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MEMORANDUM

DATE: March 19, 2025

TO: Priit Kaskla, Associate Planner, City of Garden Grove

FROM: Dean Arizabal, Principal, LSA

SUBJECT: Transportation Memorandum for the 12821 Knott Street Project (LSA Project No. 20241951)

This Transportation Memorandum evaluates the potential transportation impacts associated with the implementation of the proposed 12821 Knott Street project (project). This technical information is provided pursuant to the California Environmental Quality Act (CEQA).

PROJECT DESCRIPTION

The 7.97-acre (ac) project site (Assessor's Parcel Number [APN] 215-014-01) is at 12821 Knott Street in Garden Grove (as shown on Figure 1: Project Location; all figures provided in Attachment A). The project site is designated as a Planned Unit Development (PUD-104-70 (REV. 2019)) and is approved for Industrial/Commercial Mixed Use (IC) in the City of Garden Grove (City) General Plan. The project site is currently developed with a 173,080-square-foot (sf) warehouse building. The site is bordered by the Garden Room banquet facility and wedding venue to the north, State Route (SR-22) and the city of Westminster to the south, Knott Street to the east, and Brady Way along with single-family residences to the west. The proposed project site plan is illustrated on Figure 2.

The proposed project would add 10,338 sf of mezzanine (office) space to the existing 173,080 sf warehouse building for a total building area of 183,418 sf. The existing warehouse building has 27,909 sf split between the first and second floors. The proposed project would increase office space on the second floor, bringing the second-floor office space total to 28,247 sf, for a total of 38,247 sf at project completion. No new office space square footage is planned on the first floor. At project completion, the project site would have 183,418 total sf and would exceed the maximum floor area ratio (FAR) of 0.50 allowed under the IC land use designation, requiring a General Plan Amendment.

No exterior construction is proposed as part of the project. In compliance with Section 9.18.140.040 of the City Municipal Code, the project would not expand parking. The site currently provides 198 parking spaces, which is 14 more than the 184 parking spaces required per the City Municipal Code.

Regional access to and from the proposed project is provided via SR-22, directly south of the project site, and Beach Boulevard (SR-39), approximately 0.75 mile east of the project site. Vehicular access to the proposed project will be provided via a full-access driveway on Knott Street, along with a right-in/right-out driveway directly south of the full-access driveway.

TRANSPORTATION ANALYSIS

This section analyzes the proposed project's potential impacts to the transportation system based on the significance thresholds in Appendix G of the *State CEQA Guidelines.*

Regulatory Setting

The following is a summary of State, regional, and local regulations that apply to transportation and circulation within the project study area.

State

Senate Bill 743. On September 27, 2013, Governor Jerry Brown signed Senate Bill (SB) 743 into law and codified a process that revises the approach to determining transportation impacts and mitigation measures under CEQA. SB 743 directed the Governor's Office of Planning and Research (OPR), now known as the Governor's Office of Land Use and Climate Innovation (LCI), , to administer new CEQA guidance for jurisdictions by replacing the focus on automobile vehicle delay and level of service (LOS) or other similar measures of vehicular capacity or traffic congestion in the transportation impact analysis with vehicle miles traveled (VMT). This change shifts the focus of the transportation impact analysis from measuring impacts to drivers, such as the amount of delay and LOS at an intersection, to measuring the impact of driving on the local, regional, and statewide circulation system and the environment. This shift in focus is expected to better align transportation impact analysis with the statewide goals related to reducing greenhouse gas emissions, encouraging infill development, and promoting public health through active transportation. As a result of SB 743, the California Office of Administrative Law cleared the revised *State CEQA Guidelines* for use on December 28, 2018, and the statewide implementation data on July 1, 2020. The OPR *Technical Advisory on Evaluating Transportation Impacts under CEQA* (OPR Technical Advisory) (2018) provides a resource for agencies to use at their discretion.

Region

Southern California Association of Governments. The Southern California Association of Governments (SCAG) is an association of county and city governments to address regional transportation issues. Its members include six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 cities in an area covering more than 38,000 square miles. As the federally designated Metropolitan Planning Organization and the State-designated Regional Transportation Planning Agency, SCAG is responsible for developing long-range regional transportation plans, including sustainable communities strategy and growth forecast components, regional transportation improvement programs, regional housing needs allocations, and a portion of the South Coast Air Quality Management District plans.

Local

City of Garden Grove. The project site is in Garden Grove. As such, the Circulation Element of the *City of Garden Grove General Plan* (May 2008) and the *City of Garden Grove Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment* (City Guidelines), adopted in May 2020, are applicable to the proposed project. These guidelines are intended to ensure that the traffic impacts of a development proposal on the existing and/or planned major street system are

adequately addressed. The City's guidelines include screening criteria, significance thresholds, recommended methodologies, and procedures for VMT analysis for projects within Garden Grove.

Environmental Setting

Existing Circulation System

Key roadways in the project vicinity are as follows:

- **Knott Street** is a three-lane north-south Primary Arterial adjacent to and runs along the east boundary of the project site. Knott Street provides direct access to the project site, with sidewalks on both sides of the street. On-street parking is not permitted on either side of the street. The posted speed limit is 40 miles per hour (mph).

- **The Garden Grove Freeway (SR-22)** is the main regional access route to Garden Grove. It is a eight-lane, east-west State highway that runs between Pacific Coast Highway in Long Beach and the Costa Mesa Freeway (SR-55) in Orange.

Transportation Analysis Methodology

The City Guidelines state that preparation and submission of a Traffic Impact Analysis (TIA) shall be required if a development project is estimated to generate a net increase of 50 or more peak-hour trips and if it does not satisfy the screening criteria for a VMT assessment (e.g., transit priority area, low-VMT-generating area, and project-type screening [project generating fewer than 110 daily vehicle trips]). A TIA considers operational deficiencies or LOS impacts to the circulation system for non-CEQA purposes, as well as VMT impacts for CEQA purposes, potentially generated by a proposed development project. A TIA should identify feasible measures or corrective conditions to offset any deficiencies or impacts (if any). Based on the low peak-hour trip generation of the proposed project, a formal TIA per the City Guidelines is not required.

Impact Analysis

a. Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less Than Significant Impact. To assess the impact of the proposed project on the surrounding circulation system, LSA calculated the existing and proposed project potential trip generation.

Trip generation for the existing and proposed uses were developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual (11th Edition) for Land Use 150 – "Warehousing, Setting/Location: General Urban/Suburban" and Land Use 710 – "General Office Building, Setting/Location: General Urban/Suburban." Truck percentages for the warehousing use were obtained from the South Coast Air Quality Management District (SCAQMD) as recommended for warehousing uses. Based on the *Warehouse Truck Trip Study Data Results and Usage* (SCAQMD, July 2014), 31 percent of the trips are trucks. The 31 percent truck mix was 6.8 percent 2-axle, 5.5 percent 3-axle, and 18.7 percent 4-axle or more. The truck trips were converted to passenger car equivalents (PCEs) as a conservative analysis using the following factors: 1.0 for cars, 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4-axle or more trucks. PCE trips are typically examined for

LOS purposes and trucks' influence on level of delay. Table A, below, summarizes the total existing net PCE trip generation, the total automobile trip generation, and the net truck trip PCE generation for the existing use.

Table A: Project Trip Generation

Land Use	Size	Unit	PCE[3]	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Trip Rates[1,2]										
Warehousing (cars)		tsf		1.180	0.089	0.028	0.117	0.035	0.089	0.124
Warehousing (2-axle trucks)		tsf		0.116	0.009	0.003	0.012	0.003	0.009	0.012
Warehousing (3-axle trucks)		tsf		0.094	0.007	0.002	0.009	0.003	0.007	0.010
Warehousing (4-axle trucks)		tsf		0.320	0.025	0.007	0.032	0.009	0.025	0.034
Warehousing (total)		tsf		1.710	0.130	0.040	0.170	0.050	0.130	0.180
Office		tsf		10.840	1.340	0.180	1.520	0.240	1.200	1.440
Existing Trip Generation (in PCEs)										
Warehousing (cars)		tsf	1.0	171	13	4	17	5	13	18
Warehousing (2-axle trucks)		tsf	1.5	25	2	1	3	1	2	3
Warehousing (3-axle trucks)		tsf	2.0	27	2	1	3	1	2	3
Warehousing (trucks)		tsf	3.0	139	11	3	14	4	11	15
Warehousing (Truck Sum)		tsf	-	191	15	5	20	6	15	21
Warehousing Total (Cars+Trucks)	145.171	tsf	-	362	28	9	37	11	28	39
Office	27.909	tsf	1.0	303	37	5	42	7	33	40
Total	**173.080**	**tsf**	**-**	**665**	**65**	**14**	**79**	**18**	**61**	**79**
Project Trip Generation (in PCEs)										
Warehousing (cars)		tsf	1.0	171	13	4	17	5	13	18
Warehousing (2-axle trucks)		tsf	1.5	25	2	1	3	1	2	3
Warehousing (3-axle trucks)		tsf	2.0	27	2	1	3	1	2	3
Warehousing (4-axle trucks)		tsf	3.0	139	11	3	14	4	11	15
Warehousing (Truck Sum)		tsf	-	191	15	5	20	6	15	21
Warehousing Total (Cars+Trucks)	145.171	tsf	-	362	28	9	37	11	28	39
Office[4]	38.247	tsf	1.0	415	51	7	58	9	45	54
Total	**183.418**	**tsf**	**-**	**777**	**79**	**16**	**95**	**20**	**73**	**93**
Net Trip Generation (Project - Existing)				**112**	**14**	**2**	**16**	**2**	**12**	**14**

[1] Trip rates referenced from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 11th Edition (2021).
Land Use Code 150 - Warehousing, Setting/Location: General Urban/Suburban
Land Use Code 710 - General Office Building, Setting/Location: General Urban/Suburban

[2] Trips were converted to passenger vehicles and trucks based on the South Coast Air Quality Management District (SCAQMD) requirements for warehouse projects. Based on the *Warehouse Truck Trip Study Data Results and Usage* (SCAQMD, July 2014), 31% of the trips are trucks. The 31% truck mix was 6.8% 2-axle, 5.5% 3-axle, and 18.7% 4-axle or more.

[3] Trips were converted to PCEs using the following factors: 1.0 for cars, 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4-axle or more trucks.

[4] The addition of 10,338 sf office use (mezzanine space), increasing the total office area to 38,247 sf.

PCE = passenger car equivalent
tsf = thousand square feet (or thousand-square-foot)

As shown on Table A, the existing warehouse use is estimated to generate 37 PCE trips in the a.m. peak hour, 39 PCE trips in the p.m. peak hour, and 362 daily PCE trips. This includes 17 automobile trips in the a.m. peak hour, 18 automobile trips in the p.m. peak hour, and 171 daily automobile trips. Truck PCE trips are estimated to represent 20 trips in the a.m. peak hour, 21 trips in the p.m. peak hour, and 191 daily trips.

The existing office use is estimated to generate 42 automobile trips in the a.m. peak hour, 40 automobile trips in the p.m. peak hour, and 303 daily automobile trips. The summed total of the existing uses is estimated to generate 79 PCE trips in the a.m. peak hour, 79 PCE trips in the p.m. peak hour, and 665 daily PCE trips. This includes 59 automobile trips in the a.m. peak hour, 58 automobile trips in the p.m. peak hour, and 474 daily automobile trips. Truck PCE trips are estimated to represent 20 trips in the a.m. peak hour, 21 trips in the p.m. peak hour, and 191 daily trips.

The proposed project would add 10,338 sf of mezzanine (office) space to the existing warehouse building, increasing the total office area to 38,247 sf and the total building area would be 183,418 sf.

Table A also presents the project's potential trip generation. The increased office use component would generate 58 trips during the a.m. peak hour, 54 trips during the p.m. peak hour and 415 daily trips. With the warehousing use unchanged (362 daily PCE trips, 37 a.m. peak-hour trips, and 39 p.m. peak-hour trips of which Truck PCE trips represent 20 trips in the a.m. peak hour, 21 trips in the p.m. peak hour, and 191 daily trips), the entire site (183,418 sf) is estimated to generate 95 PCE trips in the a.m. peak hour, 93 PCE trips in the p.m. peak hour and 777 daily PCE trips. As shown in Table A, after accounting for the existing use (Project-Existing) the proposed project (the addition of 10,338 sf of office use) is expected to generate 112 daily auto trips, including 16 auto trips (14 inbound and 2 outbound) during the a.m. peak hour and 14 auto trips (2 inbound and 12 outbound) during the p.m. peak hour.

The City's General Plan Circulation Element provides policy direction for the transportation system and links circulation strategies with those of population growth, environmental quality, and economic well-being. The Circulation Element establishes key goals, policies, programs, and requirements for achieving a transportation system that balances the needs of all road users. The proposed project would not remove any sidewalks, bus shelters, obstruct any bicycle lanes or make any modifications to any transportation facilities (e.g., vehicular, transit, bicycle, or pedestrian).Therefore, the proposed project would not conflict with the Circulation Element. No mitigation is required.

b. Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)?

Less Than Significant Impact. *State CEQA Guidelines* Section 15064.3, Subdivision (b), states that for land use projects, transportation impacts are to be measured by evaluating the project's VMT, as outlined in the following:

> *Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.*

VMT is the amount and distance of automobile travel attributable to a project. According to the 2018 OPR Technical Advisory, "automobile" refers to "on-road passenger vehicles, specifically cars and light trucks."

Project VMT Screening Determination

The City Guidelines outline three screening criteria for land use projects:

- **Transit Priority Area (TPA) Screening:** Projects within a TPA that meet criteria such as minimum FARs may be presumed to have a less than significant VMT impact. The proposed project is not within a TPA; therefore, this criterion does not apply.

- **Low-VMT-Area Screening:** Projects in low-VMT-generating areas may be presumed to have a less than significant VMT impact. The proposed project is not in such an area; therefore, this criterion does not apply.

- **Project Type Screening:** Certain land use types (e.g., local-serving retail uses, schools, and gas stations), projects generating fewer than 110 daily vehicle trips and warehousing uses up to 63,000 square feet are presumed to have a less than significant VMT impact. The existing use generates 665 daily trips; with the addition of the proposed project, the site would generate 777 daily trips resulting in a net increase of 112 daily trips, slightly exceeding the daily trip threshold. Therefore, this criterion does not apply.

Based on the VMT screening criteria of the City Guidelines, the proposed project is not screened out of a detailed VMT analysis. Therefore, a VMT analysis has been prepared for the proposed project. The VMT analysis methodology and results are presented in the following sections.

VMT Analysis

Detailed VMT Analysis Methodology. As recommended in the City Guidelines, the most recent version of the Orange County Transportation Analysis Model (OCTAM), OCTAM 5.1, was used to conduct the detailed project VMT analysis. Additionally, the City Guidelines recommend use of two types of VMT for land use project evaluation: project-generated VMT and the project's effect on VMT.

The City Guidelines established VMT per service population (population plus employment) as the metric to evaluate project-generated VMT. The threshold was established as 85 percent of the County of Orange's (County) baseline average VMT per service population. Therefore, the proposed project would result in a significant VMT impact if the project-generated VMT per service population is greater than the average County VMT per service population under baseline conditions. The average County VMT per service population was obtained from LSA's "no project" OCTAM run under baseline conditions.

The project's potential effect on VMT is determined by comparing the citywide VMT per service population for baseline and cumulative "with project" scenarios with the corresponding "no project" scenarios. The proposed project would result in a significant impact if the citywide roadway VMT per

service population increases in the "with project" conditions compared to "no project" conditions. The following is a detailed description of the VMT analysis:

Project Traffic Analysis Zone Update. The first step in preparation of this analysis was to update the traffic analysis zone (TAZ) in the OCTAM that includes the project area. Typically, project VMT is estimated by isolating the project in a new TAZ or multiple TAZs depending on the diversity of project land uses and project size. Since the OCTAM does not allow addition of new TAZs, one TAZ was borrowed for this project. Land use from the borrowed TAZ was moved to an adjacent TAZ and the project land use was added to the borrowed TAZ. Moving land use from the borrowed TAZ to an adjacent TAZ does not affect model's performance while it helps with isolating the project in the model and to determine project VMT and its impact. The project TAZ was used to calculate project-specific VMT per service population.

OCTAM is a socioeconomic model and therefore project land uses should be converted into model employment types. Project land use was converted to socioeconomic data using appropriate regional factors. The land use to employee conversion factors were developed using Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th edition. The ITE trip generation manual includes trip generation rates for different land use categories by different units such as square footage, number of units, and/or number of employees. Employee/square footage rate was determined for project use by dividing the daily trip rate per 1,000 sf by daily trip rate per employee. This ratio was used to estimate number of employees per square feet for the project use, which, in turn, was used to estimate total project employees.

A similar approach was used for the cumulative year. It should be noted that, for these purposes, the project land use was included in OCTAM as an additional land use and no shifting of land use/socioeconomic data from the parent TAZ was applied. Therefore, the cumulative VMT analysis can be considered as a conservative estimate.

Model Runs and Project VMT Estimation. Model runs were conducted for the updated "with project" OCTAM scenarios after incorporating the project land use as described above. Project-generated VMT was estimated from the OCTAM outputs using origin-destination trip matrices and multiplying them with the final assignment skim matrices. The Origin/Destination (OD) method for calculating VMT sums all weekday VMT generated by trips with at least one trip-end in the study area and tracks those trips to their origins or destinations. Origins are all vehicle trips that start in a specific TAZ, whereas destinations are all vehicle trips that end in a specific TAZ. The OD method accounts for all trip purposes and therefore provides a more complete estimate of VMT. Origin-destination matrix outputs were used as trips and the trip lengths were derived from the skimming step to estimate OD VMT as recommended in the guidelines. OD matrix outputs include all vehicle trips (all trip purposes) and, hence, no conversion for automobile occupancy was applied. The trip length or distance was obtained using the model outputs from the "skimming" step. The extracted project VMT was divided by the estimated project service population (project employment) to develop the project-generated VMT per service population for both the base and cumulative scenarios.

Similarly, the OCTAM output roadway volumes were used to estimate citywide roadway VMT per service population for the "no project" and "with project" conditions for both the base and cumulative scenarios.

Project's Potential VMT Impact. Table B summarizes the City's significance threshold and project VMT per service population for the base year. As shown in Table B, the project's potential VMT per service population is 24.2 percent lower than the City's threshold. Therefore, based on the City Guidelines, the proposed project would not have a significant VMT impact for the base year.

Detailed VMT calculations for the project are provided in Attachment B.

Table B: Threshold and Base Year Project VMT per Service Population

City of Garden Grove Threshold (2019 Baseline Orange County)[1]	Knott Street Expansion (project)	Difference	% Difference	Significant Impact
21.6	16.3	(5.2)	-24.2%	**No**

[1] Estimated using "no project" OCTAM base year (2019) model runs
OCTAM = Orange County Transportation Analysis Model
VMT = vehicle miles traveled

Table C summarizes the significant threshold and the project VMT per service population for the cumulative year. As shown in Table C, the project's cumulative year VMT per service population is 28.4 percent lower than the City's threshold. Therefore, as stated in the guidelines, the project will not have a significant VMT impact for the cumulative year.

Detailed VMT calculations for the proposed project are provided in Attachment B.

Table C: Threshold and Cumulative Year Project VMT per Service Population

City of Garden Grove Threshold (2019 Baseline Orange County)	Knott Street Expansion (project)	Difference	% Difference	Significant Impact
21.6	15.4	(6.1)	-28.4%	**No**

Source: Compiled by LSA using OCTAM (2025).
OCTAM = Orange County Transportation Analysis Model
VMT = vehicle miles traveled

Project's Potential Effect on VMT. Table D summarizes the base year "no project" and "with project" citywide roadway VMT per service population. As shown in Table D, the "with project" citywide roadway VMT per service population remains unchanged compared to the "no project" metric. As such, the project's effect on VMT for the base year is less than significant.

Detailed VMT calculations for the proposed project are provided in Attachment B.

Table D: Base Year (2019) Townwide Roadway VMT per Service Population

2019	No Project	With Project	Difference	Percentage Difference
City of Garden Grove[1]	11.0	11.0	0.0	0.0%

Source: Compiled by LSA using OCTAM (2025).
OCTAM = Orange County Transportation Analysis Model
VMT = vehicle miles traveled

Table E summarizes the corresponding values for cumulative year. As shown in Table E, the "with project" citywide roadway VMT per service population remains unchanged compared to the "no project" metric. As such, the project's effect on VMT for the cumulative year is less than significant.

Table E: Cumulative Year (2050) Townwide Roadway VMT per Service Population

2050	No Project	With Project	Difference	Percentage Difference
City of Garden Grove[1]	11.2	11.2	0.0	0.0%

[1] Estimates from OCTAM (2025)
OCTAM = Orange County Transportation Analysis Model
VMT = vehicle miles traveled

As such, the proposed project would not conflict or be inconsistent with *State CEQA Guidelines* Section 15064.3(b). Potential impacts are determined to be less than significant, and no mitigation is required.

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. Knott Street would provide direct access to the project site. Improvements are not required to accommodate traffic along this roadway. Adequate visibility (without any sight obstructions) is currently provided along Knott Street for all vehicles to safely access the project site. The proposed project would not create any new sight obstructions, would not modify any existing intersections or create any new intersections and would not call for any incompatible uses such as farm equipment. The proposed project would not substantially increase hazards for vehicles due to a geometric design feature or incompatible uses. Therefore, no mitigation is required.

d. Would the project result in inadequate emergency access?

Less Than Significant Impact. The proposed project would utilize the existing regional and local roadway network serving the project area and would not introduce any new roadways or land uses that conflict with existing development. The existing emergency access conditions comply with Orange County Fire Authority (OCFA) access requirements as well as Chapter 5 of the California Fire

Code (CFC) and the proposed project would not alter or otherwise affect these existing conditions. Because no modifications would be necessary and no improvements to Knott Street are required, no roadway or lane closures are anticipated, and project-related vehicles would not impede traffic flow on the surrounding circulation system. Design features such as internal access, ingress, and egress would be subject to review by the City's Department of Public Works to ensure adequate fire engine access and turning radii. All emergency access routes to the project site and adjacent areas would be kept clear and unobstructed at all times. The proposed project would not require improvements to Knott Street, as described above. No roadway closures or lane closures are anticipated, and project vehicles would not impede traffic flow on the surrounding circulation system. Therefore, the proposed project would not result in inadequate emergency access, and no mitigation is required.

Attachments: A: Figures 1 and 2
B: VMT Calculations

ATTACHMENT A

FIGURES 1 AND 2

LSA

Project Location

FIGURE 1

N

0 500 1000
FEET

SOURCE: ESRI Streetmap 2021; Google Earth, 2023

12821 Knott Street Garden Grove
Regional and Project Location

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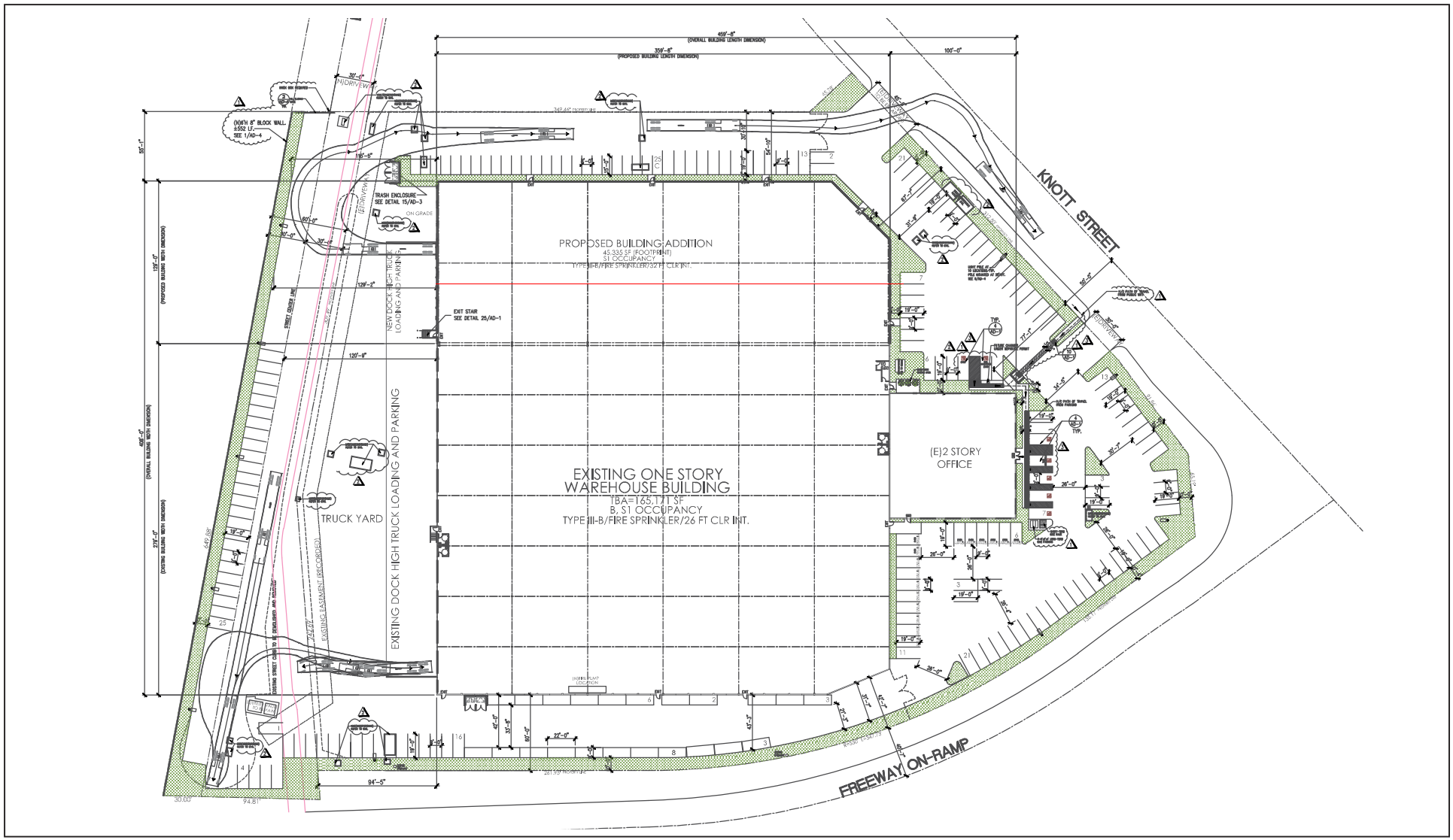

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FIGURE 2

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0 60 120

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12821 Knott St, Garden Grove
Transportation Memorandum

Conceptual Site Plan

SOURCE: Cataldo Architects, September 2024

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ATTACHMENT B

VMT CALCULATIONS

LSA

Appendix A1
VMT Calculation Worksheet - Knott St Expansion
Project Generated VMT

2019	Knott St Expansion (project)	2019 Baseline Orange County (Threshold) *
Population (a)	0	3,196,231
Employment (b)	34	1,805,476
Enrollment('c)	0	783,227
Total Service Population (d=a+b+c)	34	5,784,934
Total OD VMT ('e)	555	146,706,295
OD VMT per service population (f = e/d)	16.3	25.4

2050	Knott St Expansion (project)	2019 Baseline Orange County (Threshold) *
Population (a)	0	3,196,231
Employment (b)	34	1,805,476
Enrollment('c)	0	783,227
Total Service Population (d=a+b+c)	34	5,784,934
Total OD VMT ('e)	525	146,706,295
OD VMT per service population (f = e/d)	15.4	25.4

** Threshold value obtained from OCTAM "No Project" model runs*

LSA

Appendix A2

VMT Calculation Worksheet - Knott St Expansion

Project's Effect on VMT - Roadway VMT Within City of Garden Grove

2019	With Project	Without Project
Roadway VMT	2,913,748	2,914,184
Service Population	266,006	265,972
VMT per service population	11.0	11.0

2050	With Project	Without Project
Roadway VMT	3,110,997	3,111,392
Service Population	277,529	277,495
VMT per service population	11.2	11.2