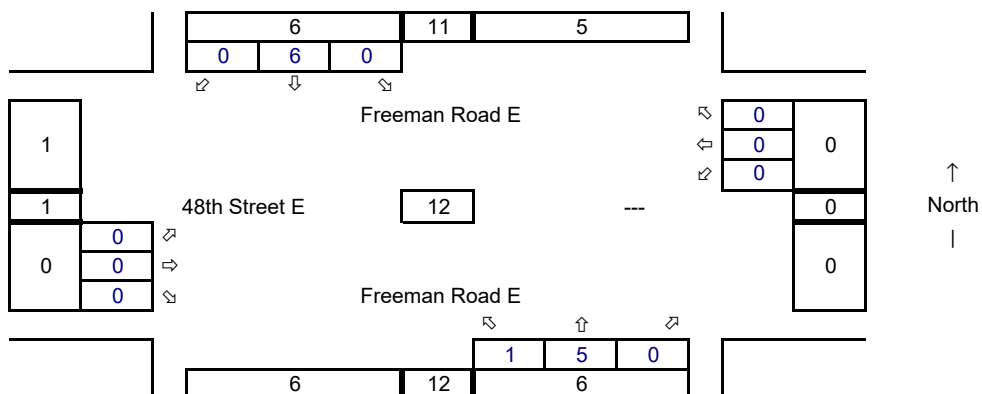
Years of Growth =

Total Growth = 1.0927



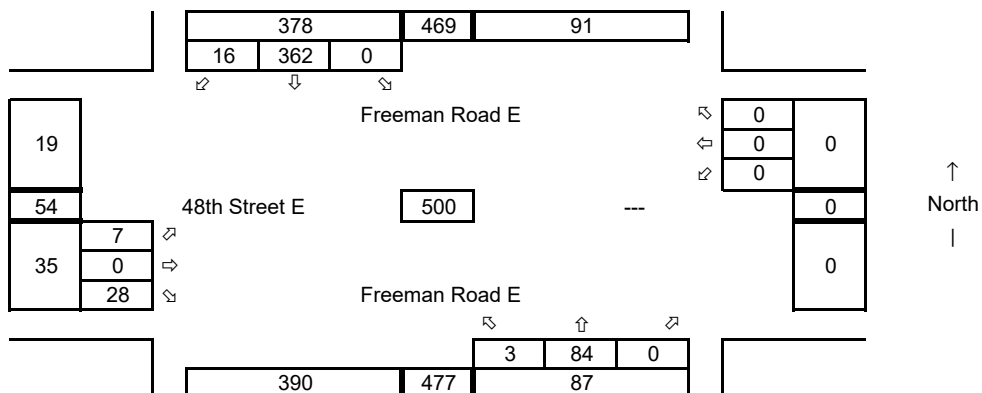
Total Development Trips

Average Weekday
PM Peak Hour



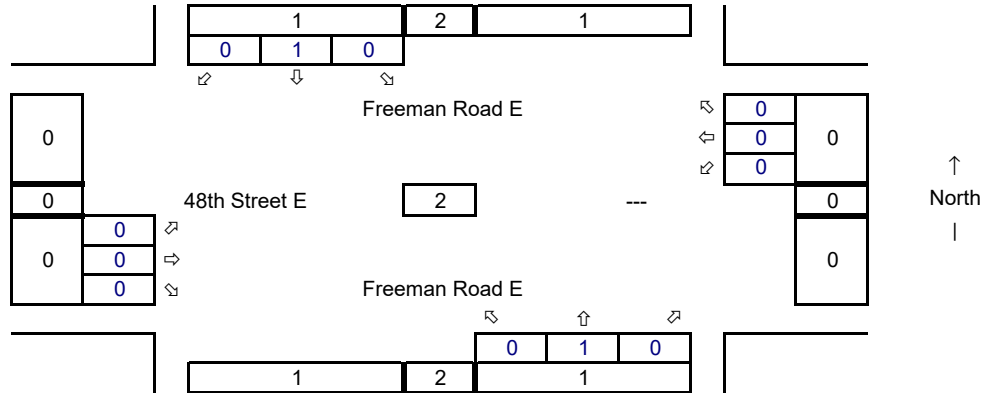
Future with Project

Average Weekday
PM Peak Hour

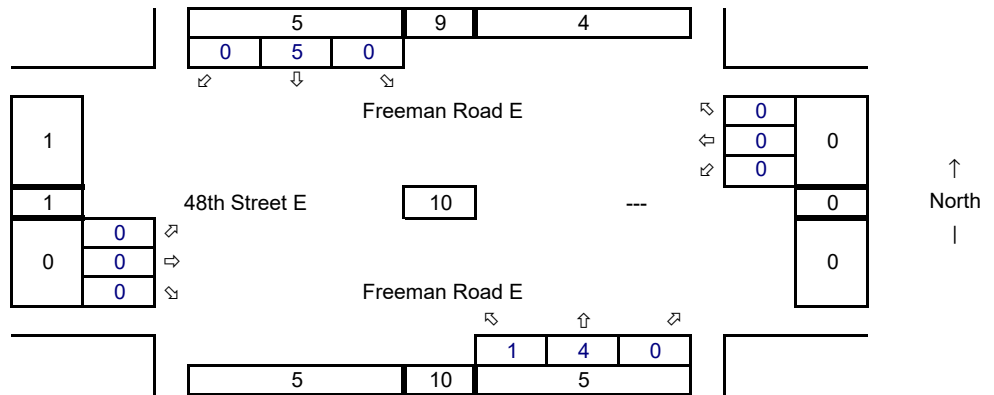


2 Freeman Rd E @ 48th St E

Development Truck Trips Average Weekday PM Peak Hour

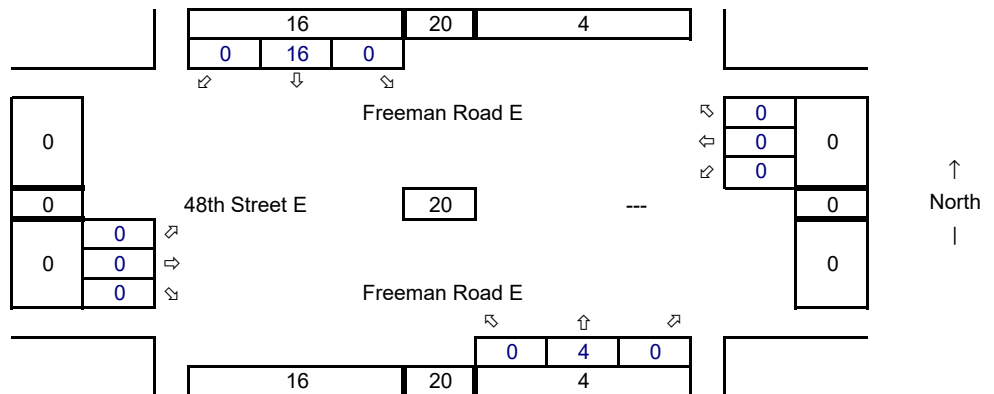


Development Car Trips Average Weekday PM Peak Hour



Total Pipeline Project Trips Average Weekday PM Peak Hour

Prologis Park Edgewood



3 Freeman Rd E @ 22nd Ave NW

Synchro ID: 3

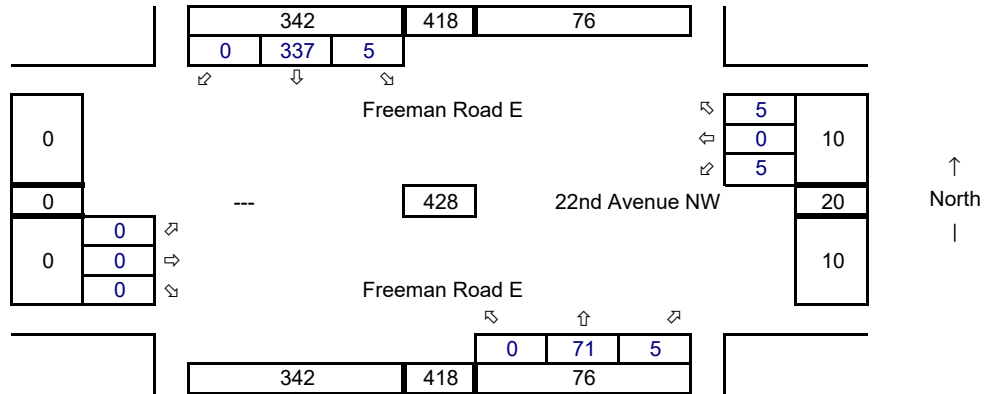
Existing

Average Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the south leg of Freeman Rd E at 48th St E. A conservative estimate of 5 trips was added to each approach for 22nd Ave NW.



Future without Project

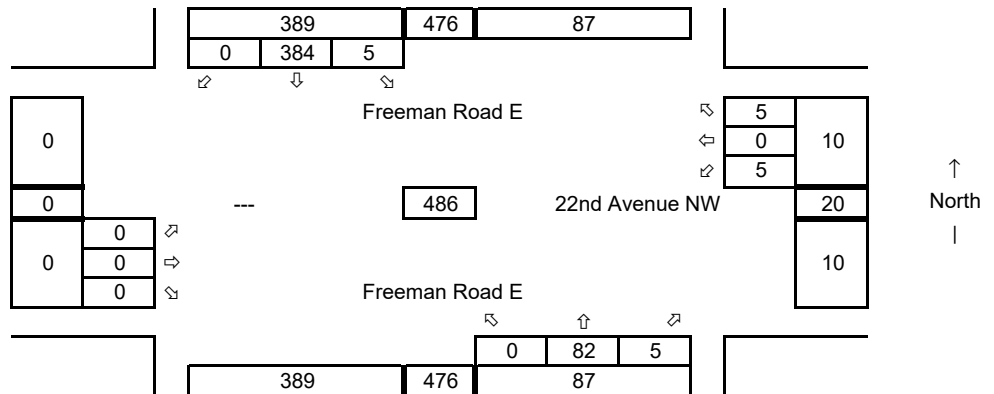
Average Weekday
PM Peak Hour

Year: 2024

Growth Rate = 3.0%

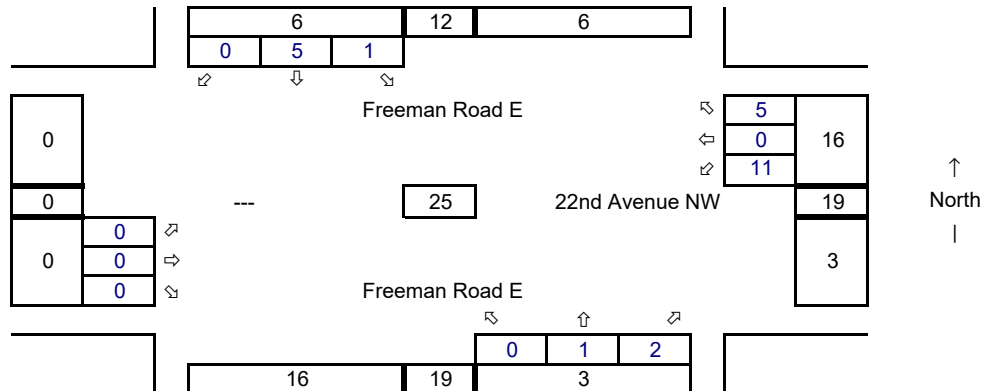
Years of Growth = 3

Total Growth = 1.0927



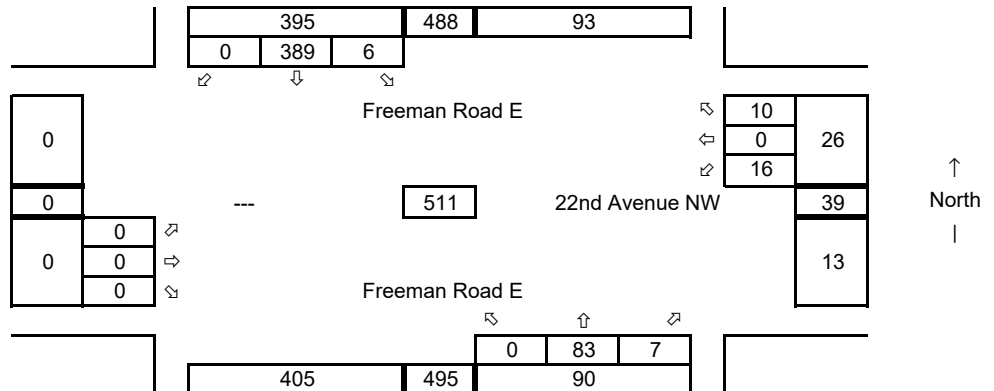
Total Development Trips

Average Weekday
PM Peak Hour



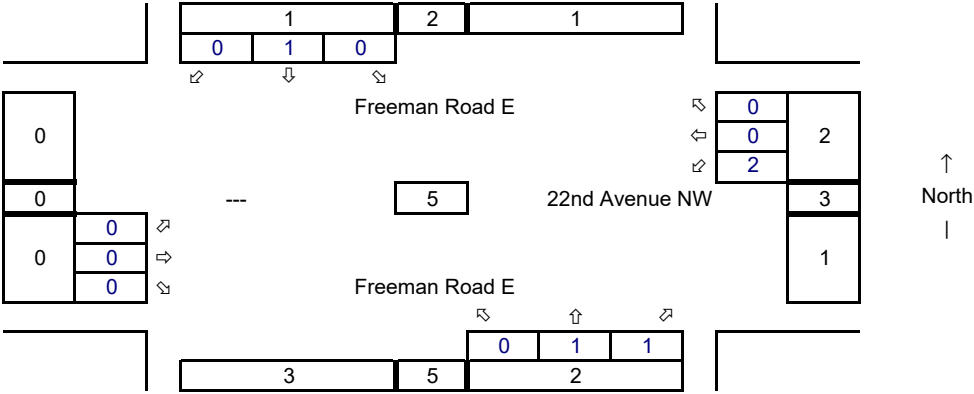
Future with Project

Average Weekday
PM Peak Hour

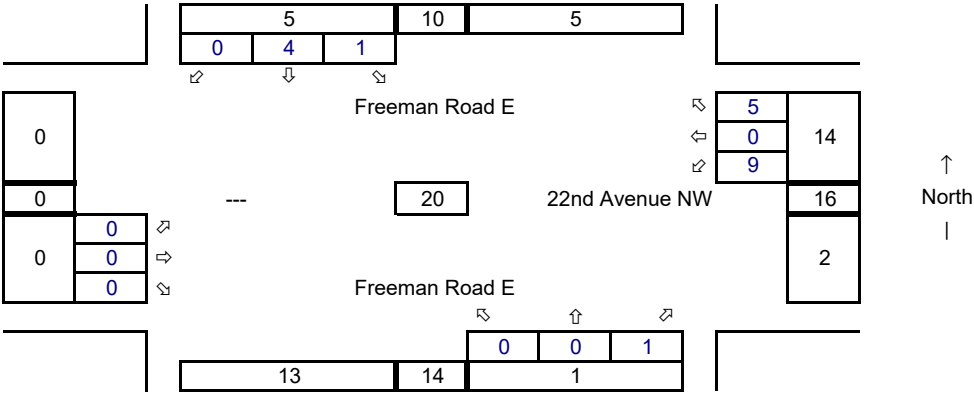


3 Freeman Rd E @ 22nd Ave NW

Development Truck Trips
Average Weekday
PM Peak Hour

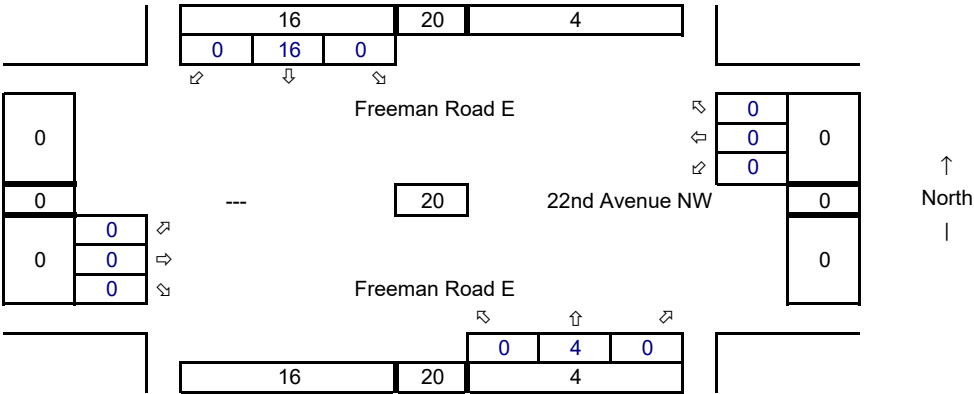


Development Car Trips
Average Weekday
PM Peak Hour



Total Pipeline Project Trips
Average Weekday
PM Peak Hour

Prologis Park Edgewood



4 Freemand Rd E @ 50th St E

Synchro ID: 4

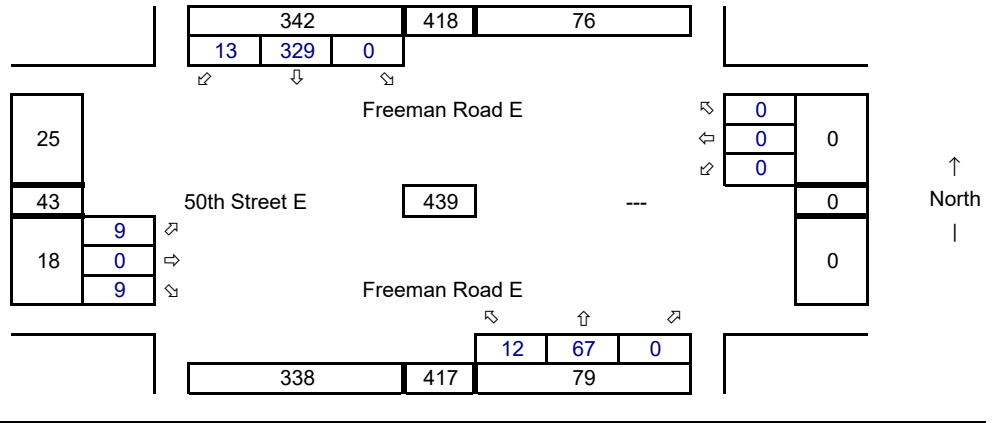
Existing

Average Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

N/S Volume extrapolated from
south leg of Freeman Rd E at
49th St E. Volume on 50th St E
based on ITE rates for SFD (19),
SFA (36) and Assisted Living (21
beds).



Future without Project

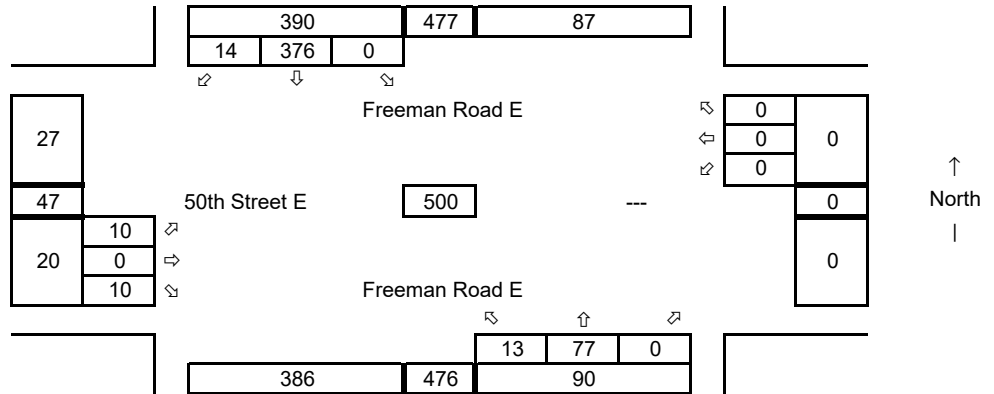
Average Weekday
PM Peak Hour

Year: 2024

Growth Rate = 3.0%

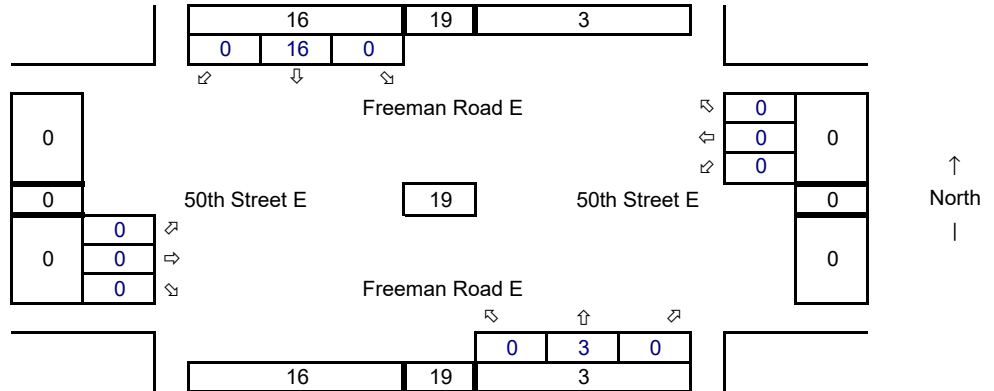
Years of Growth = 3

Total Growth = 1.0927



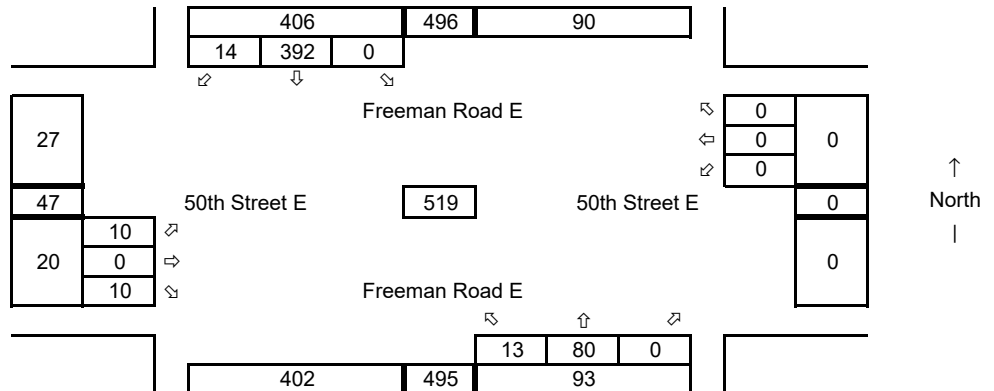
Total Development Trips

Average Weekday
PM Peak Hour



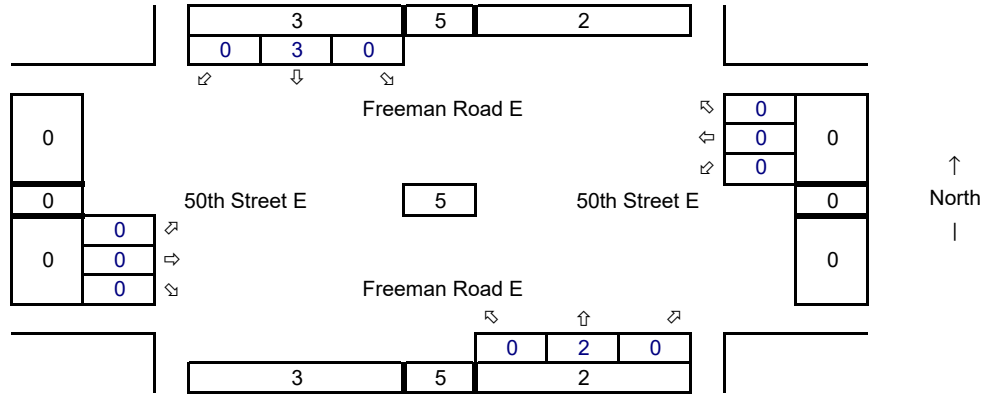
Future with Project

Average Weekday
PM Peak Hour

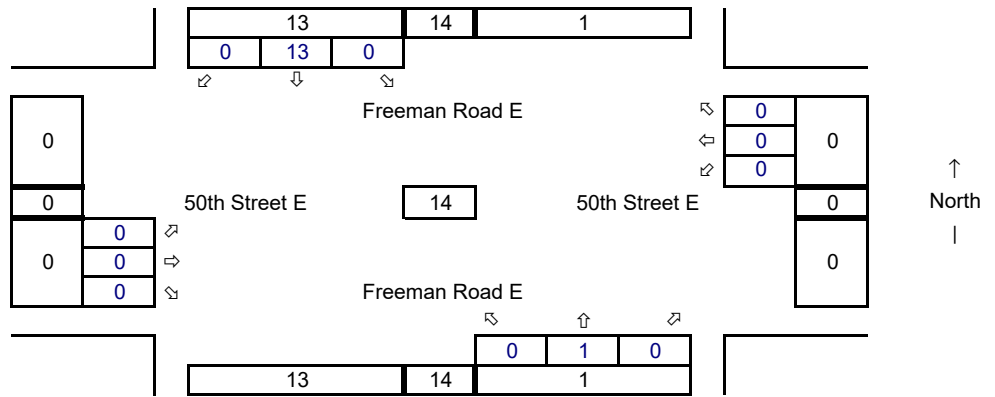


4 Freemond Rd E @ 50th St E

Development Truck Trips Average Weekday PM Peak Hour

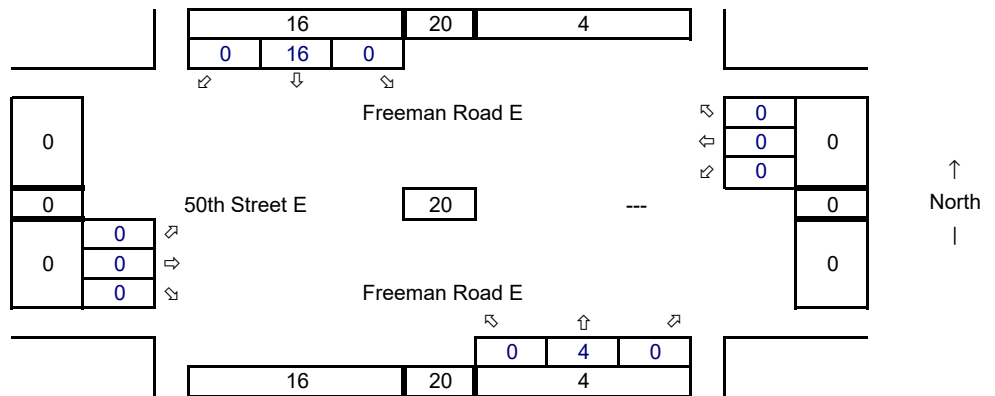


Development Car Trips Average Weekday PM Peak Hour



Total Pipeline Project Trips Average Weekday PM Peak Hour

Prologis Park Edgewood



5 Freeman Rd E @ N Levee Rd

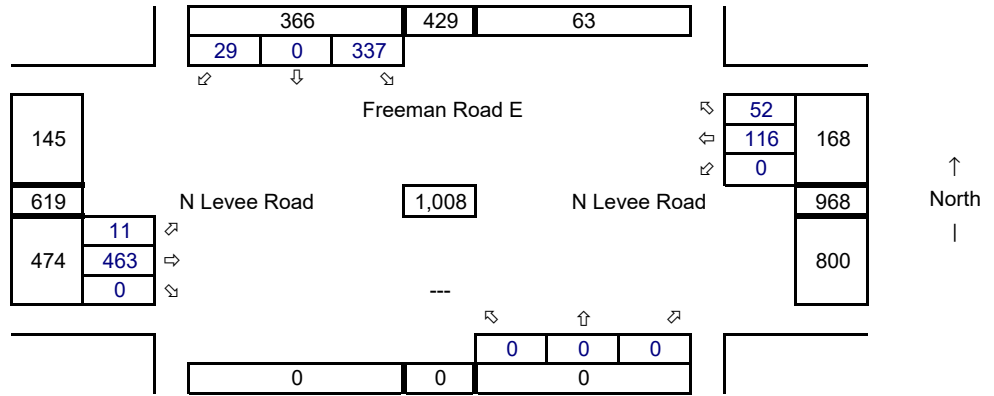
Synchro ID: 5

Existing

Average Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax



Future without Project

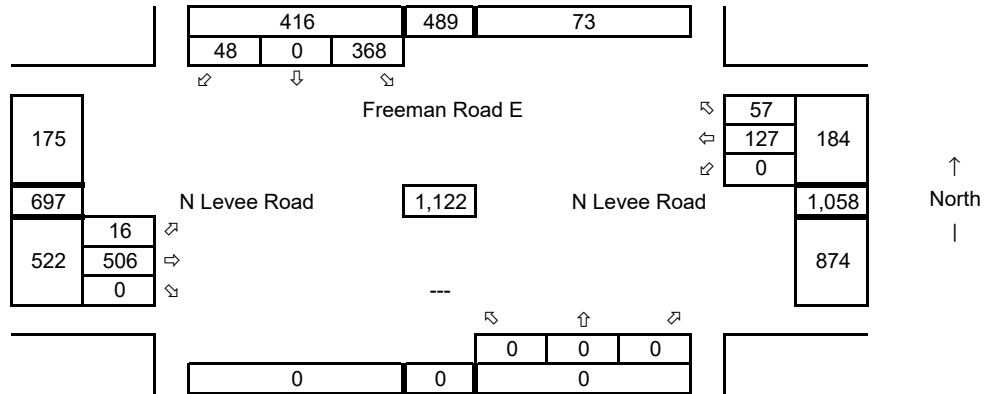
Average Weekday
PM Peak Hour

Year: 2024

Growth Rate = 3.0%

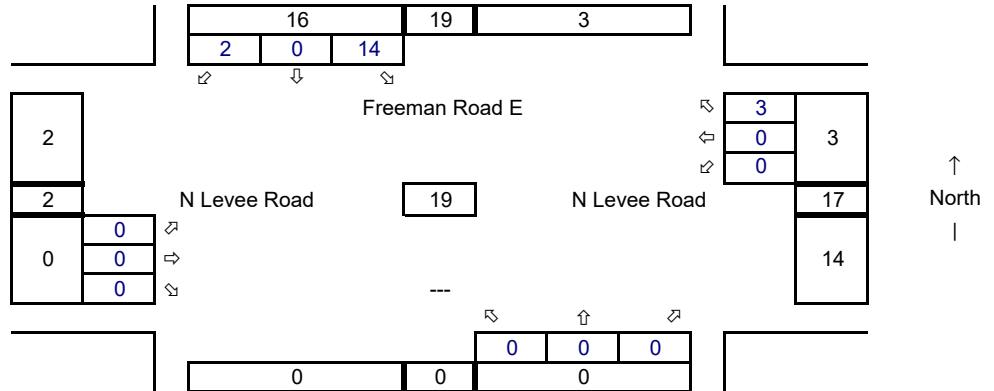
Years of Growth = 3

Total Growth = 1.0927



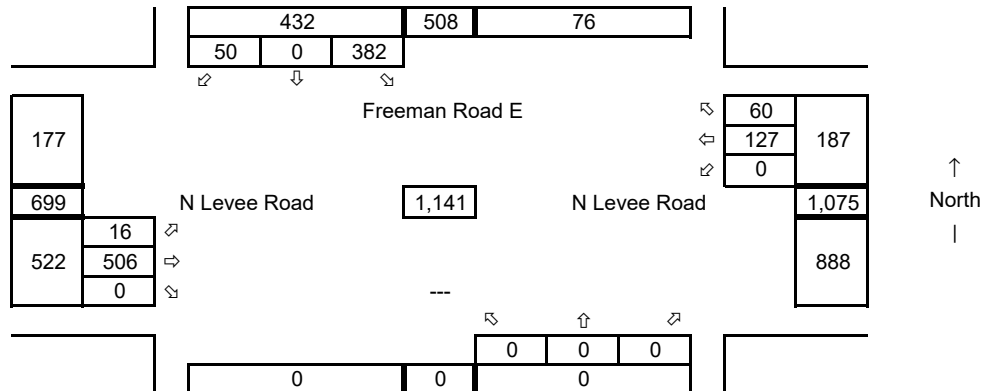
Total Development Trips

Average Weekday
PM Peak Hour



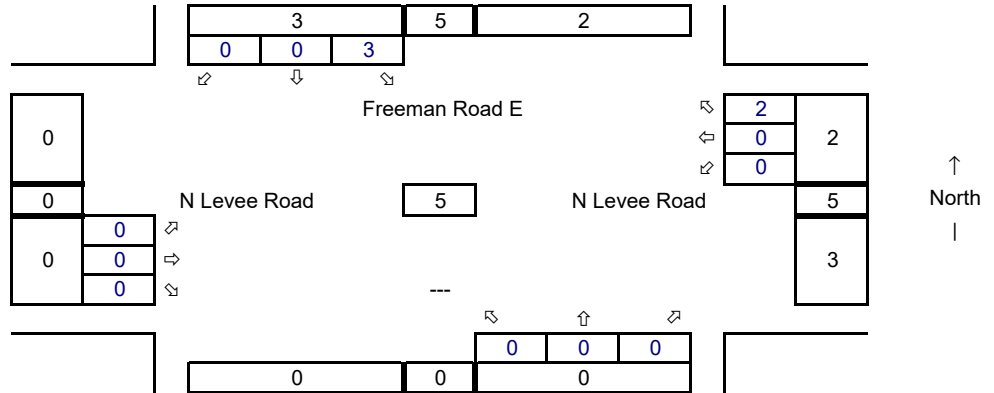
Future with Project

Average Weekday
PM Peak Hour

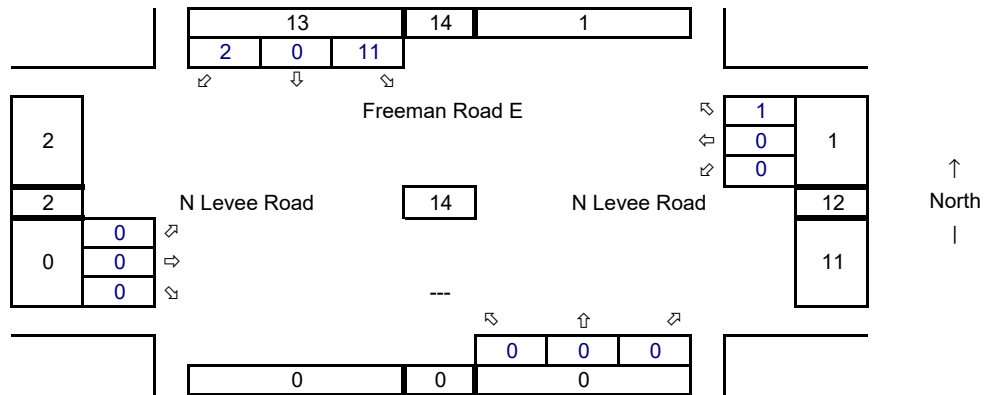


5 Freeman Rd E @ N Levee Rd

Development Truck Trips Average Weekday PM Peak Hour

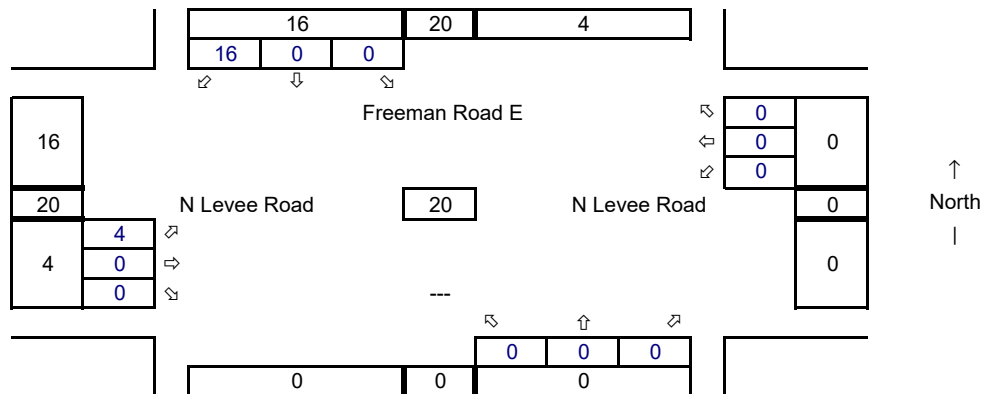


Development Car Trips Average Weekday PM Peak Hour



Total Pipeline Project Trips Average Weekday PM Peak Hour

Prologis Park Edgewood



6 Freeman Rd E @ N Site Access

Synchro ID: 6

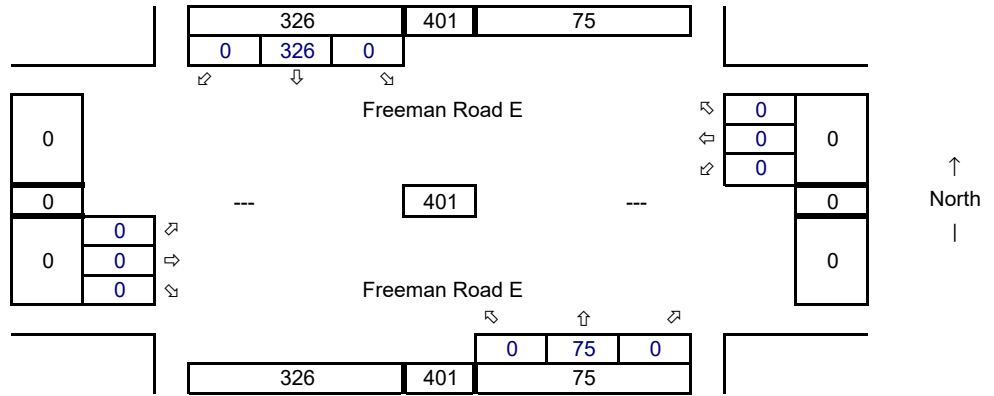
Existing

Average Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the
north leg of Freeman Road E at
48th Street E.



Future without Project

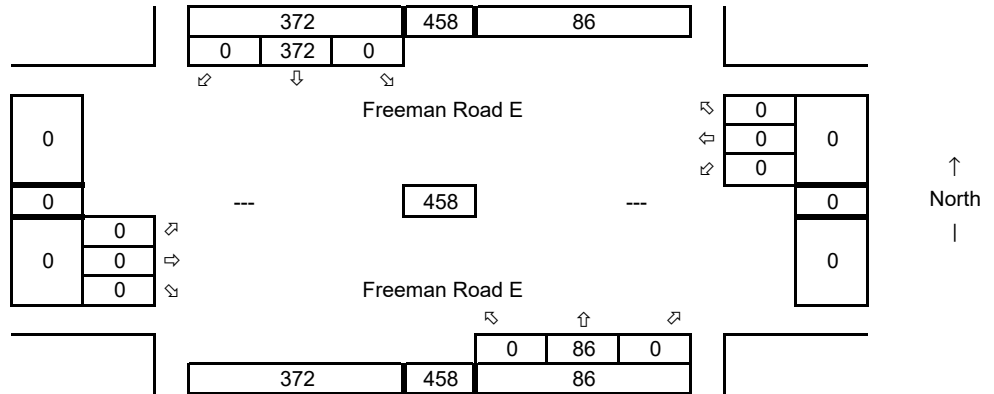
Average Weekday
PM Peak Hour

Year: 2024

Growth Rate = 3.0%

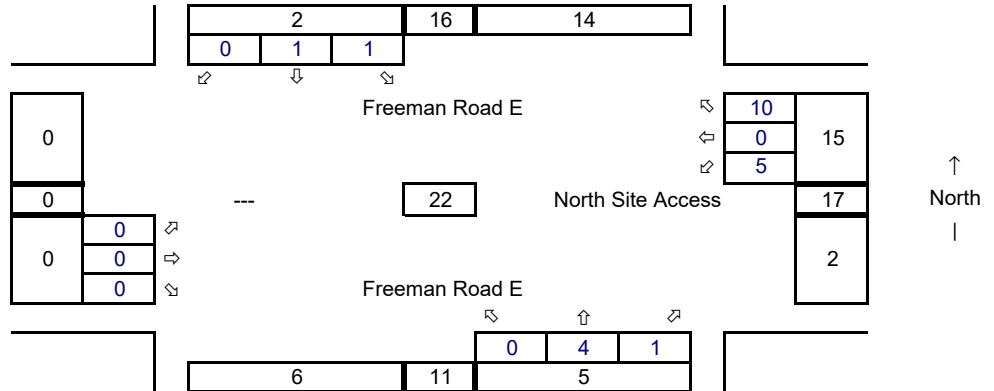
Years of Growth = 3

Total Growth = 1.0927



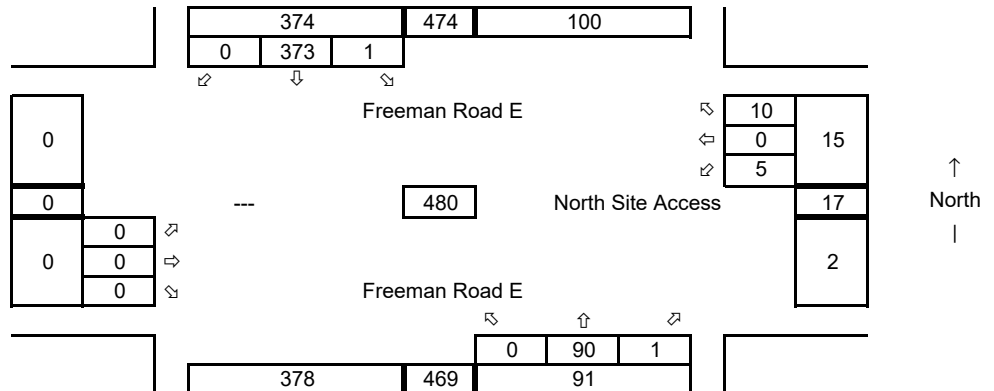
Total Development Trips

Average Weekday
PM Peak Hour



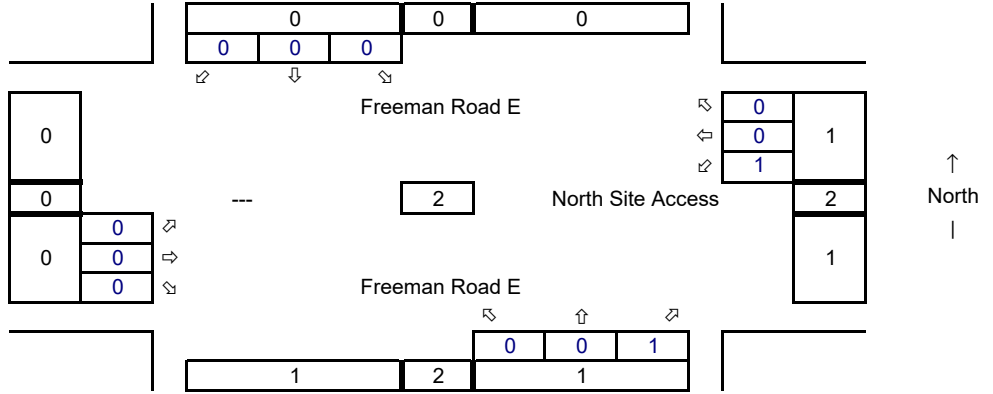
Future with Project

Average Weekday
PM Peak Hour

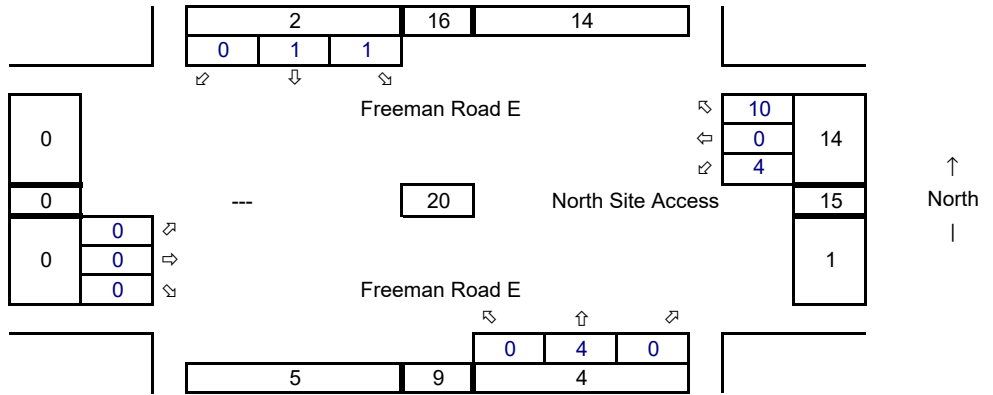


6 Freeman Rd E @ N Site Access

Development Truck Trips
Average Weekday
PM Peak Hour

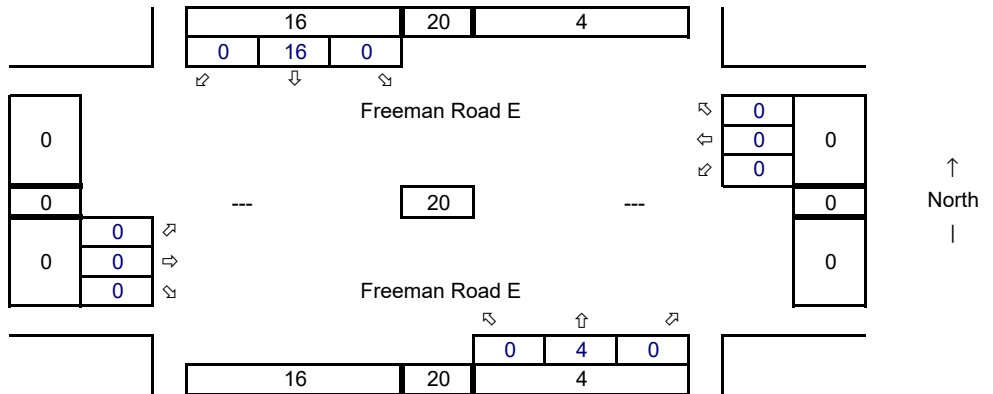


Development Car Trips
Average Weekday
PM Peak Hour



Total Pipeline Project Trips
Average Weekday
PM Peak Hour

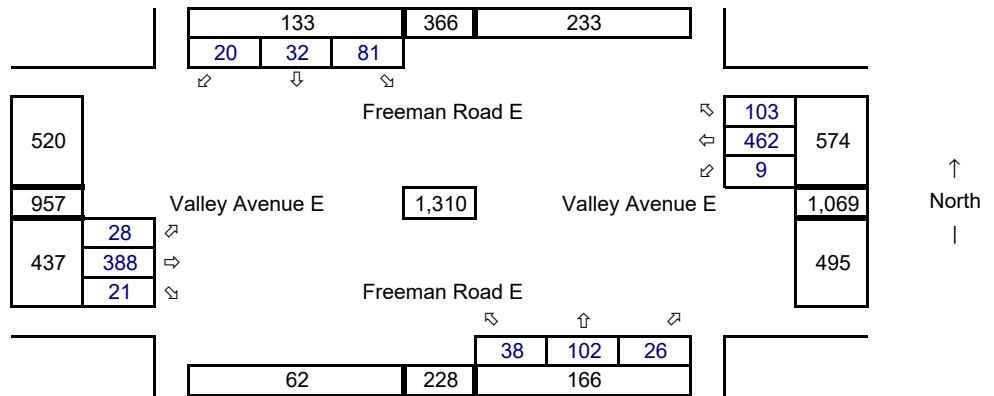
Prologis Park Edgewood



With SR-167 Extension AM Turning Movements

1 Freeman Rd E @ Valley Ave E

Data Source: [Idax](#)



Total Growth = 1.1328

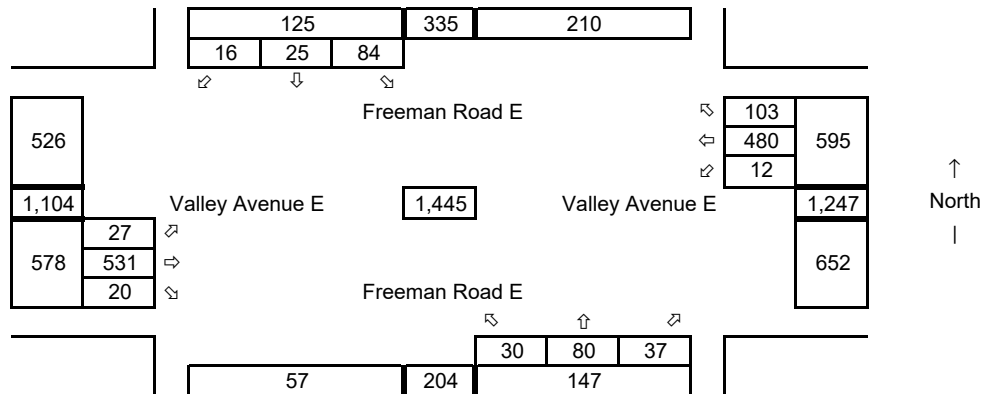


Diagram illustrating a traffic light control system for a road network. The network consists of Freeman Road E (horizontal) and Valley Avenue E (vertical).

Freeman Road E (Horizontal Road):

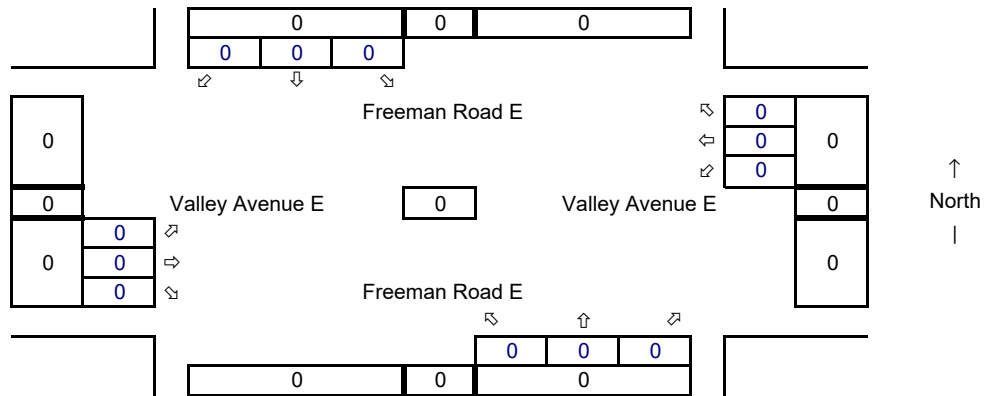
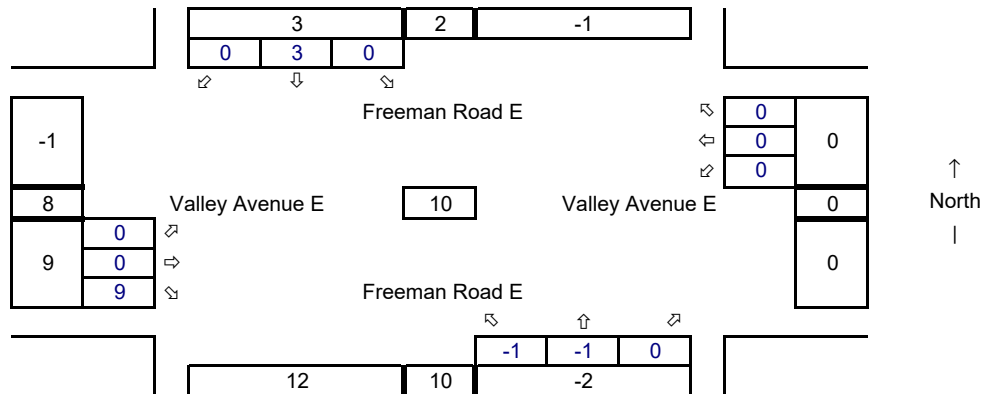
- Left End (T-Intersection):**
 - Left-to-Right Phase: 0 (Red), 3 (Yellow), 9 (Green)
 - Right-to-Left Phase: 2 (Red), 3 (Yellow), 0 (Green)
- Middle (Standard Intersection):**
 - Left-to-Right Phase: 0 (Red), 3 (Yellow), 9 (Green)
 - Right-to-Left Phase: 0 (Red), 0 (Yellow), 0 (Green)
- Right End (T-Intersection):**
 - Left-to-Right Phase: 0 (Red), 3 (Yellow), 9 (Green)
 - Right-to-Left Phase: 0 (Red), 0 (Yellow), 0 (Green)

Valley Avenue E (Vertical Road):

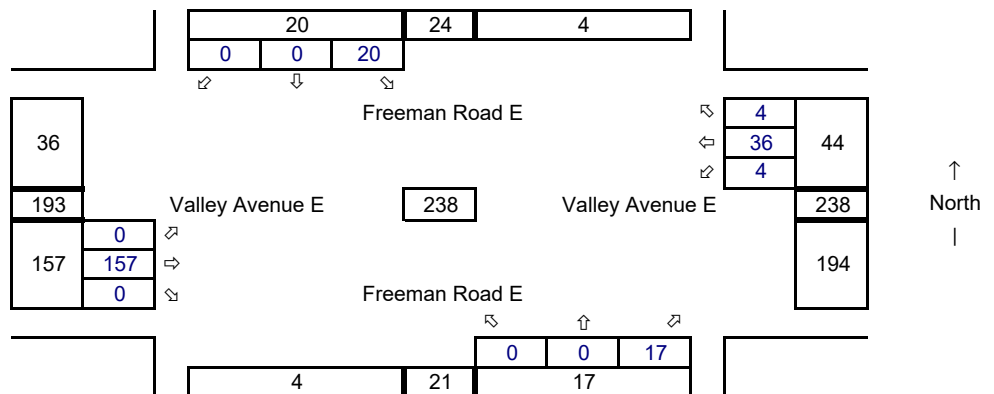
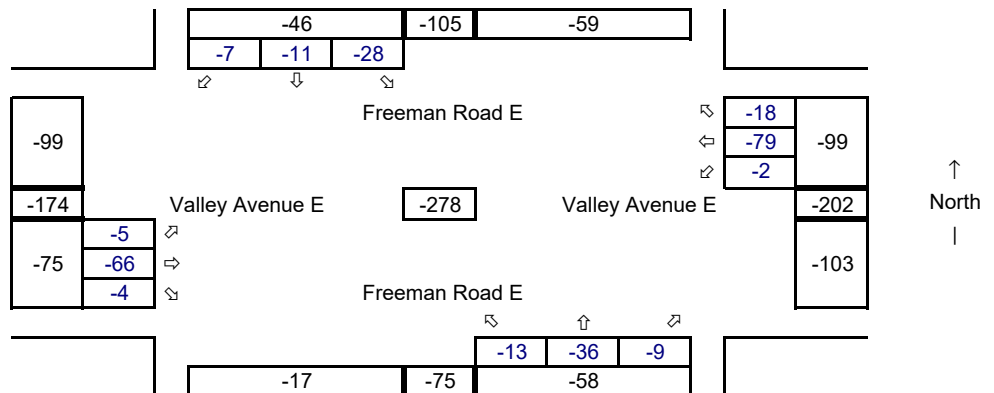
- Top (T-Intersection):**
 - Up-to-Down Phase: -1 (Red), -1 (Yellow), 0 (Green)
- Bottom (Standard Intersection):**
 - Up-to-Down Phase: -1 (Red), -1 (Yellow), 0 (Green)
 - Down-to-Up Phase: 12 (Red), 10 (Yellow), -2 (Green)

North Arrow: Indicated by an upward arrow on the right side of the diagram.

The map shows the intersection of Valley Avenue E and Freeman Road E. The streets are labeled 'Valley Avenue E' and 'Freeman Road E'. The map includes a north arrow pointing upwards. The map shows the following lot numbers: 128, 337, 209, 16, 28, 84, 525, 1,112, 27, 587, 531, 29, 1,455, 103, 480, 12, 595, 1,247, 652, 29, 79, 37, 69, 214, 145. The map also shows the locations of the streets 'Valley Avenue E' and 'Freeman Road E'. The map includes a north arrow pointing upwards.

Development Truck TripsAverage Weekday
AM Peak Hour**Development Car Trips**Average Weekday
AM Peak Hour**Total Pipeline Project Trips**Average Weekday
AM Peak Hour

Prologis Park Edgewood

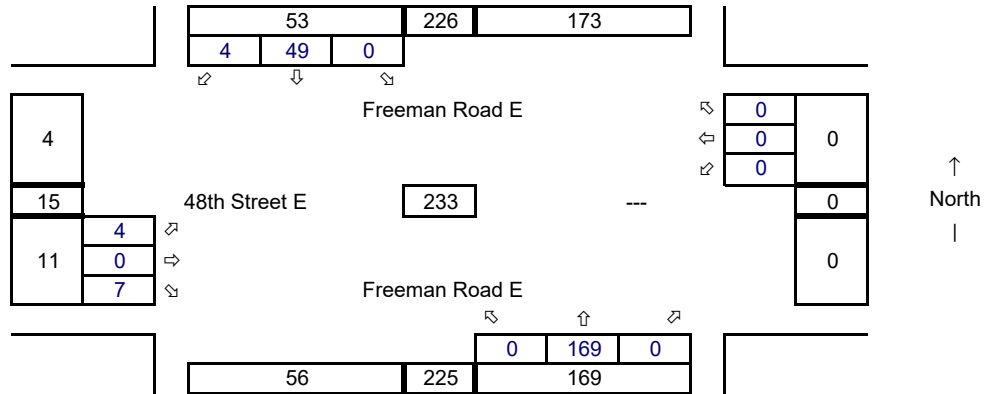
**SR-167 Extension Diversion**Average Weekday
AM Peak HourN/S Diversion % -31%
E/W Diversion % -15%

Synchro ID: 2

ExistingAverage Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

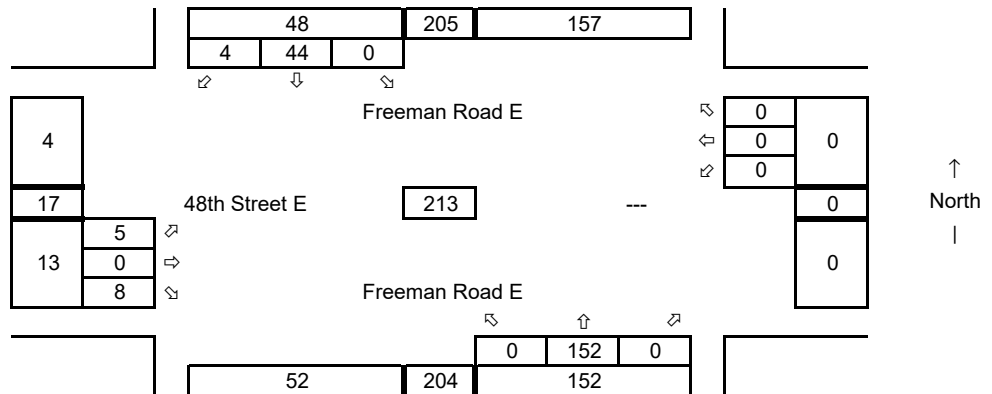
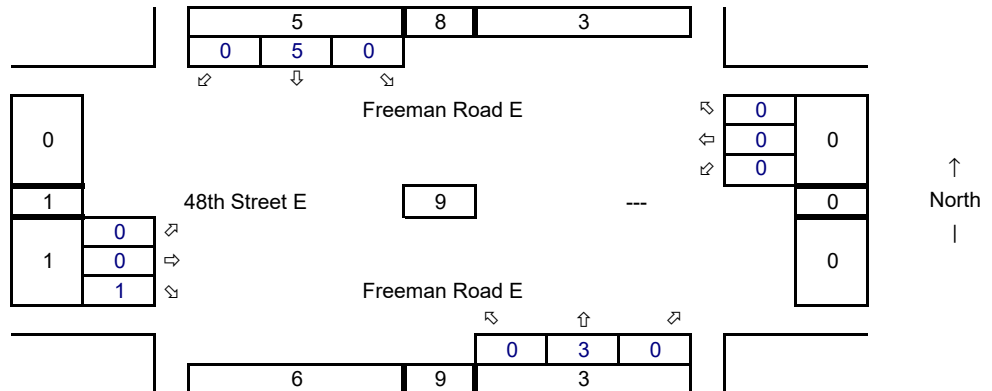
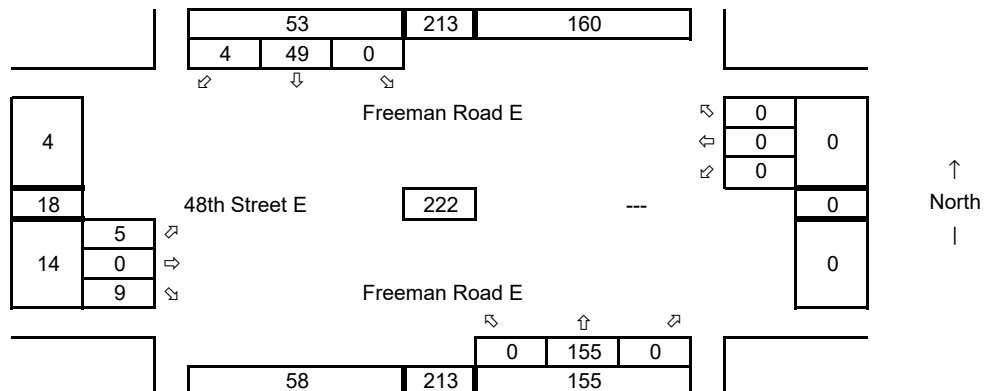
**Future without Project**Average Weekday
AM Peak Hour

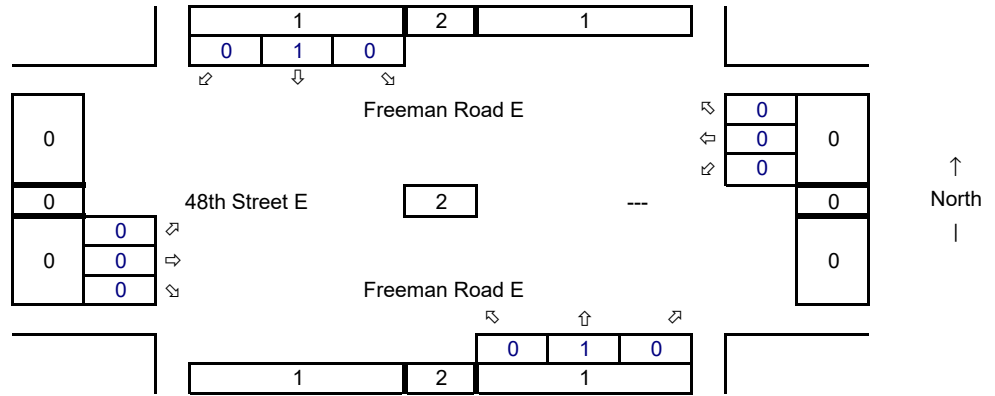
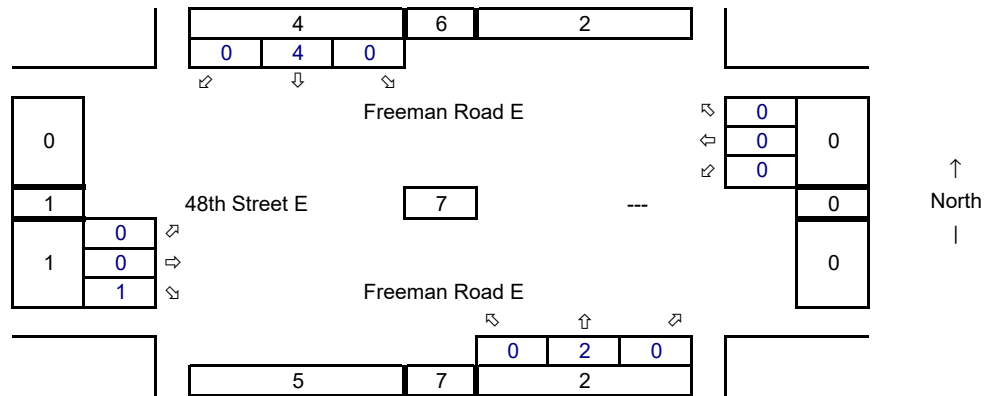
Year: 2027

Growth Rate = 2.1%

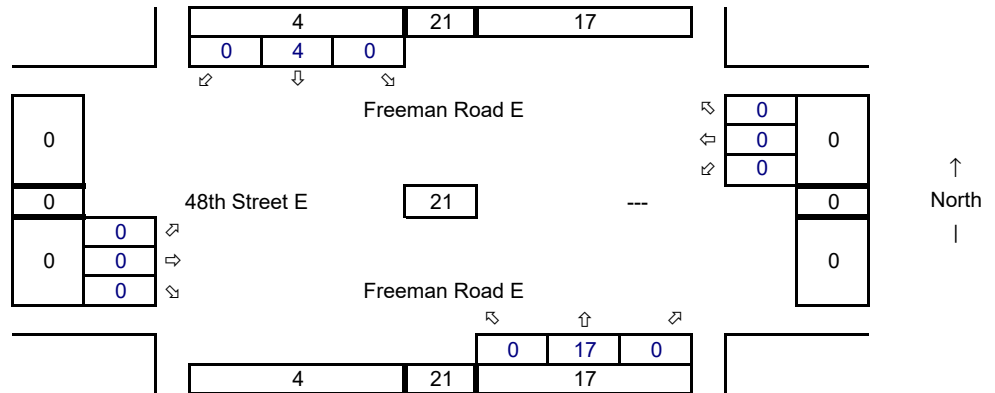
Years of Growth = 6

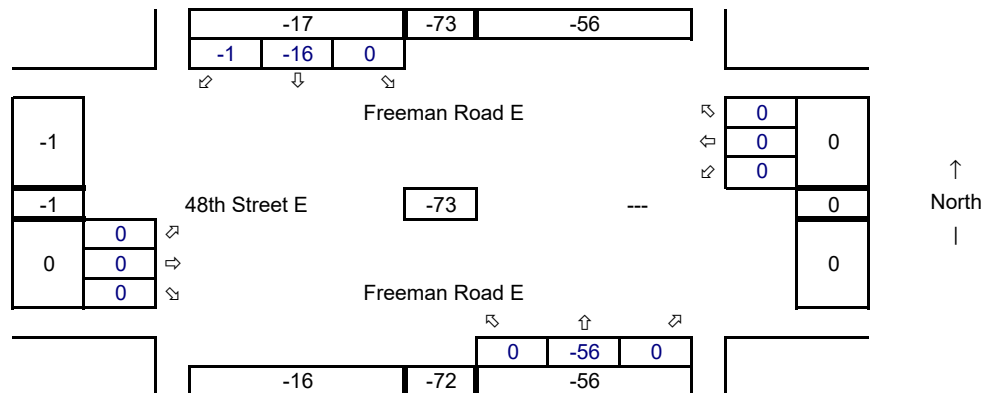
Total Growth = 1.1328

**Total Development Trips**Average Weekday
AM Peak Hour**Future with Project**Average Weekday
AM Peak Hour

Development Truck Trips
 Average Weekday
 AM Peak Hour

Development Car Trips
 Average Weekday
 AM Peak Hour

Total Pipeline Project Trips
 Average Weekday
 AM Peak Hour

Prologis Park Edgewood


SR-167 Extension Diversion
 Average Weekday
 AM Peak Hour

 N/S Diversion % -29%
 E/W Diversion % 0%


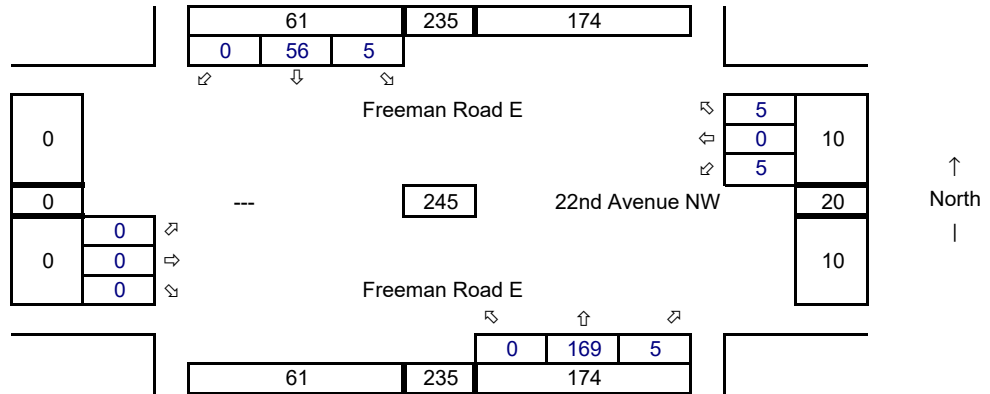
Synchro ID: 3

ExistingAverage Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the south leg of Freeman Rd E at 48th St E. A conservative estimate of 5 trips was added to each approach for 22nd Ave NW.

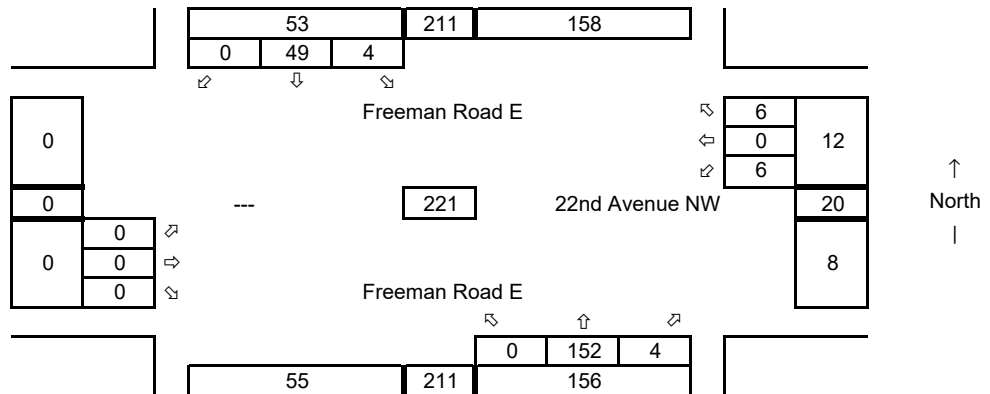
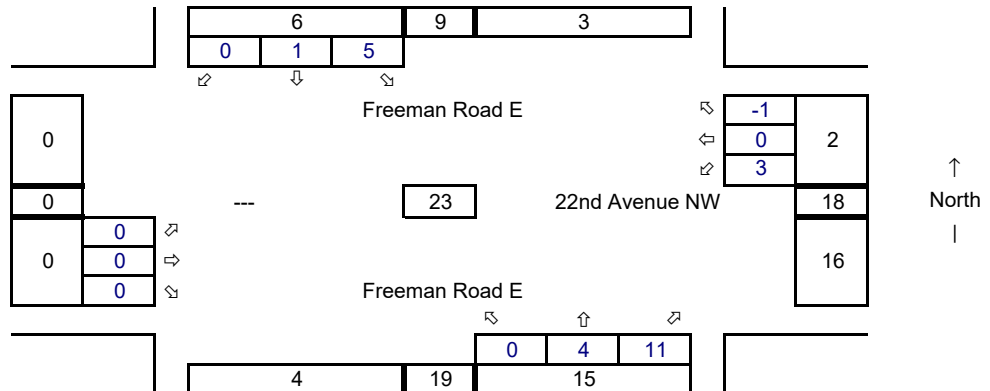
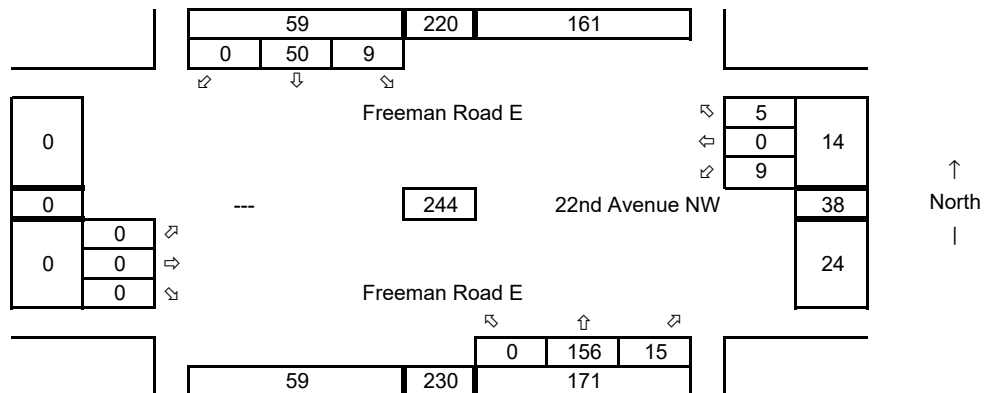
**Future without Project**Average Weekday
AM Peak Hour

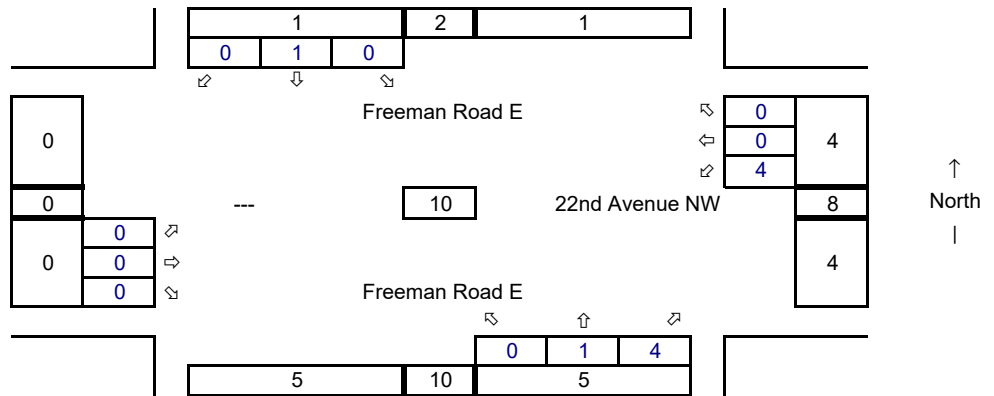
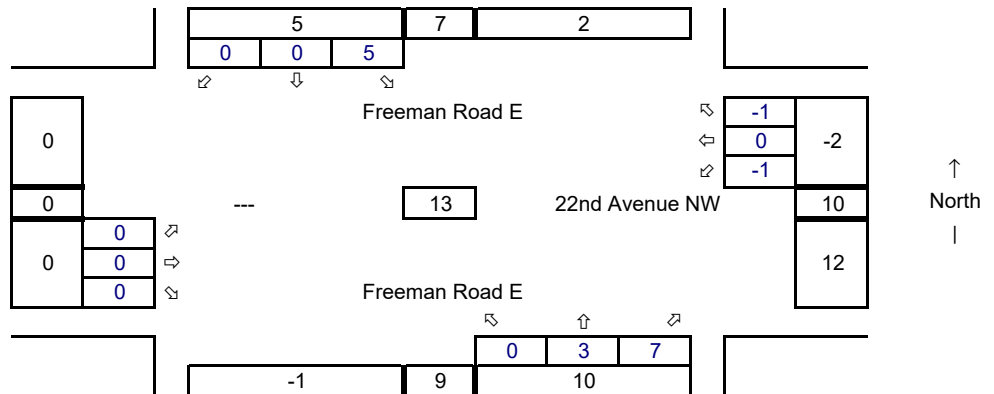
Year: 2027

Growth Rate = 2.1%

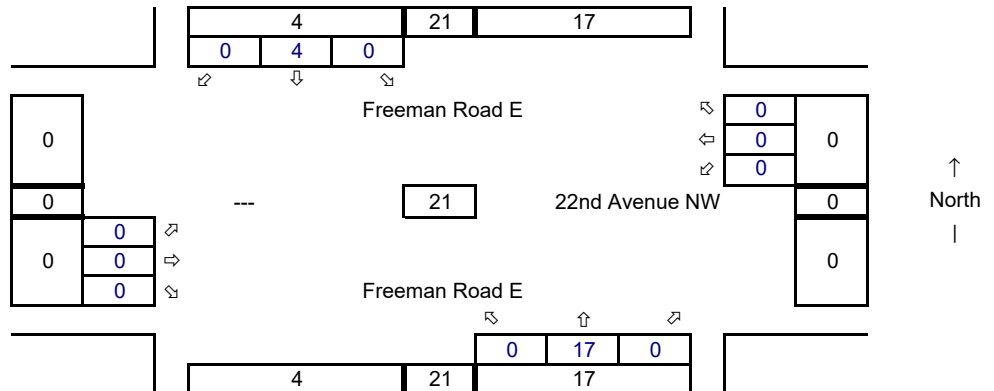
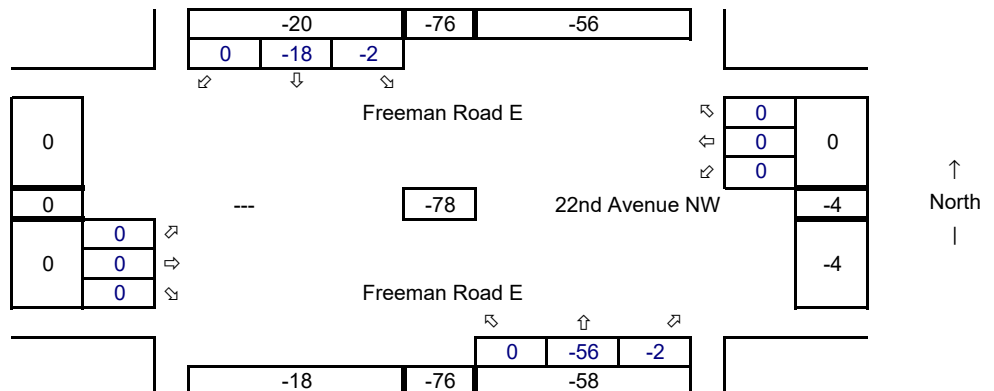
Years of Growth = 6

Total Growth = 1.1328

**Total Development Trips**Average Weekday
AM Peak Hour**Future with Project**Average Weekday
AM Peak Hour

Development Truck TripsAverage Weekday
AM Peak Hour**Development Car Trips**Average Weekday
AM Peak Hour**Total Pipeline Project Trips**Average Weekday
AM Peak Hour

Prologis Park Edgewood

**SR-167 Extension Diversion**Average Weekday
AM Peak HourN/S Diversion % -29%
E/W Diversion % 0%

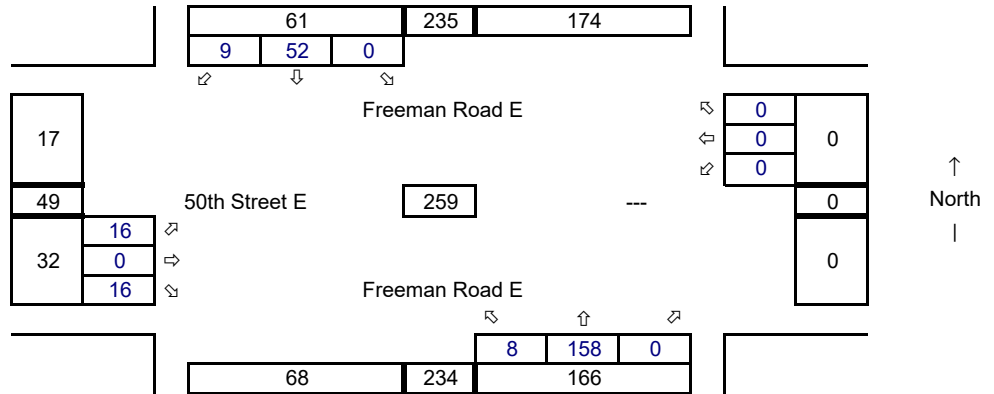
Synchro ID: 4

ExistingAverage Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

N/S Volume extrapolated from
south leg of Freeman Rd E at
49th St E. Volume on 50th St E
based on ITE rates and 55 units
of Single-Family and 21
bedrooms of Assisted Living.

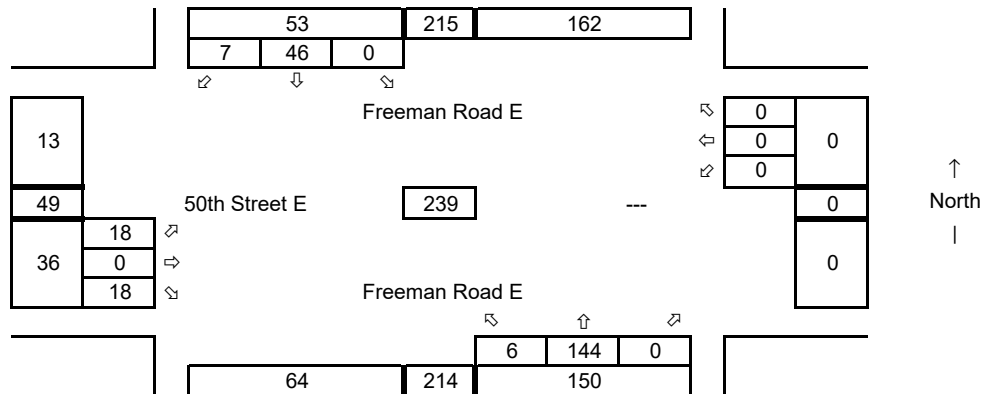
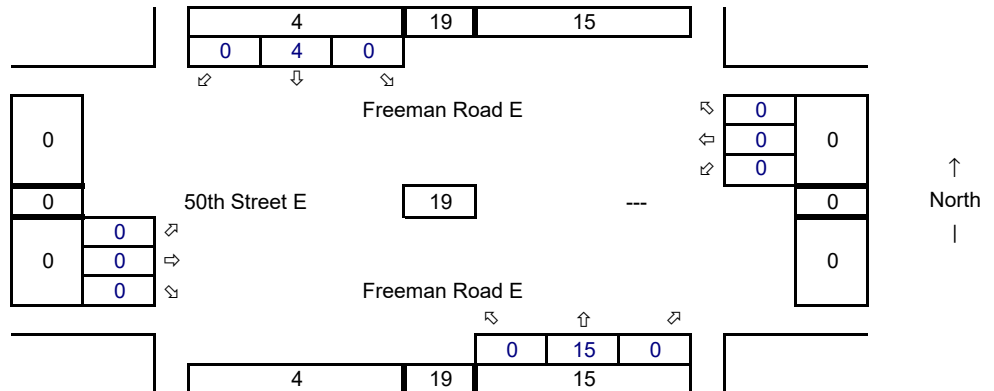
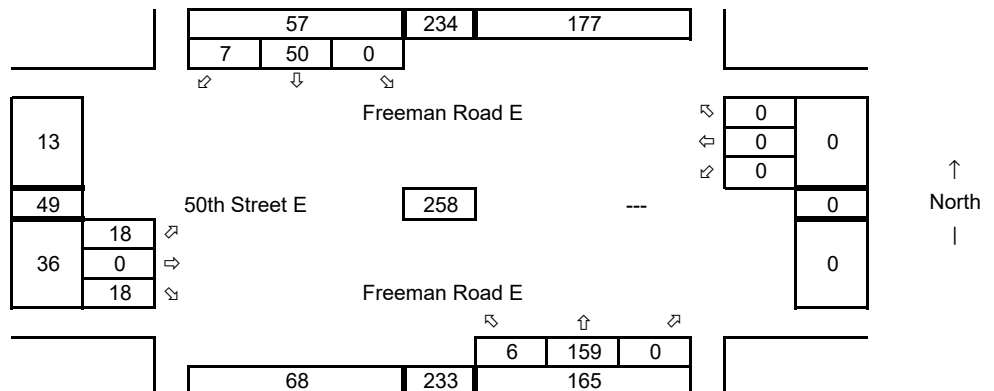
**Future without Project**Average Weekday
AM Peak Hour

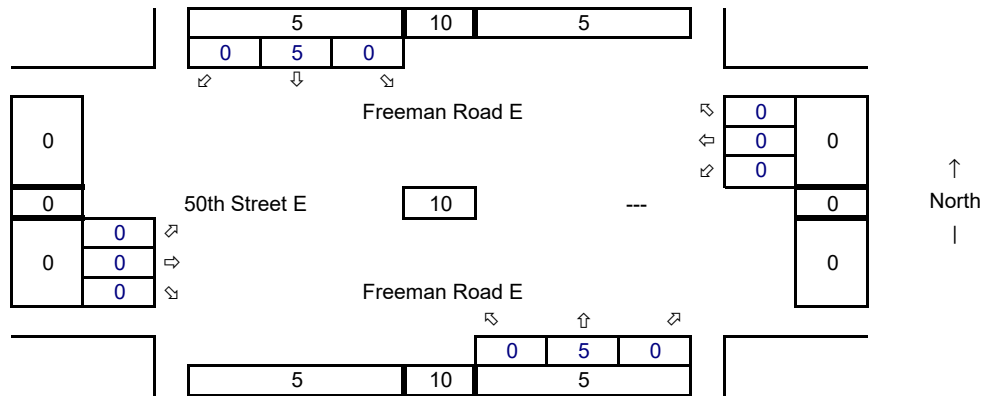
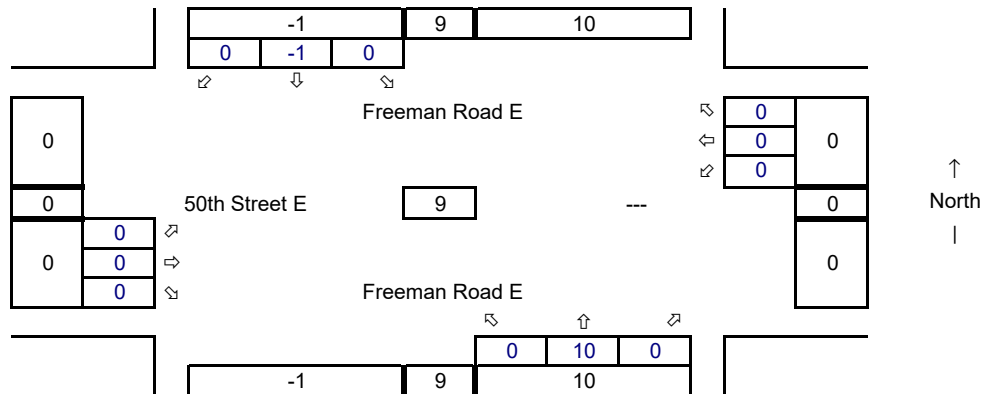
Year: 2027

Growth Rate = 2.1%

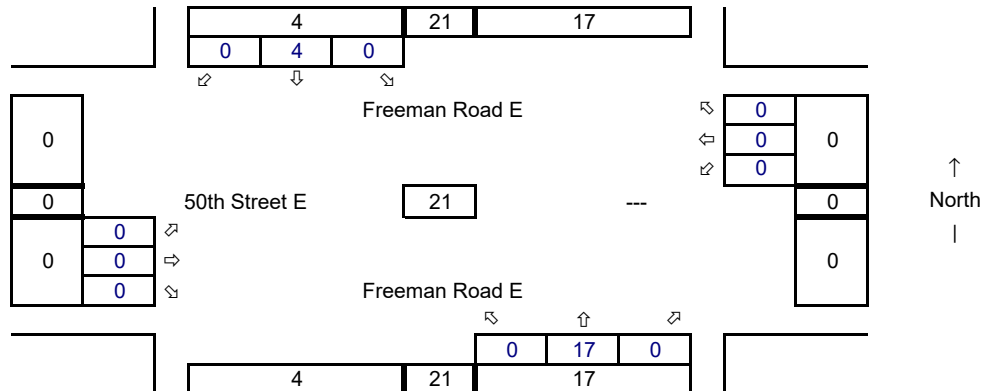
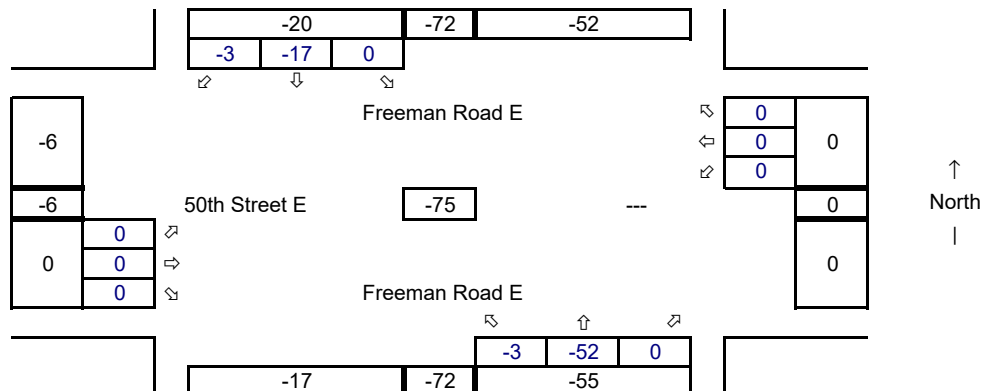
Years of Growth = 6

Total Growth = 1.1328

**Total Development Trips**Average Weekday
AM Peak Hour**Future with Project**Average Weekday
AM Peak Hour

Development Truck TripsAverage Weekday
AM Peak Hour**Development Car Trips**Average Weekday
AM Peak Hour**Total Pipeline Project Trips**Average Weekday
AM Peak Hour

Prologis Park Edgewood

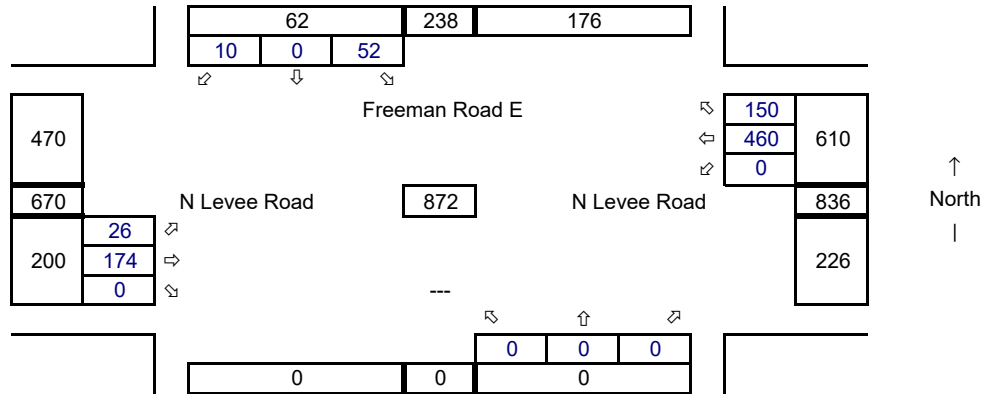
**SR-167 Extension Diversion**Average Weekday
AM Peak HourN/S Diversion % -29%
E/W Diversion % 0%

Synchro ID: 5

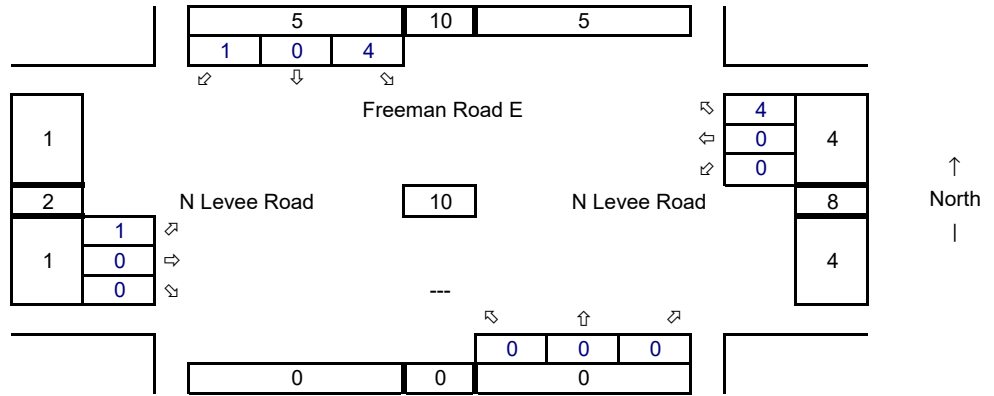
ExistingAverage Weekday
AM Peak Hour

Year: 10/13/21

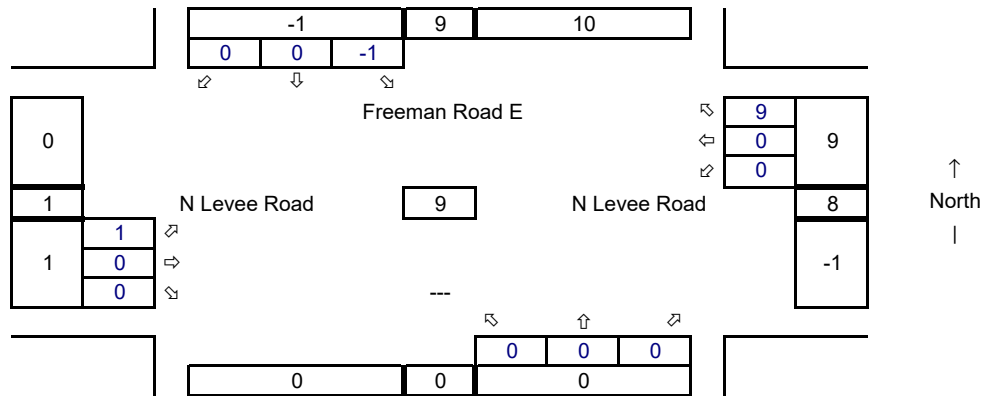
Data Source: Idax



Development Truck Trips
Average Weekday
AM Peak Hour

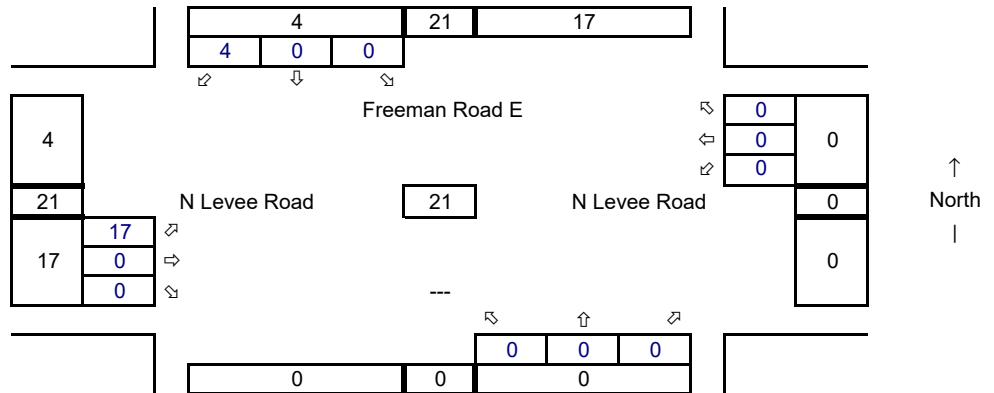


Development Car Trips
Average Weekday
AM Peak Hour



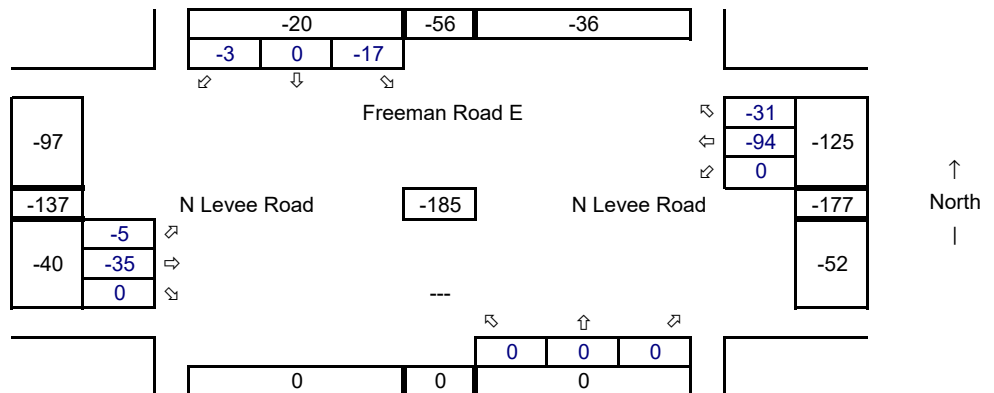
Total Pipeline Project Trips
Average Weekday
AM Peak Hour

Prologis Park Edgewood



SR-167 Extension Diversion
Average Weekday
AM Peak Hour

N/S Diversion % -29%
E/W Diversion % -18%



With SR-167 Extension

6 Freeman Rd E @ N Site Access

Synchro ID: 6

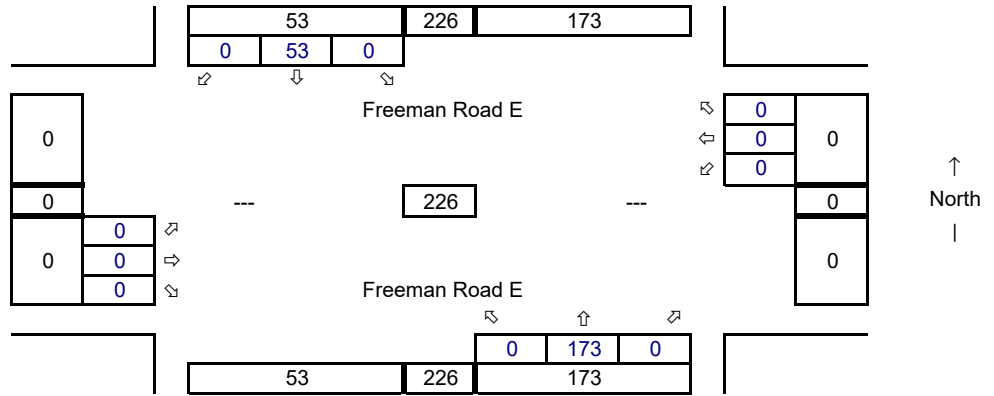
Existing

Average Weekday
AM Peak Hour

Year: 10/13/21

Data Source: Idax

Volumes extrapolated from the
north leg of Freeman
Road E at 48th Street E.



Future without Project

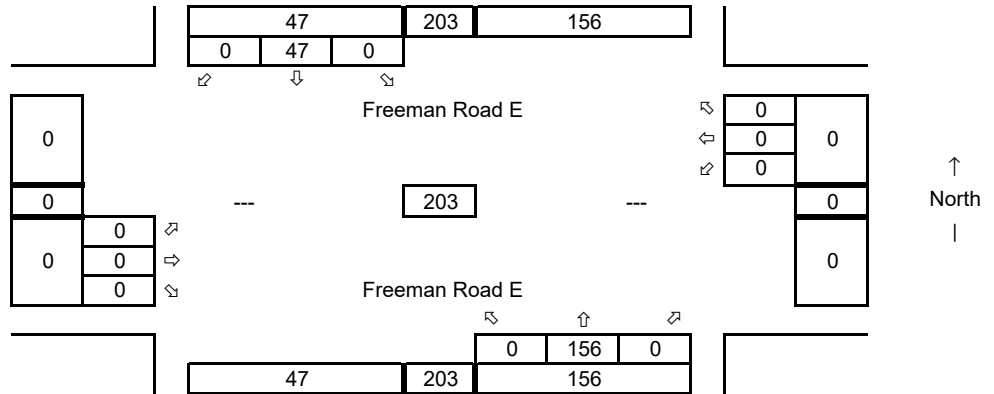
Average Weekday
AM Peak Hour

Year: 2027

Growth Rate = 2.1%

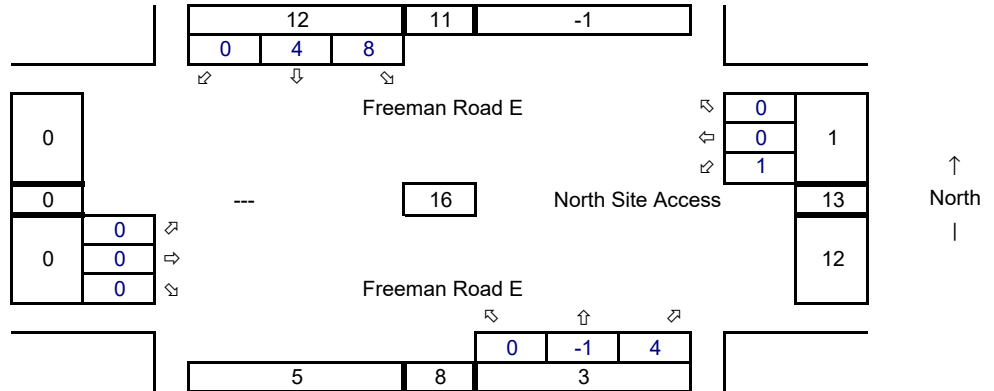
Years of Growth = 6

Total Growth = 1.1328



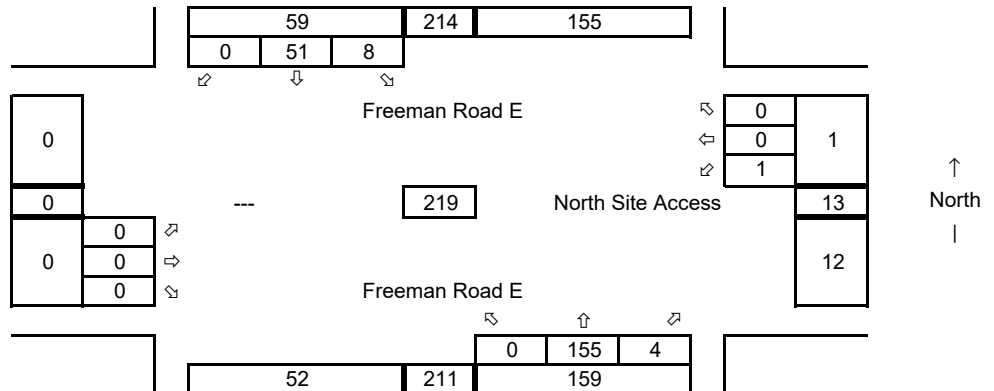
Total Development Trips

Average Weekday
AM Peak Hour

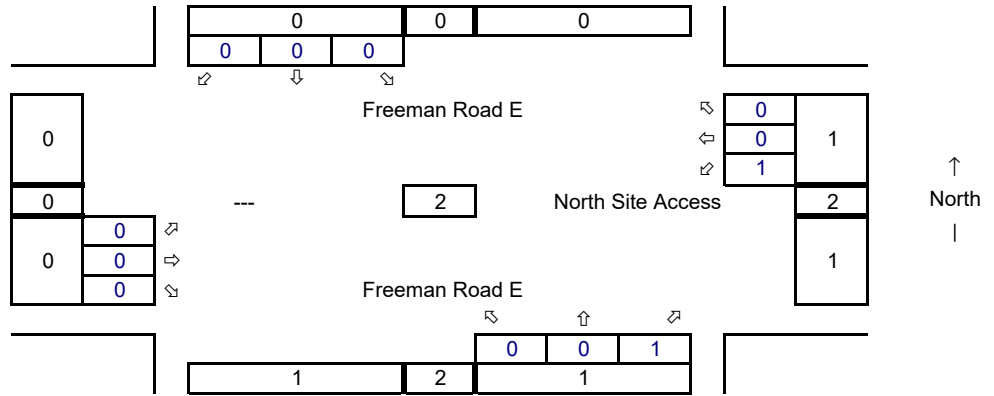


Future with Project

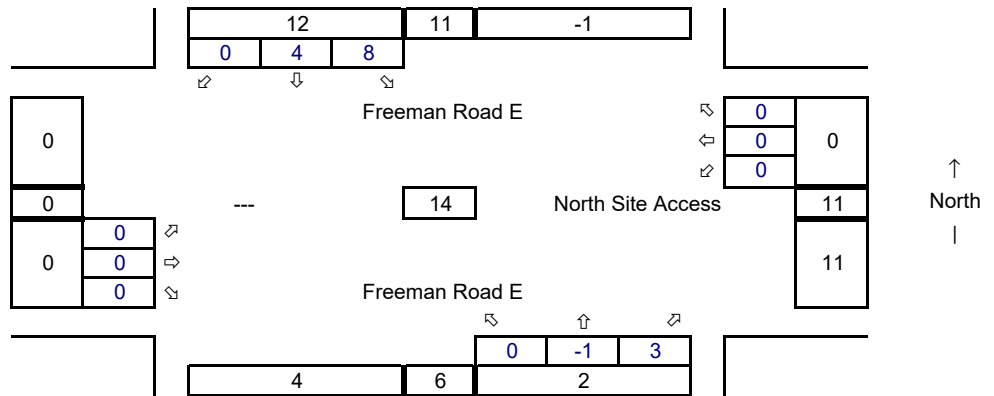
Average Weekday
AM Peak Hour



Development Truck Trips
Average Weekday
AM Peak Hour

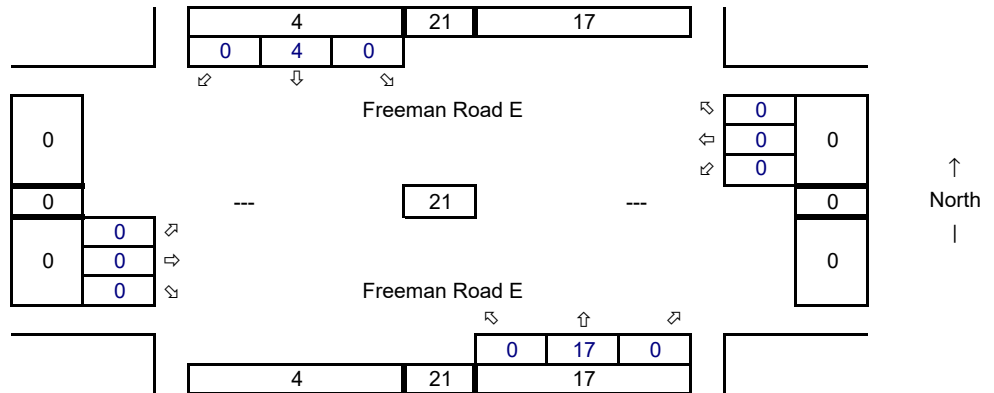


Development Car Trips
Average Weekday
AM Peak Hour



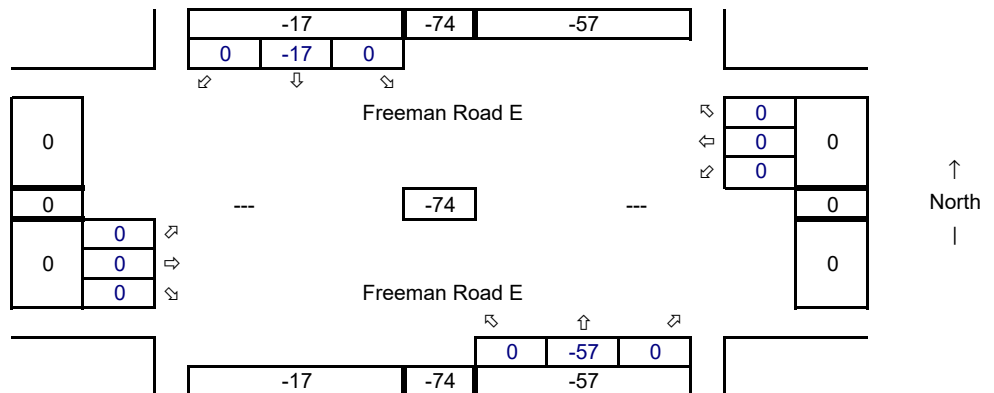
Total Pipeline Project Trips
Average Weekday
AM Peak Hour

Prologis Park Edgewood



SR-167 Extension Diversion
Average Weekday
AM Peak Hour

N/S Diversion % -29%
E/W Diversion % 0%



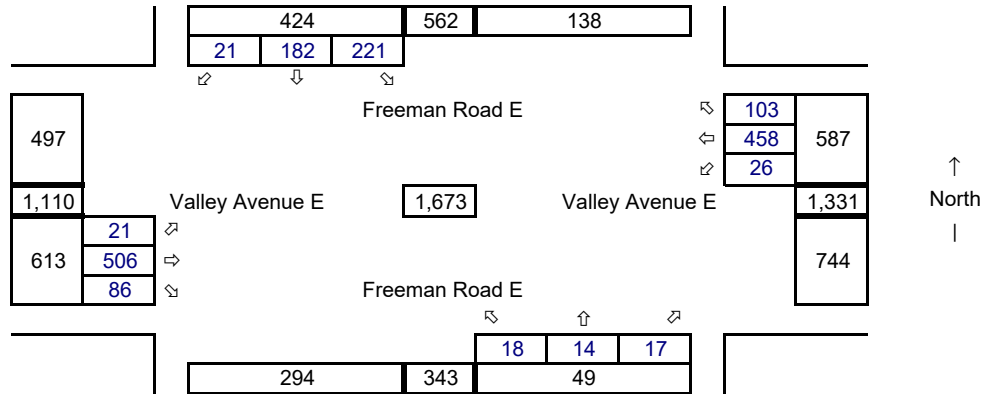
With SR-167 Extension PM Turning Movements

Synchro ID: 1

ExistingAverage Weekday
PM Peak Hour

Year: 10/6/21

Data Source: Idax

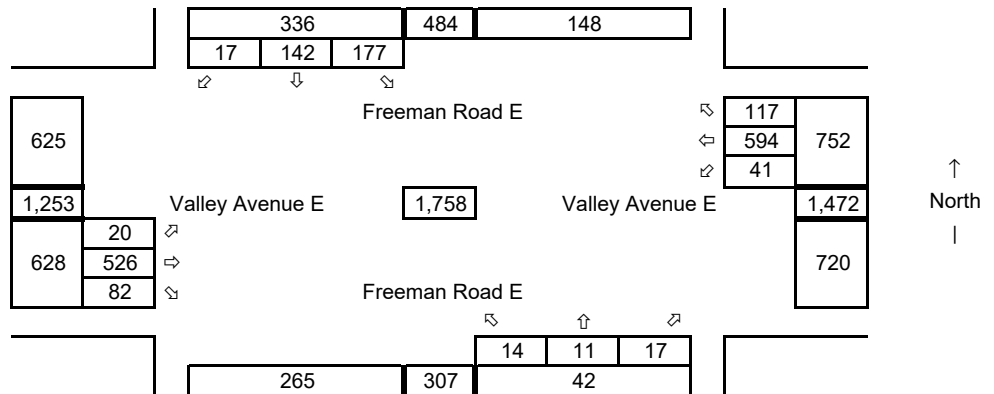
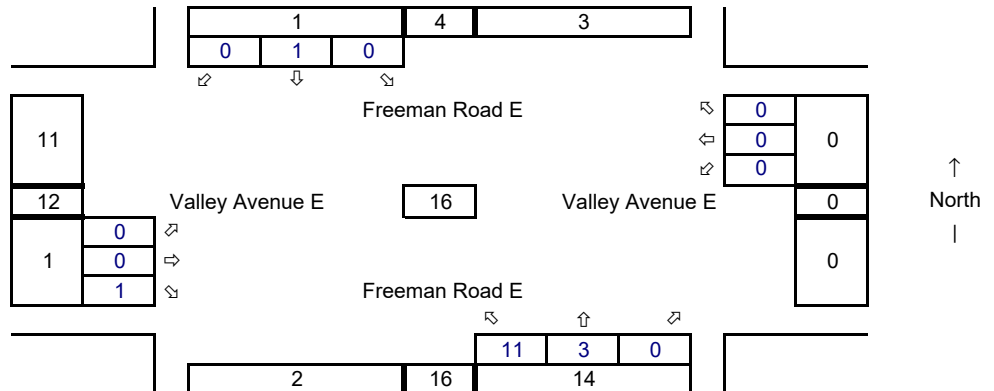
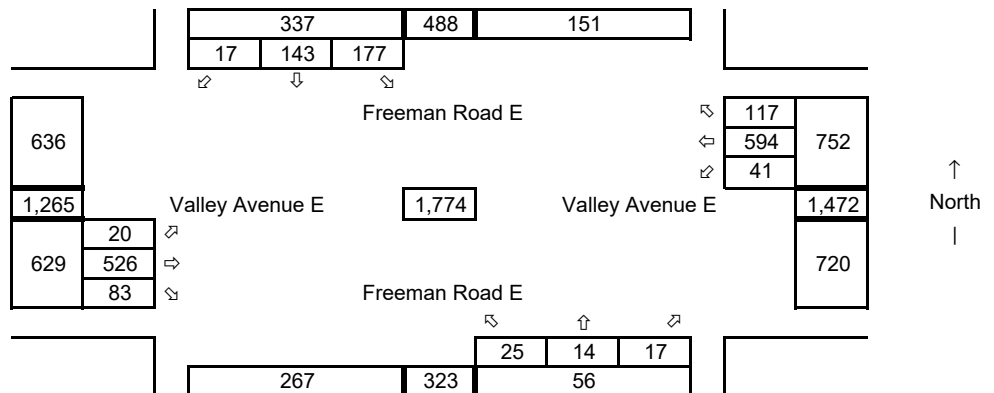
**Future without Project**Average Weekday
PM Peak Hour

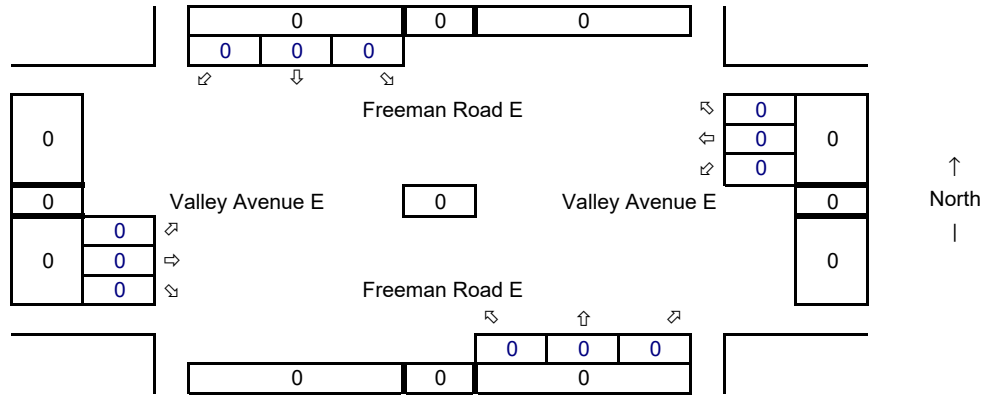
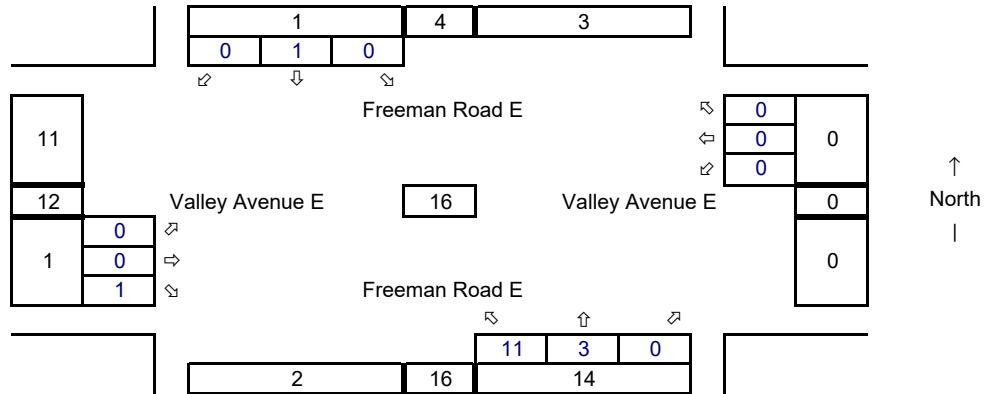
Year: 2027

Growth Rate = 2.1%

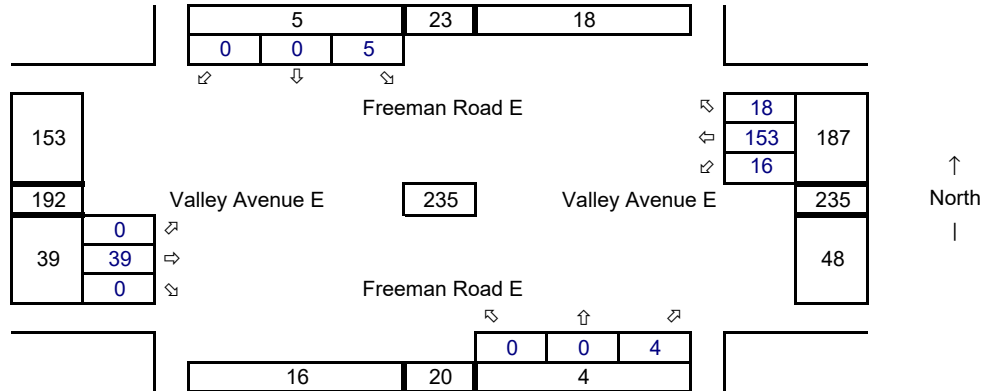
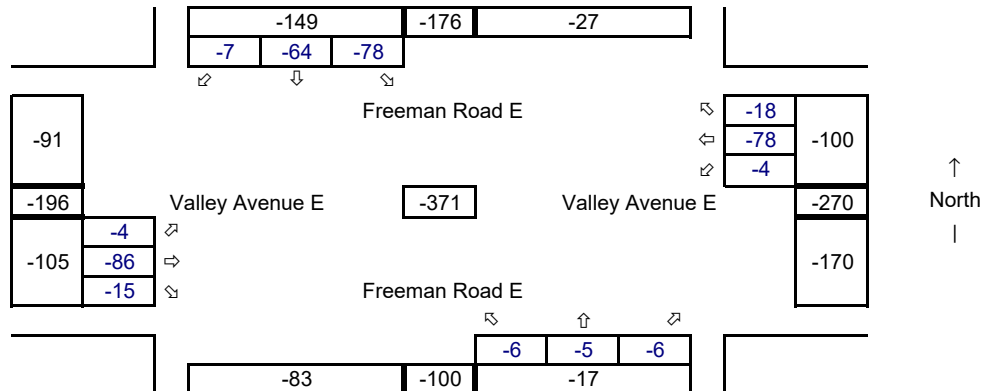
Years of Growth = 6

Total Growth = 1.1328

**Total Development Trips**Average Weekday
PM Peak Hour**Future with Project**Average Weekday
PM Peak Hour

Development Truck TripsAverage Weekday
PM Peak Hour**Development Car Trips**Average Weekday
PM Peak Hour**Total Pipeline Project Trips**Average Weekday
PM Peak Hour

Prologis Park Edgewood

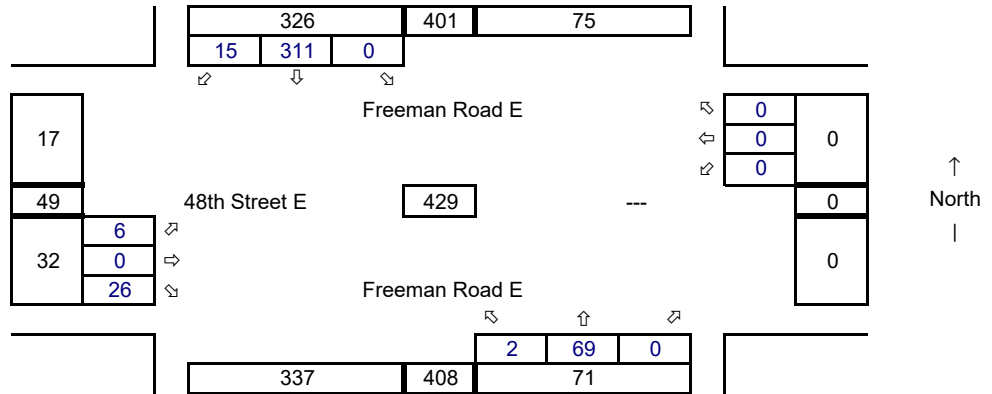
**SR-167 Extension Diversion**Average Weekday
PM Peak HourN/S Diversion % -31%
E/W Diversion % -15%

Synchro ID: 2

ExistingAverage Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

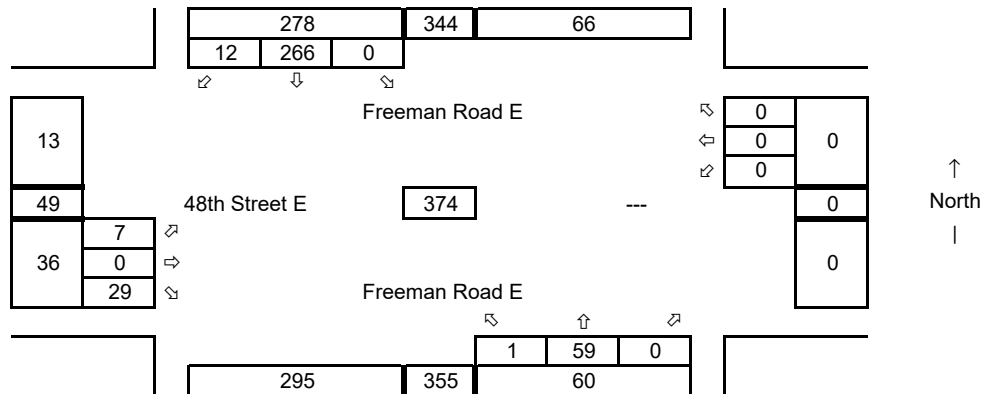
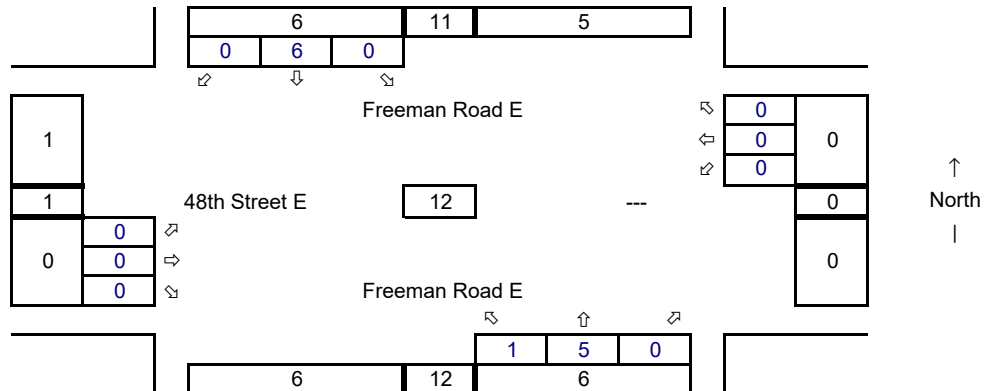
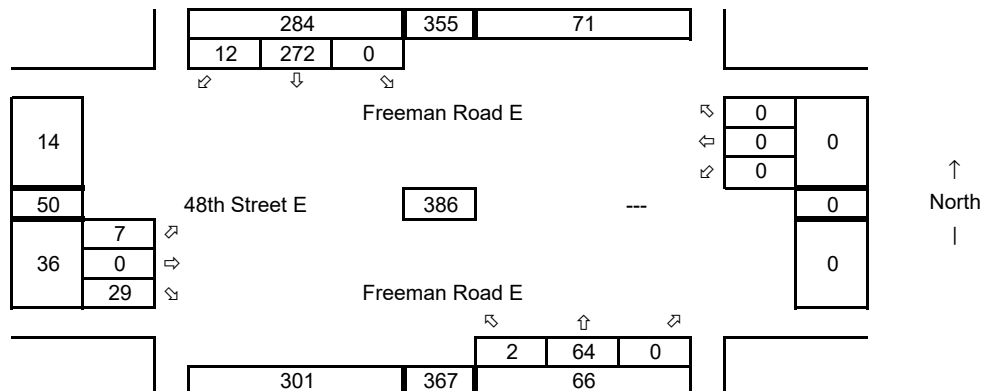
**Future without Project**Average Weekday
PM Peak Hour

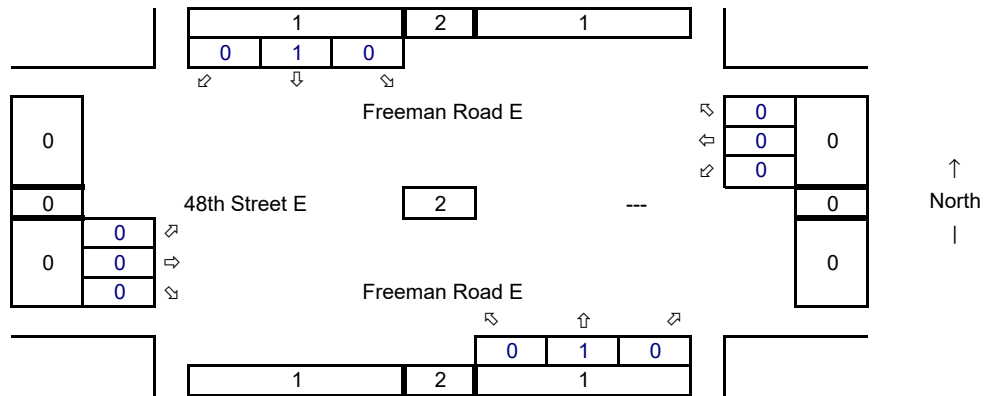
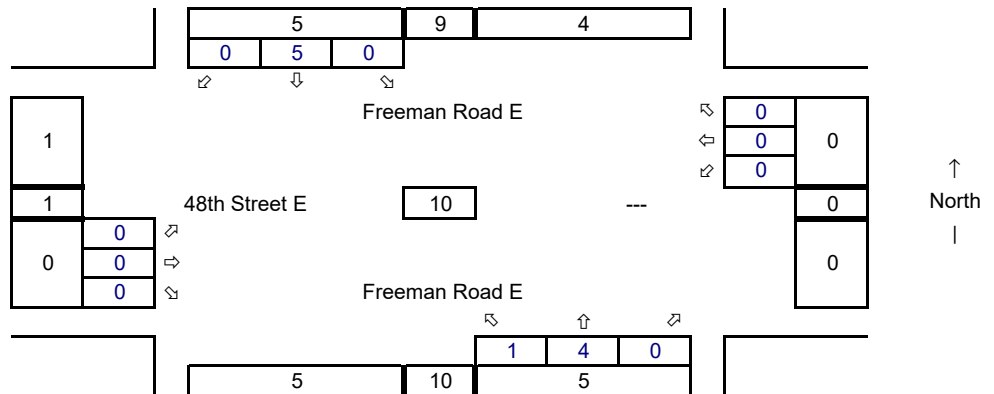
Year: 2027

Growth Rate = 2.1%

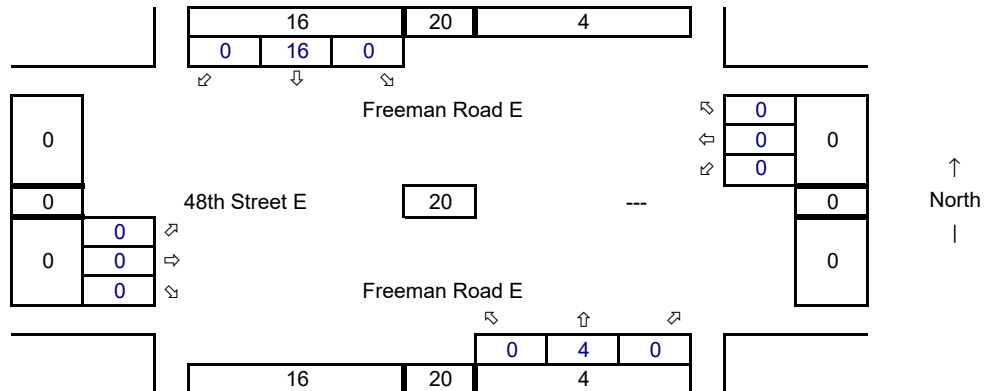
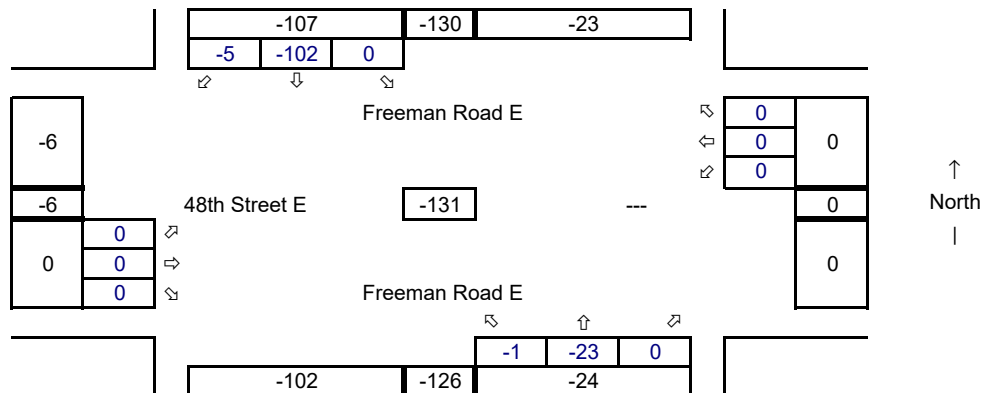
Years of Growth = 6

Total Growth = 1.1328

**Total Development Trips**Average Weekday
PM Peak Hour**Future with Project**Average Weekday
PM Peak Hour

Development Truck TripsAverage Weekday
PM Peak Hour**Development Car Trips**Average Weekday
PM Peak Hour**Total Pipeline Project Trips**Average Weekday
PM Peak Hour

Prologis Park Edgewood

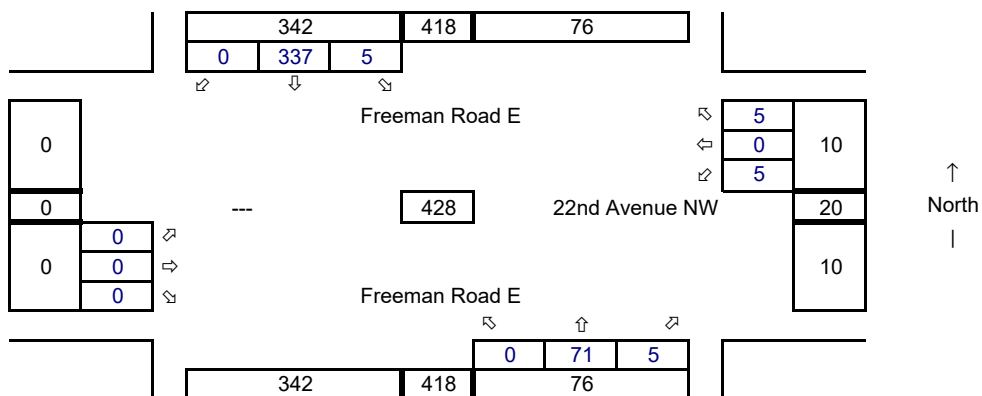
**SR-167 Extension Diversion**Average Weekday
PM Peak HourN/S Diversion % -29%
E/W Diversion % 0%

3 Freeman Rd E @ 22nd Ave NW

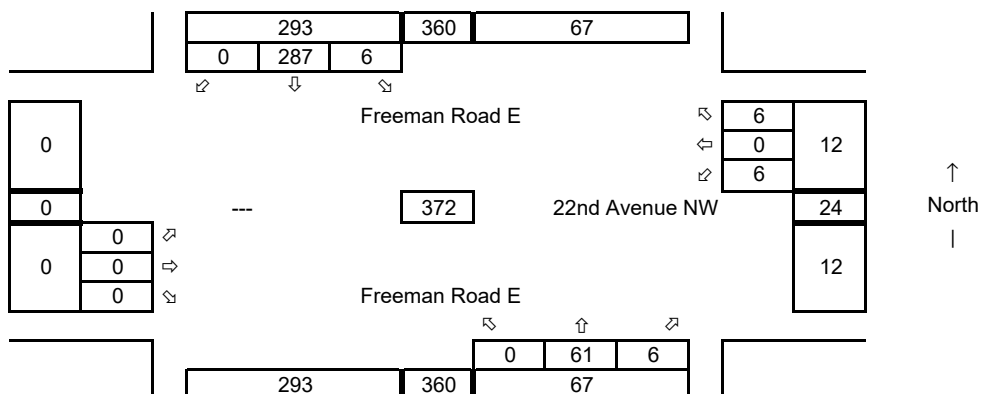
Existing

Year: **10/13/21**

Volumes extrapolated from the south leg of Freeman Rd E at 48th St E. A conservative estimate of 5 trips was added to each approach for 22nd Ave NW.



Total Growth = 1.1328



The diagram illustrates a traffic intersection with the following details:

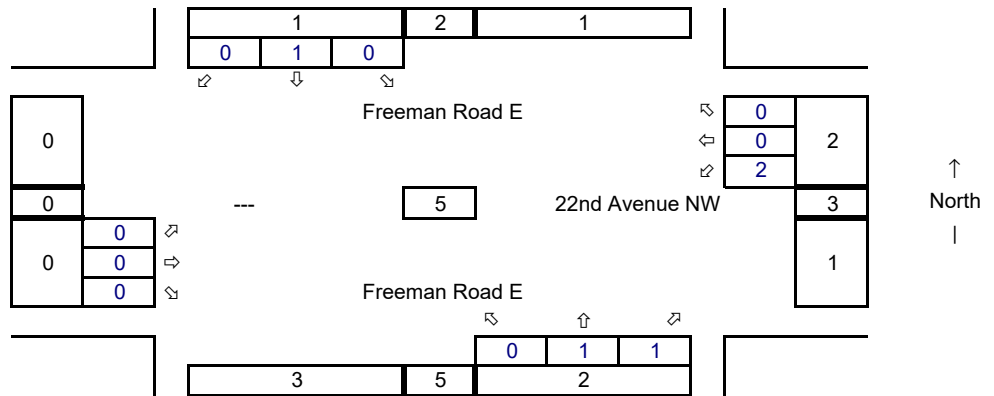
- Streets:** Freeman Road E (horizontal) and 22nd Avenue NW (vertical).
- Vehicle Counts (Blue Numbers):**
 - Freeman Road E (Northbound): 0 (left), 5 (through), 1 (right).
 - Freeman Road E (Southbound): 0 (left), 0 (through), 0 (right).
 - 22nd Avenue NW (Eastbound): 5 (left), 0 (through), 11 (right).
 - 22nd Avenue NW (Westbound): 0 (left), 1 (through), 2 (right).
- Other Counts:**
 - Freeman Road E (Northbound): 12 (left of intersection), 6 (right of intersection).
 - Freeman Road E (Southbound): 16 (left of intersection), 19 (right of intersection).
 - 22nd Avenue NW (Eastbound): 16 (left of intersection), 19 (right of intersection).
 - 22nd Avenue NW (Westbound): 3 (left of intersection).
- Arrows:**
 - Freeman Road E (Northbound): Left, Through, Right.
 - Freeman Road E (Southbound): Left, Through, Right.
 - 22nd Avenue NW (Eastbound): Left, Through, Right.
 - 22nd Avenue NW (Westbound): Left, Through, Right.

The map shows the intersection of Freeman Road E and 22nd Avenue NW. The lot numbers are as follows:

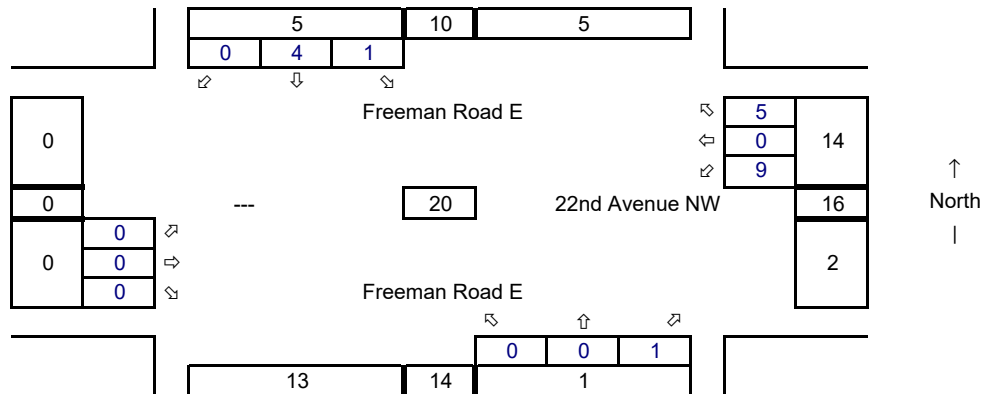
- Top-left: 299, 372, 73
- Top-center: 0, 292, 7
- Top-right: 11, 0, 17, 28, 43, 15
- Center: 397
- Bottom-left: 0, 0, 0
- Bottom-center: 309, 379, 70
- Bottom-right: 0, 62, 8

Street names are Freeman Road E and 22nd Avenue NW. A north arrow points upwards on the right side. Various symbols like arrows and a 'V' are placed at the intersection and along the streets.

Average Weekday
PM Peak Hour



Average Weekday
PM Peak Hour



Average Weekday
PM Peak Hour

The diagram illustrates a traffic intersection with the following details:

- Streets:** Freeman Road E (horizontal) and 22nd Avenue NW (vertical).
- North Arrow:** Points upwards on the right side of the diagram.
- Vehicle Counts (Blue Numbers):**
 - Top-left corner: 16 (horizontal), 0 (vertical), 16 (horizontal), 0 (vertical).
 - Top-right corner: 20 (horizontal), 4 (horizontal).
 - Bottom-left corner: 0 (horizontal), 0 (vertical), 0 (horizontal), 0 (vertical).
 - Bottom-right corner: 0 (horizontal), 0 (vertical), 0 (horizontal), 0 (vertical).
 - Center: 20 (horizontal).
- Movement Indicators (Arrows):**
 - Top-left: Upward arrow, Downward arrow, Rightward arrow.
 - Top-right: Leftward arrow, Rightward arrow, Upward arrow.
 - Bottom-left: Upward arrow, Downward arrow, Rightward arrow.
 - Bottom-right: Leftward arrow, Upward arrow, Rightward arrow.

Average Weekday
PM Peak Hour

Diagram illustrating a traffic intersection layout and signal timing. The intersection is between Freeman Road E and 22nd Avenue NW.

Freeman Road E (Northbound):

- Left Turn Lane: 0
- Through-Right Lane: -111, -134, -23
- Right Turn Lane: 0

22nd Avenue NW (Eastbound):

- Left Turn Lane: 0
- Through-Right Lane: 0, 0, 0
- Right Turn Lane: 0

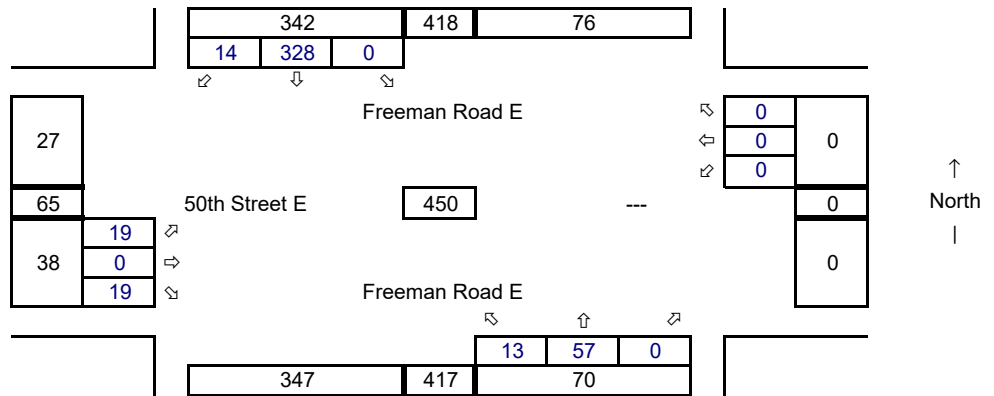
Signal Timing (Minutes):

- Freeman Road E: 0, -111, 0
- 22nd Avenue NW: 0, -23, 0

Arrows indicate the direction of traffic flow: Northbound on Freeman Road E, Eastbound on 22nd Avenue NW, and Southbound on Freeman Road E.

4 Freemond Rd E @ 50th St E

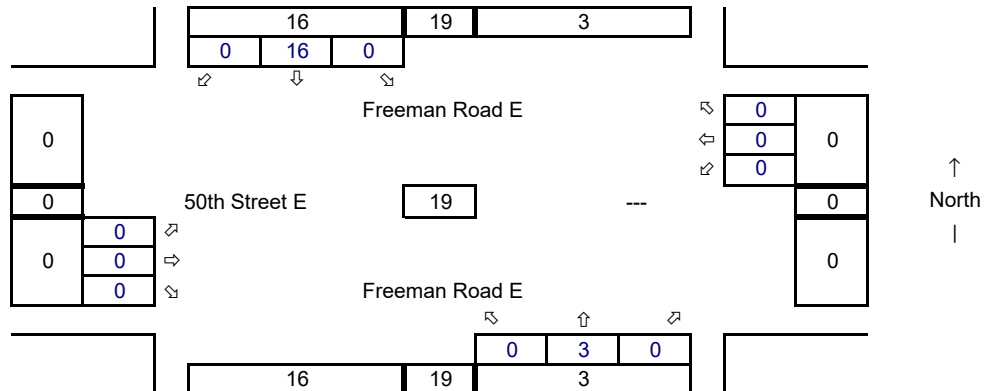
N/S Volume extrapolated from south leg of Freeman Rd E at 49th St E. Volume on 50th St E based on ITE rates and 55 units of Single-Family and 21 bedrooms of Assisted Living.



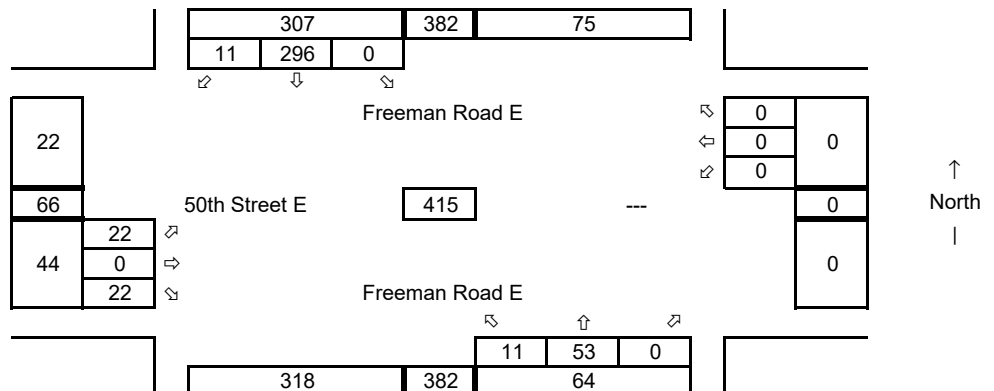
Years of Growth = 6
Total Growth = 1.1328



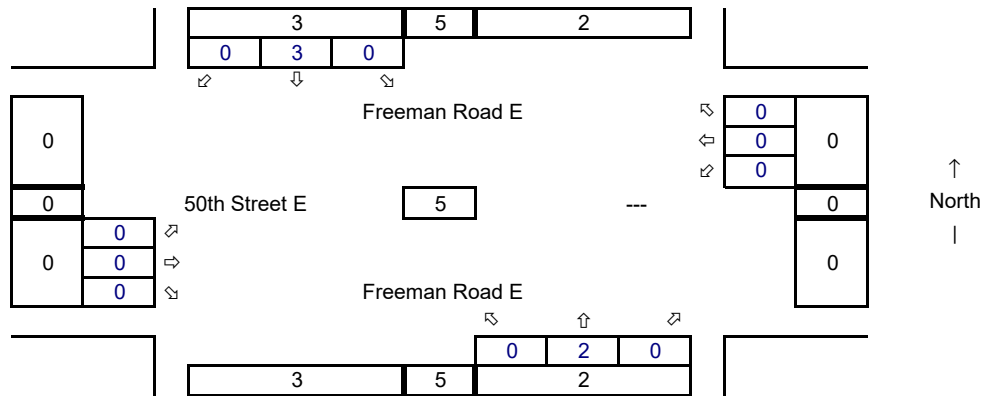
Average Weekday
PM Peak Hour



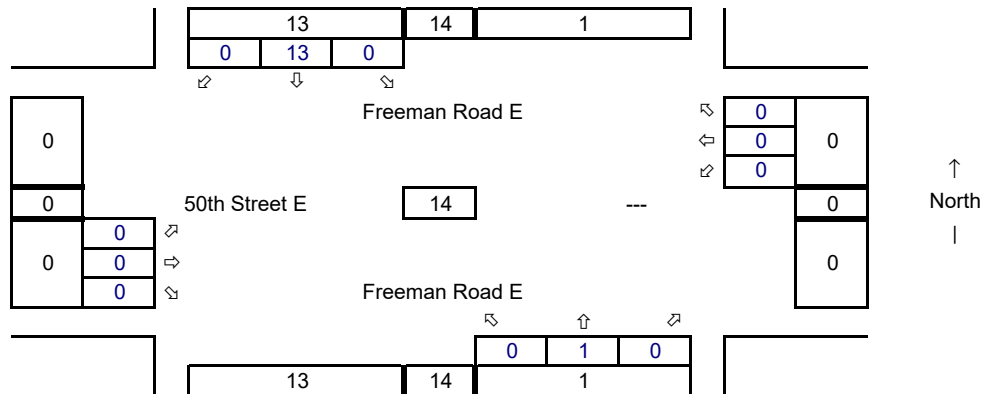
Average Weekday
PM Peak Hour



Average Weekday
PM Peak Hour



Average Weekday
PM Peak Hour



Average Weekday
PM Peak Hour

The diagram illustrates a traffic intersection with the following signalized approaches and timing:

- Northbound Approach:** 0, 16, 0
- Eastbound Approach:** 0, 20, 4
- Southbound Approach:** 0, 4, 0
- Westbound Approach:** 16, 20, 4

The intersection is controlled by a traffic signal with four phases. The diagram also shows the layout of the intersection, including the signalized approaches, the intersection area, and the surrounding streets: Freeman Road E, 50th Street E, and North.

Average Weekday
PM Peak Hour

The map shows a street intersection with the following details:

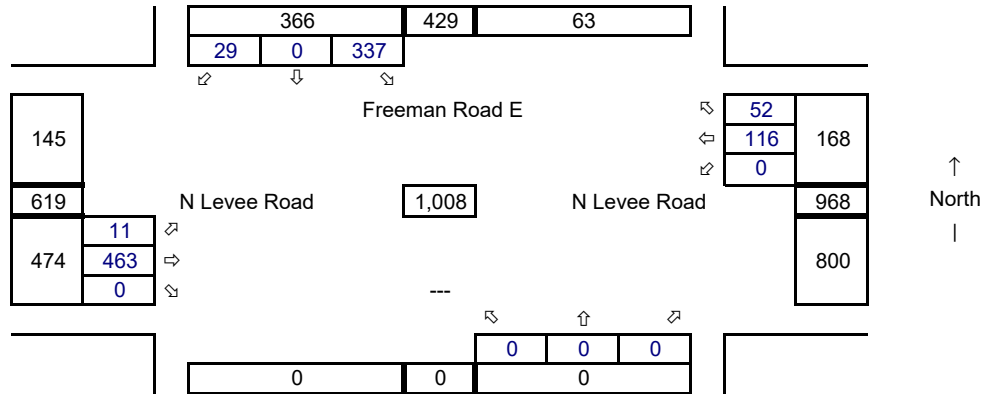
- Streets:** Freeman Road E (horizontal), 50th Street E (vertical).
- Building Footprints and Numbers:**
 - Top-left: A row of three buildings with numbers -113, -108, and -5. Below them are three arrows pointing down.
 - Top-right: A building with number -19.
 - Left side of 50th Street E: A building with number -9, and below it a building with number -9. To the right of these are three buildings with numbers 0, 0, and 0, each with an arrow pointing right.
 - Center: A building with number -136.
 - Right side of 50th Street E: A building with number 0, and below it a building with number 0. To the left of these are three buildings with numbers 0, 0, and 0, each with an arrow pointing left.
 - Bottom: A row of three buildings with numbers -4, -19, and 0. Below them are three arrows pointing up. Below this row are three buildings with numbers -108, -131, and -23.
- North Arrow:** Located on the right side, pointing upwards, labeled "North".

Synchro ID: 5

ExistingAverage Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

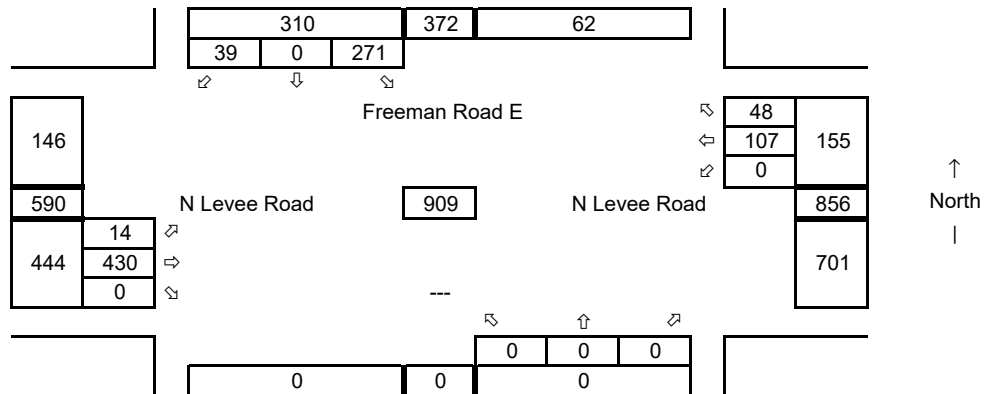
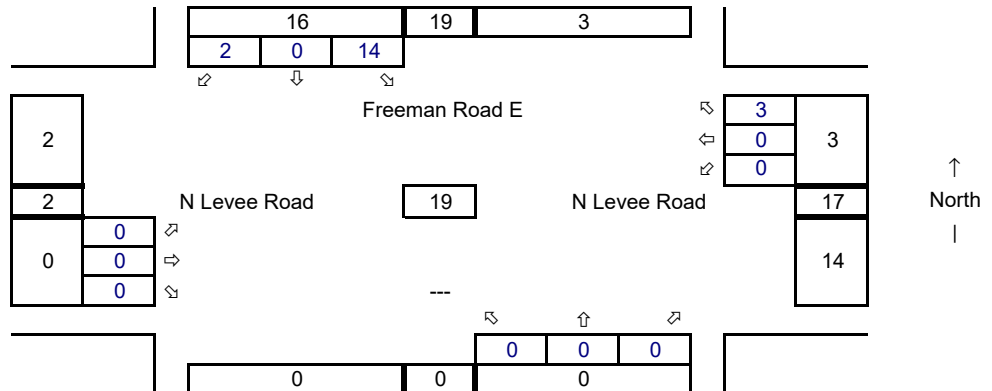
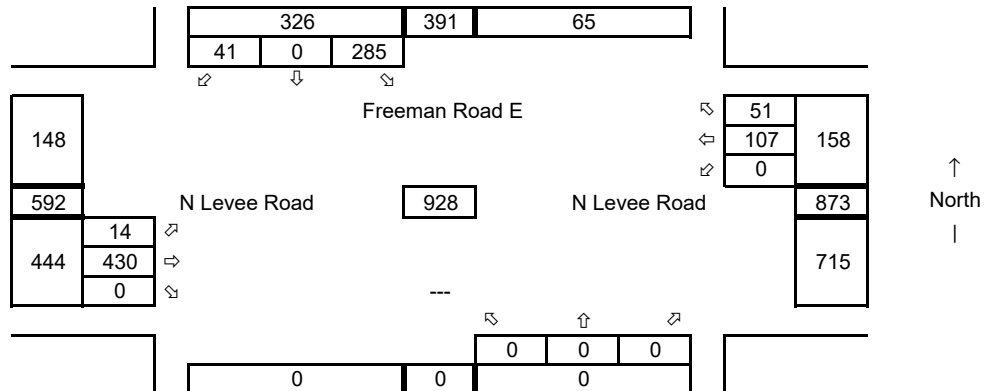
**Future without Project**Average Weekday
PM Peak Hour

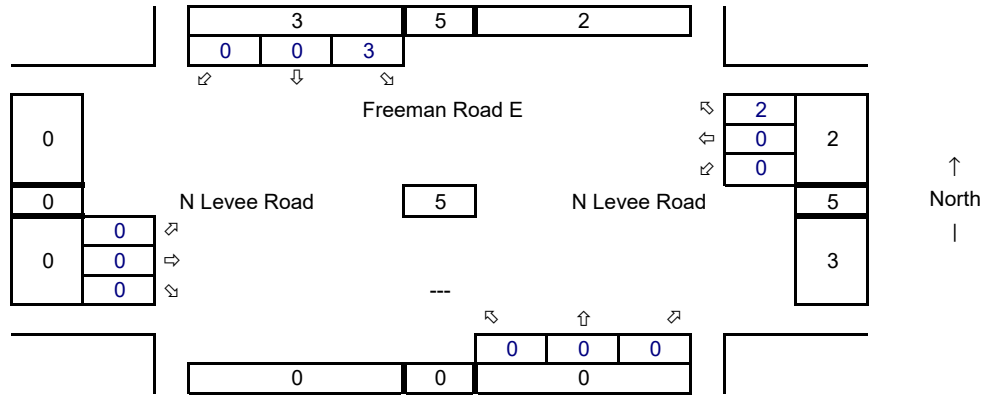
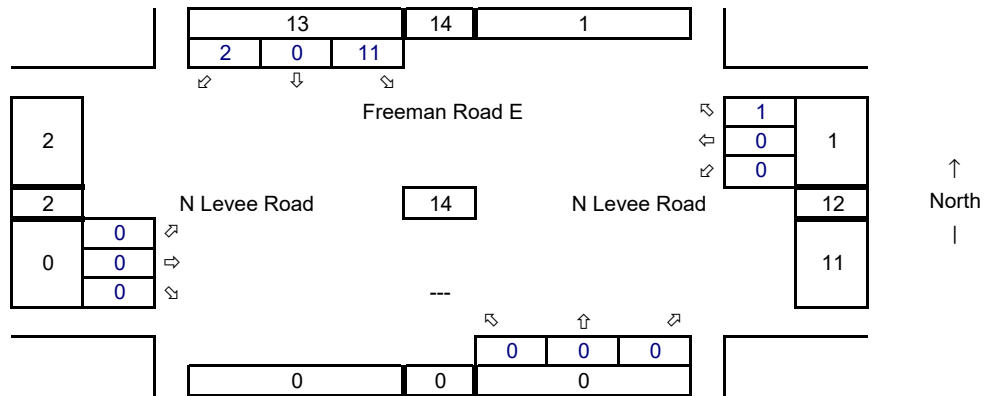
Year: 2027

Growth Rate = 2.1%

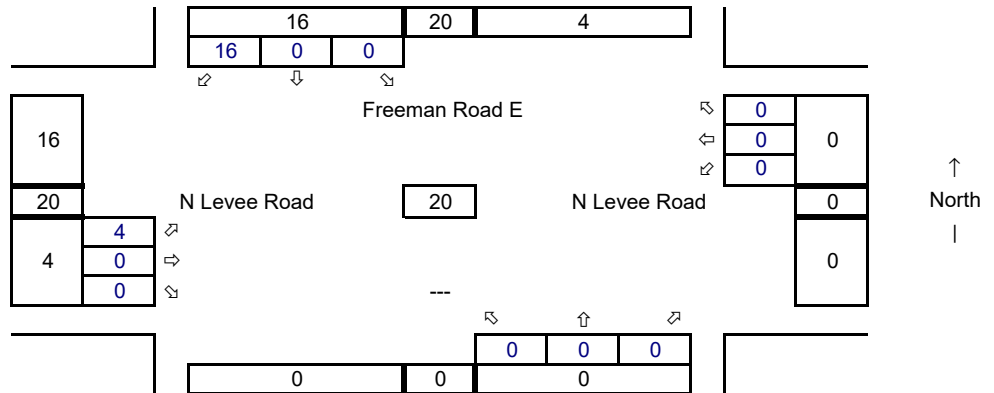
Years of Growth = 6

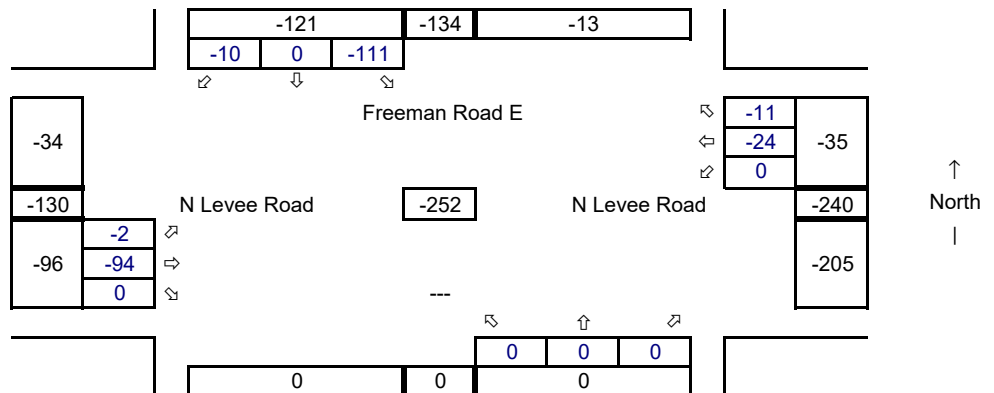
Total Growth = 1.1328

**Total Development Trips**Average Weekday
PM Peak Hour**Future with Project**Average Weekday
PM Peak Hour

Development Truck Trips
 Average Weekday
 PM Peak Hour

Development Car Trips
 Average Weekday
 PM Peak Hour

Total Pipeline Project Trips
 Average Weekday
 PM Peak Hour

Prologis Park Edgewood


SR-167 Extension Diversion
 Average Weekday
 PM Peak Hour

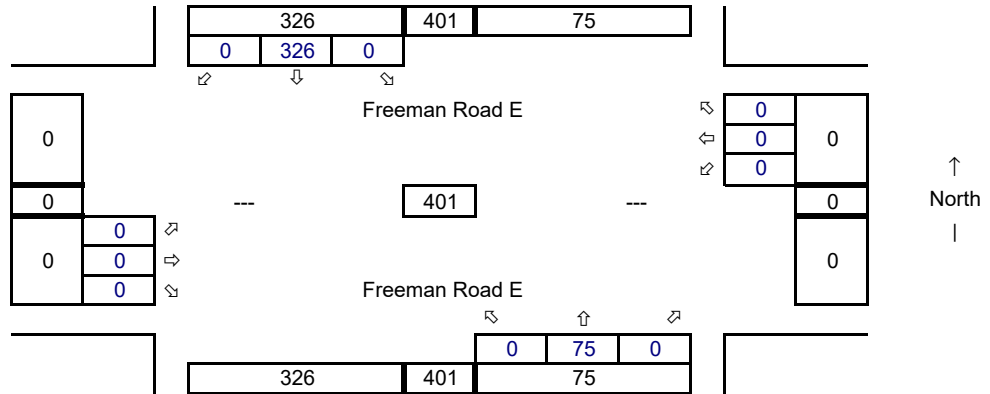
 N/S Diversion % -29%
 E/W Diversion % -18%


Synchro ID: 6

ExistingAverage Weekday
PM Peak Hour

Year: 10/13/21

Data Source: Idax

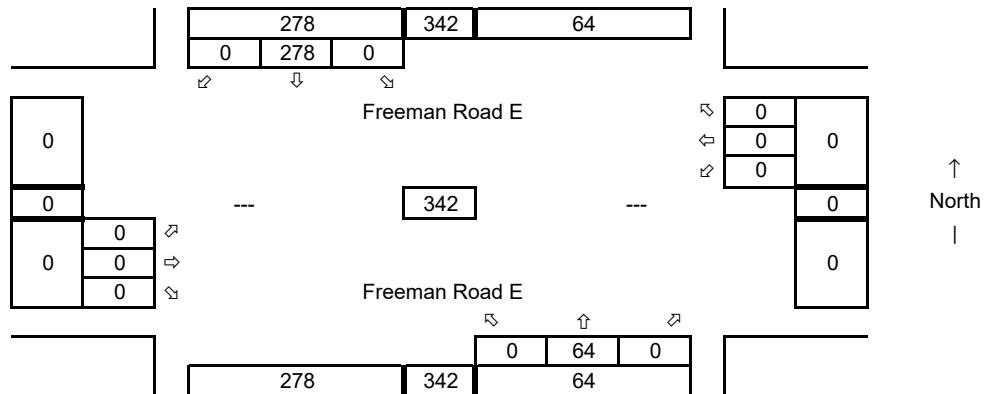
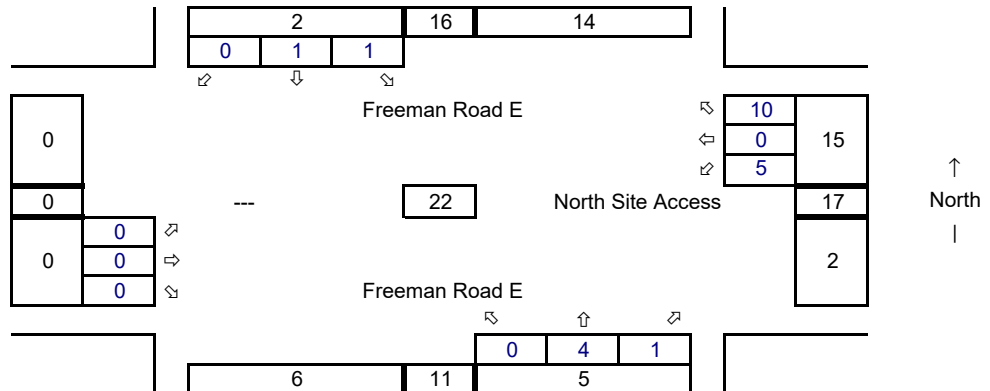
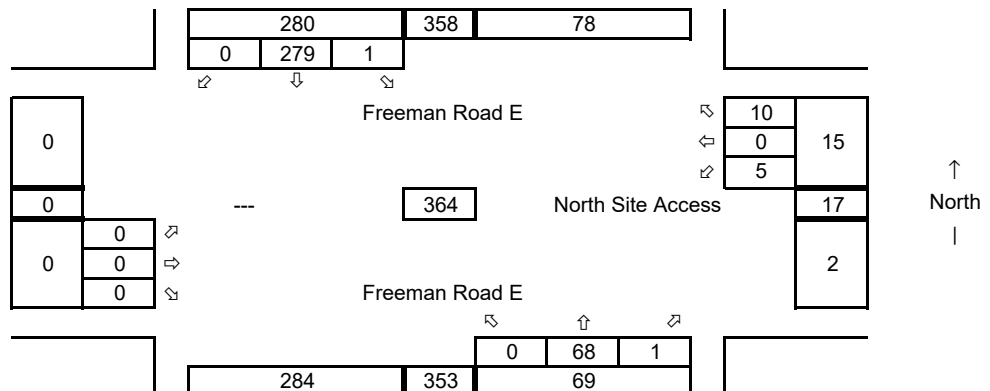
Volumes extrapolated from the
north leg of Freeman Road E at
48th Street E.**Future without Project**Average Weekday
PM Peak Hour

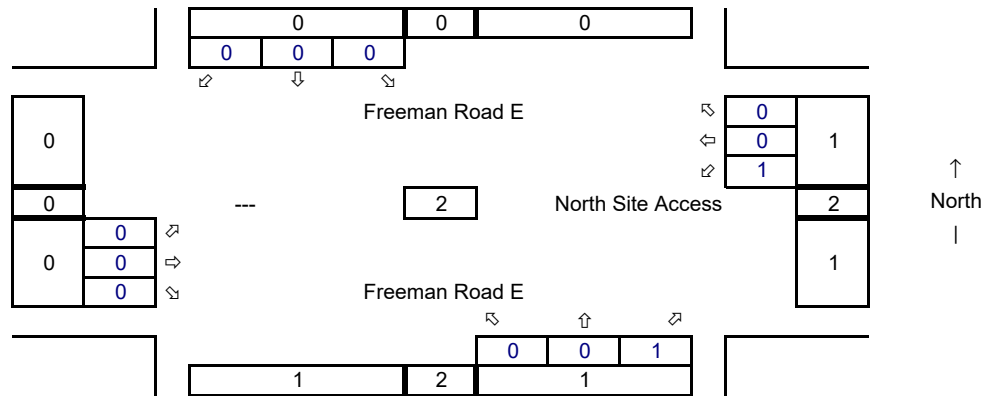
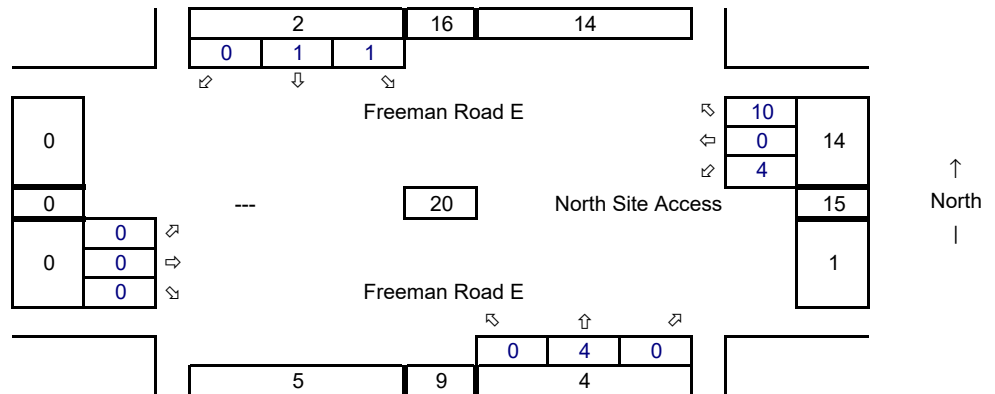
Year: 2027

Growth Rate = 2.1%

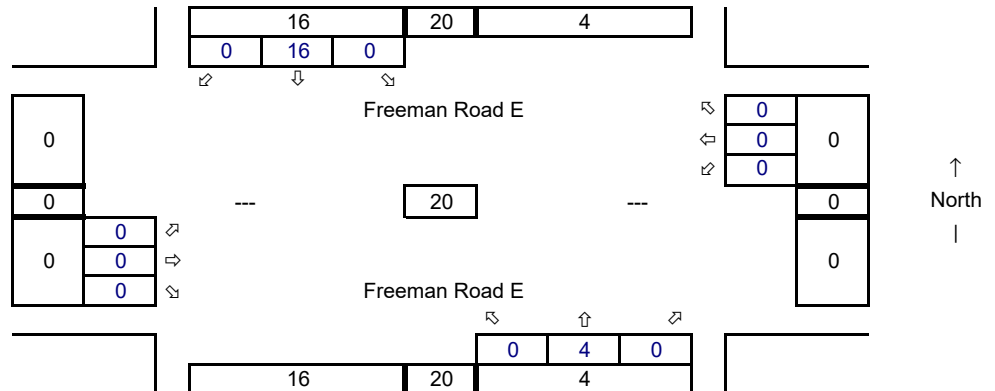
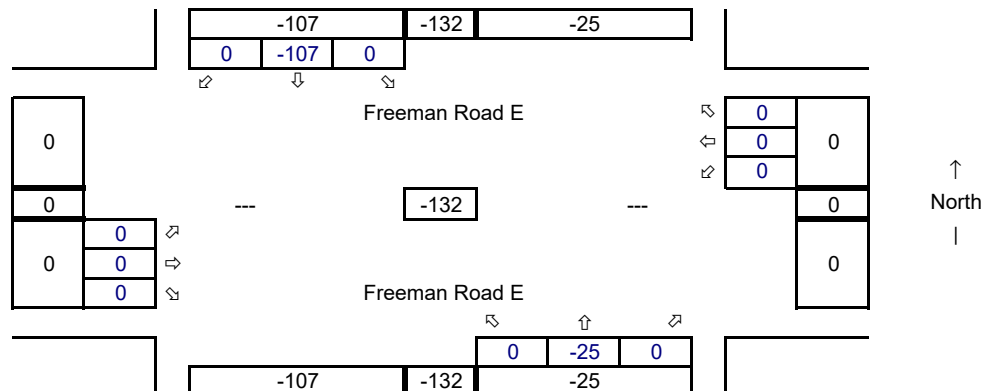
Years of Growth = 6

Total Growth = 1.1328

**Total Development Trips**Average Weekday
PM Peak Hour**Future with Project**Average Weekday
PM Peak Hour

Development Truck TripsAverage Weekday
PM Peak Hour**Development Car Trips**Average Weekday
PM Peak Hour**Total Pipeline Project Trips**Average Weekday
PM Peak Hour

Prologis Park Edgewood

**SR-167 Extension Diversion**Average Weekday
PM Peak HourN/S Diversion % -29%
E/W Diversion % 0%

AM Level of Service Calculations

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2021 Existing Conditions
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	388	21	9	462	103	38	102	26	81	32	20
Future Volume (vph)	28	388	21	9	462	103	38	102	26	81	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00			1.00				0.99	
Frt		0.992			0.973			0.970			0.941	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	3030	0	1530	2977	0	1530	1562	0	1530	1507	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1530	3030	0	1522	2977	0	1527	1562	0	1530	1507	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			32			11			22	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)			3	3			1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	440	0	10	608	0	41	138	0	87	56	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		23.0	23.0		22.0	22.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		21.9%	21.9%		21.0%	21.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	49.3		5.6	47.4		12.1	12.1		10.2	10.2	
Actuated g/C Ratio	0.07	0.58		0.07	0.56		0.14	0.14		0.12	0.12	
v/c Ratio	0.30	0.25		0.10	0.36		0.19	0.59		0.47	0.28	
Control Delay	49.5	11.6		44.3	13.5		35.0	42.9		44.7	27.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.5	11.6		44.3	13.5		35.0	42.9		44.7	27.9	
LOS	D	B		D	B		D	D		D	C	
Approach Delay		14.0			14.0			41.1			38.1	
Approach LOS		B			B			D			D	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

K:\SNO_TPTO\2022\22-083 Freeman Rd Logistics\Synchro\Intersection Level of Service Analysis.syn

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2021 Existing Conditions
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	15	54		5	77		18	61		42	16	
Queue Length 95th (ft)	50	133		24	184		54	138		101	57	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	100	1770		100	1749		338	354		320	332	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.30	0.25		0.10	0.35		0.12	0.39		0.27	0.17	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 84.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 19.9

Intersection Capacity Utilization 46.0%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service A

Splits and Phases: 1: Freeman Road E & Valley Avenue E

 Ø1	 Ø2	 Ø3	 Ø4
10 s	50 s	23 s	22 s
 Ø5	 Ø6		
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2021 Exsiting Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 0.4

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	4	7	0	169	49	4
Future Vol, veh/h	4	7	0	169	49	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	8	0	194	56	5

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	253	59	61	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	194	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	736	1007	1542	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	839	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	736	1007	1542	-	-	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	839	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1542	-	888	-	-
HCM Lane V/C Ratio	-	-	0.014	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2021 Exsiting Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	169	5	5	56
Future Vol, veh/h	5	5	169	5	5	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	184	5	5	61

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	258	187	0	0	189
Stage 1	187	-	-	-	-
Stage 2	71	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	731	855	-	-	1385
Stage 1	845	-	-	-	-
Stage 2	952	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	728	855	-	-	1385
Mov Cap-2 Maneuver	728	-	-	-	-
Stage 1	845	-	-	-	-
Stage 2	948	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	786	1385
HCM Lane V/C Ratio	-	-	0.014	0.004
HCM Control Delay (s)	-	-	9.6	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2021 Exsiting Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 1.7

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	19	19	13	155	47	14
Future Vol, veh/h	19	19	13	155	47	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	21	14	168	51	15

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	255	59	66	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	734	1007	1536	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	727	1007	1536	-	-	-
Mov Cap-2 Maneuver	727	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	837	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9.5	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1536	-	844	-	-
HCM Lane V/C Ratio	0.009	-	0.049	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2021 Exsiting Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 1.5

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	26	174	460	150	52	10
Future Vol, veh/h	26	174	460	150	52	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	27	183	484	158	55	11

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	642	0	-	0	800	563
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.19	-	-	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.281	-	-	-	3.581	3.381
Pot Cap-1 Maneuver	910	-	-	-	345	513
Stage 1	-	-	-	-	556	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	910	-	-	-	334	513
Mov Cap-2 Maneuver	-	-	-	-	334	-
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	786	-

Approach EB WB SB

HCM Control Delay, s	1.2	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	910	-	-	-	354
HCM Lane V/C Ratio	0.03	-	-	-	0.184
HCM Control Delay (s)	9.1	0	-	-	17.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline Conditions
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	581	23	14	541	117	42	111	45	109	35	22
Future Volume (vph)	31	581	23	14	541	117	42	111	45	109	35	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00			1.00				0.99	
Frt		0.994			0.973			0.957			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	3038	0	1530	2977	0	1530	1541	0	1530	1509	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1530	3038	0	1524	2977	0	1527	1541	0	1530	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			31			17			24	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)			3	3			1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	650	0	15	708	0	45	167	0	117	62	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		23.0	23.0		22.0	22.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		21.9%	21.9%		21.0%	21.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	46.7		5.6	44.6		13.5	13.5		12.0	12.0	
Actuated g/C Ratio	0.06	0.52		0.06	0.50		0.15	0.15		0.13	0.13	
v/c Ratio	0.35	0.41		0.16	0.47		0.19	0.68		0.57	0.28	
Control Delay	55.2	16.2		49.3	17.6		37.1	47.7		49.3	28.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.2	16.2		49.3	17.6		37.1	47.7		49.3	28.5	
LOS	E	B		D	B		D	D		D	C	
Approach Delay		18.1			18.2			45.4			42.1	
Approach LOS		B			B			D			D	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

K:\SNO_TPTO\2022\22-083 Freeman Rd Logistics\Synchro\Intersection Level of Service Analysis.syn

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline Conditions
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	17	98		8	138		21	75		59	18	
Queue Length 95th (ft)	54	213		32	230		59	164		129	61	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	95	1588		95	1569		321	337		304	319	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.35	0.41		0.16	0.45		0.14	0.50		0.38	0.19	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 89.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 23.8

Intersection Capacity Utilization 51.6%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service A

Splits and Phases: 1: Freeman Road E & Valley Avenue E

 Ø1	 Ø2	 Ø3	 Ø4
10 s	50 s	23 s	22 s
 Ø5	 Ø6		
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Baseline Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 0.4

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	4	8	0	202	58	4
Future Vol, veh/h	4	8	0	202	58	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	9	0	232	67	5

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	302	70	72	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	690	993	1528	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	690	993	1528	-	-	-
Mov Cap-2 Maneuver	690	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1528	-	866	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Baseline Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	202	5	5	65
Future Vol, veh/h	5	5	202	5	5	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	220	5	5	71

Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	304	223	0	0	225	0
Stage 1	223	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	688	817	-	-	1344	-
Stage 1	814	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	685	817	-	-	1344	-
Mov Cap-2 Maneuver	685	-	-	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	745	1344
HCM Lane V/C Ratio	-	-	0.015	0.004
HCM Control Delay (s)	-	-	9.9	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Baseline Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	21	14	186	55	15
Future Vol, veh/h	21	21	14	186	55	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	23	15	202	60	16

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	300	68	76	0	0
Stage 1	68	-	-	-	-
Stage 2	232	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	691	995	1523	-	-
Stage 1	955	-	-	-	-
Stage 2	807	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	683	995	1523	-	-
Mov Cap-2 Maneuver	683	-	-	-	-
Stage 1	944	-	-	-	-
Stage 2	807	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1523	-	810	-	-
HCM Lane V/C Ratio	0.01	-	0.056	-	-
HCM Control Delay (s)	7.4	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Baseline Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 2

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	45	190	503	164	57	15
Future Vol, veh/h	45	190	503	164	57	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	47	200	529	173	60	16

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	702	0	-	0	910	616
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	294	-
Critical Hdwy	4.19	-	-	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.281	-	-	-	3.581	3.381
Pot Cap-1 Maneuver	864	-	-	-	296	478
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	864	-	-	-	278	478
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	741	-

Approach EB WB SB

HCM Control Delay, s	1.8	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	864	-	-	-	305
HCM Lane V/C Ratio	0.055	-	-	-	0.248
HCM Control Delay (s)	9.4	0	-	-	20.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with Development Conditions

AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	581	32	14	541	117	41	110	45	109	38	22
Future Volume (vph)	31	581	32	14	541	117	41	110	45	109	38	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00			1.00				0.99	
Frt		0.992			0.973			0.957			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	3030	0	1530	2977	0	1530	1541	0	1530	1514	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1530	3030	0	1524	2977	0	1527	1541	0	1530	1514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			31			17			24	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)			3	3			1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	659	0	15	708	0	44	166	0	117	65	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		23.0	23.0		22.0	22.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		21.9%	21.9%		21.0%	21.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	46.7		5.6	44.6		13.4	13.4		12.0	12.0	
Actuated g/C Ratio	0.06	0.52		0.06	0.50		0.15	0.15		0.13	0.13	
v/c Ratio	0.35	0.42		0.16	0.47		0.19	0.67		0.57	0.29	
Control Delay	55.2	16.2		49.3	17.5		37.1	47.6		49.2	29.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.2	16.2		49.3	17.5		37.1	47.6		49.2	29.2	
LOS	E	B		D	B		D	D		D	C	
Approach Delay		18.0			18.2			45.4			42.1	
Approach LOS		B			B			D			D	

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Lanes, Volumes, Timings

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Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with Development Conditions
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	17	100		8	138		20	74		59	19	
Queue Length 95th (ft)	54	216		32	230		58	163		129	64	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	95	1587		95	1571		322	337		304	320	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.35	0.42		0.16	0.45		0.14	0.49		0.38	0.20	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 89.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 23.7

Intersection Capacity Utilization 51.6%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service A

Splits and Phases: 1: Freeman Road E & Valley Avenue E

 Ø1	 Ø2	 Ø3	 Ø4
10 s	50 s	23 s	22 s
 Ø5	 Ø6		
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Future with Development Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	9	0	205	63	4
Future Vol, veh/h	4	9	0	205	63	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	10	0	236	72	5

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	311	75	77	0	-	0
Stage 1	75	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	681	986	1522	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	803	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	681	986	1522	-	-	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1522	-	867	-	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Future with Development Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	4	206	16	10	66
Future Vol, veh/h	8	4	206	16	10	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	4	224	17	11	72

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	327	233	0	0	241
Stage 1	233	-	-	-	-
Stage 2	94	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	667	806	-	-	1326
Stage 1	806	-	-	-	-
Stage 2	930	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	661	806	-	-	1326
Mov Cap-2 Maneuver	661	-	-	-	-
Stage 1	806	-	-	-	-
Stage 2	922	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	703	1326
HCM Lane V/C Ratio	-	-	0.019	0.008
HCM Control Delay (s)	-	-	10.2	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Future with Development Conditions

AM Peak-Hour

Intersection

Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	21	14	201	59	15
Future Vol, veh/h	21	21	14	201	59	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	23	15	218	64	16

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	320	72	80	0	0
Stage 1	72	-	-	-	-
Stage 2	248	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	673	990	1518	-	-
Stage 1	951	-	-	-	-
Stage 2	793	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	666	990	1518	-	-
Mov Cap-2 Maneuver	666	-	-	-	-
Stage 1	941	-	-	-	-
Stage 2	793	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1518	-	796	-	-
HCM Lane V/C Ratio	0.01	-	0.057	-	-
HCM Control Delay (s)	7.4	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with Development Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh 2.1

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	47	190	503	177	60	16
Future Vol, veh/h	47	190	503	177	60	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	49	200	529	186	63	17

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	715	0	-	0	920	622
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	4.19	-	-	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.281	-	-	-	3.581	3.381
Pot Cap-1 Maneuver	854	-	-	-	292	474
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	854	-	-	-	273	474
Mov Cap-2 Maneuver	-	-	-	-	273	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	737	-

Approach EB WB SB

HCM Control Delay, s	1.9	0	21.3
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	854	-	-	-	300
HCM Lane V/C Ratio	0.058	-	-	-	0.267
HCM Control Delay (s)	9.5	0	-	-	21.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1

Freeman Road Logistics
6: Freeman Road E & North Site Access

2024 Future with Development Conditions
AM Peak-Hour

Intersection

Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	205	4	8	66
Future Vol, veh/h	1	0	205	4	8	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	223	4	9	72

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	315	225	0	0	227
Stage 1	225	-	-	-	-
Stage 2	90	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	678	814	-	-	1341
Stage 1	812	-	-	-	-
Stage 2	934	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	673	814	-	-	1341
Mov Cap-2 Maneuver	673	-	-	-	-
Stage 1	812	-	-	-	-
Stage 2	927	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	673	1341
HCM Lane V/C Ratio	-	-	0.002	0.006
HCM Control Delay (s)	-	-	10.4	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

PM Level of Service Calculations

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2021 Existing Conditions
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	506	86	26	458	103	18	14	17	221	182	21
Future Volume (vph)	21	506	86	26	458	103	18	14	17	221	182	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.978			0.973			0.918			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	3114	0	1597	3093	0	1597	1544	0	1597	1656	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1593	3114	0	1595	3093	0	1597	1544	0	1597	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			32			18			5	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)	2		1	1		2						
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	624	0	27	590	0	19	33	0	233	214	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	20.0		25.0	25.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		19.0%	19.0%		23.8%	23.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.7	46.9		5.7	46.9		6.9	6.9		17.0	17.0	
Actuated g/C Ratio	0.07	0.57		0.07	0.57		0.08	0.08		0.20	0.20	
v/c Ratio	0.20	0.35		0.25	0.34		0.14	0.23		0.71	0.63	
Control Delay	47.4	12.9		48.6	12.5		43.2	29.5		45.9	40.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	47.4	12.9		48.6	12.5		43.2	29.5		45.9	40.1	
LOS	D	B		D	B		D	C		D	D	
Approach Delay		14.1			14.1			34.5			43.1	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

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Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2021 Existing Conditions
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	12	94		14	86		10	8		113	99	
Queue Length 95th (ft)	39	174		45	161		34	38		#238	198	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	109	1768		109	1760		307	311		406	425	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.20	0.35		0.25	0.34		0.06	0.11		0.57	0.50	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 83

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 22.1

Intersection LOS: C

Intersection Capacity Utilization 48.0%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Freeman Road E & Valley Avenue E

			
10 s	50 s	20 s	25 s
			
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2021 Existing Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 0.8

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	6	26	2	69	311	15
Future Vol, veh/h	6	26	2	69	311	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	7	30	2	80	362	17

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	455	371	379	0	-	0
Stage 1	371	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	559	670	1169	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	558	670	1169	-	-	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	934	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	10.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1169	-	646	-	-
HCM Lane V/C Ratio	0.002	-	0.058	-	-
HCM Control Delay (s)	8.1	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2021 Existing Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	71	5	5	337
Future Vol, veh/h	5	5	71	5	5	337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	77	5	5	366

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	456	80	0	0	82
Stage 1	80	-	-	-	-
Stage 2	376	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	562	980	-	-	1515
Stage 1	943	-	-	-	-
Stage 2	694	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	560	980	-	-	1515
Mov Cap-2 Maneuver	560	-	-	-	-
Stage 1	943	-	-	-	-
Stage 2	691	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	713	1515
HCM Lane V/C Ratio	-	-	0.015	0.004
HCM Control Delay (s)	-	-	10.1	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2021 Existing Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 0.7

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	9	9	12	67	329	13
Future Vol, veh/h	9	9	12	67	329	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	10	13	73	358	14

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	464	365	372	0	-	0
Stage 1	365	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	556	680	1186	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	550	680	1186	-	-	-
Mov Cap-2 Maneuver	550	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11.1	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1186	-	608	-	-
HCM Lane V/C Ratio	0.011	-	0.032	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2021 Existing Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 23.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
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Lane Configurations						
Traffic Vol, veh/h	11	463	116	52	337	29
Future Vol, veh/h	11	463	116	52	337	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	12	509	127	57	370	32

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	184	0	0	689	156
Stage 1	-	-	-	156	-
Stage 2	-	-	-	533	-
Critical Hdwy	4.15	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	3.545	3.345
Pot Cap-1 Maneuver	1373	-	-	407	882
Stage 1	-	-	-	865	-
Stage 2	-	-	-	582	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1373	-	-	402	882
Mov Cap-2 Maneuver	-	-	-	402	-
Stage 1	-	-	-	855	-
Stage 2	-	-	-	582	-

Approach	EB	WB	SB
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HCM Control Delay, s	0.2	0	65.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
-----------------------	-----	-----	-----	-----	-------

Capacity (veh/h)	1373	-	-	-	420
HCM Lane V/C Ratio	0.009	-	-	-	0.958
HCM Control Delay (s)	7.6	0	-	-	65.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	11.2

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline Conditions
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	592	94	44	653	131	20	15	23	246	199	23
Future Volume (vph)	23	592	94	44	653	131	20	15	23	246	199	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.979			0.975			0.910			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	3118	0	1597	3101	0	1597	1530	0	1597	1656	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1594	3118	0	1596	3101	0	1597	1530	0	1597	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			28			24			5	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)	2		1	1		2						
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	722	0	46	825	0	21	40	0	259	233	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	20.0		25.0	25.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		19.0%	19.0%		23.8%	23.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	46.5		5.6	50.3		7.0	7.0		18.4	18.4	
Actuated g/C Ratio	0.06	0.51		0.06	0.56		0.08	0.08		0.20	0.20	
v/c Ratio	0.24	0.45		0.46	0.48		0.17	0.29		0.80	0.69	
Control Delay	50.5	16.7		60.8	15.1		45.0	28.8		55.0	45.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.5	16.7		60.8	15.1		45.0	28.8		55.0	45.4	
LOS	D	B		E	B		D	C		E	D	
Approach Delay		17.8			17.5			34.4			50.5	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

K:\SNO_TPTO\2022\22-083 Freeman Rd Logistics\Synchro\Intersection Level of Service Analysis.syn

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline Conditions
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	14	148		28	136		12	9		150	128	
Queue Length 95th (ft)	42	210		#76	247		36	42		#279	217	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	99	1610		99	1735		279	287		369	386	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.24	0.45		0.46	0.48		0.08	0.14		0.70	0.60	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 90.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 25.6

Intersection LOS: C

Intersection Capacity Utilization 58.0%

ICU Level of Service B

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Freeman Road E & Valley Avenue E

			
10 s	50 s	20 s	25 s
			
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Baseline Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 0.9

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	7	28	2	79	356	16
Future Vol, veh/h	7	28	2	79	356	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	33	2	92	414	19

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	520	424	433	0	-	0
Stage 1	424	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	513	626	1116	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	512	626	1116	-	-	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1116	-	599	-	-
HCM Lane V/C Ratio	0.002	-	0.068	-	-
HCM Control Delay (s)	8.2	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Baseline Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	82	5	5	384
Future Vol, veh/h	5	5	82	5	5	384
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	89	5	5	417

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	519	92	0	0	94
Stage 1	92	-	-	-	-
Stage 2	427	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	517	965	-	-	1500
Stage 1	932	-	-	-	-
Stage 2	658	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	515	965	-	-	1500
Mov Cap-2 Maneuver	515	-	-	-	-
Stage 1	932	-	-	-	-
Stage 2	655	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	672	1500
HCM Lane V/C Ratio	-	-	0.016	0.004
HCM Control Delay (s)	-	-	10.4	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Baseline Conditions
PM Peak-Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	13	77	376	14
Future Vol, veh/h	10	10	13	77	376	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	14	84	409	15
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	529	417	424	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	112	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	510	636	1135	-	-	-
Stage 1	665	-	-	-	-	-
Stage 2	913	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	503	636	1135	-	-	-
Mov Cap-2 Maneuver	503	-	-	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	913	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.7	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1135	-	562	-	-	
HCM Lane V/C Ratio	0.012	-	0.039	-	-	
HCM Control Delay (s)	8.2	0	11.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Baseline Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 50.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
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Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	16	506	127	57	368	48
Future Vol, veh/h	16	506	127	57	368	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	18	556	140	63	404	53

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	203	0	0	764	172
Stage 1	-	-	-	172	-
Stage 2	-	-	-	592	-
Critical Hdwy	4.15	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	3.545	3.345
Pot Cap-1 Maneuver	1351	-	-	~ 368	864
Stage 1	-	-	-	851	-
Stage 2	-	-	-	547	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1351	-	-	~ 361	864
Mov Cap-2 Maneuver	-	-	-	~ 361	-
Stage 1	-	-	-	835	-
Stage 2	-	-	-	547	-

Approach	EB	WB	SB
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HCM Control Delay, s	0.2	0	136.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
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Capacity (veh/h)	1351	-	-	-	387
HCM Lane V/C Ratio	0.013	-	-	-	1.181
HCM Control Delay (s)	7.7	0	-	-	136.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	18.2

Notes

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

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with Development Conditions

PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	592	95	44	653	131	31	18	23	246	200	23
Future Volume (vph)	23	592	95	44	653	131	31	18	23	246	200	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.979			0.975			0.916			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	3118	0	1597	3101	0	1597	1540	0	1597	1656	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1594	3118	0	1596	3101	0	1597	1540	0	1597	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			28			24			5	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)	2		1	1		2						
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	723	0	46	825	0	33	43	0	259	235	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	20.0		25.0	25.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		19.0%	19.0%		23.8%	23.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	46.5		5.6	50.4		7.5	7.5		18.5	18.5	
Actuated g/C Ratio	0.06	0.51		0.06	0.55		0.08	0.08		0.20	0.20	
v/c Ratio	0.24	0.45		0.47	0.48		0.25	0.29		0.80	0.69	
Control Delay	50.9	17.0		61.3	15.4		46.7	29.2		55.7	46.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.9	17.0		61.3	15.4		46.7	29.2		55.7	46.2	
LOS	D	B		E	B		D	C		E	D	
Approach Delay		18.1			17.8			36.8			51.2	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

K:\SNO_TPTO\2022\22-083 Freeman Rd Logistics\Synchro\Intersection Level of Service Analysis.syn

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with Development Conditions
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	14	151		28	140		20	11		151	131	
Queue Length 95th (ft)	41	212		#77	250		50	44		#281	#223	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	98	1603		98	1726		277	287		367	385	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.24	0.45		0.47	0.48		0.12	0.15		0.71	0.61	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 91.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 26.1

Intersection LOS: C

Intersection Capacity Utilization 59.2%

ICU Level of Service B

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Freeman Road E & Valley Avenue E

			
10 s	50 s	20 s	25 s
			
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Future with Development Conditions

PM Peak-Hour

Intersection

Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	28	3	84	362	16
Future Vol, veh/h	7	28	3	84	362	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	33	3	98	421	19

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	535	431	440	0	0
Stage 1	431	-	-	-	-
Stage 2	104	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-
Pot Cap-1 Maneuver	503	620	1109	-	-
Stage 1	651	-	-	-	-
Stage 2	915	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	501	620	1109	-	-
Mov Cap-2 Maneuver	501	-	-	-	-
Stage 1	649	-	-	-	-
Stage 2	915	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1109	-	592	-	-
HCM Lane V/C Ratio	0.003	-	0.069	-	-
HCM Control Delay (s)	8.3	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Future with Development Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	10	83	7	6	389
Future Vol, veh/h	16	10	83	7	6	389
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	11	90	8	7	423

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	531	94	0	0	98
Stage 1	94	-	-	-	-
Stage 2	437	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	509	963	-	-	1495
Stage 1	930	-	-	-	-
Stage 2	651	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	506	963	-	-	1495
Mov Cap-2 Maneuver	506	-	-	-	-
Stage 1	930	-	-	-	-
Stage 2	647	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	619	1495
HCM Lane V/C Ratio	-	-	0.046	0.004
HCM Control Delay (s)	-	-	11.1	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Future with Development Conditions

PM Peak-Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	13	80	392	14
Future Vol, veh/h	10	10	13	80	392	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	14	87	426	15
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	549	434	441	0	-	0
Stage 1	434	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	497	622	1119	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	491	622	1119	-	-	-
Mov Cap-2 Maneuver	491	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.8	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1119	-	549	-	-	
HCM Lane V/C Ratio	0.013	-	0.04	-	-	
HCM Control Delay (s)	8.3	0	11.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with Development Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh 58.6

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	16	506	127	60	382	50
Future Vol, veh/h	16	506	127	60	382	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	18	556	140	66	420	55

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	206	0	-	0	765	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	592	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1348	-	-	-	~ 367	863
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1348	-	-	-	~ 360	863
Mov Cap-2 Maneuver	-	-	-	-	~ 360	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	547	-

Approach EB WB SB

HCM Control Delay, s	0.2	0	154.6
HCM LOS			F

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1348	-	-	-	386
HCM Lane V/C Ratio	0.013	-	-	-	1.23
HCM Control Delay (s)	7.7	0	-	-	154.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	20

Notes

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

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with Dev - Separate L/R
PM Peak-Hour

Intersection

Int Delay, s/veh 45.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
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Lane Configurations

Traffic Vol, veh/h	16	506	127	60	382	50
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Future Vol, veh/h	16	506	127	60	382	50
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Conflicting Peds, #/hr	0	0	0	0	0	0
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Sign Control	Free	Free	Free	Free	Stop	Stop
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RT Channelized	-	None	-	None	-	None
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Storage Length	-	-	-	-	0	50
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Veh in Median Storage, #	-	0	0	-	0	-
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Grade, %	-	0	0	-	0	-
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Peak Hour Factor	91	91	91	91	91	91
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Heavy Vehicles, %	5	5	5	5	5	5
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Mvmt Flow	18	556	140	66	420	55
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Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	206	0	0	765	173
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Stage 1	-	-	-	173	-
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Stage 2	-	-	-	592	-
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Critical Hdwy	4.15	-	-	6.45	6.25
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Critical Hdwy Stg 1	-	-	-	5.45	-
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Critical Hdwy Stg 2	-	-	-	5.45	-
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Follow-up Hdwy	2.245	-	-	3.545	3.345
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Pot Cap-1 Maneuver	1348	-	-	~ 367	863
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Stage 1	-	-	-	850	-
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Stage 2	-	-	-	547	-
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Platoon blocked, %	-	-	-	-	-
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Mov Cap-1 Maneuver	1348	-	-	~ 360	863
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Mov Cap-2 Maneuver	-	-	-	~ 360	-
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Stage 1	-	-	-	834	-
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Stage 2	-	-	-	547	-
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Approach	EB	WB	SB
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HCM Control Delay, s	0.2	0	119.5
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HCM LOS			F
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Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
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Capacity (veh/h)	1348	-	-	-	360	863
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HCM Lane V/C Ratio	0.013	-	-	-	1.166	0.064
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HCM Control Delay (s)	7.7	0	-	-	133.9	9.5
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HCM Lane LOS	A	A	-	-	F	A
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HCM 95th %tile Q(veh)	0	-	-	-	16.8	0.2
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Notes

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

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with Dev - Sep L/R AWSC
PM Peak-Hour

Intersection

Intersection Delay, s/veh 42.9
Intersection LOS E

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	506	127	60	382	50
Future Vol, veh/h	16	506	127	60	382	50
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	18	556	140	66	420	55
Number of Lanes	0	1	1	0	1	1
Approach	EB		WB		SB	
Opposing Approach	WB		EB			
Opposing Lanes	1		1		0	
Conflicting Approach Left	SB				WB	
Conflicting Lanes Left	2		0		1	
Conflicting Approach Right			SB		EB	
Conflicting Lanes Right	0		2		1	
HCM Control Delay	57.5		13.8		37.8	
HCM LOS	F		B		E	

Lane	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	0%	100%	0%
Vol Thru, %	97%	68%	0%	0%
Vol Right, %	0%	32%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	522	187	382	50
LT Vol	16	0	382	0
Through Vol	506	127	0	0
RT Vol	0	60	0	50
Lane Flow Rate	574	205	420	55
Geometry Grp	2	2	7	7
Degree of Util (X)	0.982	0.381	0.862	0.094
Departure Headway (Hd)	6.166	6.68	7.516	6.291
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	591	540	487	573
Service Time	4.166	4.701	5.216	3.991
HCM Lane V/C Ratio	0.971	0.38	0.862	0.096
HCM Control Delay	57.5	13.8	41.5	9.6
HCM Lane LOS	F	B	E	A
HCM 95th-tile Q	14	1.8	9	0.3

Freeman Road Logistics
6: Freeman Road E & North Site Access

2024 Future with Development Conditions
PM Peak-Hour

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	90	1	1	373
Future Vol, veh/h	5	10	90	1	1	373
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	98	1	1	405

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	506	99	0	0	99
Stage 1	99	-	-	-	-
Stage 2	407	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	526	957	-	-	1494
Stage 1	925	-	-	-	-
Stage 2	672	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	525	957	-	-	1494
Mov Cap-2 Maneuver	525	-	-	-	-
Stage 1	925	-	-	-	-
Stage 2	671	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	751	1494
HCM Lane V/C Ratio	-	-	0.022	0.001
HCM Control Delay (s)	-	-	9.9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

AM Level of Service Calculations with SR-167 Extension

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline with 167th Ext
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	531	20	12	480	103	30	80	37	84	25	16
Future Volume (vph)	27	531	20	12	480	103	30	80	37	84	25	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00			1.00				0.99	
Frt		0.994			0.973			0.952			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	3038	0	1530	2977	0	1530	1533	0	1530	1509	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1530	3038	0	1524	2977	0	1527	1533	0	1530	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			31			19			17	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)			3	3			1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	593	0	13	627	0	32	126	0	90	44	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		23.0	23.0		22.0	22.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		21.9%	21.9%		21.0%	21.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	49.4		5.6	47.4		11.3	11.3		10.4	10.4	
Actuated g/C Ratio	0.07	0.59		0.07	0.56		0.13	0.13		0.12	0.12	
v/c Ratio	0.29	0.33		0.13	0.37		0.16	0.57		0.48	0.22	
Control Delay	48.8	12.1		44.8	13.5		34.9	39.8		44.3	27.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.8	12.1		44.8	13.5		34.9	39.8		44.3	27.0	
LOS	D	B		D	B		C	D		D	C	
Approach Delay		13.9			14.1			38.8			38.7	
Approach LOS		B			B			D			D	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

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Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline with 167th Ext
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	14	76		6	77		14	50		42	12	
Queue Length 95th (ft)	49	185		28	191		45	122		103	48	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	101	1788		101	1763		341	356		322	331	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.33		0.13	0.36		0.09	0.35		0.28	0.13	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 84

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 18.6

Intersection Capacity Utilization 41.4%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service A

Splits and Phases: 1: Freeman Road E & Valley Avenue E

 Ø1	 Ø2	 Ø3	 Ø4
10 s	50 s	23 s	22 s
 Ø5	 Ø6		
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Baseline with 167th Ext
AM Peak-Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	8	0	152	44	4
Future Vol, veh/h	5	8	0	152	44	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	9	0	175	51	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	229	54	56	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	759	1013	1549	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	759	1013	1549	-	-	-
Mov Cap-2 Maneuver	759	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1549	-	897	-	-	
HCM Lane V/C Ratio	-	-	0.017	-	-	
HCM Control Delay (s)	0	-	9.1	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Baseline with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	152	4	4	49
Future Vol, veh/h	6	6	152	4	4	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	165	4	4	53

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	228	167	0
Stage 1	167	-	-
Stage 2	61	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	760	877	-
Stage 1	863	-	-
Stage 2	962	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	758	877	-
Mov Cap-2 Maneuver	758	-	-
Stage 1	863	-	-
Stage 2	959	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	813	1409
HCM Lane V/C Ratio	-	-	0.016	0.003
HCM Control Delay (s)	-	-	9.5	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Baseline with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh 1.6

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	18	18	6	144	46	7
Future Vol, veh/h	18	18	6	144	46	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	20	7	157	50	8

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	225	54	58	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	763	1013	1546	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	759	1013	1546	-	-	-
Mov Cap-2 Maneuver	759	-	-	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	859	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1546	-	868	-	-
HCM Lane V/C Ratio	0.004	-	0.045	-	-
HCM Control Delay (s)	7.3	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Baseline with 167th Ext
AM Peak-Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	162	427	139	42	12
Future Vol, veh/h	41	162	427	139	42	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	43	171	449	146	44	13
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	595	0	-	0	779	522
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	257	-
Critical Hdwy	4.19	-	-	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.281	-	-	-	3.581	3.381
Pot Cap-1 Maneuver	948	-	-	-	355	541
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	948	-	-	-	337	541
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	770	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.8	0		16.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	948	-	-	-	368	
HCM Lane V/C Ratio	0.046	-	-	-	0.154	
HCM Control Delay (s)	9	0	-	-	16.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with 167th Ext
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	531	29	12	480	103	29	79	37	84	28	16
Future Volume (vph)	27	531	29	12	480	103	29	79	37	84	28	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00			1.00				1.00	
Frt		0.992			0.973			0.952			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	3030	0	1530	2977	0	1530	1533	0	1530	1516	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1530	3030	0	1524	2977	0	1527	1533	0	1530	1516	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			31			20			17	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)			3	3			1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	602	0	13	627	0	31	125	0	90	47	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		23.0	23.0		22.0	22.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		21.9%	21.9%		21.0%	21.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.6	49.4		5.6	47.4		11.2	11.2		10.4	10.4	
Actuated g/C Ratio	0.07	0.59		0.07	0.57		0.13	0.13		0.12	0.12	
v/c Ratio	0.29	0.34		0.13	0.37		0.15	0.56		0.48	0.23	
Control Delay	48.7	12.1		44.7	13.4		35.0	39.4		44.2	27.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.7	12.1		44.7	13.4		35.0	39.4		44.2	27.8	
LOS	D	B		D	B		C	D		D	C	
Approach Delay		13.8			14.0			38.6			38.6	
Approach LOS		B			B			D			D	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

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Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with 167th Ext
AM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	14	77		6	77		14	49		42	14	
Queue Length 95th (ft)	49	187		28	191		45	121		103	51	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	101	1787		101	1766		341	358		323	333	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.34		0.13	0.36		0.09	0.35		0.28	0.14	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 83.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 18.5

Intersection Capacity Utilization 41.4%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service A

Splits and Phases: 1: Freeman Road E & Valley Avenue E

 Ø1	 Ø2	 Ø3	 Ø4
10 s	50 s	23 s	22 s
 Ø5	 Ø6		
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Future with 167th Ext
AM Peak-Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	9	0	155	49	4
Future Vol, veh/h	5	9	0	155	49	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	10	0	178	56	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	237	59	61	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	178	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	751	1007	1542	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	751	1007	1542	-	-	-
Mov Cap-2 Maneuver	751	-	-	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt		NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1542	-	898	-	-
HCM Lane V/C Ratio		-	-	0.018	-	-
HCM Control Delay (s)		0	-	9.1	-	-
HCM Lane LOS		A	-	A	-	-
HCM 95th %tile Q(veh)		0	-	0.1	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Future with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	5	156	15	9	50
Future Vol, veh/h	9	5	156	15	9	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	170	16	10	54

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	252	178	0	0	186
Stage 1	178	-	-	-	-
Stage 2	74	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	737	865	-	-	1388
Stage 1	853	-	-	-	-
Stage 2	949	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	732	865	-	-	1388
Mov Cap-2 Maneuver	732	-	-	-	-
Stage 1	853	-	-	-	-
Stage 2	942	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	775	1388
HCM Lane V/C Ratio	-	-	0.02	0.007
HCM Control Delay (s)	-	-	9.7	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Future with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh 1.5

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	18	18	6	159	50	7
Future Vol, veh/h	18	18	6	159	50	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	20	7	173	54	8

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	245	58	62	0	-	0
Stage 1	58	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	743	1008	1541	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	739	1008	1541	-	-	-
Mov Cap-2 Maneuver	739	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1541	-	853	-	-
HCM Lane V/C Ratio	0.004	-	0.046	-	-
HCM Control Delay (s)	7.3	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh 1.6

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	43	162	427	152	45	13
Future Vol, veh/h	43	162	427	152	45	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	45	171	449	160	47	14

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	609	0	-	0	790	529
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	4.19	-	-	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	2.281	-	-	-	3.581	3.381
Pot Cap-1 Maneuver	936	-	-	-	349	536
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	936	-	-	-	331	536
Mov Cap-2 Maneuver	-	-	-	-	331	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	767	-

Approach EB WB SB

HCM Control Delay, s	1.9	0	17
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	936	-	-	-	362
HCM Lane V/C Ratio	0.048	-	-	-	0.169
HCM Control Delay (s)	9	0	-	-	17
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Freeman Road Logistics
6: Freeman Road E & North Site Access

2024 Future with 167th Ext
AM Peak-Hour

Intersection

Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	155	4	8	51
Future Vol, veh/h	1	0	155	4	8	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	168	4	9	55

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	243	170	0	0	172
Stage 1	170	-	-	-	-
Stage 2	73	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	745	874	-	-	1405
Stage 1	860	-	-	-	-
Stage 2	950	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	740	874	-	-	1405
Mov Cap-2 Maneuver	740	-	-	-	-
Stage 1	860	-	-	-	-
Stage 2	943	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	740	1405
HCM Lane V/C Ratio	-	-	0.001	0.006
HCM Control Delay (s)	-	-	9.9	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

PM Level of Service Calculations with SR-167 Extension

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline with 167th Ext
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	20	526	82	41	594	117	14	11	17	177	142	17
Future Volume (vph)	20	526	82	41	594	117	14	11	17	177	142	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.980			0.975			0.910			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	3121	0	1597	3101	0	1597	1530	0	1597	1655	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1594	3121	0	1595	3101	0	1597	1530	0	1597	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			27			18			5	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)	2		1	1		2						
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	640	0	43	748	0	15	30	0	186	167	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	20.0		25.0	25.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		19.0%	19.0%		23.8%	23.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.7	47.7		5.7	49.5		6.7	6.7		14.9	14.9	
Actuated g/C Ratio	0.07	0.57		0.07	0.59		0.08	0.08		0.18	0.18	
v/c Ratio	0.19	0.36		0.40	0.40		0.12	0.22		0.65	0.56	
Control Delay	47.4	13.0		54.0	12.5		43.1	28.6		45.1	39.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	47.4	13.0		54.0	12.5		43.1	28.6		45.1	39.7	
LOS	D	B		D	B		D	C		D	D	
Approach Delay		14.1			14.7			33.5			42.5	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

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Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Baseline with 167th Ext
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	12	112		24	101		8	7		101	86	
Queue Length 95th (ft)	38	180		#69	215		29	36		177	155	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	108	1792		108	1851		305	307		404	422	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.36		0.40	0.40		0.05	0.10		0.46	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 83.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 20.3

Intersection LOS: C

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Freeman Road E & Valley Avenue E

			
10 s	50 s	20 s	25 s
			
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Baseline with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	7	29	1	59	266	12
Future Vol, veh/h	7	29	1	59	266	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	34	1	69	309	14

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	387	316	323	0	-	0
Stage 1	316	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	612	720	1226	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	611	720	1226	-	-	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	947	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	10.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1226	-	696	-	-
HCM Lane V/C Ratio	0.001	-	0.06	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Baseline with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	61	6	6	287
Future Vol, veh/h	6	6	61	6	6	287
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	66	7	7	312

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	396	70	0	0	73
Stage 1	70	-	-	-	-
Stage 2	326	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	609	993	-	-	1527
Stage 1	953	-	-	-	-
Stage 2	731	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	605	993	-	-	1527
Mov Cap-2 Maneuver	605	-	-	-	-
Stage 1	953	-	-	-	-
Stage 2	727	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	752	1527
HCM Lane V/C Ratio	-	-	0.017	0.004
HCM Control Delay (s)	-	-	9.9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Baseline with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh 1.4

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	22	22	11	50	280	11
Future Vol, veh/h	22	22	11	50	280	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	24	12	54	304	12

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	388	310	316	0	-	0
Stage 1	310	-	-	-	-	-
Stage 2	78	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	616	730	1244	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	610	730	1244	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	737	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	10.8	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1244	-	665	-	-
HCM Lane V/C Ratio	0.01	-	0.072	-	-
HCM Control Delay (s)	7.9	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Baseline with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	11.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	430	107	48	271	39
Future Vol, veh/h	14	430	107	48	271	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	473	118	53	298	43

Major/Minor	Major1	Major2		Minor2	
Conflicting Flow All	171	0	-	0	648
Stage 1	-	-	-	-	145
Stage 2	-	-	-	-	503
Critical Hdwy	4.15	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.245	-	-	-	3.545
Pot Cap-1 Maneuver	1388	-	-	-	430
Stage 1	-	-	-	-	875
Stage 2	-	-	-	-	601
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1388	-	-	-	424
Mov Cap-2 Maneuver	-	-	-	-	424
Stage 1	-	-	-	-	862
Stage 2	-	-	-	-	601

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	33.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1388	-	-	-	454
HCM Lane V/C Ratio	0.011	-	-	-	0.75
HCM Control Delay (s)	7.6	0	-	-	33.1
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	6.3

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with 167th Ext
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	526	83	41	594	117	25	14	17	177	143	17
Future Volume (vph)	20	526	83	41	594	117	25	14	17	177	143	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	230		0	50		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.980			0.975			0.918			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	3121	0	1597	3101	0	1597	1544	0	1597	1655	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1594	3121	0	1595	3101	0	1597	1544	0	1597	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			27			18			5	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		671			1259			262			494	
Travel Time (s)		15.3			28.6			7.1			13.5	
Confl. Peds. (#/hr)	2		1	1		2						
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	641	0	43	748	0	26	33	0	186	169	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	20.0		25.0	25.0	
Total Split (%)	9.5%	47.6%		9.5%	47.6%		19.0%	19.0%		23.8%	23.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	None		None	None	
Act Effct Green (s)	5.7	47.8		5.7	49.6		7.1	7.1		15.1	15.1	
Actuated g/C Ratio	0.07	0.57		0.07	0.59		0.08	0.08		0.18	0.18	
v/c Ratio	0.20	0.36		0.40	0.41		0.19	0.23		0.65	0.56	
Control Delay	47.9	13.4		54.8	12.8		44.2	29.4		45.0	39.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	47.9	13.4		54.8	12.8		44.2	29.4		45.0	39.9	
LOS	D	B		D	B		D	C		D	D	
Approach Delay		14.5			15.1			35.9			42.6	

Kimley-Horn and Associates, Inc [SPF KH #090222083]

Lanes, Volumes, Timings

K:\SNO_TPTO\2022\22-083 Freeman Rd Logistics\Synchro\Intersection Level of Service Analysis.syn

Freeman Road Logistics
1: Freeman Road E & Valley Avenue E

2024 Future with 167th Ext
PM Peak-Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	12	114		25	104		15	8		102	88	
Queue Length 95th (ft)	38	181		#69	217		42	38		177	157	
Internal Link Dist (ft)		591			1179			182			414	
Turn Bay Length (ft)	150			230			50			250		
Base Capacity (vph)	107	1783		107	1841		304	308		402	420	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.20	0.36		0.40	0.41		0.09	0.11		0.46	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 84

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 20.8

Intersection LOS: C

Intersection Capacity Utilization 53.3%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Freeman Road E & Valley Avenue E

			
10 s	50 s	20 s	25 s
			
10 s	50 s		

Freeman Road Logistics
2: Freeman Road E & 48th Street E

2024 Future with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	29	2	64	272	12
Future Vol, veh/h	7	29	2	64	272	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	34	2	74	316	14

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	401	323	330	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	78	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	601	713	1218	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	600	713	1218	-	-	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1218	-	688	-	-
HCM Lane V/C Ratio	0.002	-	0.061	-	-
HCM Control Delay (s)	8	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
3: Freeman Road E & 22nd Avenue NW

2024 Future with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	11	62	8	7	292
Future Vol, veh/h	17	11	62	8	7	292
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	12	67	9	8	317

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	405	72	0	0	76
Stage 1	72	-	-	-	-
Stage 2	333	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	602	990	-	-	1523
Stage 1	951	-	-	-	-
Stage 2	726	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	598	990	-	-	1523
Mov Cap-2 Maneuver	598	-	-	-	-
Stage 1	951	-	-	-	-
Stage 2	722	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	708	1523
HCM Lane V/C Ratio	-	-	0.043	0.005
HCM Control Delay (s)	-	-	10.3	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Freeman Road Logistics
4: Freeman Road E & 50th Street E

2024 Future with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh 1.4

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	22	22	11	53	296	11
Future Vol, veh/h	22	22	11	53	296	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	24	12	58	322	12

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	410	328	334	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	598	713	1225	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	592	713	1225	-	-	-
Mov Cap-2 Maneuver	592	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1225	-	647	-	-
HCM Lane V/C Ratio	0.01	-	0.074	-	-
HCM Control Delay (s)	8	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	13					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	430	107	51	285	41
Future Vol, veh/h	14	430	107	51	285	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	473	118	56	313	45

Major/Minor	Major1	Major2		Minor2	
Conflicting Flow All	174	0	-	0	649
Stage 1	-	-	-	-	146
Stage 2	-	-	-	-	503
Critical Hdwy	4.15	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.245	-	-	-	3.545
Pot Cap-1 Maneuver	1385	-	-	-	430
Stage 1	-	-	-	-	874
Stage 2	-	-	-	-	601
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1385	-	-	-	424
Mov Cap-2 Maneuver	-	-	-	-	424
Stage 1	-	-	-	-	861
Stage 2	-	-	-	-	601

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	36.7
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1385	-	-	-	454
HCM Lane V/C Ratio	0.011	-	-	-	0.789
HCM Control Delay (s)	7.6	0	-	-	36.7
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	7.1

Freeman Road Logistics
5: N Levee Road E & Freeman Road E

2024 Future with 167th Ext - Alternative
PM Peak-Hour

Intersection

Int Delay, s/veh	10.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	430	107	51	285	41
Future Vol, veh/h	14	430	107	51	285	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	473	118	56	313	45

Major/Minor	Major1	Major2		Minor2	
Conflicting Flow All	174	0	-	0	649
Stage 1	-	-	-	-	146
Stage 2	-	-	-	-	503
Critical Hdwy	4.15	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.245	-	-	-	3.545
Pot Cap-1 Maneuver	1385	-	-	-	430
Stage 1	-	-	-	-	874
Stage 2	-	-	-	-	601
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1385	-	-	-	424
Mov Cap-2 Maneuver	-	-	-	-	424
Stage 1	-	-	-	-	861
Stage 2	-	-	-	-	601

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	30.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1385	-	-	-	424	893
HCM Lane V/C Ratio	0.011	-	-	-	0.739	0.05
HCM Control Delay (s)	7.6	0	-	-	33.9	9.2
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	0	-	-	-	5.9	0.2

Freeman Road Logistics
6: Freeman Road E & North Site Access

2024 Future with 167th Ext
PM Peak-Hour

Intersection

Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	68	1	1	279
Future Vol, veh/h	5	10	68	1	1	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	74	1	1	303

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	380	75	0	0	75
Stage 1	75	-	-	-	-
Stage 2	305	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	622	986	-	-	1524
Stage 1	948	-	-	-	-
Stage 2	748	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	621	986	-	-	1524
Mov Cap-2 Maneuver	621	-	-	-	-
Stage 1	948	-	-	-	-
Stage 2	747	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	824	1524
HCM Lane V/C Ratio	-	-	0.02	0.001
HCM Control Delay (s)	-	-	9.5	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Collision Data

PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY/ REFERENCE POINT NAME	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	MILEPOST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	FIRST COLLISION TYPE / OBJECT STRUCK																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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VALLEY AVE E	FREEMAN RD E	0				E815715	2018-07-06	20:44	No Apparent Injury	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Maximum Trip Generation Impacts

Land Use: 155

High-Cube Fulfillment Center Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

Warehousing (Land Use 150), high-cube transload and short-term storage warehouse (Land Use 154), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related land uses.

Land Use Subcategory

Each fulfillment center in the ITE database has been categorized as either a sort or non-sort facility. A sort facility is a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. A non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means. Separate sets of data plots are presented for the sort and non-sort fulfillment centers. Some limited assembly and repackaging may occur within the facility.

Additional Data

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled "High-Cube Warehouse Vehicle Trip Generation Analysis," published in October 2016. The results of this study are posted on the ITE website at <http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498>.

The sites were surveyed in the 2000s and the 2010s in California, New Jersey, and Texas.

Source Numbers

752, 941, 1001, 1002, 1011

High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 1360

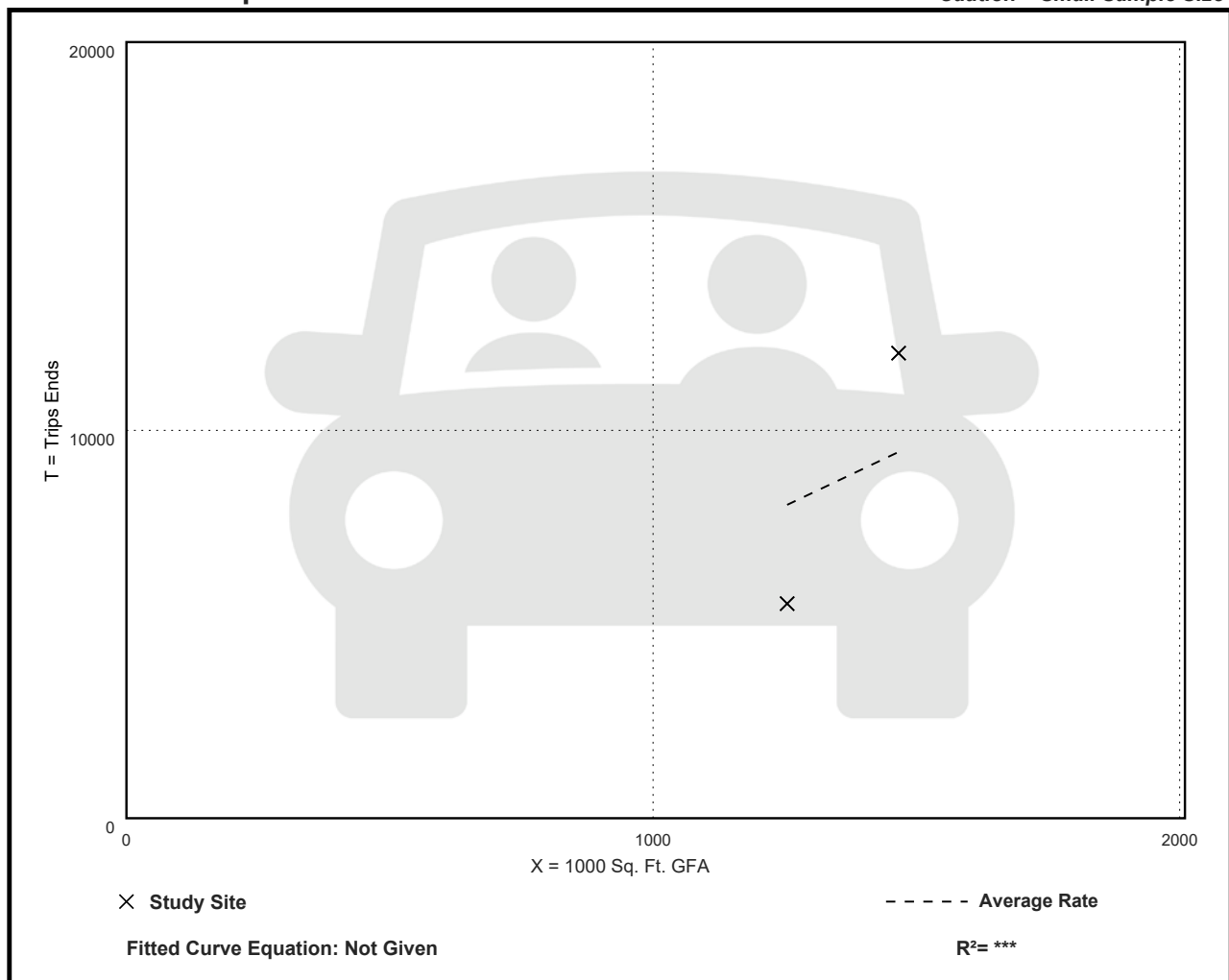
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
6.44	4.41 - 8.18	***

Data Plot and Equation

Caution – Small Sample Size



High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 3

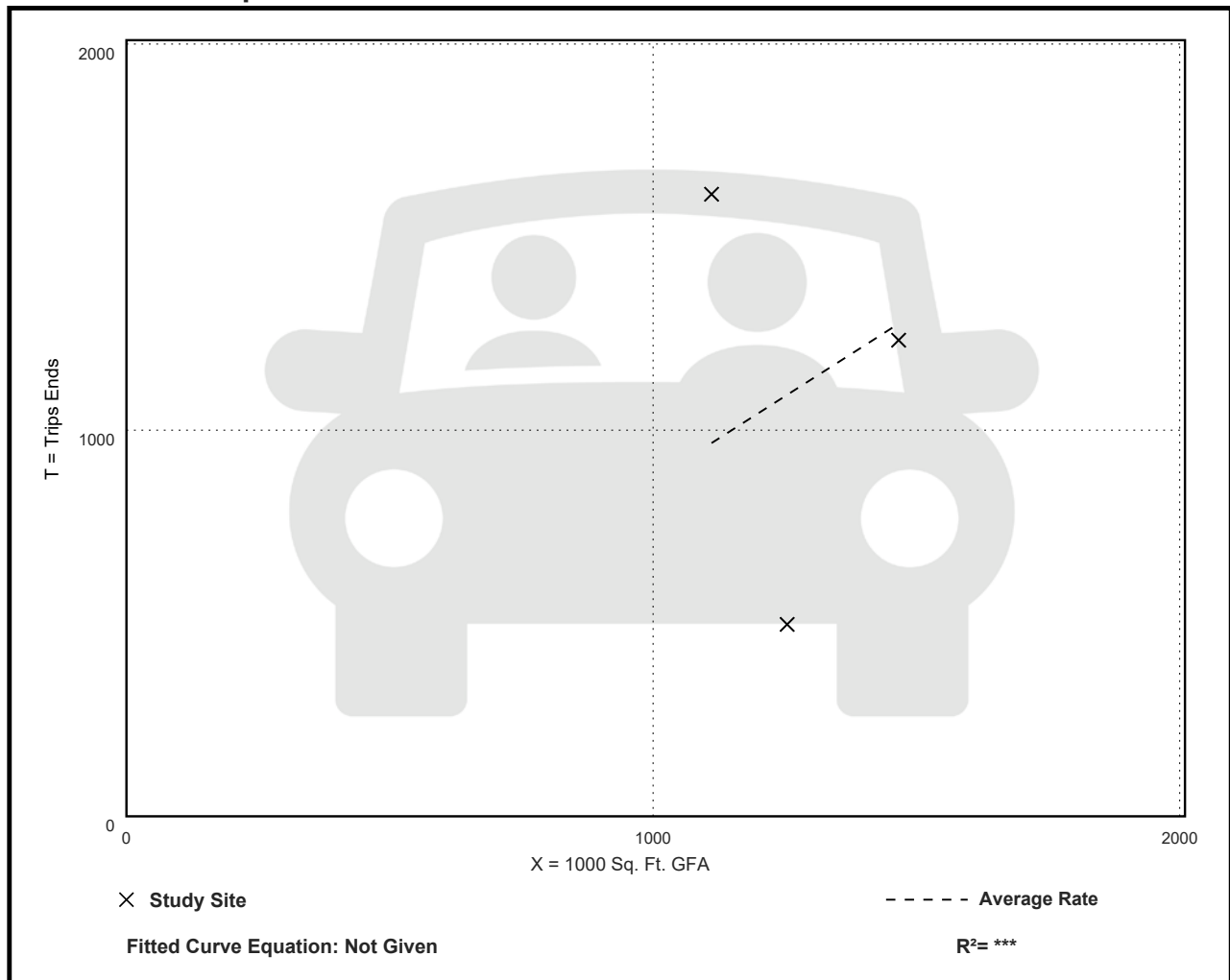
Avg. 1000 Sq. Ft. GFA: 1277

Directional Distribution: 81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.87	0.40 - 1.45	0.51

Data Plot and Equation



High-Cube Fulfillment Center Warehouse - Sort (155)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 3

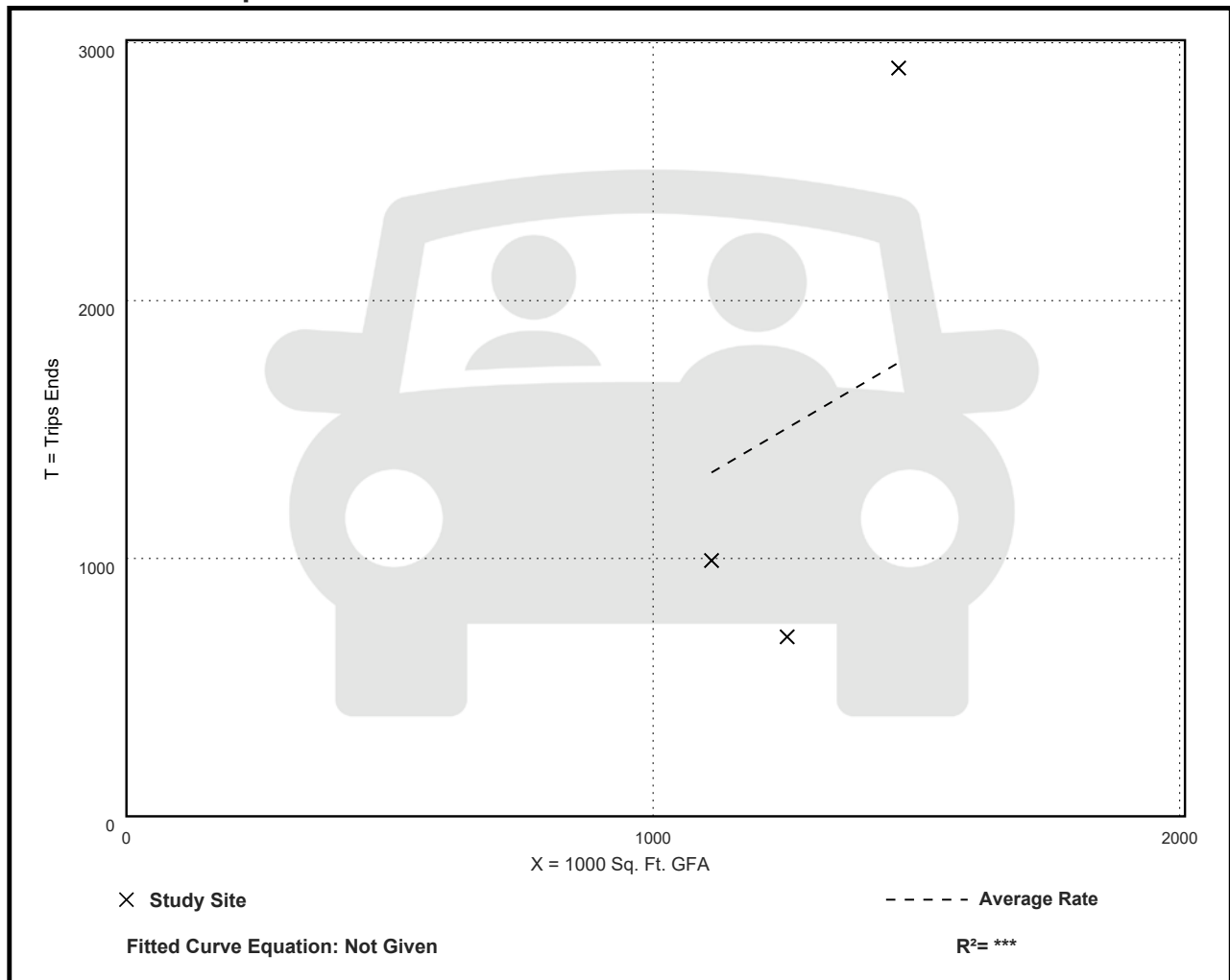
Avg. 1000 Sq. Ft. GFA: 1277

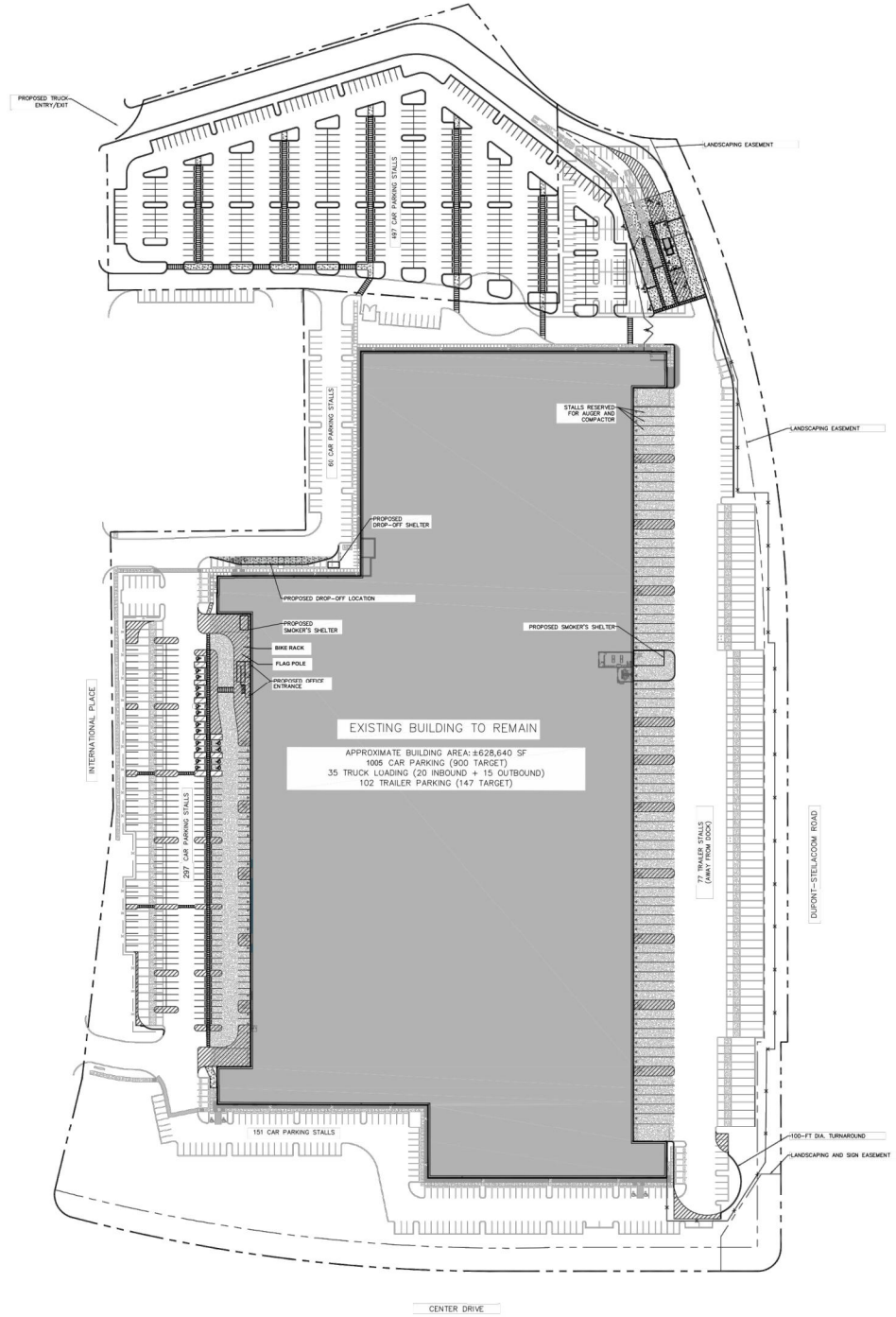
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.20	0.55 - 1.98	0.77

Data Plot and Equation





HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

SNOW BLOSSOM FULFILLMENT CENTER

SITE PLAN
FIGURE 2

**Trip Generation for: Development Peak Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
(a.k.a.): Weekday PM Peak Hour**

NET EXTERNAL TRIPS BY TYPE																							
IN BOTH DIRECTIONS											DIRECTIONAL ASSIGNMENTS												
LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW				
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)		In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	In	Out	In	Out
High-Cube Fulfillment Center (Sort) Building A (Total)	234,218 KSF	155	1.20	39%	61%	281.06	0%	0.00	0%	0.00	0%	0.00	0%	0.00	281.06	0%	0.00	0%	0.00	109.61	171.45		
High-Cube Fulfillment Center (Sort) Building B (Total)	257,105 KSF	155	1.20	39%	61%	308.53	0%	0.00	0%	0.00	0%	0.00	0%	0.00	308.53	0%	0.00	0%	0.00	120.33	188.20		
Single-Family Detached	-14 Units	210	0.94	63%	37%	-13.16	0%	0.00	0%	0.00	0%	0.00	0%	0.00	-13.16	0%	0.00	0%	0.00	-8.29	-4.87		
Total Vehicle Trips						576.43		0.00		576.43		0.00		0.00	576.43		0.00		0.00	221.65	354.78		

NET EXTERNAL TRIPS BY TYPE																							
IN BOTH DIRECTIONS											DIRECTIONAL ASSIGNMENTS												
LAND USES	VARIABLE	ITE LU code	Gross Truck Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW				
			Truck Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)		In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	In	Out	In	Out
High-Cube Fulfillment Center (Sort) Building A (Truck)	234,218 KSF	155	0.02	46%	54%	4.68	0%	0.00	0%	0.00	0%	0.00	0%	0.00	4.68	0%	0.00	0%	0.00	2.15	2.53		
High-Cube Fulfillment Center (Sort) Building B (Truck)	257,105 KSF	155	0.02	46%	54%	5.14	0%	0.00	0%	0.00	0%	0.00	0%	0.00	5.14	0%	0.00	0%	0.00	2.36	2.78		
Total Truck Trips						9.82		0.00		9.82		0.00		0.00	9.82		0.00		0.00	4.51	5.31		

Freeman Road Logistics
KH #090222083

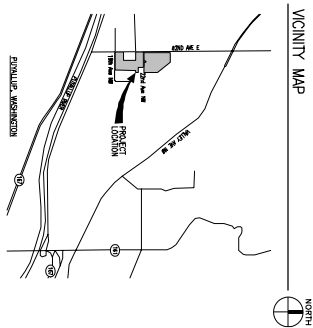
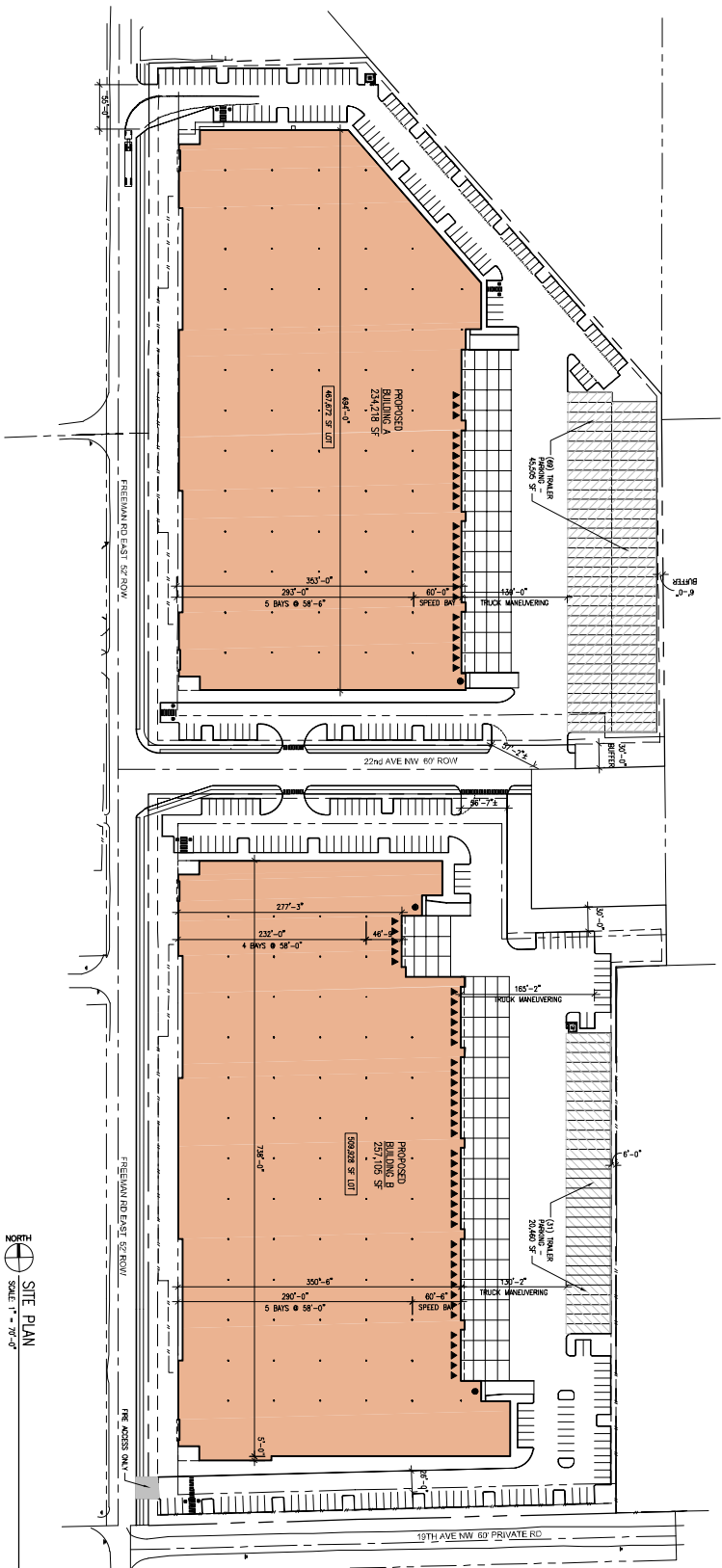
PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	3032	222	355	576
1%	30.32	2.22	3.55	5.76
2%	60.64	4.43	7.10	11.53
3%	90.96	6.65	10.64	17.29
4%	121.28	8.87	14.19	23.06
5%	151.61	11.08	17.74	28.82
6%	181.93	13.30	21.29	34.59
7%	212.25	15.52	24.83	40.35
8%	242.57	17.73	28.38	46.11
9%	272.89	19.95	31.93	51.88
10%	303.21	22.17	35.48	57.64
11%	333.53	24.38	39.03	63.41
12%	363.85	26.60	42.57	69.17
13%	394.17	28.81	46.12	74.94
14%	424.49	31.03	49.67	80.70
15%	454.82	33.25	53.22	86.46
16%	485.14	35.46	56.76	92.23
17%	515.46	37.68	60.31	97.99
18%	545.78	39.90	63.86	103.76
19%	576.10	42.11	67.41	109.52
20%	606.42	44.33	70.96	115.29
21%	636.74	46.55	74.50	121.05
22%	667.06	48.76	78.05	126.81
23%	697.38	50.98	81.60	132.58
24%	727.70	53.20	85.15	138.34
25%	758.03	55.41	88.70	144.11
26%	788.35	57.63	92.24	149.87
27%	818.67	59.85	95.79	155.64
28%	848.99	62.06	99.34	161.40
29%	879.31	64.28	102.89	167.16
30%	909.63	66.50	106.43	172.93
31%	939.95	68.71	109.98	178.69
32%	970.27	70.93	113.53	184.46
33%	1000.59	73.14	117.08	190.22
34%	1030.91	75.36	120.63	195.99
35%	1061.24	77.58	124.17	201.75
36%	1091.56	79.79	127.72	207.51
37%	1121.88	82.01	131.27	213.28
38%	1152.20	84.23	134.82	219.04
39%	1182.52	86.44	138.36	224.81
40%	1212.84	88.66	141.91	230.57
41%	1243.16	90.88	145.46	236.34
42%	1273.48	93.09	149.01	242.10
43%	1303.80	95.31	152.56	247.86
44%	1334.12	97.53	156.10	253.63
45%	1364.45	99.74	159.65	259.39
46%	1394.77	101.96	163.20	265.16
47%	1425.09	104.18	166.75	270.92
48%	1455.41	106.39	170.29	276.69
49%	1485.73	108.61	173.84	282.45
50%	1516.05	110.83	177.39	288.22
51%	1546.37	113.04	180.94	293.98
52%	1576.69	115.26	184.49	299.74
53%	1607.01	117.47	188.03	305.51
54%	1637.33	119.69	191.58	311.27
55%	1667.66	121.91	195.13	317.04
56%	1697.98	124.12	198.68	322.80
57%	1728.30	126.34	202.22	328.57
58%	1758.62	128.56	205.77	334.33
59%	1788.94	130.77	209.32	340.09
60%	1819.26	132.99	212.87	345.86
61%	1849.58	135.21	216.42	351.62
62%	1879.90	137.42	219.96	357.39
63%	1910.22	139.64	223.51	363.15
64%	1940.54	141.86	227.06	368.92
65%	1970.87	144.07	230.61	374.68
66%	2001.19	146.29	234.15	380.44
67%	2031.51	148.51	237.70	386.21
68%	2061.83	150.72	241.25	391.97
69%	2092.15	152.94	244.80	397.74
70%	2122.47	155.16	248.35	403.50
71%	2152.79	157.37	251.89	409.27
72%	2183.11	159.59	255.44	415.03
73%	2213.43	161.80	258.99	420.79
74%	2243.75	164.02	262.54	426.56
75%	2274.08	166.24	266.09	432.32
76%	2304.40	168.45	269.63	438.09
77%	2334.72	170.67	273.18	443.85
78%	2365.04	172.89	276.73	449.62
79%	2395.36	175.10	280.28	455.38
80%	2425.68	177.32	283.82	461.14
81%	2456.00	179.54	287.37	466.91
82%	2486.32	181.75	290.92	472.67
83%	2516.64	183.97	294.47	478.44
84%	2546.96	186.19	298.02	484.20
85%	2577.29	188.40	301.56	489.97
86%	2607.61	190.62	305.11	495.73
87%	2637.93	192.84	308.66	501.49
88%	2668.25	195.05	312.21	507.26
89%	2698.57	197.27	315.75	513.02
90%	2728.89	199.49	319.30	518.79
91%	2759.21	201.70	322.85	524.55
92%	2789.53	203.92	326.40	530.32
93%	2819.85	206.13	329.95	536.08
94%	2850.17	208.35	333.49	541.84
95%	2880.50	210.57	337.04	547.61
96%	2910.82	212.78	340.59	553.37
97%	2941.14	215.00	344.14	559.14
98%	2971.46	217.22	347.68	564.90
99%	3001.78	219.43	351.23	570.67
100%	3032.10	221.65	354.78	576.43

Study Intersections

1. 54th Ave E / 12th St E (Fife)
2. 54th Ave E / Pacific Hwy E (SR 99) (Fife/WSDOT)
3. 54th Ave E / I-5 Southbound Ramps (Fife/WSDOT)
4. 54th Ave E / 20th St E (Fife)
5. 70th Ave E / Pacific Hwy E (SR 99) (Fife/WSDOT)
6. 70th Ave E / 20th St E (Fife)
7. Freeman Rd E / 20th Street E (Fife)
8. 70th Ave E / Valley Ave E (Fife)
9. Freeman Rd E / Valley Ave E (Fife)
10. N Levee Rd E / 66th Ave E (Fife)
11. 70th Ave E / 48th St E (Fife)
12. Freeman Rd E / 48th St E (Fife)
13. Freeman Rd E / N Levee Rd (Fife)
14. 27th Ave Ct NW / Valley Ave NW (Puyallup)
15. Fred Meyer Distribution / Valley Ave NW (Puyallup)
16. Meridian Ave N (SR 161) / Valley Ave NW (Puyallup/WSDOT)
17. Meridian Ave N (SR 161) / SR 167 Ramps (Puyallup/WSDOT)
18. Meridian Ave N (SR 161) / River Road / 2nd St NE (Puyallup/WSDOT)
19. 4th Street NW / River Road (Puyallup/WSDOT)
20. 2nd Street NE / 5th Ave NE (Puyallup)
21. 2nd Street NE / E Stewart Ave / E Main Ave (Puyallup)
22. Meridian Ave N (SR 161) / W Stewart Ave (Puyallup/WSDOT)
23. Meridian Ave S (SR 161) / E Main Ave (Puyallup/WSDOT)
24. Meridian Ave S (SR 161) / W Pioneer Ave (Puyallup/WSDOT)

Site Plan



SITE PLAN
SCALE: 1" = 70'-0"
NORTH

www.synthesislab.com

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Kirkland, WA 98034

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Kirkland, WA 98034

PROJECT DATA

▲ 9"x10" DOCK DOOR	69
● 12"x14" GARAGE ACCESS DOOR	4