March 11, 2021

VIA E-MAIL sara.buizer@hayward-ca.gov

Planning Commissioners
c/o Sara Buizer, Planning Manager
City of Hayward Planning Commission
777 B Street
Hayward, CA 94541

Re: Applicant's Objection to Transportation-Related Fees and Exactions
Amazon Delivery Station, File No. PH 21-019
Agenda Item #2, March 11, 2021 Planning Commission Meeting

Dear Commissioners:

Amazon submits this letter in connection with your consideration of our proposed Delivery Station at 2701 W. Winton Avenue, which requires a Zoning Text Amendment and a Conditional Use Permit (CUP). Specifically, we are writing to object to proposed Conditions of Approval 37 through 42, requiring transportation-related fees and exactions to offset the impacts of 4,151 daily trips, which are more than three times the project trips.

These fees and exactions are not consistent with Condition of Approval 10, which restricts our operations to those reflected in our May 11, 2020 business plan – a plan that will allow us to produce only approximately 1,200 trips during non-holiday periods due to limited van parking and staging. The fees and exactions are also inconsistent with Conditions 33 through 35, which require that we implement a TDM plan to further reduce those trips.

We recognize that through the exercise of its police power, the City of Hayward has the authority to impose exactions, including development impact fees. However, the City may do so only if the exactions have the required nexus, rough proportionality and reasonable relationship to the burden the proposed development will place upon the City. *Nollan v. California Coastal Comm'n,* 483 U.S. 825 (1987); *Dolan v. City of Tigard,* 512 U.S. 319 (1994); Gov't Code §§ 66000 and following. As demonstrated below, there is no such relationship between these fees and the trips the CUP would allow the facility to generate.

The City calculated the proposed fees by relying on Institute of Transportation Engineers (ITE) rates that result in a project with 4,151 trips per day. The City's March 9, 2021 letter notes that ITE rates account for warehouse space, plus hallways, maintenance areas, dining areas or break rooms, restrooms, loading docks or other similar facilities. However, use of this approach is not appropriate for our Operations. Although the facility will use loading docks for its line haul trucks, unlike the ITE facilities, the facility will also have van staging, queuing and loading, and much of the employee parking, occurring indoors. Therefore, the ITE rates should <u>not</u> be applied to indoor areas devoted to staging, queuing, loading and parking. The area of the project in which activities other than parking, queuing, and van loading will occur is approximately 122,000 square feet. (See Sheet 1-10 in the Plan Submittal Set provided May 11, 2020) At the ITE ratio of 8.18 trips per 1,000 square feet the City used in its Local Transportation Assessment (LTA), our 122,000 square feet would generate 998 trips.

This modified ITE projection of 998 daily trips is similar to the other numbers we calculated. As noted in the City's LTA, we initially projected 638 trips out and 638 trips in each day, for a total of 1,276 daily trips. (See Ex. E at page 303 of the .pdf file.) In Addition, as show in the attached NV5 study, projected trips from our facilities are 9.96 trips per 1,000 square feet of operating space. For the 122,000 square feet of operating space proposed for this project, that equates to 1,182 daily trips.

All these calculations confirm that the number of trips that will result from Condition 10 requiring that we implement our operations plan will result in trips that are about 70% lower than the 4,151 trips projected by the City. Accordingly, there is no nexus, rough proportionality or reasonable relationship between the proposed CUP and the City's efforts to project fees and exactions based on 4,151 trips.

In addition, the City has not adopted a Citywide fee for these costs under the Mitigation Fee Act, and we are unaware of any attempt by the City to apply such a fee to any other project in the City. It therefore appears that the City is singling out this project for disparate treatment without any basis for doing so.

However, we appreciate the City's desire to improve traffic facilities within the area, and proposes to pay $1,005,000 for the cost of the improvements the LTA indicated would be triggered. Specifically, we are willing to pay for the following improvements:

- Traffic signal at the Cabot Boulevard/West Winton Avenue intersection. ($500,000)
- Traffic signal at the Clawiter Road and SR 92 eastbound ramps/Eden Landing Road intersection. ($500,000)
- The extension of the northbound left-turn pocket at the intersection of Clawiter Road/Winton Avenue by 50 feet into the existing two-way left turn lane, which can be accomplished by re-striping the existing two-way left turn lane. ($5,000)

In addition, we are willing to consider contributions towards City-established programs, based upon our actual trip generation pursuant to Condition 10. These could include items such as a fair share contribution toward a sidewalk extension along West Winton Avenue connecting the project site to the Bay Trail entrance, or similar sidewalk improvements in the project vicinity as identified in the City's Bicycle and Pedestrian Master Plan.

Thank you for your consideration of this compromise offer.

Very truly yours,

Melissa Watkins

cc: Cecily Barclay, Perkins Coie LLP

DELIVERY STATION

California Trip Generation Study

White Paper

February 2021

NV5

CALIFORNIA: DELIVERY STATION TRIP GENERATION STUDY WHITE PAPER

CONTACT: JOHN KARNOWSKI, P.E., PTOE, AICP

Executive Summary

There is a national trend towards on-line shopping and delivery of goods in North America. None of the current ITE Trip Generation land uses represent the trips of delivery stations with a 24-hour schedule. This study presents data from four California delivery stations. Rates were based on 7-day averages for daily, AM/PM of the commuter peak hour, and AM/PM of the generator peak hour trip ends. Trip generation rates were calculated trip per 1,000 square foot of operational area.

The data confirms that 24-hour Delivery Stations exhibit trip generation characteristics that are significantly different from other potentially comparable land uses included in ITE's Trip Generation Manual, specifically land use codes (LU) 150, 154, 155, and 156. The results of the study support the need for a delivery station land use category.

The evaluation of four sites across the state of California yielded operational area (excluding all interior loading, queuing, and parking areas) as a functional metric. Total daily, AM and PM peaks of the adjacent street (typical commuting hours) and AM and PM peak of the generator average trip rates and best fit equations were developed and are documented within the report. Graphs similar to those included in ITE's Trip Generation Manual are included in the Appendix. The recommended weighted average trip rates are shown below.

Land Use	Independent Variable	Daily	Peak Hour of the Adjacent Street		Peak Hour of the Generator	
			AM	PM	AM	PM
Delivery Station	1,000 SF of Operational Area	9.66	0.31	0.55	1.21	0.81

Since Delivery Stations often designate driveways for specific purposes, such as delivery vehicle exits, the typical mix of vehicle types throughout the day and during peak periods are also provided.

Vehicle	Independent Variable	Daily	Peak Hour of the Adjacent Street		Peak Hour of the Generator	
			AM	PM	AM	PM
Passenger Vehicles	1,000 SF of Operational Area	6.78	0.30	0.42	0.55	0.44
Delivery Vans		2.71	-	0.13	0.65	0.36
Line-Haul Trucks		0.17	0.01	-	0.01	0.01

Key Conclusions

- 24-Hour Delivery Stations exhibit trip generation characteristics that are significantly different from other potentially comparable land uses included in ITE's Trip Generation Manual.
- Operational Area, the minimal building size requirement to process packages and support onsite workers, provides potential trip generation rates.

CALIFORNIA: DELIVERY STATION TRIP GENERATION STUDY WHITE PAPER

CONTACT: JOHN KARNOWSKI, P.E., PTOE, AICP

There is a national trend toward on-line shopping and delivery of goods in North America. The current ITE Trip Generation Land Use Codes do not represent the trips of delivery stations operating with 24-hour schedules. This study summarizes trip characteristics of four delivery stations in California, develops trip generation rates for an independent variable with the best possible correlation among the collected data, and compares the results to the existing trip rates for specific ITE Land Use Codes.

INTRODUCTION AND BACKGROUND

ITE does not have a standard for e-commerce delivery station operations. Traffic studies for these facilities frequently use warehousing, high-cube transload warehousing, fulfillment center, high-cube parcel hub warehousing (land use codes 154-156), or possibly another land use category to estimate trips for the stations. Consultants and local traffic agencies do not universally apply the land use codes for delivery stations. The inconsistent use of trip rates can result in confusion on the part of reviewing agencies, a distrust of the numbers provided by developers, delays in preparing traffic studies, and possibly unnecessary mitigation measures.

The purpose of this paper is to present delivery station trip characteristics, evaluate trip generation rates using independent variables, and develop a standard metric for delivery stations in California.

STUDY DESIGN

This trip generation study was designed to establish a method to generate delivery station trip ends based on actual trip counts from multiple delivery stations of various sizes in California.

- Sites were selected where trips into and out of a facility could be isolated from other trip generators, provided all necessary parking onsite (no off-site parking), were located where there were minimal or no multi-modal transportation options, and had been in operation long enough to establish routine schedules (30 days minimum).
- Trip counts were collected for 24-hour periods for seven consecutive days.
- Site operators provided employee numbers (onsite workers, not including delivery drivers).
- Site operators provided site plans, including the interior layouts for buildings.

Data Collection Methodology

Trip data was collected by National Data & Surveying Services (NDS) for all sites to ensure consistency. Data for three of the sites was collected Thursday, November 5 through Wednesday, November 11, 2020. Data for the fourth site was collected Thursday January 14 through Wednesday January 20, 2021. Data was recorded by video and tabulated as entering or exiting trips for each discrete driveway by vehicle type: automobiles (cars and pickup trucks), vans (26' cargo vans), box trucks, tractor-trailers, and others (motorcycles, garbage pickup vehicles, etc.). A 24-hour bi-directional tube count was also taken at each site on an adjacent roadway with the highest daily traffic volume to establish the adjacent street AM and PM peak hours. Raw data is provided in a separate technical appendix, available upon request.

The data was collected during the COVID-19 pandemic and may be conservatively high due to an increase in on-line shopping due to stay-at-home orders issued to reduce the spread of the virus.

Raw data was summarized combining counts from all driveways to obtain total trip volumes and total trip volumes by vehicle type for each site. The peak hours of the adjacent street were determined by the highest volumes between 7:00 – 9:00 am and 4:00 – 6:00 pm from the 24-hour tube counts. The peak hours of the generator (the delivery station's highest volume in the morning and afternoon or evening) was determined by the highest volume between midnight and noon and between noon and midnight from the total trip counts at each site.

Trip data was summarized into vehicle types for passenger vehicle, delivery van and trucks (line-haul) for this study. Other unidentified vehicle types were added to the passenger vehicle type since they would be using the same driveways and there was insufficient data to categorize them otherwise. Box trucks were manually assigned as either delivery vans or line-haul trucks depending on their individual trip characters (e.g., Entering and exiting at the same times as vans vs. arriving and departing like line-haul trucks). Depending on the site, some packages are delivered to the station with box trucks when a line-haul truck is not necessary. At other locations, box trucks are used for some special delivery routes. A separate rate for heavy vehicles was not calculated since the presence of box trucks are atypical and the raw data did not specify if any of the other vehicle types were heavy vehicles.

Site	Address	Average Daily Trips	Average Employees	Building Size (SF)	Operational Area (S.F.)
A	1757 Tapo Canyon, Simi Valley, CA 93063	385	25	204,680	96,200
B	400 Littlefield Ave S. San Francisco CA 94080	850	124	166,640	56,970
C	600 W Technology Dr Palmdale, CA 93551	1,545	134	128,192	128,192
D	Vantage Point Poway, CA 92064	1,609	220	533,950	173,170

Independent Variables

A comparison of site plans for delivery stations (not just these four sites) exposes a wide variety of layouts, including site sizes, building sizes, and numbers of parking spaces. A preliminary assessment of daily trips to employees and total building size revealed very poor correlation of data among the sites. While the poor correlation between number of employees and total trip ends could not be explained, the differences between the sites in terms of total building size and how the buildings were being used was apparent. Delivery stations frequently occupy buildings that are larger than necessary for sorting packages for delivery routes. At many sites, vans are loaded inside the building. Others also have enough interior space for the next wave of delivery vehicles to queue before moving into the loading area. Still others have enough excess interior space to park delivery vehicles overnight, and in rare cases employees and delivery drivers also park inside buildings. Other sites do not have sufficient space to accommodate all parking needs.

Each delivery station has a minimal building size requirement to process packages and support onsite workers. This is termed "operational area" and is the initial requirement for site selection for new delivery stations. Existing and proposed buildings available for lease are often larger than this

operational area but are still leased for the delivery station and excess internal space is used for other functions as mentioned above. Operational areas for the four sites were estimated from site plans and then compared to the total daily trip ends. An explanation of how to determine operational area and the operational areas of the sites included in this study are included in the Appendix.

STUDY RESULTS

Weighted average trip rates, Standard Deviations (SD), best-fit curve equations (where applicable), equation coefficients of determination (R^2) (where applicable), percentages of entering and exiting trips, and vehicle mixes were calculated for the sites for the following time periods to mirror the types of rates documented in the ITE Trip Generation Manual. Trip ends per 1,000 square feet of operational area are presented below with graphed data summary sheets in the Appendix.

1. Total Daily Trips (7-Day Average)
2. AM Peak Hour of Adjacent Street Traffic (the delivery station's volume during rush hour)
3. PM Peak Hour of Adjacent Street Traffic (the delivery station's volume during rush hour)
4. AM Peak Hour of Generator (the delivery station's highest volume in the morning)
5. PM Peak Hour of Generator (the delivery station's highest volume in the afternoon or evening)

Total Daily Trips

Total daily trips for each site were summarized for all vehicle types at all driveways and averaged for the seven-day collection period. The data reflects the range of trip generation characteristics for the selected delivery stations. As expected, daily trips are evenly split between entering and exiting.

Passenger vehicles make up an average of 70% of the daily trip ends, delivery vans account for 28%, and tractor-trailer trucks comprise 2% of the daily trip ends. Trip rates by vehicle type are summarized on page 6.

Daily Trip Rate (7-Day Weighted Average)			
Site	Trips	Operational Area (S.F.)	Rate/ 1,000 SF
A	385	96,200	4.00
B	850	56,658	15.00
C	1,545	128,192	12.05
D	1,609	173,170	9.29
Average Rate:			9.66
SD:			4.68
Equation:			T = 8.6894x + 110.52
R^2:			0.54

AM Peak Hour of Adjacent Street Traffic

The AM peak hour of the adjacent street was determined for each site based on the 24-hour tube counts for the hours between 7:00 am and 9:00 am. The majority of morning peak trips are entering (85%) versus exiting (15%). Passenger vehicles make up the bulk (97%) of AM peak hour of the adjacent street trip ends. Delivery vans, and tractor-trailer trucks account for the remaining trip ends (1% and 2% respectively).

Adjacent Street AM Peak Hour Trip Rate (7-Day Weighted Average)			
Site	Trips	Operational Area (S.F.)	Rate/ 1,000 SF
A	9	96,200	0.09
B	20	56,658	0.35
C	86	128,192	0.67
D	27	173,170	0.16
Average Rate:			0.31
SD:			0.26
R^2:			<0.50

The data shows that all the delivery stations generate fewer than 90 peak hour trips with three of the sites generating fewer than 30 trips during the typical AM commuting peak hour.

PM Peak Hour of Adjacent Street Traffic

The PM peak hour of the adjacent street was determined for each site based on the 24-hour tube counts for the hours between 4:00 pm and 6:00 pm. Evening peak hour traffic is almost evenly split between entering (48%) and exiting (52%). The vehicle breakdown during this period is very similar to the daily mix with 76% passenger vehicles, 24% delivery vans and on average no tractor-trailer trip ends.

Adjacent Street PM Peak Hour Trip Rate
(7-Day Weighted Average)

Site	Trips	Operational Area (S.F.)	Rate/ 1,000 SF
A	36	96,200	0.37
B	30	56,658	0.53
C	119	128,192	0.93
D	66	173,170	0.38
Average Rate:		0.55	
SD:		0.26	
$R^{2:}$		<0.50	

The data shows that all the delivery stations generate fewer than 120 peak hour trips with three of the sites generating fewer than 70 trips during the typical PM commuting peak hour.

AM Peak Hour of Generator

The AM peak hour of the generator was determined for each site based on the highest hourly total driveway volumes between midnight and noon as delivery stations operate 24-hours a day and schedule employees as well as deliveries off peak to the extent feasible in any given market. For all sites, the morning peak hour of the generator occurred between 10:00 am and 11:00 am. During this hour 41% of the trips are entering and 59% are exiting. During the morning peak hour of the generator passenger vehicles account for 46% of the trip ends. Delivery vans make up another 54% and on average there are no tractor-trailer trip ends during this peak.

Delivery Station AM Peak Hour Trip Rate
(7-Day Weighted Average)

Site	Trips	Operational Area (S.F.)	Rate/ 1,000 SF
A	74	96,200	0.77
B	99	56,658	1.75
C	157	128,192	1.22
D	220	173,170	1.27
Average Rate:		1.21	
SD:		0.40	
Equation:		T = 1.1628X + 5.4573	
$R^{2:}$		0.78	

The data confirms delivery stations generate more trips during a different morning hour than the typical peak hour of the adjacent street. An examination of the PM peak hour of the generator also confirms this is the highest peak hour of the day.

PM Peak Hour of Generator

The PM Peak hour of the generator was determined for each site based on the highest hourly total driveway volumes between the hours of noon and midnight similar to the morning peak hour of the generator. The evening peak hour of the generator occurred after 6:00 pm and typically occurred between 8:00 and 9:00 pm. During this hour traffic is almost evenly split between entering (52%) and exiting (48%). The mix of vehicles during this peak PM hour of the generator are 54% passenger vehicles, 45% delivery van, and 1% tractor-trailer trucks

Delivery Station PM Peak Hour Trip Rate
(7-Day Weighted Average)

Site	Trips	Operational Area (S.F.)	Rate/ 1,000 SF
A	37	96,200	0.38
B	56	56,658	0.99
C	124	128,192	0.97
D	151	173,170	0.87
Average Rate:		0.81	
SD:		0.28	
Equation:		T = 0.9565x – 16.61	
$R^{2:}$		0.76	

The data confirms delivery stations generate more trips during a different evening hour than the typical peak hour of the adjacent street.

Trip Rates by Vehicle Type

Trip Rates by Vehicle Type (7-Day Weighted Average)			
Time of Day	Passenger Vehicles	Delivery Vans	Line-Haul Trucks
Daily	6.78	2.71	0.17
AM Peak Hour of the Adjacent Street	0.30	-	0.01
AM Peak Hour of the Generator	0.55	0.65	0.01
PM Peak Hour of the Adjacent Street	0.42	0.13	-
PM Peak Hour of the Generator	0.44	0.36	0.01

Comparison to ITE Rates

The ITE Trip Generation land use descriptions for Warehousing (LU 150), High-Cube Transload and Short-Term Storage Warehouse (LU 154), High-Cube Fulfillment Center Warehouse (LU 155 non-sort), and High-Cube Parcel Hub Warehouse (LU 156) are the most comparable to the description of a delivery station. The sort version of the High-Cube Fulfillment Center Warehouse (LU 155) is not comparable but is included in these comparisons to so demonstrate.

Comparison 1: Published Trip Rates vs. This Study

The table below summarizes trip rates for square-footage-based size for these land uses and this study. Since the studies use different size types, this comparison is of little use, other than possibly to note that the standard deviation in the rates from this study are generally within the range of the standard deviations from the studies used in the Trip Generation Manual.

Trip Generation Rate Comparison[1]										
Source	Average Day		Peak Hour of the Adjacent Street				Peak Hour of the Generator			
	Rate	SD	AM	SD	PM	SD	AM	SD	PM	SD
ITE 150 - Warehousing	1.74	1.55	0.17	0.20	0.19	0.18	0.22	0.28	0.24	0.24
ITE 154 – High-Cube Transload & Short-Term Storage Warehouse	1.40	0.86	0.08	0.05	0.10	0.06	0.12	0.06	0.16	0.06
ITE 155 – High Cube Fulfillment Center Warehouse (Non-Sort)	1.81	0.76	0.15	0.15	0.16	0.15	0.22[2]	NA	0.27[2]	NA
ITE 155 – High Cube Fulfillment Center Warehouse (Sort)	6.44[3]	****	0.87[4]	0.51	1.20[4]	0.77	NA	-	NA	-
ITE 156 – High-Cube Parcel Hub Warehouse	4.63[5]	5.06	0.70[6]	0.21	0.64[6]	0.27	0.88[3]	NA	0.71[3]	NA
This Study[7]	**9.66**	**4.68**	**0.3**	**0.26**	**0.55**	**0.26**	**1.21**	**0.40**	**0.81**	**0.28**

[1]Gross floor area/1,000 used for ITE rates. This study uses operational area/1,000
[2]Based on a single study
[3]Based on two studies
[4]Based on three studies
[5]Based on eight studies
[6]Based on four studies
[7]Per 1,000 SF of operational area. Based on four studies

Comparison 2: Studies Used in Published ITE Rates vs. This Study

A comparison using the average sizes of the buildings included in the trip generation studies for the ITE published land uses demonstrates the variability of results using these rates. The average size of the buildings included in the ITE land uses are much larger than the average operational size of the delivery stations yet depending on the type of activity the buildings house, the typical delivery station may produce much less or much more traffic than a particular comparable land use.

Trips Generated using Average Size of Sites Included in Various Studies[1]						
Trip Rate Source	Average Size or Area[1]	Trip Ends				
		Average Day	Peak Hour of the Adjacent Street		Peak Hour of the Generator	
			AM	PM	AM	PM
ITE 150 - Warehousing	285,000	496	48	54	63	68
ITE 154 – High-Cube Transload & Short-Term Storage Warehouse	798,000	1,117	64	80	96	128
ITE 155 – High Cube Fulfillment Center Warehouse (Non-Sort)	886,000	1,604	133	142	197	241
ITE 155 – High Cube Fulfillment Center Warehouse (Sort)	1,360,000	8,758	1,183	1,632	-	-
ITE 156 – High-Cube Parcel Hub Warehouse	543,000	2,516	382	350	481	388
This Study	**113,555**	**1,097**	**36**	**63**	**138**	**92**

[1]Gross floor area/1,000 used for published ITE Land Uses. This study uses operational area/1,000

Comparison 3: Published ITE Rates Applied to This Study's Average Building Size vs. This Study

An additional comparison was developed based on the average building size (258,366 SF) and the average operational area (100,110 SF) from this study. ITE land uses were applied to generate the trip ends and compared to trip ends from this study. The results using the trip rates developed in this study are quite different from the results using the ITE rates.

Trips Generated using Average Size of Sites Included in this Study[1]						
Trip Rate Source	Average Size or Area[1]	Trip Ends				
		Average Day	Peak Hour of the Adjacent Street		Peak Hour of the Generator	
			AM	PM	AM	PM
ITE 150 - Warehousing	214,456	373	36	41	47	51
ITE 154 – High-Cube Transload & Short-Term Storage Warehouse	214,456	300	17	21	26	34
ITE 155 – High Cube Fulfillment Center Warehouse (Non-Sort)	214,456	388	32	34	48	58
ITE 155 – High Cube Fulfillment Center Warehouse (Sort)	214,456	1,381	187	257	-	-
ITE 156 – High-Cube Parcel Hub Warehouse	214,456	994	151	138	190	153
This Study	**113,555**	**1,097**	**36**	**63**	**138**	**92**

[1]Gross floor area/1,000 of this study used for published ITE land uses. This study uses operational area/1,000

These comparisons confirms that delivery station trip characteristics are different from other industrial land uses currently included in the ITE Trip Generation Manual.

Special Circumstances

All four sites in this study had on-site parking only. In situations where off-site parking is required, it is typically limited to delivery vans and employee parking remains on-site. When van parking is off-site, drivers park at the off-site location and drive the vans to the site. There is no reduction in trips to the site as it is a one-for-one swap of trips.

Trips are reduced when employees or delivery drivers use transit, ride sharing, or other non-single occupant vehicle transportation options are available. Employee and delivery driver trips can be reduced, but delivery vehicle trips cannot.

Conclusions and Recommendations

The data confirms that 24-hour Delivery Station trip generation characteristics are significantly different from those documented in the ITE Trip Generation for comparable land uses (land use codes 150, 154, 155 non-sort, 155 sort, and 156).

Key Conclusions:

- 24-Hour Delivery Stations exhibit trip generation characteristics that are significantly different from other potentially comparable land uses included in ITE's Trip Generation Manual.
- Operational area, as defined by that interior area necessary to the parcel sorting and delivery preparation activities (excluding all interior loading, queuing, and parking areas), provides promising trip generation rates. While operational area is not a conventional trip rate metric, ITE does include trip rates based on atypical metrics, such as fueling spots for gasoline stations and full-time doctors for medical clinics, when such metrics provide the best relationships between trip data.

The authors note that the goal of this study is to improve the traffic engineer's ability to select the proper land use trip generation rates specific to a project when working with delivery stations that operate off-peak hour employee and delivery schedules. The results are not intended to replace current trip generation rates or their application where operational characteristics are unknown.

APPENDIX

APPENDIX A

AVERAGE VEHICLE TRIP ENDS VS:

OPERATIONAL AREA

LAST MILE DELIVERY STATION

Description

Delivery Stations are package handling facilities that support the “last mile” of a fulfillment logistics network operating 24-hours a day with off-peak commuter peak periods.

Additional Data

Truck trips account for 2% of the typical daily traffic of the sites surveyed. No vehicle occupancy data were available specifically for delivery station, but the average is assumed to be 1.0 person per automobile for all industrial uses as this was observed during the COVID-19 pandemic.

The peak hour of the generator does not coincide with the peak hour of the adjacent street traffic.

Facilities with employees on shift work schedules are 24-hour.

Three sites were surveyed in the California for 7-consecutive days.

A 24-hour bi-directional tube count was taken at each site on an adjacent roadway with the highest daily traffic volume to establish the adjacent street AM and PM peak hours.

Vehicle Mix

Time Period	Passenger Vehicles	Delivery Vans	Line-Haul Trucks
Daily	70%	28%	2%
AM Peak of the Adjacent Street	97%	1%	2%
PM Peak of the Adjacent Street	76%	24%	0%
AM Peak of the Generator	46%	54%	0%
PM Peak of the Generator	54%	45%	1%

LAST MILE DELIVERY STATION

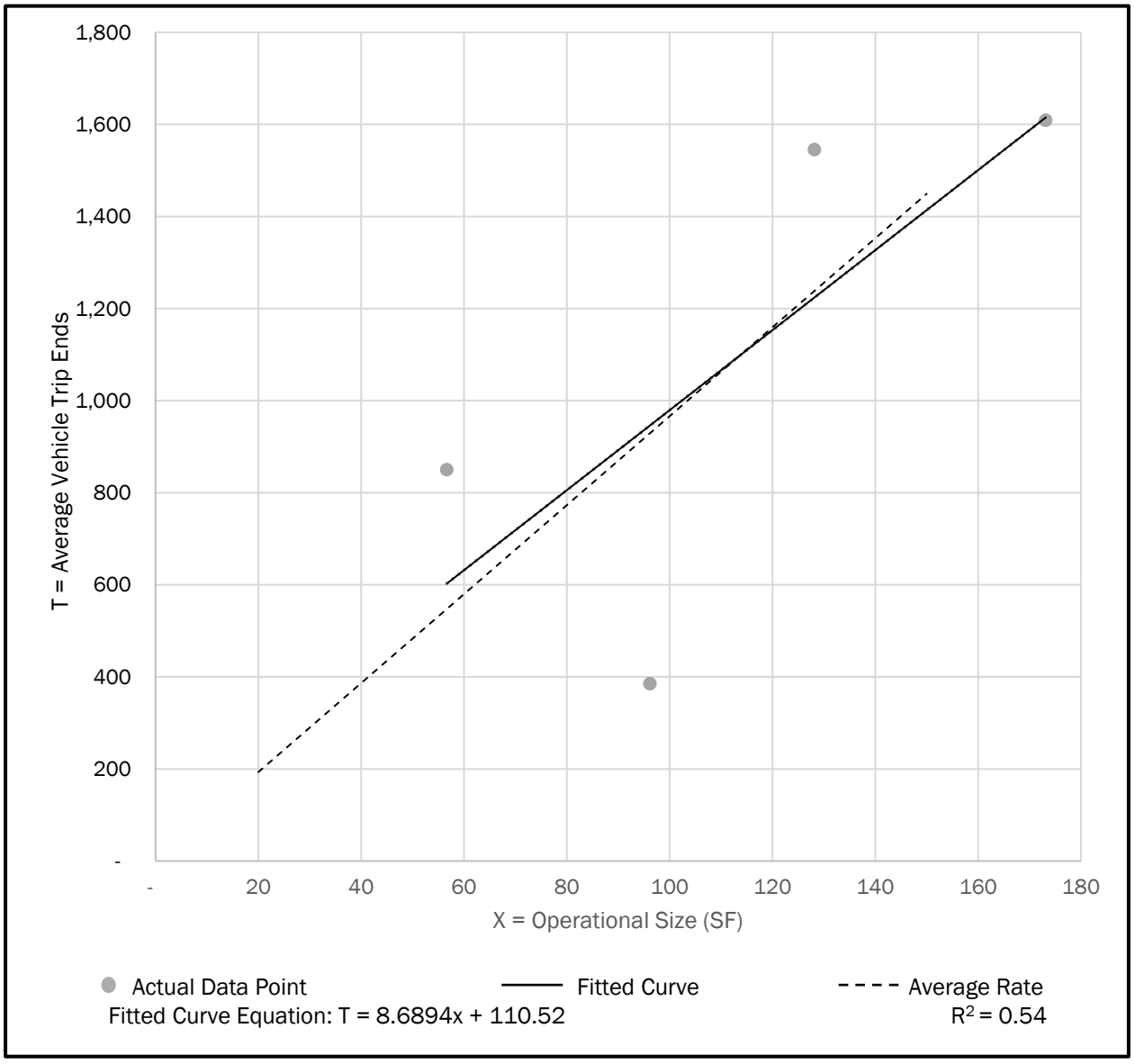
Average Vehicle Trip Ends vs: Operational Area (SF) / 1,000 SF
On a: Average Day

Number of Studies: 4 in California
Average Operational Area: 113,555 SF
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
9.66	4.00 – 15.00	4.68

Data Plot and Equation



LAST MILE DELIVERY STATION

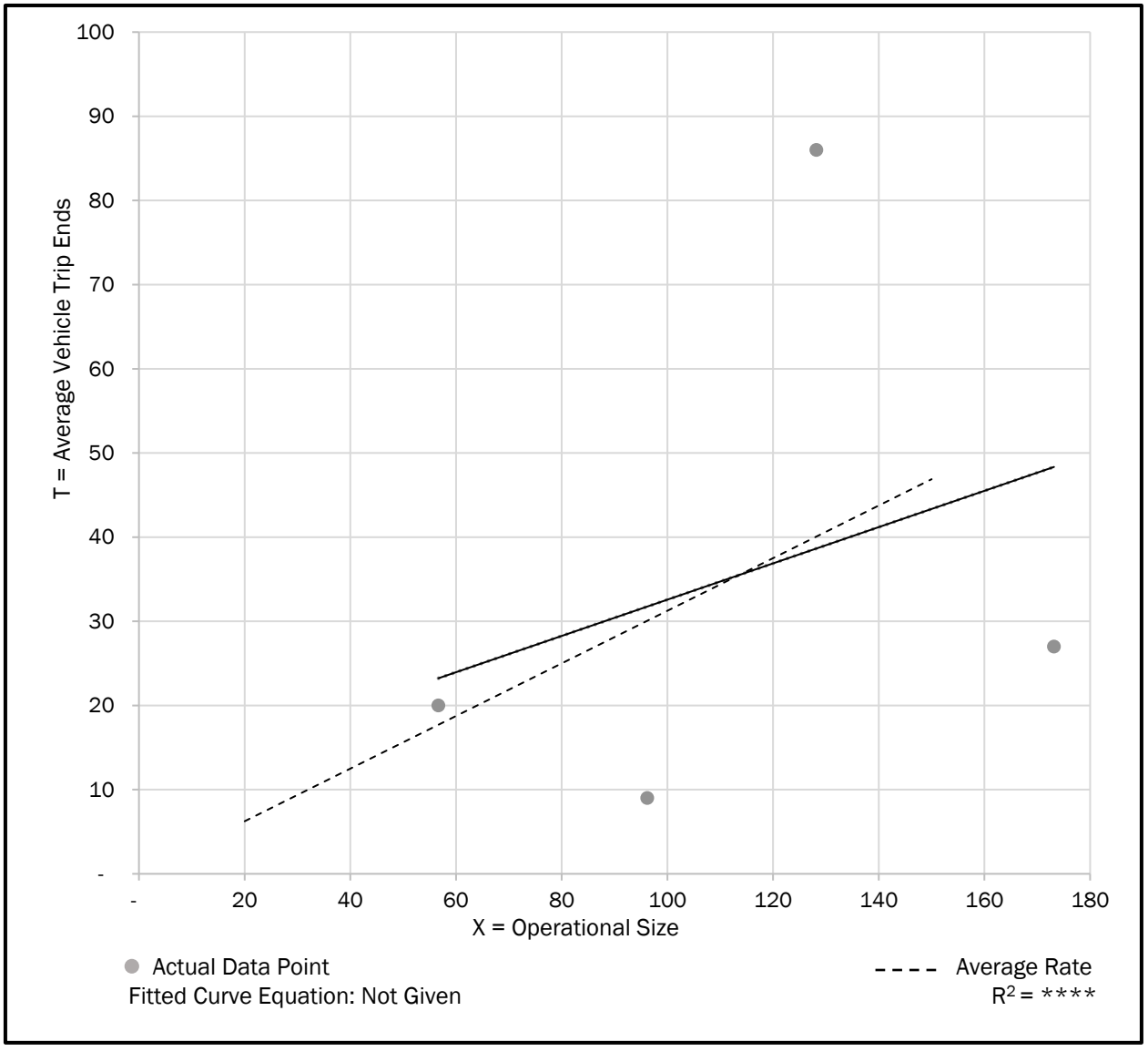
Average Vehicle Trip Ends vs: Operational Area (SF) / 1,000 SF
On a: Average Day,
AM Peak Hour of the Adjacent Street

Number of Studies: 4 in California
Average Net Occupied Space: 113,555 SF
Directional Distribution: 85% entering, 15% exiting

Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.31	0.09 – 0.67	0.26

Data Plot and Equation



LAST MILE DELIVERY STATION

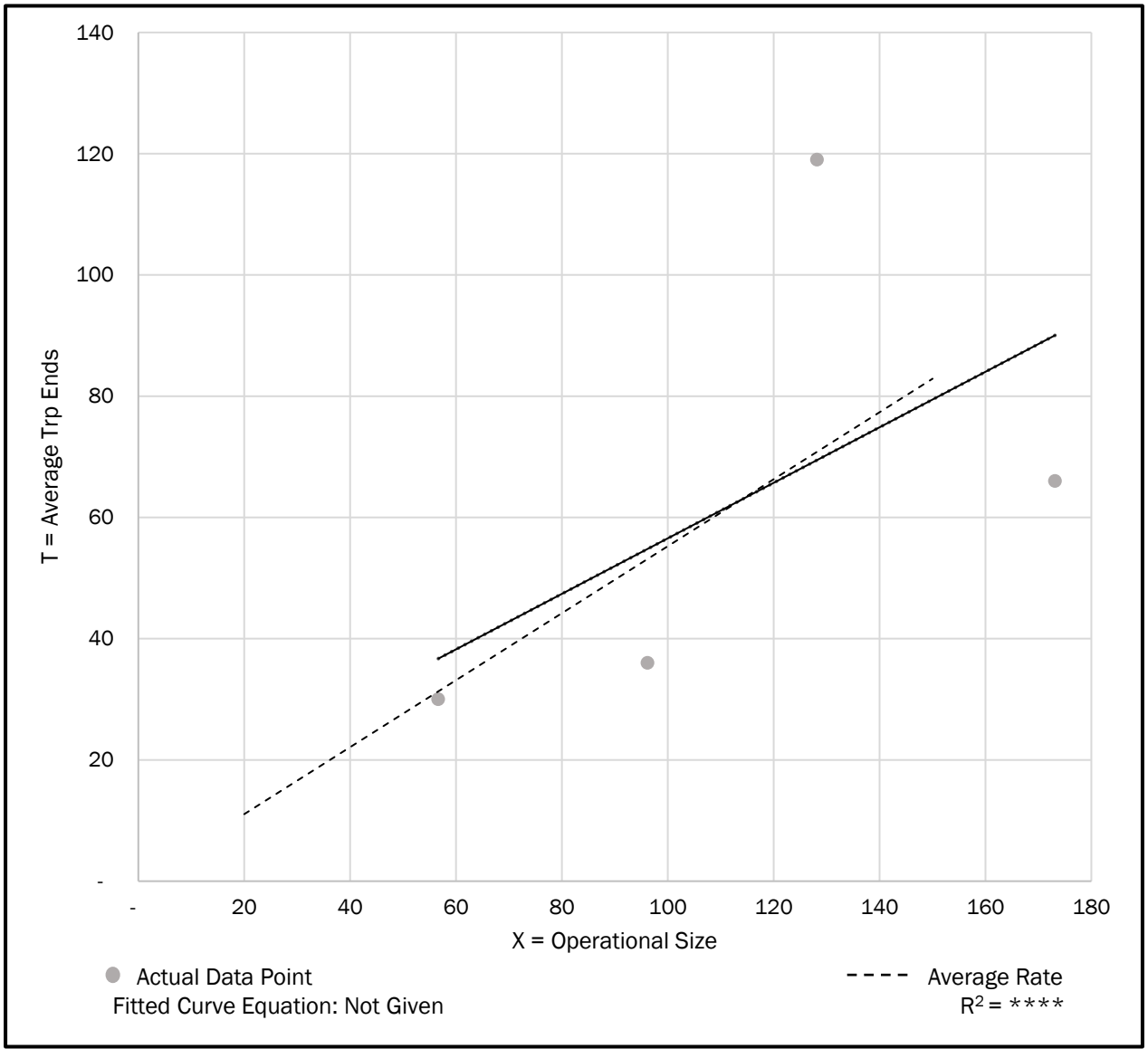
Average Vehicle Trip Ends vs: Operational Area (SF) / 1,000 SF
On a: Average Day,
PM Peak Hour of the Adjacent Street

Number of Studies: 4 in California
Average Net Occupied Space: 113,555 SF
Directional Distribution: 48% entering, 52% exiting

Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.55	0.37 – 0.93	0.26

Data Plot and Equation



LAST MILE DELIVERY STATION

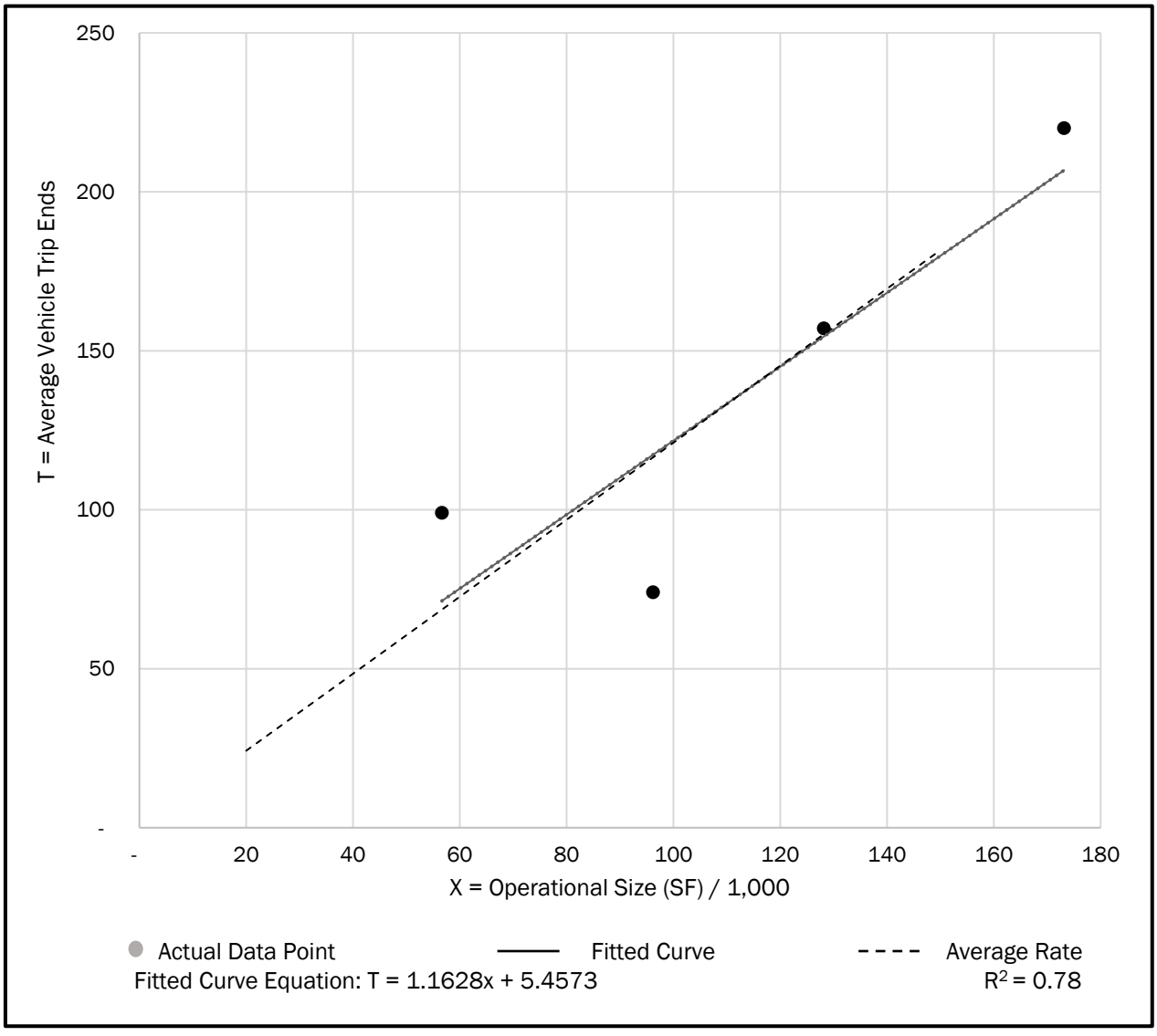
Average Vehicle Trip Ends vs: Operational Area (SF) / 1,000 SF
On a: Average Day,
AM Peak Hour of the Generator

Number of Studies: 4 in California
Average Net Occupied Space: 113,555 SF
Directional Distribution: 41% entering, 59% exiting

Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.21	0.77 – 1.75	0.40

Data Plot and Equation



LAST MILE DELIVERY STATION

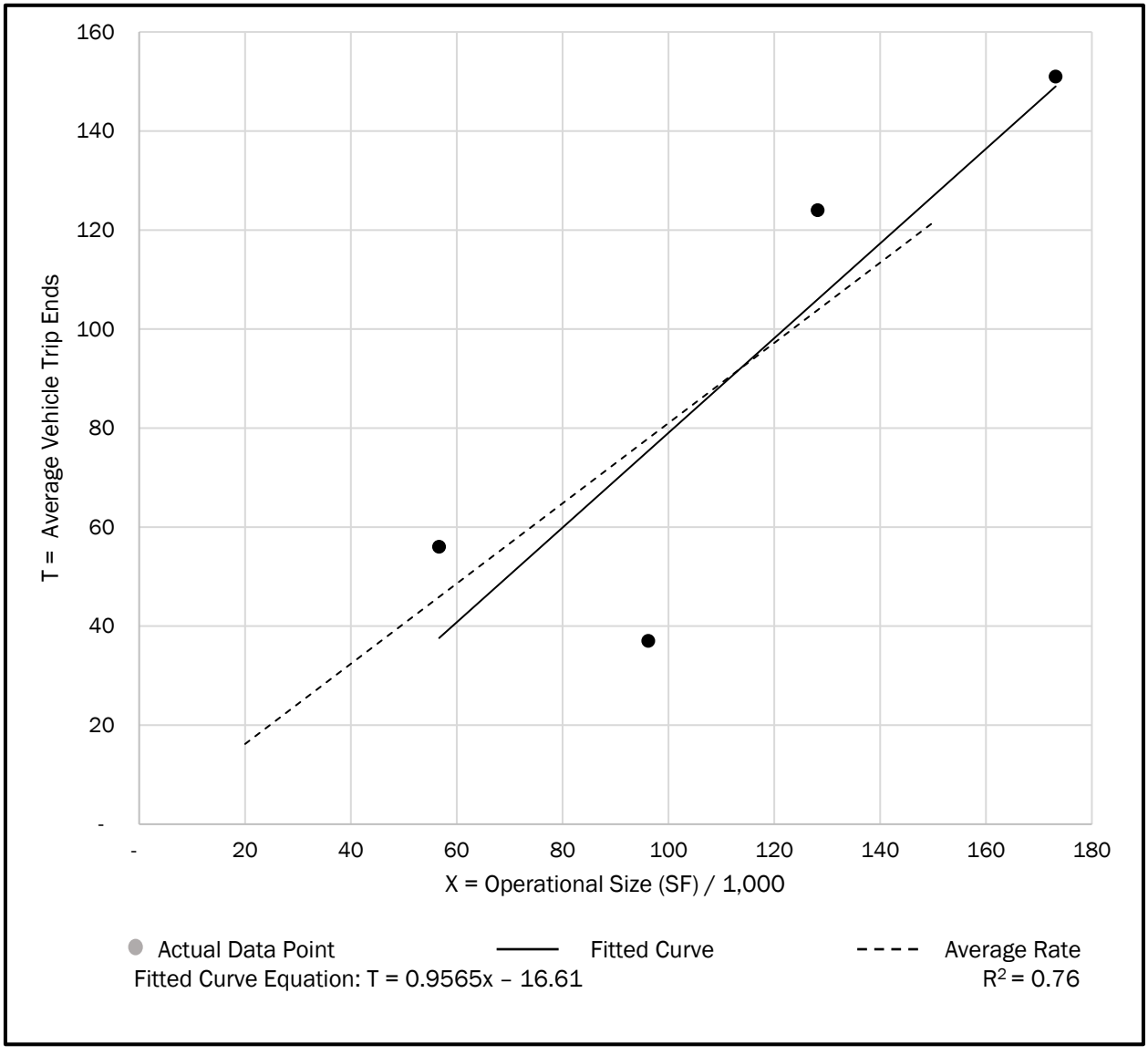
Average Vehicle Trip Ends vs: Operational Area (SF) / 1000 SF
On a: Average Day,
PM Peak Hour of the Generator

Number of Studies: 4 in California
Average Net Occupied Space: 113,555 SF
Directional Distribution: 52% entering, 48% exiting

Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.81	0.38 – 0.99	0.28

Data Plot and Equation



APPENDIX B

SITE OPERATIONAL AREAS

OPERATIONAL AREA DETERMINATION

Operational area is defined as that interior area necessary to the parcel sorting and delivery preparation activities and excludes all interior loading, queuing, and parking areas. The following pages illustrate the operational areas for those sites included in this study.

Site A

The total building size is known, and the site plan is scalable. The interior layout of the building shows van queueing areas, van loading areas, van travel paths, and a delineation between van activities and the operational area. The operational area can be scaled from the plan and is highlighted in turquoise. 96,200 SF.

Site B

The total building size is known, and the site plan is scalable. The interior layout of the building shows a van queueing area, a van loading area, and parking areas. The operational area can be scaled from the plan and is highlighted in turquoise. 56.970 SF.

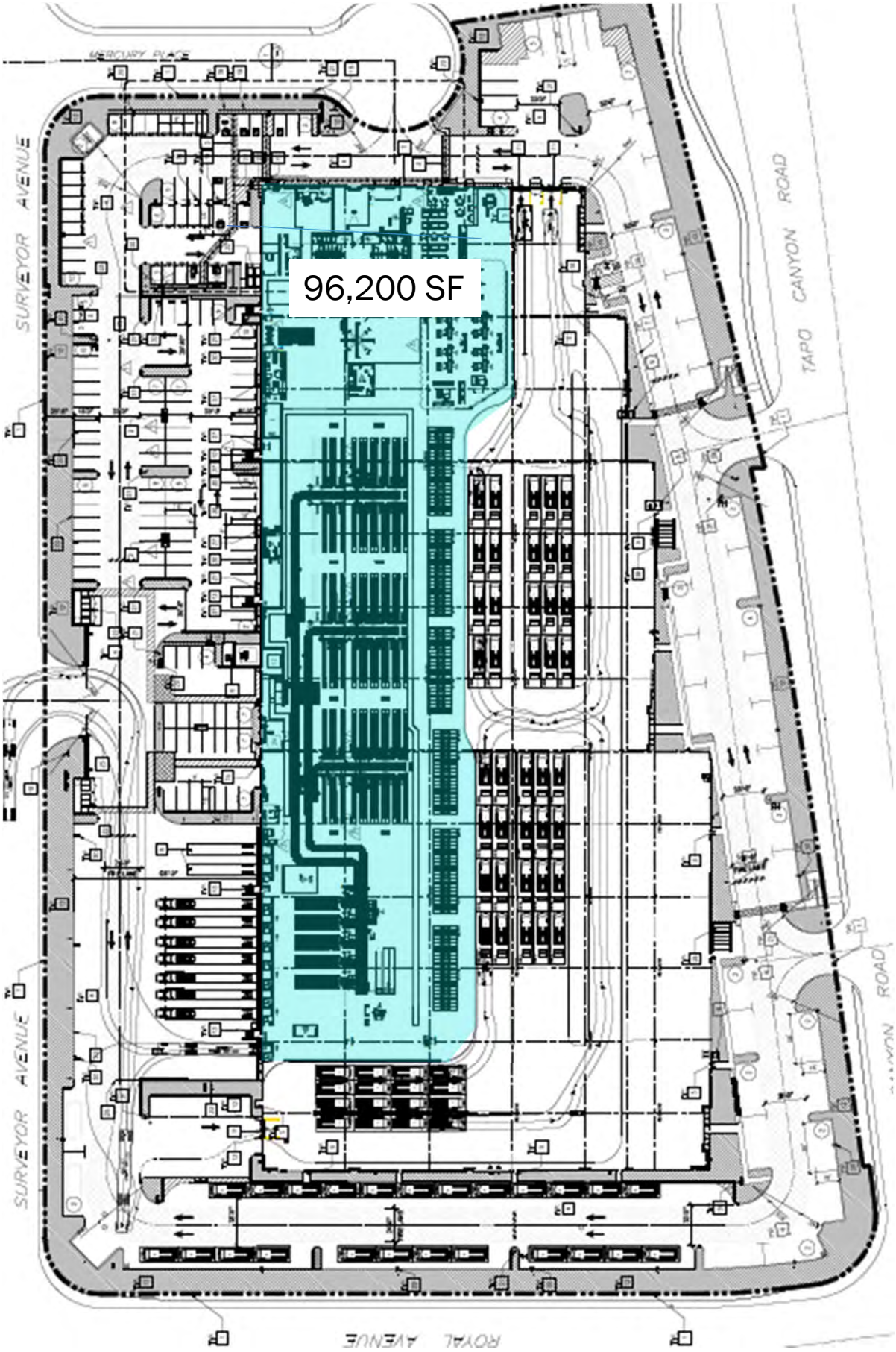
Site C

The total building size is known. The interior layout of the building does not include any parking, van queuing or loading areas. The entire building is devoted to operational activities. The operational area is highlighted in turquoise. 128,192 SF.

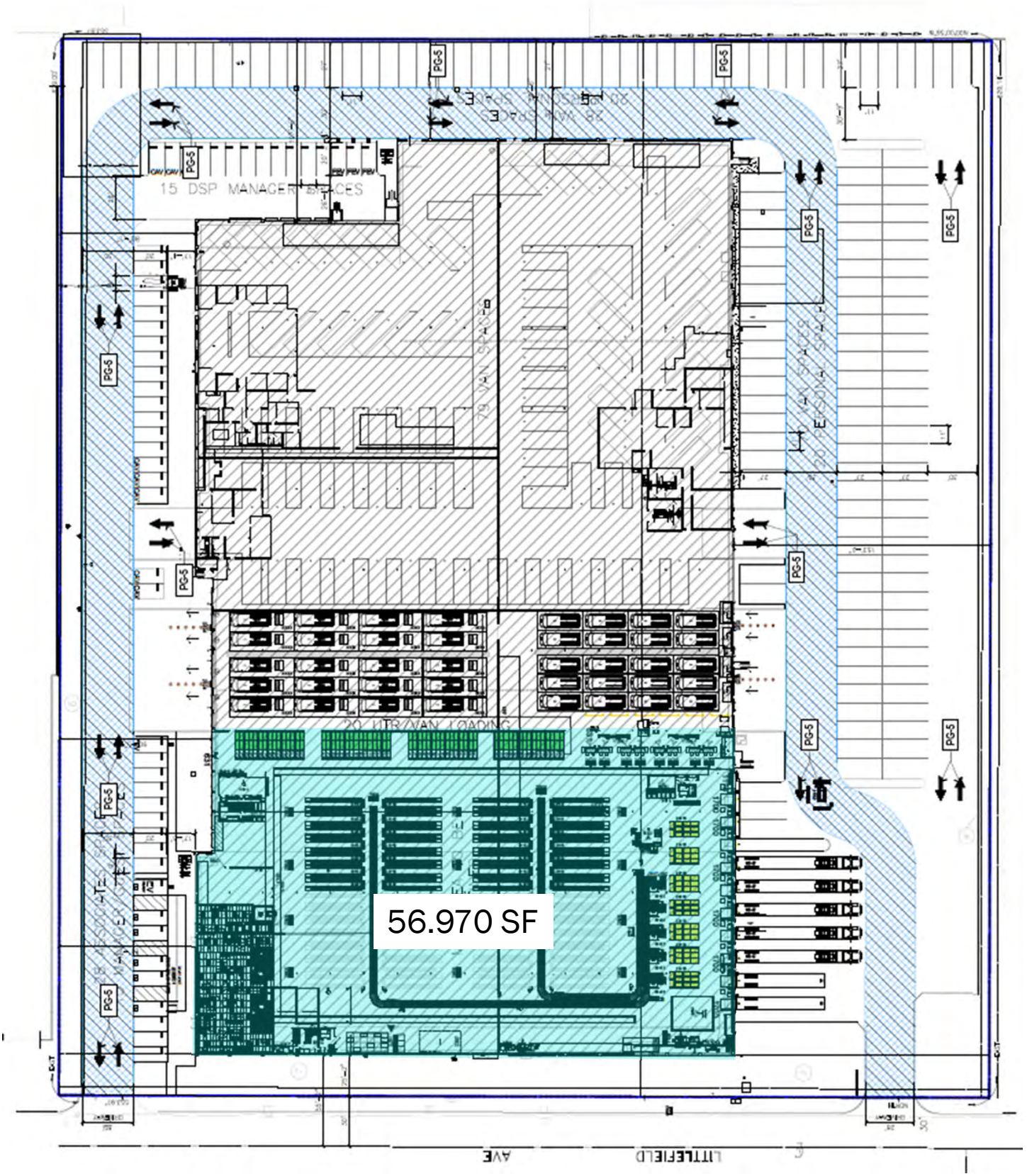
Site D

The site plan has a table indicating the area of the building that is “occupied” for the purpose of site plan trip generation and notes this does not include parking or van activity areas. Interior parking is indicated by striping while van staging areas are indicated via purple rectangles and van loading areas are indicted by green rectangles. The operational area is highlighted in turquoise. The site plan is also scalable, and the operational area size was verified. 173,170 SF.

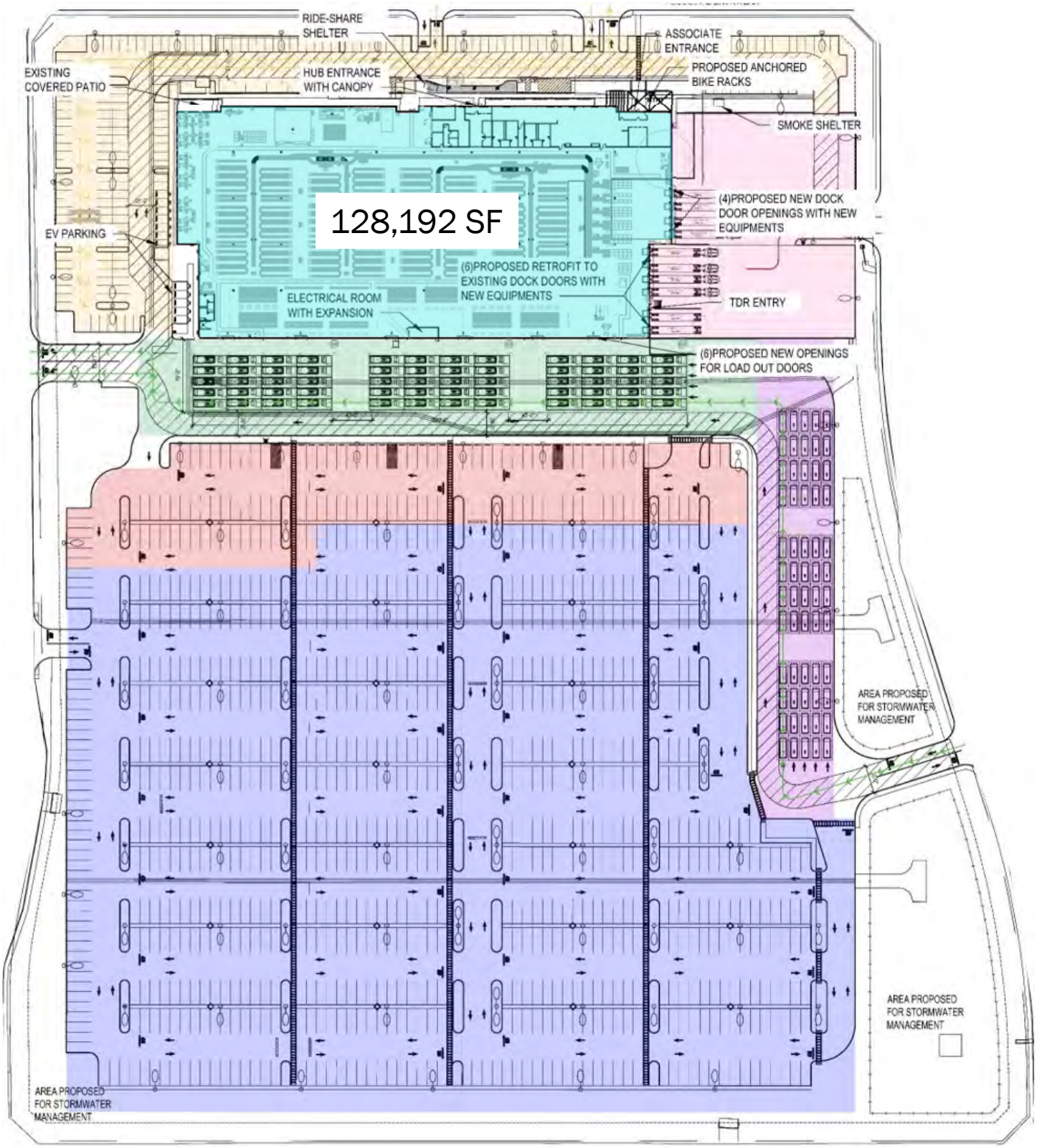
Site A Operational Area



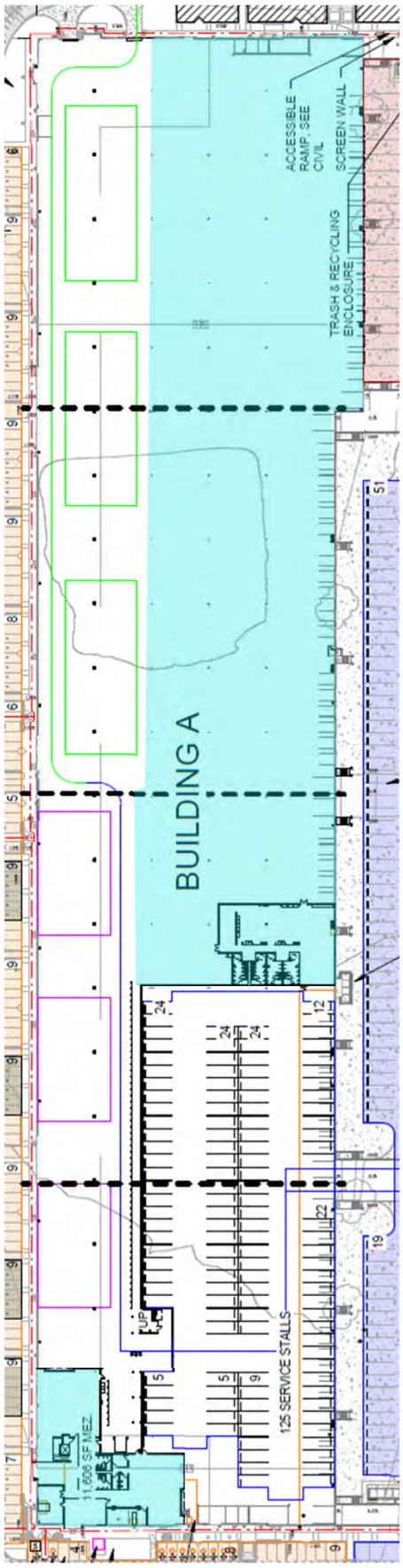
Site B Operational Area



Site C Operational Area



Site D Operational Area



173,170 SF

CURRENTLY PROPOSED PROJECT LAND USE	Portion of Total Floor Area Designated to Use (% of GSF)	Floor Area (X 1,000)	Daily Trip Rate	AM Trip %	PM Peak Hour Trip %	AM Trips	PM Peak Hour Trips
Office Park	4.92%	12.27	12	13%	13%	19	19
Warehouse	95.08%	160.91	[illegible]	13%	15%	105	121
PROJECT TOTAL		**173.17**				**124**	**140**

Notes:
1) Office area within warehouse is applied office park rate for conservatism.
2) Van parking and staging areas are not included in warehouse floor area since these activities are normally performed outside the building.

TECHNICAL MEMORANDUM

To: City of Hayward, CA

From: John Karnowski, PTOE, AICP (john.karnowski@NV5.com)

Date: March 2, 2021

Re: Evaluation of Traffic Impacts for the Amazon Delivery Station
2791 Winton Ave, Hayward, CA

We have reviewed the City's conclusions regarding impacts from the proposed Amazon Delivery Station located at 2791 Winton Ave in Hayward. The following summarizes our findings:

1. **The Traffic Impact Analysis conducted by Hexagon Consulting grossly overestimated the expected number of trips.**

NV5 conducted a trip generation study of Amazon Delivery Stations in California and in other states in the US. In California, data were collected at five sites – four of which were deemed usable. The resulting "white paper" was peer reviewed by Langan Engineers and Kimley Horn & Assoc. and was conducted in the same manner as would be conducted for submission to the Institute of Transportation Engineers (ITE) for inclusion in Trip Generation, 10th Ed., ITE, 2017. The complete paper is appended to this document.

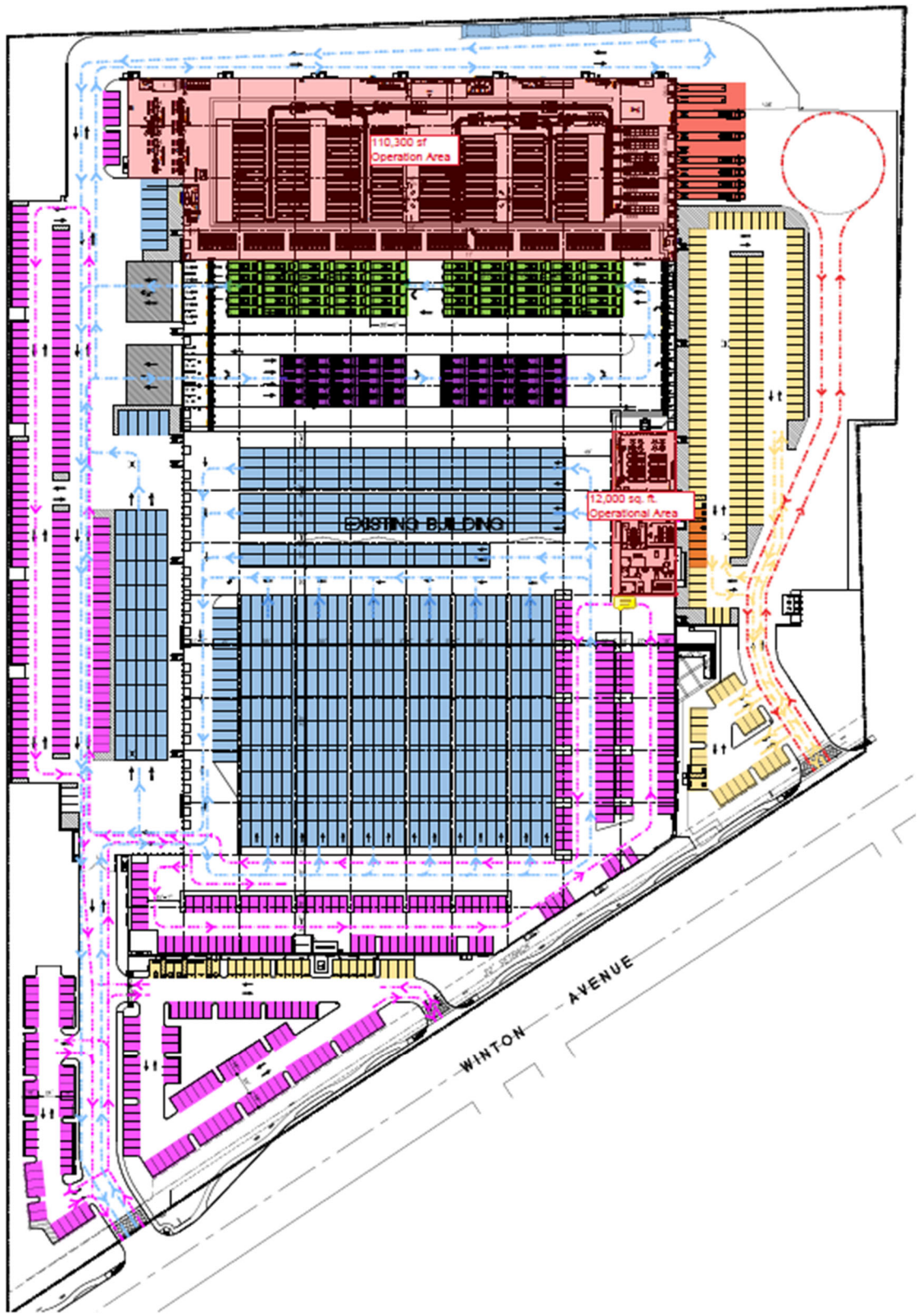
The NV5 study concluded the following regarding delivery stations:

- Delivery stations are a unique land use and are not covered by any land use categories in Trip Generation, 10th Ed., ITE, 2017
- Because the size of the building can vary wildly for the same use and output, the most reasonable and consistent independent variable is that of "Operational Area". This is defined as the total gross floor area of the building minus that area used for parking, queuing, and van loading.
- The daily trip rate is 9.66 trips per 1000 sq. ft. of Operational Area.

The site plan for 2791 Winton Ave shows that while the building may be 507,500 sq. ft., the vast majority of it (approx.. 76%) will be used to park vehicles, queue vans, and load the vans inside the building. Only 122,300 sq. ft. of the building is considered Operational Area – as defined by the trip generation study.

The following figure shows the building layout and the operational area outline in the salmon color.

Site Plan – 122,300 total sq. ft. of Operational Area



Using the rates in the CA White Paper for Delivery Stations, the following trips can be expected.

Vehicle Type	Rate per 1000 sq. ft. of Operational Area		
	Daily	AM Peak Hr	PM Peak Hr
Autos	6.78	0.3	0.42
Vans	2.71	0	0.13
Trucks	0.17	0.01	0
In/Out	50% / 50%	85% / 15%	48% / 52%

Vehicle Type	Operational Area = 122,300 sq. ft.		
	Daily	AM Peak Hr	PM Peak Hr
Autos	830	36	52
Vans	323	0	16
Trucks	20	2	0
Total	**1,182**	**38**	**68**

The Amazon modelled number of trips were reported on pages 302-305 of the Hexagon study. These included both steady state operations and Amazon's peak season operations. (I.e., between Thanksgiving and Christmas and during Prime Week.)

The Hexagon study used ITE Land Use Code 155 and used the entire building sq. ft. even though less than 25% of the building would be used for operations. The Hexagon study stated that the ITE rates were "slightly more conservative that data provided by Amazon." (Amazon steady state and peak season data were included in the Appendix of the report.) However, this assumed that the building would be used entirely for Amazon's operations. The resulting trip generation in the Hexagon study grossly overestimates the number of trips that would be generated by the delivery station.

	Daily	AM Peak Hr	PM Peak Hr
Amazon's Model Station - Steady State	1,276	2	106
Amazon's Model Station - Peak Season	2,660	208	232
Hexagon TIA	4,151	299	695
CA White Paper Trip Gen Study	**1,182**	**38**	**68**

The project is estimated to generate 1,182 daily vehicle trips, with 38 trips occurring during the AM peak hour and 68 trips during the PM peak hour. As a result of the peak hour being very low, any impacts outside the immediate vicinity of the project are spread out over a wide area. With regards to the conclusions and recommendations in the Hexagon study:

- A traffic signal at Cabot Road/Winton Avenue would not be warranted and there is little chance of congestion during the peak hours.
- The Clawiter Road/SR 92 Eastbound Ramps/Eden Landing Road intersection would probably NOT meet the signal warrant conditions.
- There should be no fair share contribution related to traffic signals at these locations.

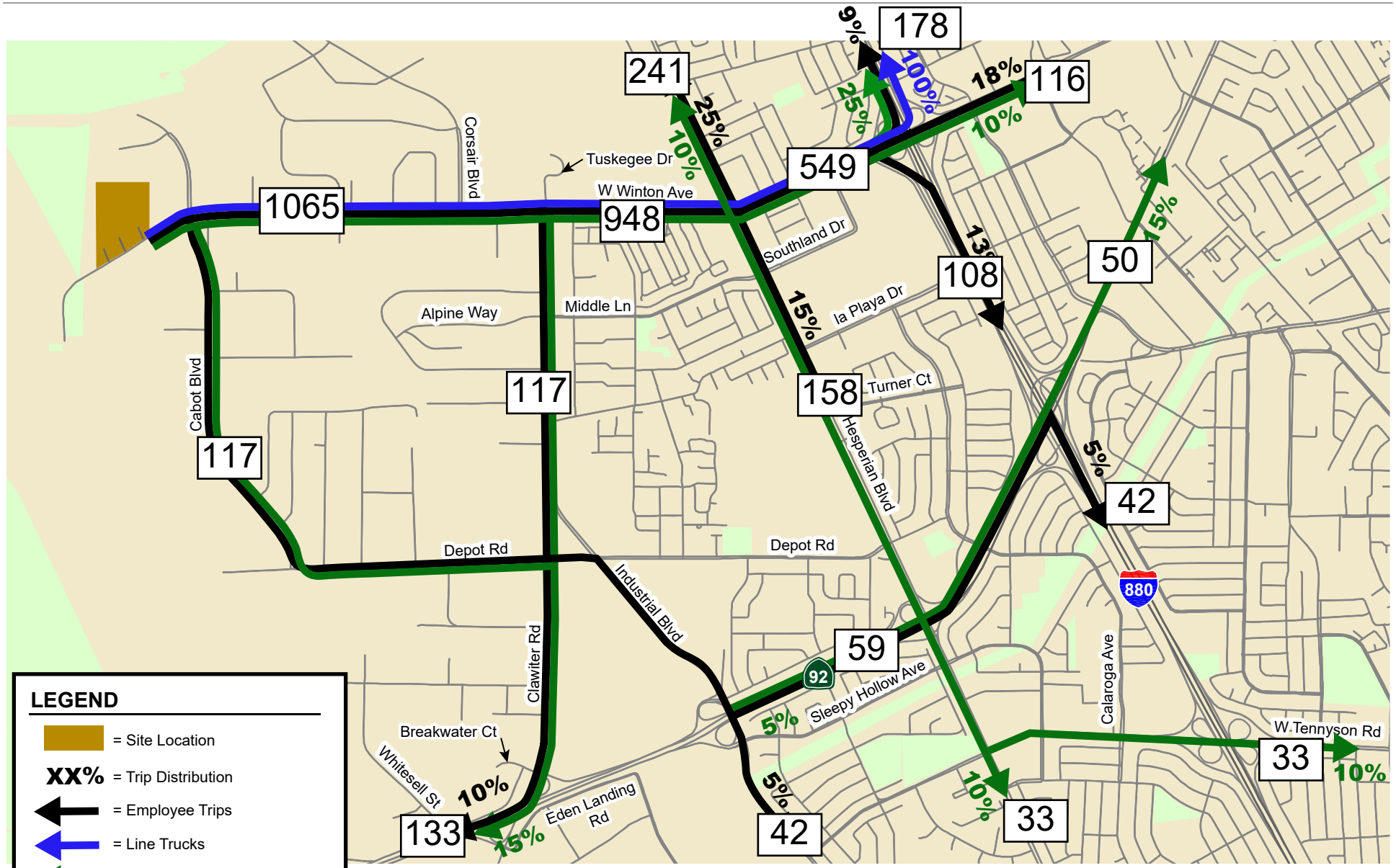
2. **The distributed trips to the nearby roadways are much less than determined in the Pavement Maintenance and Traffic Impact Contributions letter dated February 28, 2021.**

Using the trip generation shown above and multiplying by the percentages shown in Figure 7 of the Hexagon study, the number of trips per segment are much less than estimated in the letter. The figure on the following page shows the generated trips overlaid on Figure 7.

Daily Site Volume per Segment

Attachment VIII

2791 W. Winton Ave - Amazon



Vehicle Type	Daily
Autos	830
Vans	332
Trucks	20
Total	1182

Figure 7
Project Trip Distribution

HEXAGON

NORTH
Not to Scale

3. **The fair share costs shown in Table 2 of the Pavement Maintenance and Traffic Impact Contributions letter, dated February 28, 2021 are nearly four times higher than should be attributed to the impacts of the site.**

Table 2 – Project Contribution from February 28, 2021 letter

Segment	From	To	Project Trips (Daily)	Project Trips (% of Avg Daily Traffic)	Project Contribution ($)
Winton	Project	Clawiter	3,949	37.3	$3,791,155
Winton	Clawiter	Hesperian	3,546	15.6	$88,722
Winton	Hesperian	I-880 Interchange	2,032	9.0	$171,721
Clawiter	Winton	Depot	403	4.4	$102,313
Clawiter	Depot	Breakwater	605	7.0	$64,684
Cabot	Winton	Depot	202	2.9	$42,699
Depot	End	Industrial	202	1.8	$41,480
Hesperian	Winton	Tennyson	1,514	5.9	$302,273
				Total Project Contribution	**$4,605,047**

REVISED Table 2 – Project Contribution based on CA Trip Generation Values

Segment	From	To	Project Trips (Daily)	Project Trips (% of Avg Daily Traffic)	Project Contribution ($)
Winton	Project	Clawiter	1,065	10.1	$1,025,868
Winton	Clawiter	Hesperian	948	4.2	$23,907
Winton	Hesperian	I-880 Interchange	549	2.4	$45,736
Clawiter	Winton	Depot	117	1.3	$30,347
Clawiter	Depot	Breakwater	133	1.5	$13,776
Cabot	Winton	Depot	117	1.7	$25,187
Depot	End	Industrial	42	0.4	$9,296
Hesperian	Winton	Tennyson	158	0.6	$30,547
				Total Project Contribution	**$1,204,664**

Conclusions

The Hexagon study trip generation estimates are much higher than the expected volume from Amazon's intended operations. The assertion that the values used in the report are "slightly higher" is not accurate because the study used the entire building as the basis for the trip generation when only a fraction of the building will be used for delivery station operations.