APPENDICES

WAREHOUSE IMPROVEMENT PROJECT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

LEAD AGENCY:

CITY OF GARDEN GROVE
COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING SERVICES DIVISION
11222 ACACIA PARKWAY
GARDEN GROVE, CALIFORNIA 92840

REPORT PREPARED BY:

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NOVEMBER 20, 2019

GGRO 016

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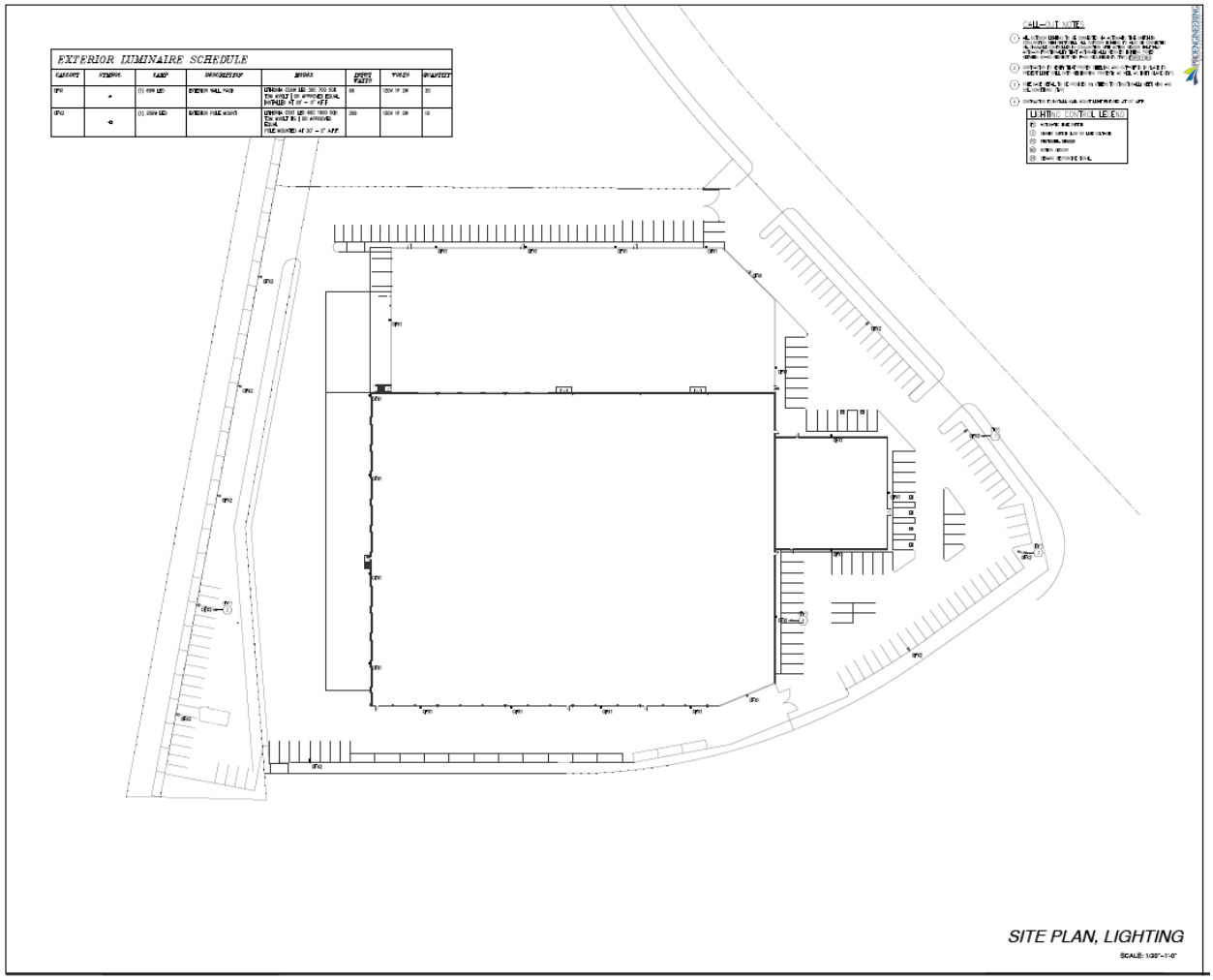
APPENDIX A
PHOTOMETRIC PLAN


EXTERIOR LUMINAIRE SCHEDULE
LIGHTING CONTROL LEGEND
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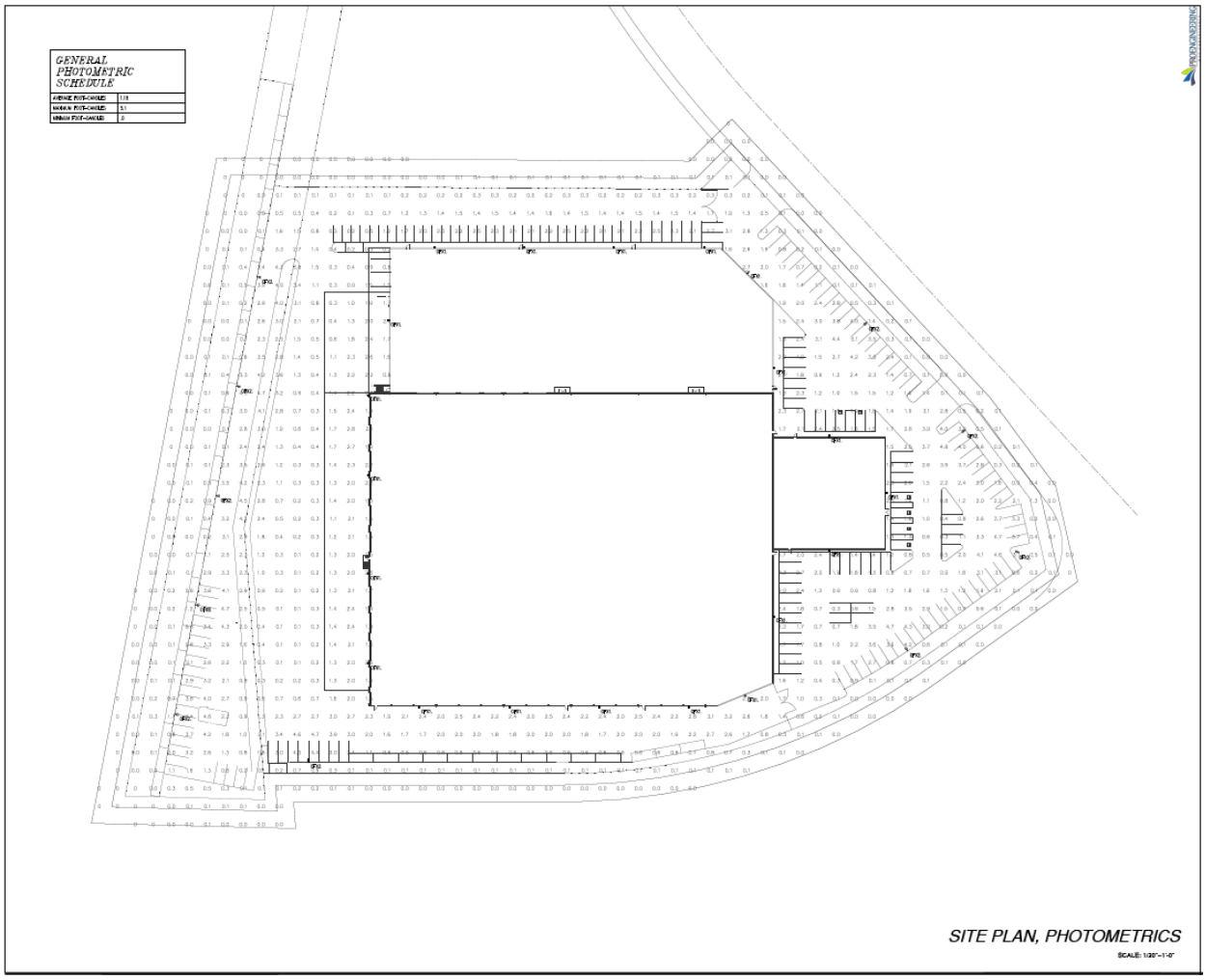
GENERAL
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APPENDIX B
AIR QUALITY WORKSHEETS

Knott Avenue Warehouse Addition
Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	44.57	1000sqft	1.02	44,565.00	0
Parking Lot	212.00	Space	1.91	84,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
Land Use -
Construction Phase - Construction times are estimated.
Construction Off-road Equipment Mitigation -
Mobile Land Use Mitigation -
Energy Mitigation -
Water Mitigation -

Knott Avenue Warehouse Addition - Orange County, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	45.00
tblConstructionPhase	NumDays	220.00	87.00
tblConstructionPhase	NumDays	6.00	22.00
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	3.00	21.00
tblConstructionPhase	PhaseEndDate	10/14/2020	7/31/2020
tblConstructionPhase	PhaseEndDate	9/16/2020	4/30/2020
tblConstructionPhase	PhaseEndDate	11/13/2019	12/31/2019
tblConstructionPhase	PhaseEndDate	9/30/2020	5/31/2020
tblConstructionPhase	PhaseEndDate	11/5/2019	11/30/2019
tblConstructionPhase	PhaseStartDate	10/1/2020	6/1/2020
tblConstructionPhase	PhaseStartDate	11/14/2019	1/1/2020
tblConstructionPhase	PhaseStartDate	11/6/2019	12/1/2019
tblConstructionPhase	PhaseStartDate	9/17/2020	5/1/2020
tblGrading	AcresOfGrading	11.00	3.00
tblGrading	AcresOfGrading	31.50	4.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0416	0.4769	0.2433	5.0000e-004	0.0724	0.0208	0.0931	0.0374	0.0191	0.0565	0.0000	45.3880	45.3880	0.0138	0.0000	45.7331
2020	0.3517	1.0223	0.9249	1.8600e-003	0.0360	0.0513	0.0873	9.6900e-003	0.0491	0.0587	0.0000	160.7555	160.7555	0.0264	0.0000	161.4153
Maximum	**0.3517**	**1.0223**	**0.9249**	**1.8600e-003**	**0.0724**	**0.0513**	**0.0931**	**0.0374**	**0.0491**	**0.0587**	**0.0000**	**160.7555**	**160.7555**	**0.0264**	**0.0000**	**161.4153**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0416	0.4769	0.2433	5.0000e-004	0.0295	0.0208	0.0503	0.0149	0.0191	0.0341	0.0000	45.3879	45.3879	0.0138	0.0000	45.7330
2020	0.3517	1.0223	0.9249	1.8600e-003	0.0360	0.0513	0.0873	9.6900e-003	0.0491	0.0587	0.0000	160.7554	160.7554	0.0264	0.0000	161.4152
Maximum	**0.3517**	**1.0223**	**0.9249**	**1.8600e-003**	**0.0360**	**0.0513**	**0.0873**	**0.0149**	**0.0491**	**0.0587**	**0.0000**	**160.7554**	**160.7554**	**0.0264**	**0.0000**	**161.4152**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	39.54	0.00	23.74	47.73	0.00	19.50	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	11-1-2019	1-31-2020	0.7729	0.7729
2	2-1-2020	4-30-2020	0.7182	0.7182
3	5-1-2020	7-31-2020	0.3996	0.3996
		Highest	0.7729	0.7729

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1887	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003
Energy	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	77.8722	77.8722	3.0100e-003	7.6000e-004	78.1729
Mobile	0.0228	0.1045	0.3453	1.3400e-003	0.1217	9.8000e-004	0.1227	0.0326	9.1000e-004	0.0335	0.0000	123.7366	123.7366	5.0300e-003	0.0000	123.8623
Waste						0.0000	0.0000		0.0000	0.0000	8.5033	0.0000	8.5033	0.5025	0.0000	21.0665
Water						0.0000	0.0000		0.0000	0.0000	3.2691	42.7510	46.0201	0.3375	8.2900e-003	56.9300
Total	**0.2124**	**0.1131**	**0.3558**	**1.3900e-003**	**0.1217**	**1.6400e-003**	**0.1233**	**0.0326**	**1.5700e-003**	**0.0342**	**11.7724**	**244.3662**	**256.1386**	**0.8481**	**9.0500e-003**	**280.0386**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1887	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003
Energy	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	77.8722	77.8722	3.0100e-003	7.6000e-004	78.1729
Mobile	0.0228	0.1045	0.3453	1.3400e-003	0.1217	9.8000e-004	0.1227	0.0326	9.1000e-004	0.0335	0.0000	123.7366	123.7366	5.0300e-003	0.0000	123.8623
Waste						0.0000	0.0000		0.0000	0.0000	8.5033	0.0000	8.5033	0.5025	0.0000	21.0665
Water						0.0000	0.0000		0.0000	0.0000	2.7592	36.0818	38.8410	0.2849	7.0000e-003	48.0489
Total	**0.2124**	**0.1131**	**0.3558**	**1.3900e-003**	**0.1217**	**1.6400e-003**	**0.1233**	**0.0326**	**1.5700e-003**	**0.0342**	**11.2625**	**237.6971**	**248.9595**	**0.7955**	**7.7600e-003**	**271.1575**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33	2.73	2.80	6.21	14.25	3.17

3.0 Construction Detail

Construction Phase

Knott Avenue Warehouse Addition - Orange County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	11/1/2019	11/30/2019	5	21	
2	Grading	Grading	12/1/2019	12/31/2019	5	22	
3	Building Construction	Building Construction	1/1/2020	4/30/2020	5	87	
4	Paving	Paving	5/1/2020	5/31/2020	5	21	
5	Architectural Coating	Architectural Coating	6/1/2020	7/31/2020	5	45	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 1.91

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 66,848; Non-Residential Outdoor: 22,283; Striped Parking Area: 5,088 (Architectural Coating – sqft)

OffRoad Equipment

Knott Avenue Warehouse Addition - Orange County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	54.00	21.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0184	0.2262	0.1251	2.6000e-004		8.9600e-003	8.9600e-003		8.2500e-003	8.2500e-003	0.0000	23.1139	23.1139	7.3100e-003	0.0000	23.2967
Total	**0.0184**	**0.2262**	**0.1251**	**2.6000e-004**	**2.3900e-003**	**8.9600e-003**	**0.0114**	**2.6000e-004**	**8.2500e-003**	**8.5100e-003**	**0.0000**	**23.1139**	**23.1139**	**7.3100e-003**	**0.0000**	**23.2967**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5000e-004	2.6000e-004	2.8400e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8246	0.8246	2.0000e-005	0.0000	0.8251
Total	**3.5000e-004**	**2.6000e-004**	**2.8400e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8246**	**0.8246**	**2.0000e-005**	**0.0000**	**0.8251**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.3000e-004	0.0000	9.3000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0184	0.2262	0.1251	2.6000e-004		8.9600e-003	8.9600e-003		8.2500e-003	8.2500e-003	0.0000	23.1138	23.1138	7.3100e-003	0.0000	23.2967
Total	**0.0184**	**0.2262**	**0.1251**	**2.6000e-004**	**9.3000e-004**	**8.9600e-003**	**9.8900e-003**	**1.0000e-004**	**8.2500e-003**	**8.3500e-003**	**0.0000**	**23.1138**	**23.1138**	**7.3100e-003**	**0.0000**	**23.2967**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5000e-004	2.6000e-004	2.8400e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8246	0.8246	2.0000e-005	0.0000	0.8251
Total	**3.5000e-004**	**2.6000e-004**	**2.8400e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8246**	**0.8246**	**2.0000e-005**	**0.0000**	**0.8251**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0678	0.0000	0.0678	0.0366	0.0000	0.0366	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.2502	0.1117	2.3000e-004		0.0118	0.0118		0.0109	0.0109	0.0000	20.3697	20.3697	6.4400e-003	0.0000	20.5309
Total	**0.0223**	**0.2502**	**0.1117**	**2.3000e-004**	**0.0678**	**0.0118**	**0.0796**	**0.0366**	**0.0109**	**0.0474**	**0.0000**	**20.3697**	**20.3697**	**6.4400e-003**	**0.0000**	**20.5309**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	3.4000e-004	3.7200e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0798	1.0798	3.0000e-005	0.0000	1.0805
Total	**4.6000e-004**	**3.4000e-004**	**3.7200e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0798**	**1.0798**	**3.0000e-005**	**0.0000**	**1.0805**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0265	0.0000	0.0265	0.0143	0.0000	0.0143	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.2502	0.1117	2.3000e-004		0.0118	0.0118		0.0109	0.0109	0.0000	20.3697	20.3697	6.4400e-003	0.0000	20.5308
Total	**0.0223**	**0.2502**	**0.1117**	**2.3000e-004**	**0.0265**	**0.0118**	**0.0383**	**0.0143**	**0.0109**	**0.0251**	**0.0000**	**20.3697**	**20.3697**	**6.4400e-003**	**0.0000**	**20.5308**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	3.4000e-004	3.7200e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0798	1.0798	3.0000e-005	0.0000	1.0805
Total	**4.6000e-004**	**3.4000e-004**	**3.7200e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0798**	**1.0798**	**3.0000e-005**	**0.0000**	**1.0805**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0995	0.7584	0.6480	1.0900e-003		0.0413	0.0413		0.0395	0.0395	0.0000	90.3253	90.3253	0.0183	0.0000	90.7836
Total	**0.0995**	**0.7584**	**0.6480**	**1.0900e-003**		**0.0413**	**0.0413**		**0.0395**	**0.0395**	**0.0000**	**90.3253**	**90.3253**	**0.0183**	**0.0000**	**90.7836**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9600e-003	0.0969	0.0264	2.3000e-004	5.7500e-003	5.0000e-004	6.2500e-003	1.6600e-003	4.8000e-004	2.1400e-003	0.0000	22.2369	22.2369	1.8600e-003	0.0000	22.2834
Worker	9.1600e-003	6.4100e-003	0.0728	2.5000e-004	0.0258	1.7000e-004	0.0260	6.8500e-003	1.6000e-004	7.0100e-003	0.0000	22.3193	22.3193	5.1000e-004	0.0000	22.3320
Total	**0.0121**	**0.1033**	**0.0992**	**4.8000e-004**	**0.0315**	**6.7000e-004**	**0.0322**	**8.5100e-003**	**6.4000e-004**	**9.1500e-003**	**0.0000**	**44.5562**	**44.5562**	**2.3700e-003**	**0.0000**	**44.6154**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0995	0.7584	0.6480	1.0900e-003		0.0413	0.0413		0.0395	0.0395	0.0000	90.3252	90.3252	0.0183	0.0000	90.7835
Total	**0.0995**	**0.7584**	**0.6480**	**1.0900e-003**		**0.0413**	**0.0413**		**0.0395**	**0.0395**	**0.0000**	**90.3252**	**90.3252**	**0.0183**	**0.0000**	**90.7835**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9800e-003	0.0969	0.0264	2.3000e-004	5.7500e-003	5.0000e-004	6.2500e-003	1.6600e-003	4.8000e-004	2.1400e-003	0.0000	22.2369	22.2369	1.8600e-003	0.0000	22.2834
Worker	9.1600e-003	6.4100e-003	0.0728	2.5000e-004	0.0258	1.7000e-004	0.0260	6.8500e-003	1.6000e-004	7.0100e-003	0.0000	22.3193	22.3193	5.1000e-004	0.0000	22.3320
Total	**0.0121**	**0.1033**	**0.0992**	**4.8000e-004**	**0.0315**	**6.7000e-004**	**0.0322**	**8.5100e-003**	**6.4000e-004**	**9.1500e-003**	**0.0000**	**44.5562**	**44.5562**	**2.3700e-003**	**0.0000**	**44.6154**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0121	0.1217	0.1240	1.9000e-004		6.8900e-003	6.8900e-003		6.3500e-003	6.3500e-003	0.0000	16.2811	16.2811	5.1600e-003	0.0000	16.4101
Paving	2.5000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0146**	**0.1217**	**0.1240**	**1.9000e-004**		**6.8900e-003**	**6.8900e-003**		**6.3500e-003**	**6.3500e-003**	**0.0000**	**16.2811**	**16.2811**	**5.1600e-003**	**0.0000**	**16.4101**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.3000e-004	4.8800e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.4965	1.4965	3.0000e-005	0.0000	1.4974
Total	**6.1000e-004**	**4.3000e-004**	**4.8800e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.4965**	**1.4965**	**3.0000e-005**	**0.0000**	**1.4974**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0121	0.1217	0.1240	1.9000e-004		6.8900e-003	6.8900e-003		6.3500e-003	6.3500e-003	0.0000	16.2810	16.2810	5.1600e-003	0.0000	16.4100
Paving	2.5000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0146**	**0.1217**	**0.1240**	**1.9000e-004**		**6.8900e-003**	**6.8900e-003**		**6.3500e-003**	**6.3500e-003**	**0.0000**	**16.2810**	**16.2810**	**5.1600e-003**	**0.0000**	**16.4100**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.3000e-004	4.8800e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.4965	1.4965	3.0000e-005	0.0000	1.4974
Total	**6.1000e-004**	**4.3000e-004**	**4.8800e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.4965**	**1.4965**	**3.0000e-005**	**0.0000**	**1.4974**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2184					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4500e-003	0.0379	0.0412	7.0000e-005		2.5000e-003	2.5000e-003		2.5000e-003	2.5000e-003	0.0000	5.7448	5.7448	4.4000e-004	0.0000	5.7559
Total	**0.2238**	**0.0379**	**0.0412**	**7.0000e-005**		**2.5000e-003**	**2.5000e-003**		**2.5000e-003**	**2.5000e-003**	**0.0000**	**5.7448**	**5.7448**	**4.4000e-004**	**0.0000**	**5.7559**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.8000e-004	7.6700e-003	3.0000e-005	2.7200e-003	2.0000e-005	2.7400e-003	7.2000e-004	2.0000e-005	7.4000e-004	0.0000	2.3517	2.3517	5.0000e-005	0.0000	2.3530
Total	**9.6000e-004**	**6.8000e-004**	**7.6700e-003**	**3.0000e-005**	**2.7200e-003**	**2.0000e-005**	**2.7400e-003**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**0.0000**	**2.3517**	**2.3517**	**5.0000e-005**	**0.0000**	**2.3530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2184					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4500e-003	0.0379	0.0412	7.0000e-005		2.5000e-003	2.5000e-003		2.5000e-003	2.5000e-003	0.0000	5.7448	5.7448	4.4000e-004	0.0000	5.7559
Total	**0.2238**	**0.0379**	**0.0412**	**7.0000e-005**		**2.5000e-003**	**2.5000e-003**		**2.5000e-003**	**2.5000e-003**	**0.0000**	**5.7448**	**5.7448**	**4.4000e-004**	**0.0000**	**5.7559**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.8000e-004	7.6700e-003	3.0000e-005	2.7200e-003	2.0000e-005	2.7400e-003	7.2000e-004	2.0000e-005	7.4000e-004	0.0000	2.3517	2.3517	5.0000e-005	0.0000	2.3530
Total	**9.6000e-004**	**6.8000e-004**	**7.6700e-003**	**3.0000e-005**	**2.7200e-003**	**2.0000e-005**	**2.7400e-003**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**0.0000**	**2.3517**	**2.3517**	**5.0000e-005**	**0.0000**	**2.3530**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0228	0.1045	0.3453	1.3400e-003	0.1217	9.8000e-004	0.1227	0.0326	9.1000e-004	0.0335	0.0000	123.7366	123.7366	5.0300e-003	0.0000	123.8623
Unmitigated	0.0228	0.1045	0.3453	1.3400e-003	0.1217	9.8000e-004	0.1227	0.0326	9.1000e-004	0.0335	0.0000	123.7366	123.7366	5.0300e-003	0.0000	123.8623

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	74.87	74.87	74.87	320,868	320,868
Total	74.87	74.87	74.87	320,868	320,868

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	16.60	8.40	6.90	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966
Unrefrigerated Warehouse-No Rail	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	68.5260	68.5260	2.8300e-003	5.9000e-004	68.7712
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	68.5260	68.5260	2.8300e-003	5.9000e-004	68.7712
NaturalGas Mitigated	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	9.3462	9.3462	1.8000e-004	1.7000e-004	9.4017
NaturalGas Unmitigated	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	9.3462	9.3462	1.8000e-004	1.7000e-004	9.4017

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	175140	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	9.3462	9.3462	1.8000e-004	1.7000e-004	9.4017
Total		**9.4000e-004**	**8.5900e-003**	**7.2100e-003**	**5.0000e-005**		**6.5000e-004**	**6.5000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**9.3462**	**9.3462**	**1.8000e-004**	**1.7000e-004**	**9.4017**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	175140	9.4000e-004	8.5900e-003	7.2100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	9.3462	9.3462	1.8000e-004	1.7000e-004	9.4017
Total		**9.4000e-004**	**8.5900e-003**	**7.2100e-003**	**5.0000e-005**		**6.5000e-004**	**6.5000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**9.3462**	**9.3462**	**1.8000e-004**	**1.7000e-004**	**9.4017**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	29680	9.4567	3.9000e-004	8.0000e-005	9.4905
Unrefrigerated Warehouse-No Rail	185390	59.0694	2.4400e-003	5.0000e-004	59.2807
Total		68.5260	2.8300e-003	5.8000e-004	68.7712

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	29680	9.4567	3.9000e-004	8.0000e-005	9.4905
Unrefrigerated Warehouse-No Rail	185390	59.0694	2.4400e-003	5.0000e-004	59.2807
Total		68.5260	2.8300e-003	5.8000e-004	68.7712

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1887	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003
Unmitigated	0.1887	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0218					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1665					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.1000e-004	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003
Total	0.1887	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0218					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1665					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.1000e-004	3.0000e-005	3.2900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.3700e-003	6.3700e-003	2.0000e-005	0.0000	6.7900e-003
Total	**0.1887**	**3.0000e-005**	**3.2900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**6.3700e-003**	**6.3700e-003**	**2.0000e-005**	**0.0000**	**6.7900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	38.8410	0.2849	7.0000e-003	48.0489
Unmitigated	46.0201	0.3375	8.2900e-003	56.9300

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	10.3045 / 0	46.0201	0.3375	8.2900e-003	56.9300
Total		**46.0201**	**0.3375**	**8.2900e-003**	**56.9300**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	8.697 / 0	38.8410	0.2849	7.0000e-003	48.0489
Total		38.8410	0.2849	7.0000e-003	48.0489

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	8.5033	0.5025	0.0000	21.0665
Unmitigated	8.5033	0.5025	0.0000	21.0665

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	41.89	8.5033	0.5025	0.0000	21.0665
Total		8.5033	0.5025	0.0000	21.0665

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	41.89	8.5033	0.5025	0.0000	21.0665
Total		8.5033	0.5025	0.0000	21.0665

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Knott Avenue Warehouse Addition
Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	44.57	1000sqft	1.02	44,565.00	0
Parking Lot	212.00	Space	1.91	84,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
Land Use -
Construction Phase - Construction times are estimated.
Construction Off-road Equipment Mitigation -
Mobile Land Use Mitigation -
Energy Mitigation -
Water Mitigation -

Knott Avenue Warehouse Addition - Orange County, Summer

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	45.00
tblConstructionPhase	NumDays	220.00	87.00
tblConstructionPhase	NumDays	6.00	22.00
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	3.00	21.00
tblConstructionPhase	PhaseEndDate	10/14/2020	7/31/2020
tblConstructionPhase	PhaseEndDate	9/16/2020	4/30/2020
tblConstructionPhase	PhaseEndDate	11/13/2019	12/31/2019
tblConstructionPhase	PhaseEndDate	9/30/2020	5/31/2020
tblConstructionPhase	PhaseEndDate	11/5/2019	11/30/2019
tblConstructionPhase	PhaseStartDate	10/1/2020	6/1/2020
tblConstructionPhase	PhaseStartDate	11/14/2019	1/1/2020
tblConstructionPhase	PhaseStartDate	11/6/2019	12/1/2019
tblConstructionPhase	PhaseStartDate	9/17/2020	5/1/2020
tblGrading	AcresOfGrading	11.00	3.00
tblGrading	AcresOfGrading	31.50	4.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.0699	22.7714	12.1997	0.0254	6.2785	1.0737	7.3522	3.3555	0.9878	4.3433	0.0000	2,516.6320	2,516.6320	0.7699	0.0000	2,535.8807
2020	9.9890	19.7521	17.2422	0.0361	0.7378	0.9636	1.7014	0.1987	0.9235	1.1222	0.0000	3,446.8820	3,446.8820	0.5454	0.0000	3,459.9824
Maximum	**9.9890**	**22.7714**	**17.2422**	**0.0361**	**6.2785**	**1.0737**	**7.3522**	**3.3555**	**0.9878**	**4.3433**	**0.0000**	**3,446.8820**	**3,446.8820**	**0.7699**	**0.0000**	**3,459.9824**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.0699	22.7714	12.1997	0.0254	2.5168	1.0737	3.5905	1.3267	0.9878	2.3145	0.0000	2,516.6320	2,516.6320	0.7699	0.0000	2,535.8807
2020	9.9890	19.7521	17.2422	0.0361	0.7378	0.9636	1.7014	0.1987	0.9235	1.1222	0.0000	3,446.8820	3,446.8820	0.5454	0.0000	3,459.9824
Maximum	**9.9890**	**22.7714**	**17.2422**	**0.0361**	**2.5168**	**1.0737**	**3.5905**	**1.3267**	**0.9878**	**2.3145**	**0.0000**	**3,446.8820**	**3,446.8820**	**0.7699**	**0.0000**	**3,459.9824**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	53.61	0.00	41.55	57.08	0.00	37.12	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0345	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599
Energy	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869
Mobile	0.1305	0.5454	1.9713	7.6400e-003	0.6806	5.3900e-003	0.6860	0.1820	5.0100e-003	0.1870		774.8017	774.8017	0.0307		775.5699
Total	**1.1702**	**0.5927**	**2.0371**	**7.9200e-003**	**0.6806**	**9.0600e-003**	**0.6897**	**0.1820**	**8.6800e-003**	**0.1907**		**831.3093**	**831.3093**	**0.0320**	**1.0300e-003**	**832.4167**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0345	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599
Energy	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869
Mobile	0.1305	0.5454	1.9713	7.6400e-003	0.6806	5.3900e-003	0.6860	0.1820	5.0100e-003	0.1870		774.8017	774.8017	0.0307		775.5699
Total	**1.1702**	**0.5927**	**2.0371**	**7.9200e-003**	**0.6806**	**9.0600e-003**	**0.6897**	**0.1820**	**8.6800e-003**	**0.1907**		**831.3093**	**831.3093**	**0.0320**	**1.0300e-003**	**832.4167**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	11/1/2019	11/30/2019	5	21	
2	Grading	Grading	12/1/2019	12/31/2019	5	22	
3	Building Construction	Building Construction	1/1/2020	4/30/2020	5	87	
4	Paving	Paving	5/1/2020	5/31/2020	5	21	
5	Architectural Coating	Architectural Coating	6/1/2020	7/31/2020	5	45	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 1.91

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 66,848; Non-Residential Outdoor: 22,283; Striped Parking Area: 5,088 (Architectural Coating – sqft)

OffRoad Equipment

Knott Avenue Warehouse Addition - Orange County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	54.00	21.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2273	0.0000	0.2273	0.0245	0.0000	0.0245			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854		2,426.5408	2,426.5408	0.7677		2,445.7341
Total	1.7557	21.5386	11.9143	0.0245	0.2273	0.8537	1.0810	0.0245	0.7854	0.8099		2,426.5408	2,426.5408	0.7677		2,445.7341

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0330	0.0216	0.2854	9.0000e-004	0.0894	6.0000e-004	0.0900	0.0237	5.5000e-004	0.0243		90.0912	90.0912	2.2100e-003		90.1466
Total	**0.0330**	**0.0216**	**0.2854**	**9.0000e-004**	**0.0894**	**6.0000e-004**	**0.0900**	**0.0237**	**5.5000e-004**	**0.0243**		**90.0912**	**90.0912**	**2.2100e-003**		**90.1466**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0886	0.0000	0.0886	9.5700e-003	0.0000	9.5700e-003			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854	0.0000	2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**0.0886**	**0.8537**	**0.9423**	**9.5700e-003**	**0.7854**	**0.7950**	**0.0000**	**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0330	0.0216	0.2854	9.0000e-004	0.0894	6.0000e-004	0.0900	0.0237	5.5000e-004	0.0243		90.0912	90.0912	2.2100e-003		90.1466
Total	**0.0330**	**0.0216**	**0.2854**	**9.0000e-004**	**0.0894**	**6.0000e-004**	**0.0900**	**0.0237**	**5.5000e-004**	**0.0243**		**90.0912**	**90.0912**	**2.2100e-003**		**90.1466**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1667	0.0000	6.1667	3.3258	0.0000	3.3258			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871		2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**6.1667**	**1.0730**	**7.2397**	**3.3258**	**0.9871**	**4.3130**		**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0412	0.0270	0.3567	1.1300e-003	0.1118	7.5000e-004	0.1125	0.0296	6.9000e-004	0.0303		112.6140	112.6140	2.7700e-003		112.6833
Total	**0.0412**	**0.0270**	**0.3567**	**1.1300e-003**	**0.1118**	**7.5000e-004**	**0.1125**	**0.0296**	**6.9000e-004**	**0.0303**		**112.6140**	**112.6140**	**2.7700e-003**		**112.6833**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4050	0.0000	2.4050	1.2971	0.0000	1.2971			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871	0.0000	2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**2.4050**	**1.0730**	**3.4780**	**1.2971**	**0.9871**	**2.2842**	**0.0000**	**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0412	0.0270	0.3567	1.1300e-003	0.1118	7.5000e-004	0.1125	0.0296	6.9000e-004	0.0303		112.6140	112.6140	2.7700e-003		112.6833
Total	**0.0412**	**0.0270**	**0.3567**	**1.1300e-003**	**0.1118**	**7.5000e-004**	**0.1125**	**0.0296**	**6.9000e-004**	**0.0303**		**112.6140**	**112.6140**	**2.7700e-003**		**112.6833**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089		2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**		**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0671	2.1877	0.5774	5.2300e-003	0.1342	0.0114	0.1456	0.0386	0.0109	0.0495		569.3708	569.3708	0.0461		570.5220
Worker	0.2075	0.1307	1.7676	5.9000e-003	0.6036	3.9900e-003	0.6076	0.1601	3.6800e-003	0.1638		588.6236	588.6236	0.0134		588.9590
Total	**0.2746**	**2.3185**	**2.3450**	**0.0111**	**0.7378**	**0.0154**	**0.7532**	**0.1987**	**0.0146**	**0.2133**		**1,157.9943**	**1,157.9943**	**0.0595**		**1,159.4810**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089	0.0000	2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**	**0.0000**	**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0671	2.1877	0.5774	5.2300e-003	0.1342	0.0114	0.1456	0.0386	0.0109	0.0495		569.3708	569.3708	0.0461		570.5220
Worker	0.2075	0.1307	1.7676	5.9000e-003	0.6036	3.9900e-003	0.6076	0.1601	3.6800e-003	0.1638		588.6236	588.6236	0.0134		588.9590
Total	0.2746	2.3185	2.3450	0.0111	0.7378	0.0154	0.7532	0.1987	0.0146	0.2133		1,157.9943	1,157.9943	0.0595		1,159.4810

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.2383					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.3930	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.4910	1.6400e-003	0.1677	1.1100e-003	0.1688	0.0445	1.0200e-003	0.0455		163.5065	163.5065	3.7300e-003		163.5997
Total	**0.0576**	**0.0363**	**0.4910**	**1.6400e-003**	**0.1677**	**1.1100e-003**	**0.1688**	**0.0445**	**1.0200e-003**	**0.0455**		**163.5065**	**163.5065**	**3.7300e-003**		**163.5997**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051	0.0000	1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.2383					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3930**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**	**0.0000**	**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.4910	1.6400e-003	0.1677	1.1100e-003	0.1688	0.0445	1.0200e-003	0.0455		163.5065	163.5065	3.7300e-003		163.5997
Total	**0.0576**	**0.0363**	**0.4910**	**1.6400e-003**	**0.1677**	**1.1100e-003**	**0.1688**	**0.0445**	**1.0200e-003**	**0.0455**		**163.5065**	**163.5065**	**3.7300e-003**		**163.5997**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.7046					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**9.9467**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0423	0.0266	0.3601	1.2000e-003	0.1230	8.1000e-004	0.1238	0.0326	7.5000e-004	0.0334		119.9048	119.9048	2.7300e-003		119.9731
Total	**0.0423**	**0.0266**	**0.3601**	**1.2000e-003**	**0.1230**	**8.1000e-004**	**0.1238**	**0.0326**	**7.5000e-004**	**0.0334**		**119.9048**	**119.9048**	**2.7300e-003**		**119.9731**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.7046					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**9.9467**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0423	0.0266	0.3601	1.2000e-003	0.1230	8.1000e-004	0.1238	0.0326	7.5000e-004	0.0334		119.9048	119.9048	2.7300e-003		119.9731
Total	**0.0423**	**0.0266**	**0.3601**	**1.2000e-003**	**0.1230**	**8.1000e-004**	**0.1238**	**0.0326**	**7.5000e-004**	**0.0334**		**119.9048**	**119.9048**	**2.7300e-003**		**119.9731**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1305	0.5454	1.9713	7.6400e-003	0.6806	5.3900e-003	0.6860	0.1820	5.0100e-003	0.1870		774.8017	774.8017	0.0307		775.5699
Unmitigated	0.1305	0.5454	1.9713	7.6400e-003	0.6806	5.3900e-003	0.6860	0.1820	5.0100e-003	0.1870		774.8017	774.8017	0.0307		775.5699

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	74.87	74.87	74.87	320,868	320,868
Total	74.87	74.87	74.87	320,868	320,868

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	16.60	8.40	6.90	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966
Unrefrigerated Warehouse-No Rail	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869
NaturalGas Unmitigated	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	479.837	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869
Total		5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.479837	5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869
Total		5.1700e-003	0.0470	0.0395	2.8000e-004		3.5800e-003	3.5800e-003		3.5800e-003	3.5800e-003		56.4514	56.4514	1.0800e-003	1.0300e-003	56.7869

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0345	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599
Unmitigated	1.0345	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9124					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4600e-003	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599
Total	**1.0345**	**2.4000e-004**	**0.0263**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0562**	**0.0562**	**1.5000e-004**		**0.0599**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.9124					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4600e-003	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599
Total	1.0345	2.4000e-004	0.0263	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0562	0.0562	1.5000e-004		0.0599

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet
Install Low Flow Kitchen Faucet
Install Low Flow Toilet

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

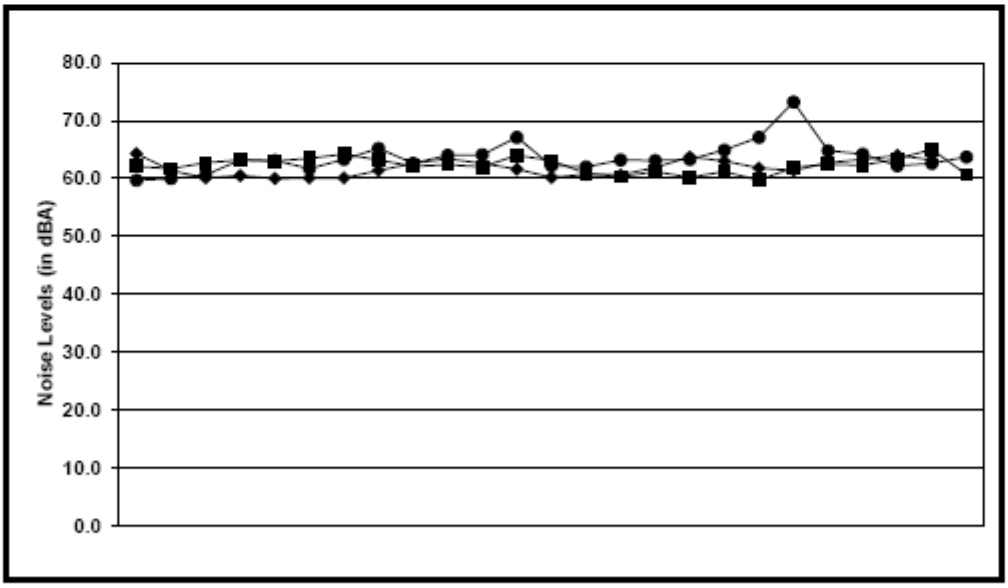
User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX C
NOISE WORKSHEETS

Actual Noise Levels During Measurement				Noise Measurement Results in Leq%				
1-25	26-50	51-75	76-100	L%	1-25	26-50	51-75	76-100
63.0	64.3	62.1	59.7	L_{99}	71.2	64.3	65.0	73.2
62.6	61.4	61.7	60.0		65.8	64.3	64.2	67.1
63.4	60.1	62.7	60.6	L_{90}	64.0	64.0	64.0	67.1
60.6	60.5	63.2	63.2		63.5	63.7	63.5	65.2
61.2	60.0	63.0	63.1		63.4	63.4	63.4	64.9
61.6	60.1	63.5	61.7		63.4	63.3	63.2	64.8
62.3	60.1	64.2	63.3		63.2	63.2	63.2	64.2
62.0	61.4	63.2	65.2		63.2	63.0	63.1	64.1
64.0	62.6	62.1	62.6		63.1	62.7	63.0	64.0
63.4	63.4	62.4	64.0		63.1	62.6	62.7	63.7
62.5	62.6	62.0	64.1		63.1	62.6	62.5	63.3
63.2	61.6	64.0	67.1	L_{50}	63.0	61.9	62.4	63.3
63.1	60.2	63.1	62.2		62.9	61.8	62.3	63.2
61.4	60.7	60.9	62.0		62.9	61.6	62.1	63.2
60.8	60.6	60.3	63.2		62.8	61.4	62.1	63.1
62.8	61.9	61.2	63.1		62.6	61.4	62.0	63.1
63.1	63.7	60.2	63.3		62.5	61.4	61.9	62.6
62.9	63.0	61.2	64.9		62.3	60.7	61.7	62.6
61.9	61.8	59.7	67.1		62.0	60.6	61.2	62.2
63.5	61.4	61.9	73.2	L_{25}	61.9	60.5	61.2	62.2
63.2	62.7	62.5	64.8		61.6	60.2	60.9	62.0
63.1	63.3	62.3	64.2		61.4	60.1	60.7	61.7
62.9	64.0	63.4	62.2	L_{10}	61.2	60.1	60.3	60.6
65.8	63.2	65.0	62.6		60.8	60.1	60.2	60.0
71.2	64.3	60.7	63.7		60.6	60.0	59.7	59.7



Noise Measurements
along the west side of the project site
Source: Blodgett Baylosis Environmental Planning

73.2	
71.2	99%
67.1	
67.1	
65.8	
65.2	
65.0	
64.9	
64.8	
64.3	
64.3	90%
64.2	
64.2	
64.1	
64.0	
64.0	
64.0	
64.0	
63.7	

63.7	
63.5	
63.5	
63.4	
63.4	
63.4	
63.4	75%
63.3	
63.3	
63.3	
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62.9	
62.8	
62.7	
62.7	
62.6	50%
62.6	
62.6	
62.6	
62.6	
62.6	
62.5	
62.5	
62.4	
62.3	
62.3	
62.2	
62.2	
62.1	
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59.7
59.7

6272.0
62.72

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APPENDIX D
TRAFFIC STUDY

TRAFFIC IMPACT STUDY
INDUSTRIAL WAREHOUSE DEVELOPMENT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦

Prepared for

REXFORD INDUSTRIAL REALTY, INC.

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♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦

Prepared by

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1475 Glen Oaks Boulevard
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Tel: 818-730-1970

Under the Supervision of:
Patrick B. Lang, P.E
Registered Traffic Engineer

October 8, 2019

CCE2019-03 PBL/MYR

TRAFFIC IMPACT STUDY
INDUSTRIAL WAREHOUSE DEVELOPMENT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

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TRAFFIC IMPACT STUDY
INDUSTRIAL WAREHOUSE DEVELOPMENT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

This is to certify that the above titled traffic study has been prepared under the supervision of Patrick B. Lang, P.E, a Professional Traffic Engineer, registered in the State of California.

Patrick B. Lang, P.E, Registration #: TR-875	10-8-2019 Date	Professional Engineer's Stamp

TRAFFIC IMPACT STUDY
INDUSTRIAL WAREHOUSE DEVELOPMENT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

EXECUTIVE SUMMARY

The purpose of this traffic impact analysis is to evaluate the impacts on traffic circulation system due to the proposed Development of 12821 Knott Street Industrial Warehouse in the City of Garden Grove, California. The combined floor area of the project's proposed buildings will be 165,171 square feet (including proposed 45,335 square feet new building addition to existing 119,836 square feet NextLevel Sports Goods building) of which a total of 20,000 square feet will be for ancillary office uses. The project site is located on the west side of Knott Street, adjacent to the westbound on-ramp to SR-22 freeway.

The project site consists of 7.83 acres of commercial land. Access to the proposed project will be provided by two existing driveways located on the west side of Knott Street. The project will provide a total of 181 parking spaces in addition to a total of 32 spaces to be used for truck docking/loading and parking.

The following are the key objectives of the study:

- Documentation of existing 2019 traffic conditions in the vicinity of the site.
- Determination of Project Opening Year (2021) traffic conditions and level of service (LOS) without and with the project.
- Determination of project related impacts to the circulation system, and
- Identification of mitigation measures to reduce any significant impacts to a level of insignificance.

The study included evaluation of the following eight key intersections in the general vicinity of the site:

- Knott Street and Stanford Avenue (Signalized)
- Knott Street and SR-22 Westbound On-ramp (Signalized)
- Knott Street and Lampson Avenue (Signalized)
- Knott Street and Garden Grove Boulevard (Signalized)
- Garden Grove Boulevard and SR-22 Westbound Off-ramp (Signalized)
- Garden Grove Boulevard and SR-22 Eastbound Off-ramp (Signalized)

- Knott Street and Northerly Project Driveway (Unsignalized)
- Knott Street and Southerly Project Driveway (Unsignalized)

The 12821 Knott Street Industrial Warehouse project is estimated to generate a net total of approximately 324 new passenger car equivalent (PCE) trips per day, with 36 trips during the AM peak hour (28 inbound and 8 outbound), and 42 trips during the PM peak hour (11 inbound and 31 outbound).

Surface parking will consist of 181 parking spaces and will adequately satisfy project's parking requirement of 165 spaces per parking code of the City. Of the total, 4 parking spaces will be ADA-compliant, and 17 spaces will be designated for electrical vehicle charging and parking purposes.

Based on the results of the traffic impact analysis, the proposed 12821 Knott Street Warehouse project would not significantly impact any of the key intersections analyzed in the surrounding roadway system. Except for the intersection of Knott Street and Garden Grove Boulevard, all the study intersections would continue to operate at an acceptable level of service (i.e., at LOS A through D) during the AM and PM peak hours. The intersection of Knott Street and Garden Grove Boulevard will operate at a deficient LOS F during the AM peak hours. However, the project's off-site traffic impact would not be considered significant at any of the study intersections based on increase in operational delay (or V/C ratio) and level of service expected after the project. Therefore, no off-site intersection mitigation measures would be necessary for the development of this project.

The low turn volume at the at the existing northerly and southerly project driveways is not expected to cause any queuing at the driveways. Adequate sight distance is available from the driveways along the north and south directions on Knott Street.

The southerly project driveway on Knott Street should be striped for right turn in and out movement only, with a right-arrow pavement marking. A right-turn arrow sign along with a Stop sign should also be posted at this driveway for exiting vehicles.

TRAFFIC IMPACT STUDY
INDUSTRIAL WAREHOUSE DEVELOPMENT
12821 KNOTT STREET
GARDEN GROVE, CALIFORNIA

INTRODUCTION

The purpose of this traffic impact analysis is to evaluate the impacts on traffic circulation system due to the proposed Development of 12821 Knott Street Industrial Warehouse in the City of Garden Grove, California. The combined floor area of the project's proposed buildings will be 165,171 square feet (including proposed 45,335 square feet new building addition to existing 119,836 square feet NextLevel Sports Goods building) of which a total of 20,000 square feet will be for ancillary office uses. The project site is located on the west side of Knott Street, adjacent to the westbound on-ramp to SR-22 freeway.

The project site consists of 7.83 acres of commercial land. Access to the proposed project will be provided by two existing driveways located on the west side of Knott Street. The project will provide a total of 181 parking spaces in addition to a total of 32 spaces to be used for truck docking/loading and parking.

The following are the key objectives of the study:

- Documentation of existing 2015-9 traffic conditions in the vicinity of the site.
- Determination of Project Opening Year (2021) traffic conditions and level of service (LOS) without and with the project.
- Determination of project related impacts to the circulation system, and
- Identification of mitigation measures to reduce any significant impacts to a level of insignificance.

The report provides data regarding existing operational characteristics of traffic in the general vicinity of the project, as well as an analysis of the proposed project's impacts to these existing and anticipated future traffic conditions. The report identifies and quantifies the impacts at key intersections and attempts to address the most appropriate and reasonable mitigation strategies at any impacted intersections which are identified to be operating at a deficient level of service.

This report investigates existing 2019 and anticipated future 2021 opening year traffic operating conditions. The study has been prepared per City of Garden Grove's Traffic Impact Study Guidelines.

REPORT METHODOLOGY

STUDY APPROACH

This report approaches the task of identifying and quantifying the anticipated impacts to the circulation system with a structured, "building block" methodology. The first step is to inventory and quantify existing conditions. Upon this foundation of fact, a travel forecast procedure, based on physical and operational characteristics of road network and manual observation of peak hour traffic movements, is structured for the entire project area and validated manually, by adjusting any traffic flow inconsistency, to produce reliable output, verifiable with the existing data. With the project traffic calculated and distributed onto the study area, at the anticipated opening year of the project in 2021, the travel forecast methodology is utilized to assess the project's traffic impacts at that time. The methodology utilizes a growth factor for existing traffic (based upon regional guidelines), traffic from any other projects in the project vicinity, as well as the traffic anticipated to be introduced from the proposed project to determine estimated cumulative traffic volume and level-of-service at intersections for the future target year.

The trip generation estimate is based on the 10th edition of Institute of Transportation Engineers (ITE)'s "Trip Generation" manual. Research and interviews have been conducted with local and regional agencies (namely, community development department of the City of Garden Grove) in order to identify and characterize the most probable trip distribution patterns within the study area.

Project impacts are identified for the future year 2021 conditions. At those intersections operating deficiently (e.g., at a level worse than LOS D) and significantly impacted by the proposed project, a mitigation measure is identified and applied, and a before-and-after mitigation analysis conducted.

LEVEL OF SERVICE CRITERIA

Roadway operations and the relationship between capacity and traffic volumes are generally expressed in terms of levels of service (LOS). Levels of service are defined as LOS A through F. These levels recognize that, while an absolute limit exists as to the amount of traffic traveling through a given intersection (the absolute capacity), the conditions that motorists experience deteriorate rapidly as traffic approaches the absolute capacity. Under such conditions, congestion as well as delay is experienced. There is generally instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays. This near-capacity situation is labeled LOS E. Beyond LOS E, capacity is exceeded, and

arriving traffic will exceed the ability of the intersection to accommodate it. An upstream queue will form and continue to expand in length until the demand volume reduces.

A complete description of the meaning of level of service can be found in the Highway Research Board's Special Report 209 titled *Highway Capacity Manual*. The manual establishes the definitions for levels of service A through F. Brief descriptions of the six levels of service, as extracted from the manual, are listed in **Table 1.** The thresholds of level of service for signalized and unsignalized intersections are shown in **Table 2**.

LOS D is the minimum threshold at all key intersections in the urbanized areas. The traffic study guidelines require that traffic mitigation measures be identified to provide for operations at the minimum threshold levels.

For the study area intersections (except those under sole jurisdiction of the City of Garden Grove), the SYNCHRO computer software has been utilized to perform intersection levels of service (LOS) analysis. The 2010 Highway Capacity Manual (HCM) operational delay method was used to determine level of service (LOS) for signalized intersections. Levels of service are presented for the entire intersection, consistent with the local and regional agency policies.

In HCM analysis, a lane capacity volume of 1,700 vehicles per hour per through lane, and 1,600 vehicles per hour per left-turn or right-turn lane was used. The peak hour factor for intersections, as calculated from traffic counts, was used to increase hourly totals. This ensures that peak 15-minute traffic volumes are used in level p service analysis.

While the level of service concept and analysis methodology provides an indication of the performance of the entire intersection, the single letter grade A through F cannot describe specific operational deficiencies at intersections. Progression, queue formation, and left-turn storage are examples of the operational issues that affect the performance of an intersection, but do not factor into the strict calculation of level of service. However, the SYNCHRO software does provide an output that quantifies operational features at intersections, such as vehicle clearance, queue formation, and left-turn storage requirements. In addition, it provides a volume to capacity (V/C) ratio that is more meaningful when identifying a project's impact and developing mitigation measures. Therefore, this V/C ratio information is also included in addition to delay information in describing an intersection's operational performance under various scenarios.

For the intersections under sole jurisdiction of the City of Garden Grove, the Intersection Capacity Utilization (ICU) procedure has been utilized to determine intersection levels of service. Levels of service are presented for the entire intersection, consistent with the local and regional agency policies.

TABLE 1
LEVEL OF SERVICE DEFINITIONS

LOS	Description
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time due to congestion. In the extreme case, both speed and volume can drop to zero.

TABLE 2
LEVEL OF SERVICE CRITERIA

Level of Service	Two-Way or All-Way Stop Controlled Intersection		Signalized Intersection Average Delay per Vehicle (sec)	
	Average Delay per Vehicle (sec)	Volume to Capacity (V/C Ratio	Average Delay per Vehicle (sec)	Volume to Capacity (V/C Ratio
A	0 - 10	0 – 0.60	< or = 10	0 – 0.60
B	> 10 - 15	> 0.60 – 0.70	> 10 - 20	> 0.60 – 0.70
C	> 15 - 25	> 0.70 - 0.80	> 20 - 35	> 0.70 - 0.80
D	> 25 - 35	> 0.80 – 0.90	> 35 - 55	> 0.80 – 0.90
E	> 35 - 50	> 0.90 – 1.00	> 55 - 80	> 0.90 – 1.00
F	> 50	> 1.00	> 80 or a V/C ratio equal or greater than 1.0	> 1.00

EXISTING ROADWAY SYSTEM AND TRAFFIC VOLUMES

EXISTING CIRCULATION NETWORK

In order to assess future operating conditions both with and without the proposed project, existing traffic conditions within the study area were evaluated. **Figure 1**, Vicinity Map, illustrates the existing circulation network within the study area as well as the location of the proposed project. **Figure 2** shows an aerial view of the circulation network. Major east-west regional access to the site is provided by Lampson Avenue, Garden Grove Boulevard and the Garden Grove Freeway (SR-22). Major north-south regional access is provided by Knott Street.

The project would provide two access driveways on Knott Street – the northerly driveway will be full-access driveway while the southerly driveway will for right-turn in and right-turn out movements only. The following paragraphs provide a brief description of the existing roadways which comprise the circulation network of the study area, providing the majority of both regional and local access to the project.

FIGURE 1: VICINITY MAP

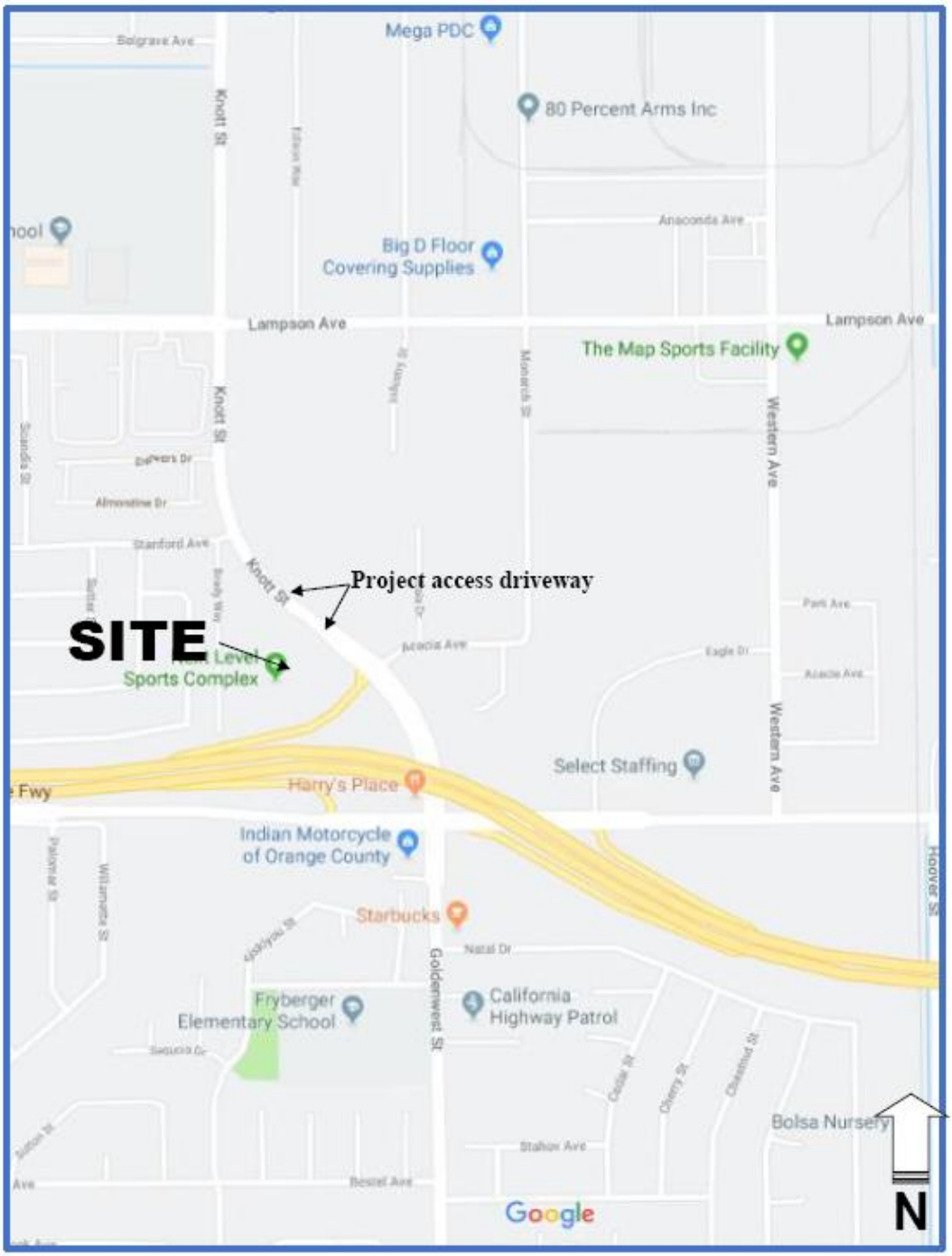


FIGURE 2: AERIAL VIEW OF CIRCULATION NETWORK

KNOTT STREET. Knott Street is a north-south major arterial street in the vicinity of the project, with two travel lanes in each direction. Directional travel is separated by striped two-way turn lane along the center as well as raised median islands near the major intersections. The street is approximately 90 feet wide and posted with a speed limit of 40 miles per hour. Most of the key intersections along Knott Street, including the intersections at Garden Grove Boulevard, Stanford Street and Lampson Avenue, are signalized. Exclusive left-turn lanes are provided at major intersections. On-street parking is not permitted along the sides of the street. Estimated average daily volume on Valley Boulevard in the vicinity is approximately 25,970 vehicles per day.

LAMPSON AVENUE. Lampson Avenue is a major east-west arterial street with two travel lanes in each direction. Directional travel is separated by striped two-way turn lanes as well as raised median islands along the center. The street is approximately 60 feet wide and posted with a speed limit of 40 miles per hour. Most of the key intersections along Lampson Avenue are signalized. Parking is permitted along the sides of the street. The average daily volume on Lampson Avenue is approximately 14,460 vehicles per day.

GARDEN GROVE BOULEVARD. Garden Grove Boulevard is a major east-west arterial street in the project area, with two travel lanes in each direction. Directional travel is separated by striped two-way turn lanes as well as raised median islands along the center. The street is approximately 76 feet wide and posted with a speed limit of 45 miles per hour. Most intersections of Garden Grove Boulevard are signalized. Parking is not permitted along the sides of the street. The average daily volume on Garden Grove Boulevard is approximately 30,580 vehicles per day.

EXISTING TRAFFIC VOLUMES

For the purpose of evaluating existing operating conditions as well as future operating conditions with and without the proposed project, the study area was carefully selected in accordance with local traffic study guidelines. Manual turning movement counts for the selected intersections were collected in the field for the morning and evening peak periods during the month of September 2019. The intersections were counted during the peak hours of 7:00 to 9:00 AM and 4:00 to 6:00 PM. It was determined that the following key intersections would be analyzed in the study:

- Knott Street and Stanford Avenue (Signalized)
- Knott Street and SR-22 Westbound On-ramp (Signalized)
- Knott Street and Lampson Avenue (Signalized)
- Knott Street and Garden Grove Boulevard (Signalized)
- Garden Grove Boulevard and SR-22 Westbound Off-ramp (Signalized)
- Garden Grove Boulevard and SR-22 Eastbound Off-ramp (Signalized)
- Knott Street and Northerly Project Driveway (Unsignalized)
- Knott Street and Southerly Project Driveway (Unsignalized)

These intersections have been selected to study project's potential impacts based on estimated contribution of traffic from project within a two-mile radius of the site.

Existing lane configurations at the key intersections are shown in **Figure 3**.

Existing turning movement counts for AM and PM peak hour conditions are shown in **Figure 4.** Detailed turning movement counts are included in the Technical Appendix of this report.

EXISTING 2019 TRAFFIC CONDITIONS

Year 2019 existing traffic conditions were evaluated using the 2010 Highway Capacity Manual (HCM) operational delay method of level of service (LOS) analysis for signalized intersections with partial jurisdiction of State highways. The Synchro traffic analysis software was used in these analyses. For City's intersections, the Intersection Capacity Utilization method was used for level of service (LOS) analysis. **Table 3** presents existing condition intersection level of service (LOS) analysis summary. Detailed calculations relating to the study intersections are included in the Technical Appendix of this report.

Based on the results of this analysis, except for the intersection of Knott Street and Garden Grove Boulevard, all of the study intersections are operating at an acceptable LOS D or better during the AM and PM peak hours, as shown in **Table 3**.

TABLE 3
EXISTING CONDITIONS (2019) LEVEL OF SERVICE SUMMARY

9

Intersection	Peak Hour	Existing 2019 Conditions	
		LOS	Delay, Sec or V/C Ratio
1. Knott Street and Stanford Avenue (Signalized)*	AM PM	A A	0.558 0.486
2. Knott Street and SR-22 W/B On-ramp (Signalized)	AM PM	B B	11.6 13.6
3. Knott Street and Lampson Avenue (Signalized)*	AM PM	C C	0.766 0.732
4. Knott Street and Garden Grove Bl (Signalized)	AM PM	F D	83.7 52.4
5. Garden Grove Bl and SR-22 E/B Off-ramp (Signalized)	AM PM	B B	10.5 10.7
6. Garden Grove Bl and SR-22 W/B Off-ramp (Signalized)	AM PM	C C	26.9 24.0
7. Knott Street and Northerly Project (Unsignalized)*	AM PM	A A	0.589 0.538
8. Knott Street and Southerly Project (Unsignalized)*	AM PM	A A	0.583 0.532

* LOS and V/C ratio determined using ICU Method

FIGURE 3: EXISTING LANE CONFIGURATION AT KEY INTERSECTIONS

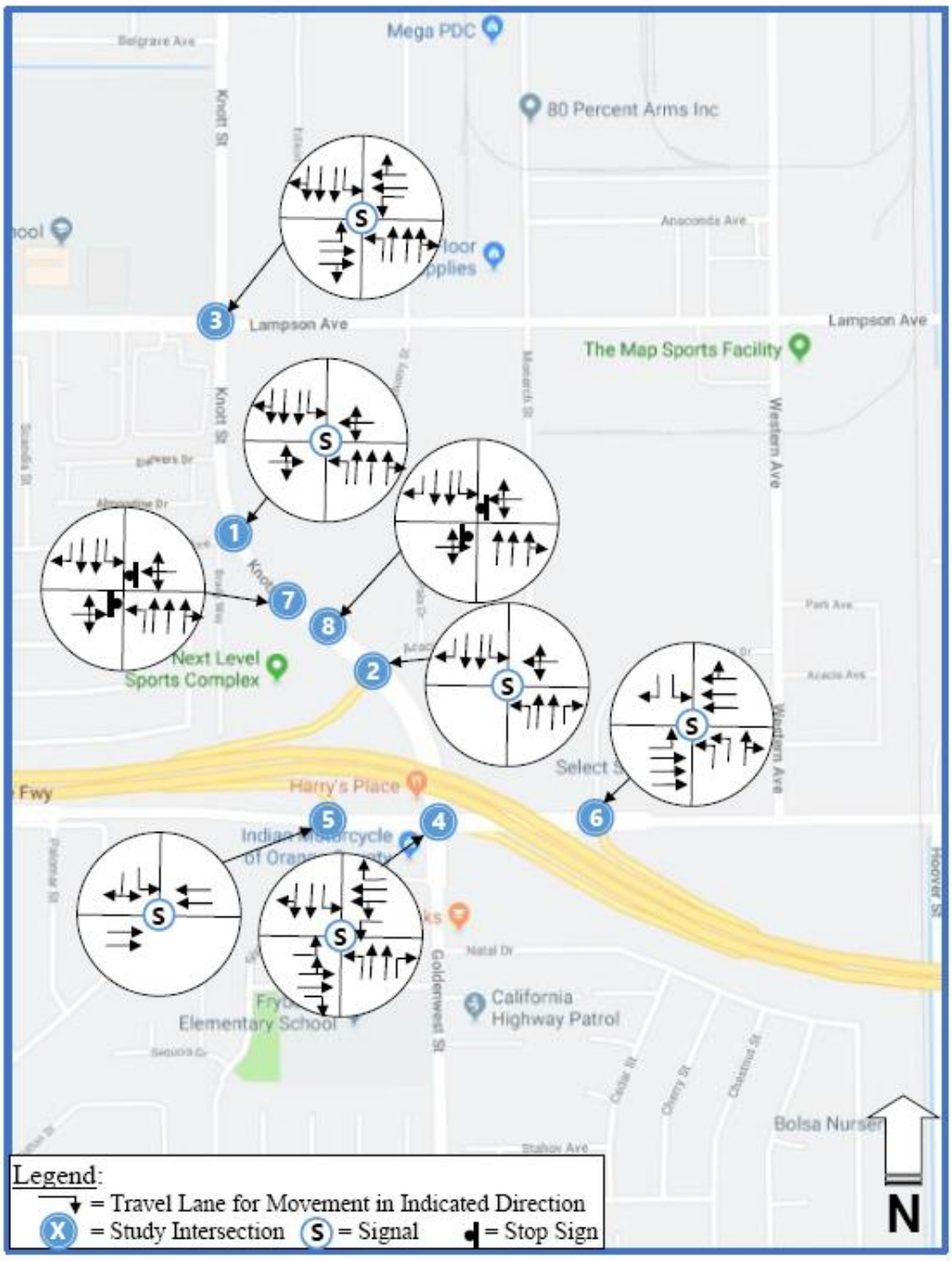
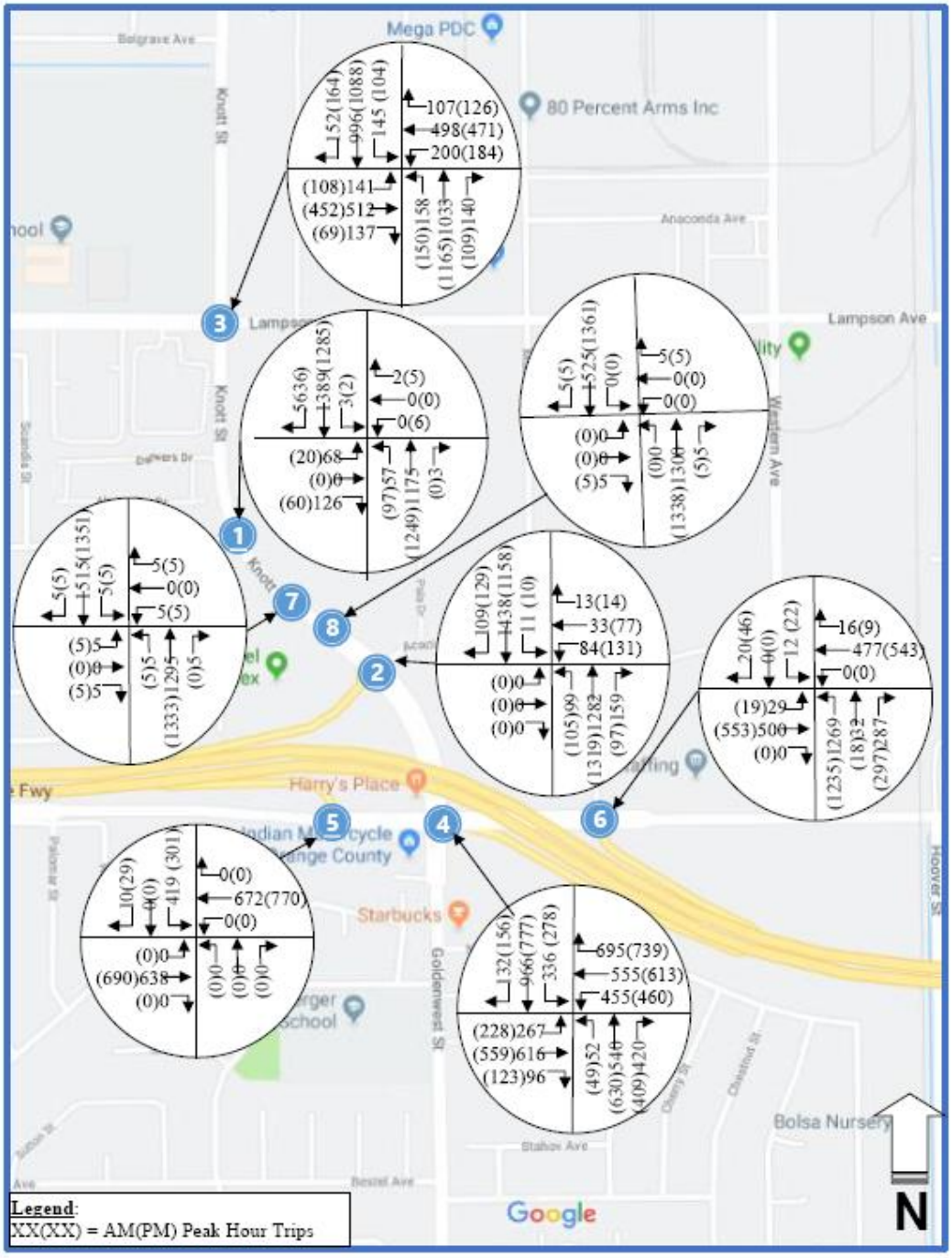


FIGURE 4: EXISTING 2019 TRAFFIC VOLUMES AT KEY INTERSECTIONS



OPENING YEAR 2021 PRE-PROJECT CONDITIONS

A 1.0 percent per year annual traffic growth rate was applied to existing traffic volumes to create a 2021 base condition (i.e., a factor of 1.02 was applied to 2019 volumes to obtain 2021 base traffic volumes due to ambient growth). This annual traffic growth rate accounts for the population growth within the study area and traffic from any other minor projects to be developed in the study area.

Per City's records, there are four (4) other related projects located within two-mile radius of the project that will contribute to cumulative traffic volumes with the development of this project. The list of these related projects has been obtained from the City's planning division's online "Open Planning Cases" map.

The location of the related projects is shown in **Figure 5**.

Trip generation estimates for the related projects were developed by using nationally recognized and recommended rates contained in "Trip Generation" manual, 10th edition, published by the Institute of Transportation Engineers (ITE).

Table 4 shows a summary of trip generation estimates for the related project. It is estimated that the related project will generate approximately 680 trips per average day (340 inbound and 340 outbound). The average weekday net new peak hour trips will be approximately 71 trips during the AM peak hour (39 inbound and 32 outbound), and 63 trips during the PM peak hour (37 inbound and 26 outbound).

Figure 5 also shows related project's trips distributed at the study intersections.

The projected peak hour traffic volumes from this related project were added to existing traffic volumes with ambient growth at the study intersections to represent a 2021 pre-project traffic condition for the AM and PM peak hours. **Figure 6** shows future 2021 pre-project traffic volumes at the study intersections.

This pre-project traffic condition was evaluated using the 2010 Highway Capacity Manual (HCM) operational delay method of level of service (LOS) analysis. For the intersections under the sole jurisdiction of the City of Garden Grove, the Intersection Capacity Utilization (ICU) method of level of service (LOS) was used. The LOS and delay or V/C ratios for the study intersections under 2021 pre-project conditions (without project) are shown in **Table 5**.

Detailed calculations relating to the study intersections are included in the Technical Appendix of this report.

As the results indicate, except for the intersection of Knott Street and Garden Grove Boulevard, all the study intersections will continue to operate at a Level of Service (LOS) D or better (i.e., within the range of acceptable thresholds of LOS A through D) during the AM and PM peak hours.

FIGURE 5: RELATED PROJECTS LOCATION AND DISTRIBUTION OF TRIPS

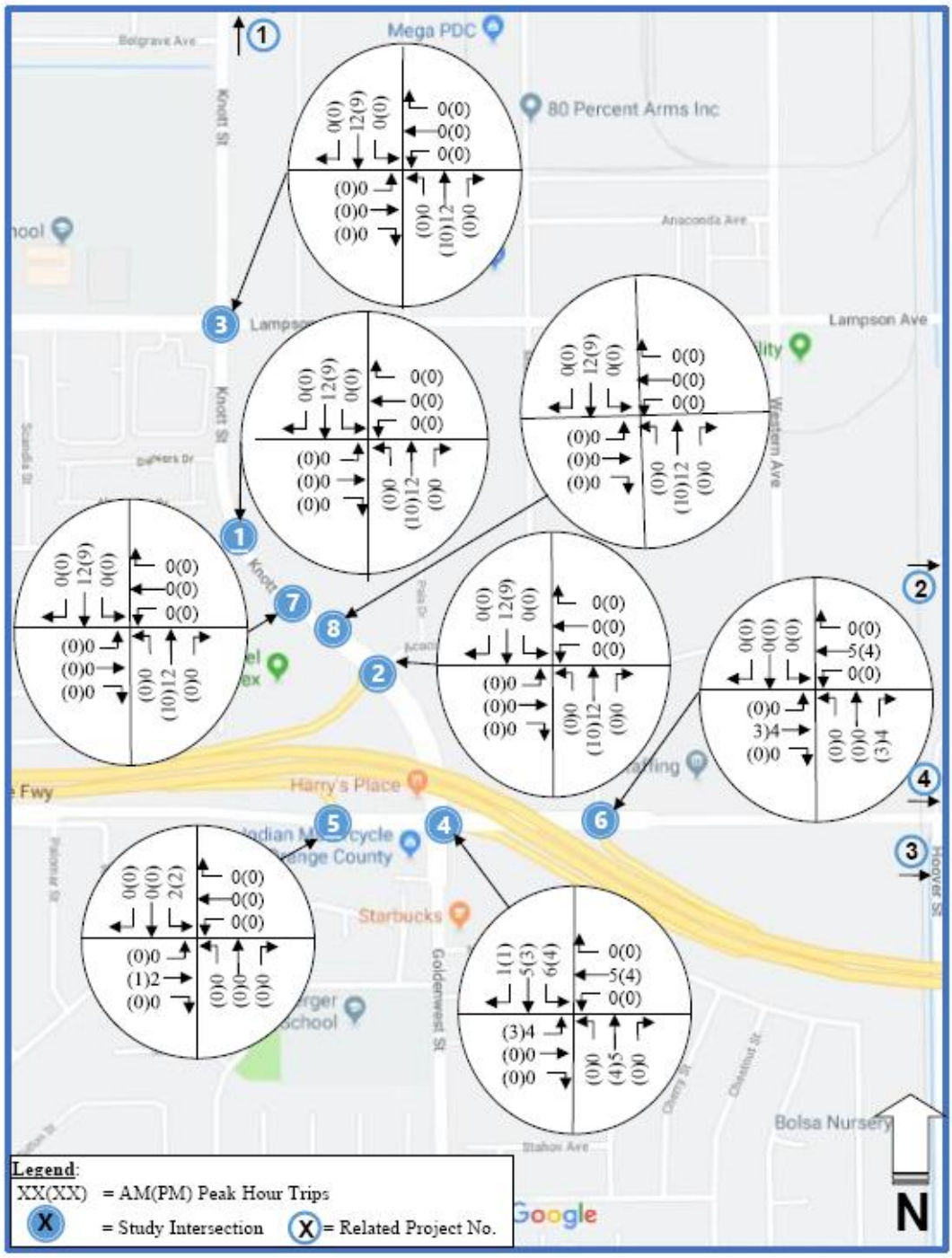


TABLE 4
TRIP GENERATION BY RELATED PROJECTS

Land Use (ITE Code)	Size & Unit	Trip Generation Rate							Average Traffic Volume						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			Total	%IN	%OUT	Total	%IN	%OUT		IN	OUT	Total	IN	OUT	Total
Related Project 1: 12072 Knott St, Garden Grove, CA – Increase of enrollment at Existing Learning Center															
520 Elem. School	34 Students	1.29	0.45	55%	45%	0.28	45%	55%	44	8	7	15	4	5	9
Related Project 2: 12931 Louise St, Garden Grove, CA – Development of 4 Apartment Units in two stories															
220 M-Fam Apts	4 DU	7.32	0.46	23%	77%	0.56	63%	37%	30	1	1	2	1	1	2
Related Project 3: 8562 Garden Grove Bl, Garden Grove, CA – 4,500 square feet Yigai Korean Restaurant															
931 Qual. Restrnt	4.500 KSF	112.2	10.00	55%	45%	9.78	61%	39%	506	25	20	45	27	17	44
Related Project 4: 8851 Garden Grove Bl, Garden Grove, CA – 882 square feet Sushi Warrior Restaurant															
931 Qual. Restrnt	0.882 KSF	112.2	10.00	55%	45%	9.78	61%	39%	100	5	4	9	5	3	8
Total Trips									680	39	32	71	37	26	63

Note: All rates are average rates.
DU = Dwelling Units
KSF Kilo (1,000) Square Feet

[Ref: Institute of Transportation Engineer's (ITE) "Trip Generation", 10th Edition, 2017]

FIGURE 6: FUTURE 2021 PRE-PROJECT TRAFFIC VOLUMES

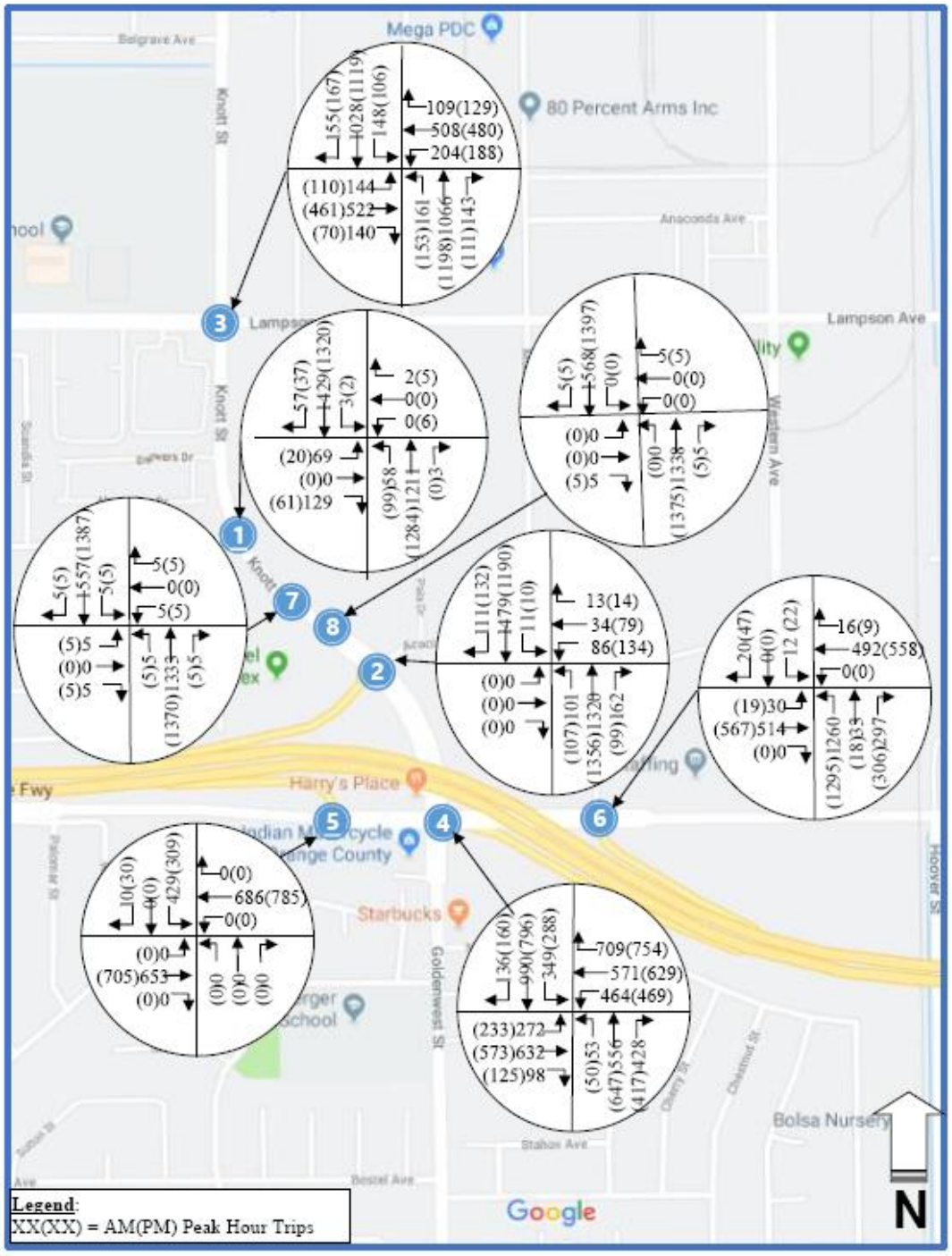


TABLE 5
2021 PRE-PROJECT CONDITIONS LEVEL OF SERVICE SUMMARY

Intersection	Peak Hour	Future 2021 Conditions Without Project	
		LOS	Delay, Sec or V/C
1. Knott Street and Stanford Avenue (Signalized)*	AM PM	A A	0.570 0.495
2. Knott Street and SR-22 W/B On-ramp (Signalized)	AM PM	B B	12.1 14.1
3. Knott Street and Lampson Avenue (Signalized)*	AM PM	C C	0.782 0.747
4. Knott Street and Garden Grove Bl (Signalized)	AM PM	F D	84.6 54.1
5. Garden Grove Bl and SR-22 E/B Off-ramp (Signalized)	AM PM	B B	11.5 10.8
6. Garden Grove Bl and SR-22 W/B Off-ramp (Signalized)	AM PM	C C	27.6 24.3
7. Knott Street and Northerly Project (Unsignalized)*	AM PM	A A	0.603 0.549
8. Knott Street and Southerly Project (Unsignalized)*	AM PM	A A	0.596 0.543

* LOS and V/C ratio determined using ICU Method

PROPOSED PROJECT

PROJECT DESCRIPTION

The purpose of this traffic impact analysis is to evaluate the impacts on traffic circulation system due to the proposed Development of 12821 Knott Street Industrial Warehouse in the City of Garden Grove, California. The combined floor area of the project's proposed buildings will be 165,171 square feet (including proposed 45,335 square feet new building addition to existing 119,836 square feet NextLevel Sports Goods building) of which a total of 20,000 square feet will be for ancillary office uses. The project site is located on the west side of Knott Street, adjacent to the westbound on-ramp to SR-22 freeway.

The project site consists of 7.83 acres of commercial land. Access to the proposed project will be provided by two existing driveways located on the west side of Knott Street. The project will provide a total of 181 parking spaces in addition to a total of 32 spaces to be used for truck docking/loading and parking.

Vehicular access (personal vehicles and trucks) will be provided by two existing driveways on Knott Street. The northerly driveway will be 40 feet wide and will provide full access for vehicles and trucks. The southerly driveway will be 26 feet wide and will provide access by right-turn in and right-turn out only movements for personal vehicles. The driveways will accommodate two lanes, one lane for ingress and one lane for egress. The internal drive aisles will connect the two driveways.

The project will provide a total of 181 parking spaces in addition to a total of 32 spaces to be used for truck docking/loading and parking.

Figure 7 shows the proposed site plan for the project.

FIGURE 7: PROJECT SITE PLAN

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PROJECT TRIP GENERATION

In order to accurately assess future traffic conditions with the proposed project, trip generation estimates were developed for the project. Trip generation rates for the project are based on the nationally recognized recommendations contained in "Trip Generation" manual, 9th edition, published by the Institute of Transportation Engineers (ITE). ITE also provides information on percentage of truck traffic associated with this type of land use. Approximately 20% of all vehicular trips generated by a warehouse are assumed to be truck trips. A truck trip is generally equivalent to 2.5 passenger car trips on an average. Therefore, a 2.5 factor was applied to the number of truck trips to estimate passenger car equivalent (PCE) trips generated by the trucks.

Table 6 shows a summary of trip generation estimates for the project. It is estimated that the project will generate approximately 374 net PCE trips per average day (187 inbound and 187 outbound). The average weekday net new peak hour PCE trips will be approximately 36 trips during the AM peak hour 28 inbound and 8 outbound), and 42 trips during the PM peak hour (11 inbound and 31 outbound).

TRIP DISTRIBUTION AND ASSIGNMENT

Arrival and departure distribution patterns for project-generated traffic were estimated based upon a review of circulation patterns within the study area network and regional traffic generation and attraction characteristics.

Figure 8 depicts the regional trip distribution percentages to and from the site.

Figure 9 depicts project traffic volumes at key circulation locations during the AM and PM peak hours.

TABLE 6
12821 KNOTT STREET WAREHOUSE PROJECT

ITE Code/ Land Use	Size & Unit	Trip Generation Rate[1]							Average Traffic Volume						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			Total	%IN	%OUT	Total	%IN	%OUT		IN	OUT	Total	IN	OUT	Total
Total Vehicle Trip Generation															
150 Warehouse	165.171 KSF	1.74	0.17	77%	23%	0.19	27%	73%	288	22	6	28	8	23	31
Vehicle Mix[2] and Passenger Car Equivalent (PCE) Trips															
Vehicle Mix	Trip %	Vehicle Trips							PCE trips						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			IN	OUT	Total	IN	OUT	Total		IN	OUT	Total	IN	OUT	Total
Car (PCE=1.0)	80.00%	230	18	5	23	6	18	24	230	18	5	23	6	18	24
2/3/4-axle Truck (PCE=2.5)	20%	58	4	1	5	2	5	7	144	10	3	13	5	13	18
TOTAL TRIPS IN PCE:									374	28	8	36	11	31	42

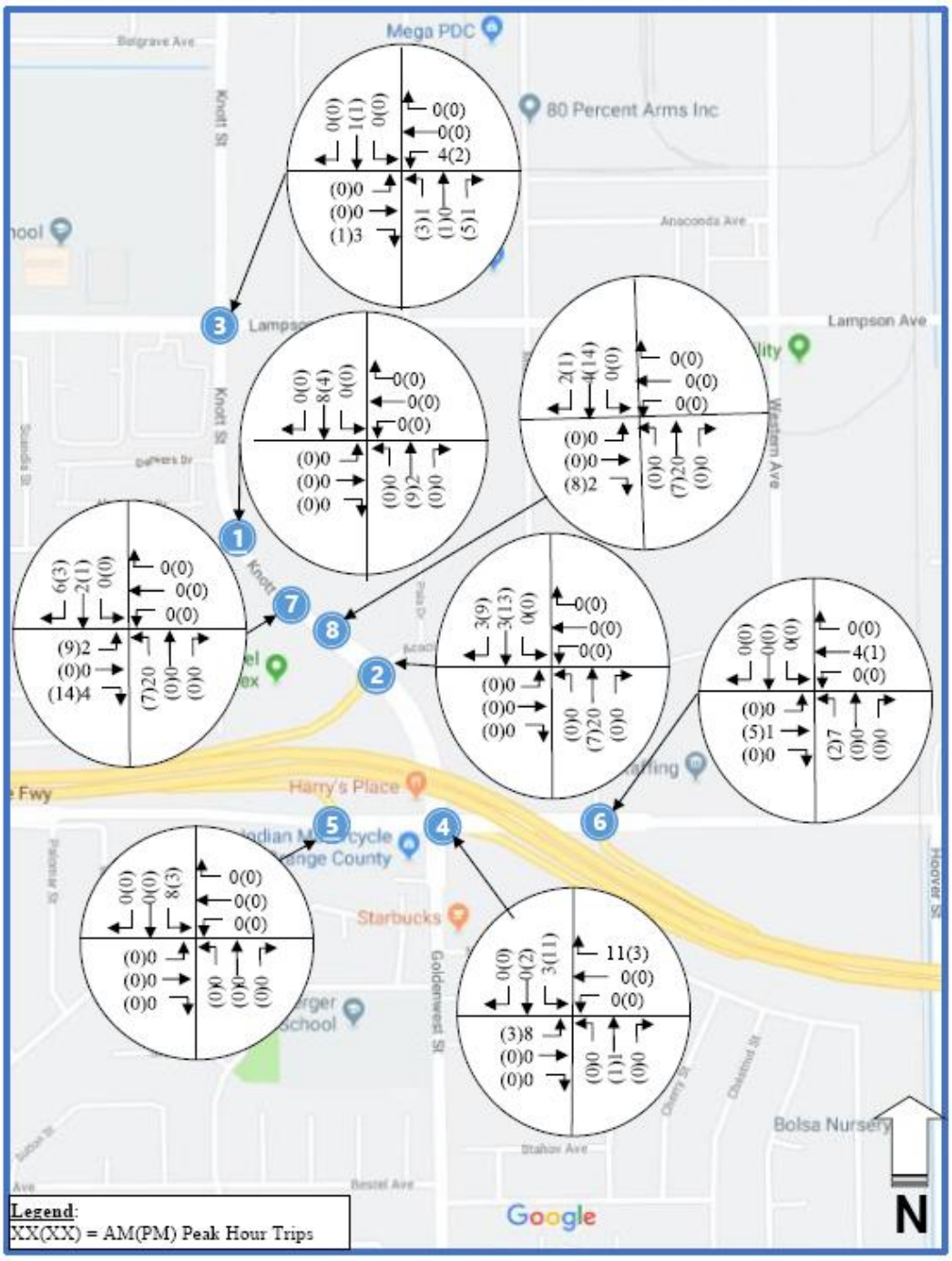
Note: All trip rates are average rates per Institute of Transportation Engineers (ITE)'s publication manual "Trip Generation", 10th Edition, 2017.

[1] Trip rates for Warehouse (ITE Code 150) from Institute of Transportation Engineers (ITE), "Trip Generation" manual, 10th Edition, 2017

[2] Vehicle mix percentages for Heavy Warehouse (ITE Code 150) from Institute of Transportation Engineers (ITE Generation" manual, 10th Edition, 2017

FIGURE 8: PERCENTAGES OF PROJECT RELATED TRIPS

FIGURE 9: DISTRIBUTION OF PROJECT TRAFFIC



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2021 CUMULATIVE CONDITIONS WITH PROJECT TRAFFIC

2021 POST-PROJECT CUMULATIVE TRAFFIC VOLUMES WITH PROJECT

The 2021 cumulative post-project traffic volumes were estimated by adding project related traffic volumes to the 2021 pre-project traffic volumes with 1.0% per year ambient growth and related project traffic. **Figure 10** shows Year 2021 post-project cumulative volumes for AM and PM peak hours.

Year 2021 post-project cumulative (i.e., existing plus ambient traffic plus related project plus project traffic) conditions were evaluated using the 2010 Highway Capacity Manual (HCM) operational delay method of level of service (LOS) analysis for signalized intersections. For the intersections under the sole jurisdiction of the City of Garden Grove, the Intersection Capacity Utilization (ICU) method of level of service (LOS) was used. The LOS and delay or V/C ratios for the study intersections under 2021 post-project cumulative conditions (with project) are summarized in **Table 7**. Detailed calculations relating to the study intersections, performed with Synchro traffic analysis software or using Intersection Capacity Utilization (ICU) methodology, are included in the Technical Appendix of this report.

The results indicate that, except for the intersection of Knott Street and Garden Grove Boulevard, all the study intersections will continue to operate at a Level of Service (LOS) D or better (i.e., within the range of acceptable thresholds of LOS A through D) during the AM and PM peak hours under existing plus project traffic conditions.

FIGURE 10: FUTURE 2021 POST-PROJECT CUMULATIVE TRAFFIC VOLUMES

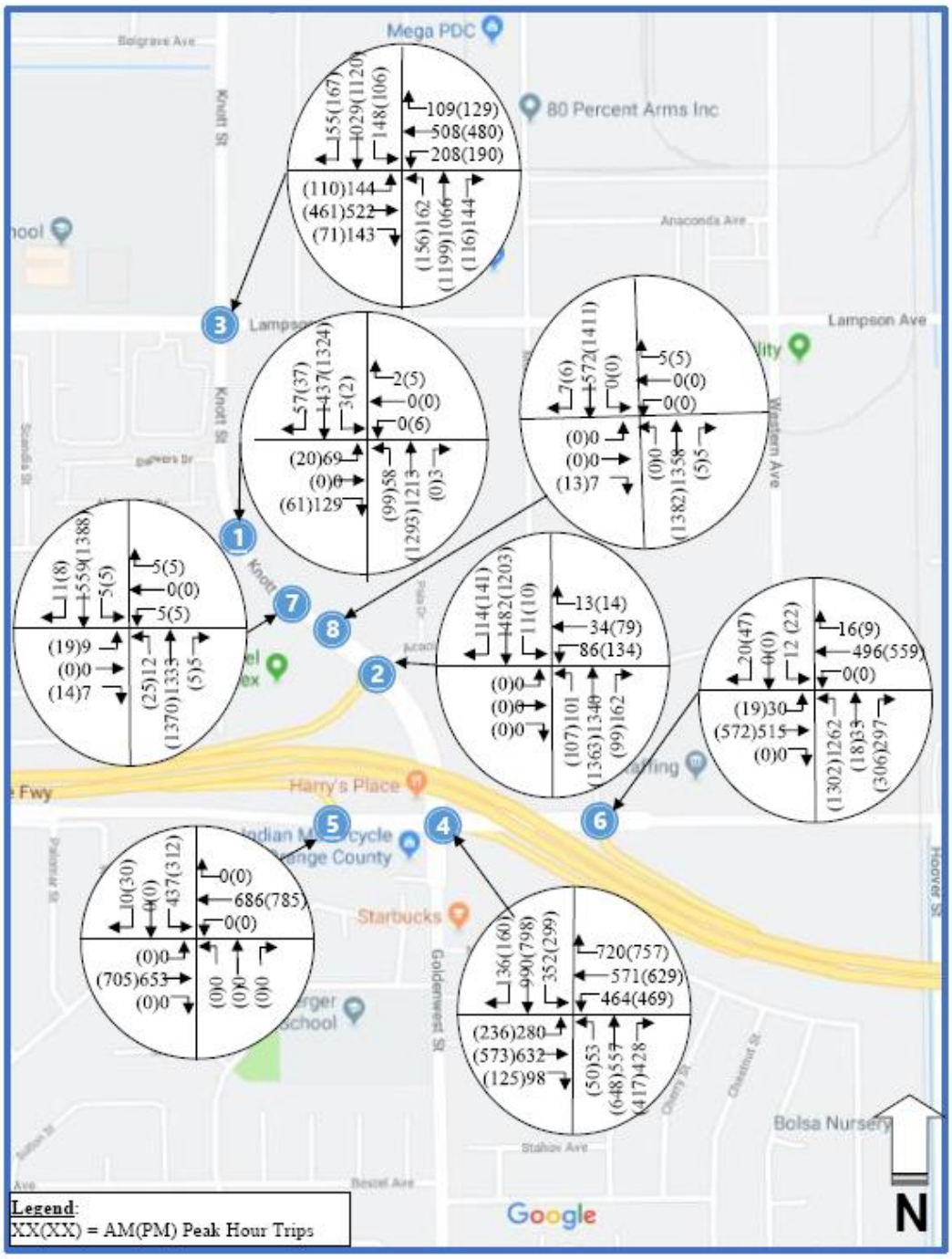


TABLE 7
FUTURE 2021 LEVEL OF SERVICE SUMMARY WITH PROJECT

Intersection	Peak Hour	Future 2021 Conditions With Project	
		LOS	Delay, Sec or V/C Ratio
1. Knott Street and Stanford Avenue (Signalized)*	AM	A	0.571
	PM	A	0.496
2. Knott Street and SR-22 W/B On-ramp (Signalized)	AM	B	12.2
	PM	B	14.3
3. Knott Street and Lampson Avenue (Signalized)*	AM	C	0.786
	PM	C	0.751
4. Knott Street and Garden Grove Bl (Signalized)	AM	F	84.7
	PM	D	54.3
5. Garden Grove Bl and SR-22 E/B Off-ramp (Signalized)	AM	B	11.5
	PM	B	10.8
6. Garden Grove Bl and SR-22 W/B Off-ramp (Signalized)	AM	C	27.7
	PM	C	25.1
7. Knott Street and Northerly Project (Unsignalized)*	AM	A	0.613
	PM	A	0.562
8. Knott Street and Southerly Project (Unsignalized)*	AM	A	0.596
	PM	A	0.549

* LOS and V/C ratio determined using ICU Method

PROJECT IMPACT AND MITIGATION MEASURES

As indicated in the previous section, except for the intersection of Knott Street and Garden Grove Boulevard, all of the study intersections would operate at an acceptable level of service (i.e., within the range of acceptable thresholds of LOS A through LOS D) during the AM or the PM peak hours with 2021 post-project cumulative traffic volumes with project. The intersection of Knott Street and Garden Grove Boulevard will operate at a deficient LOS F during the AM peak hours. However, the project's off-site traffic impact would not be considered significant at any of the study intersections based on operational delay (or V/C ratio) and level of service expected after the project. A project's traffic impact is determined to be significant if the project generated traffic volume causes the intersection to deteriorate to LOS E and F. The intersection of Knott Street and Garden Grove Boulevard operates at a deficient LOS F during the AM peak hours under existing 2019 as well as 2021 pre-project traffic conditions.

The project's off-site traffic impact would not be considered significant at any of these intersections based on delay and level of service expected after the project. A project's impact on the circulation system is determined by comparing the level of service (LOS) and delays (or V/C ratios) at key intersections under the future pre-project conditions and future post-project conditions. A LOS level D or better is acceptable for urban area intersections. A level of service worse than D (i.e., LOS E or F) is considered deficient and unacceptable. A project's traffic impact is determined to be significant if the LOS is deteriorated below D due to the project or the increase in delay is 6 seconds or more at LOS C, or 4 seconds or more at LOS D, or 2.5 seconds or more at LOS E or F, as defined by one of the largest Cities in the region, the City of Los Angeles, as follows:

Significant Transportation Impact Thresholds for Transportation Infrastructure Projects

LEVEL OF SERVICE	FINAL V/C RATIO	PROJ-RELATED INCREASE IN V/C
C	> 20 - 35	equal to or greater than 6.0 seconds
D	> 35 – 55	equal to or greater than 4.0 seconds
E	> 55 – 80	equal to or greater than 2.5 seconds
F	> 80	equal to or greater than 2.5 seconds

(Ref: City of Los Angeles Transportation Impact Study Guidelines, December 2016,

https://ladot.lacity.org/sites/g/files/wph266/f/COLA-TISGuidelines-010517.pdf)

In Intersection Capacity Utilization (ICU) method, a project's traffic impact is determined to be significant if the increase in V/C ratio is 0.04 or more at LOS C, or 0.02 or more at LOS D, or 0.01 or more at LOS E and F.

The results of future traffic (with and without Project) scenarios' LOS analysis have been summarized in **Table 8** to compare Project's traffic impact at key intersections.

TABLE 8
FUTURE 2021 LEVEL OF SERVICE SUMMARY WITH AND WITHOUT PROJECT

Intersection	Peak Hour	Future 2021 Conditions				Increase in Delay in sec (or V/C Ratio) by Project,
		Without Project		With Project		
		LOS	Delay, Sec or V/C Ratio	LOS	Delay, Sec or V/C Ratio	
1. Knott Street and Stanford Avenue (Signalized)*	AM	A	0.570	A	0.571	0.001
	PM	A	0.495	A	0.496	0.001
2. Knott Street and SR-22 W/B On-ramp (Signalized)	AM	B	12.1	B	12.2	0.1
	PM	B	14.1	B	14.3	0.2
3. Knott Street and Lampson Avenue (Signalized)*	AM	C	0.782	C	0.786	0.004
	PM	C	0.747	C	0.751	0.004
4. Knott Street and Garden Grove Bl (Signalized)	AM	F	84.6	F	84.7	0.1
	PM	D	54.1	D	54.3	0.2
5. Garden Grove Bl and SR-22 E/B Off-ramp (Signalized)	AM	B	11.5	B	11.5	0.0
	PM	B	10.8	B	10.8	0.0
6. Garden Grove Bl and SR-22 W/B Off-ramp (Signalized)	AM	C	27.6	C	27.7	0.1
	PM	C	24.3	C	25.1	0.8
7. Knott Street and Northerly Project (Unsignalized)*	AM	A	0.603	A	0.613	0.010
	PM	A	0.549	A	0.562	0.013
8. Knott Street and Southerly Project (Unsignalized)*	AM	A	0.596	A	0.596	0.000
	PM	A	0.543	A	0.549	0.006

* LOS and V/C ratio determined using ICU Method

As shown in **Table 8**, the project traffic would not cause any of the study intersections to deteriorate to LOS E or F and would not exceed the significance thresholds of project-related impacts.

Since the project's traffic impacts would not be significant at any of the off-site intersections, no off-site intersection mitigation measures would be necessary for the development of this project.

SITE ACCESS ANALYSIS

The project will provide two access driveways to surface parking area off Knott Street. The existing northerly driveway is 40 feet wide and will provide ingress and egress for both passenger cars and trucks with 1 lane in each direction. The existing southerly driveway is 26 feet wide and will provide ingress and egress for both passenger cars only with 1 lane in each direction. However, this driveway will be restricted for right-turn-in and right-turn out only movements. Both of these driveways will be Stop-controlled for exit on to Knott Street.

Figure 11 shows project traffic volumes at the driveways.

A maximum of 20 vehicles will enter the northerly driveway from the south by making a left-turn movement during the peak hour. A maximum of 15 vehicles will exit the site during the peak hour through this driveway to travel north by making a left-turn movement.

A maximum of 6 vehicles will enter the northerly driveway from north by making a right-turn movement during the peak hour. A maximum of 14 vehicles will exit the site during the peak hour through this driveway to travel south by making a right-turn movement.

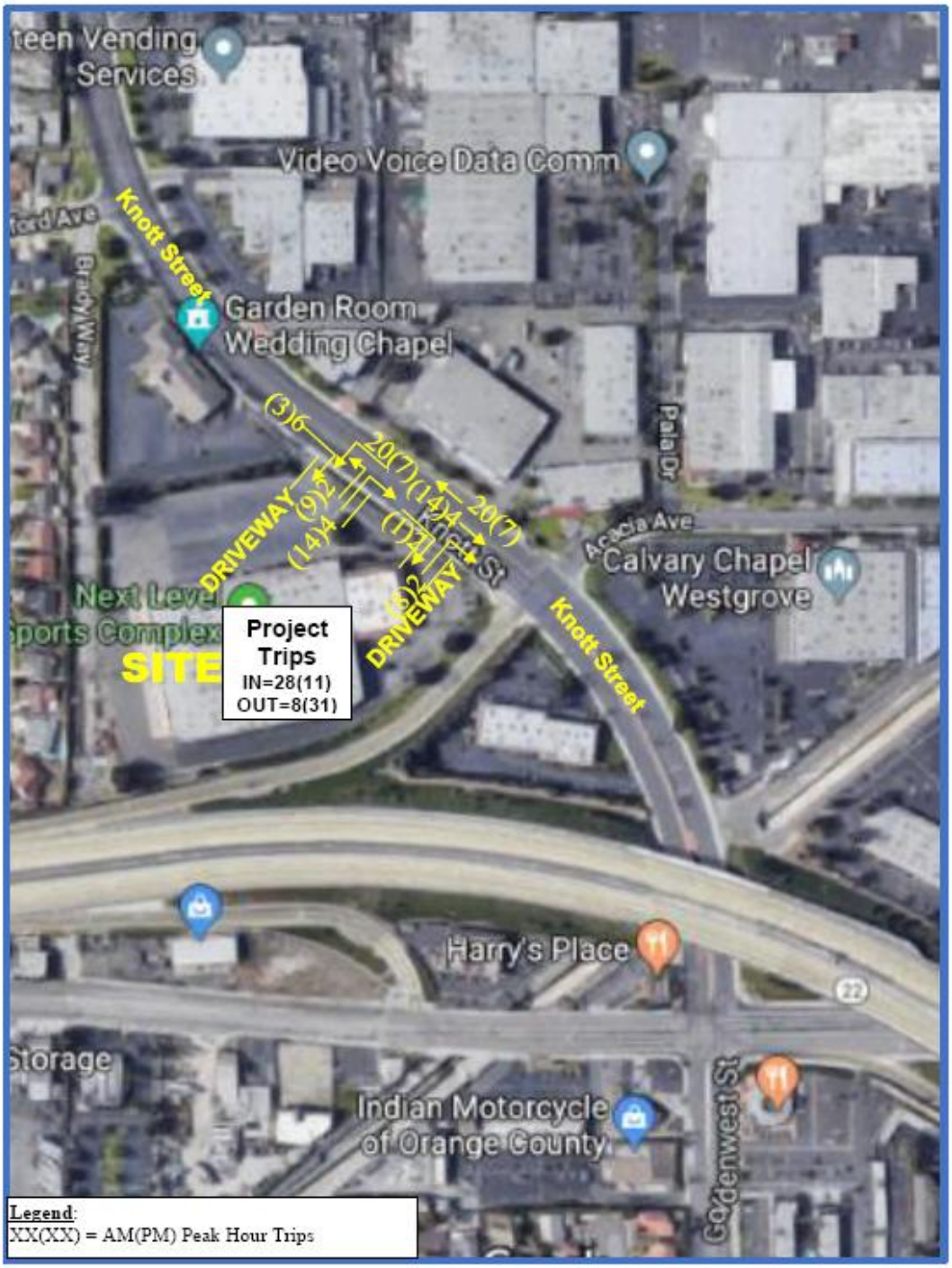
A maximum of 2 vehicles will enter the southerly driveway from north by making a right-turn movement during the peak hour. A maximum of 8 vehicles will exit the site during the peak hour through this driveway to travel south by making a right-turn movement.

The low turn volume at the driveways is not expected to cause any queuing at the driveways.

Adequate sight distance is available from the driveways along the north and south directions on Knott Street.

The southerly driveway on Knott Street should be striped for right turn in and out movement only, with a right-arrow pavement marking. A right-turn arrow sign along with a Stop sign should also be posted at this driveway for exiting vehicles.

FIGURE 11: PROJECT TRAFFIC AT DRIVEWAYS



PARKING DEMAND ANALYSIS

Adequate parking spaces will be provided on-site for the proposed 12821 Knott Street Warehouse project in accordance with the parking code requirements of the City of Garden Grove. The City's parking codes require 1 space for each one thousand square feet of warehouse uses. Accordingly, for the proposed 165,171 gross square feet warehouse project, the required space would be a total of 166.

The project's site plan indicates that the surface parking will consist of 181 parking spaces. The 181 parking spaces will adequately satisfy project's parking requirement of 166 spaces per parking code of the City. Of the total, 4 parking spaces will be ADA-compliant, and 17 spaces will be designated for electrical vehicle charging and parking purposes.

CONCLUSION

Based on the results of the traffic impact analysis, the proposed 12821 Knott Street Warehouse project would not significantly impact any of the key intersections analyzed in the surrounding roadway system. Except for the intersection of Knott Street and Garden Grove Boulevard, all the study intersections would continue to operate at an acceptable level of service (i.e., at LOS A through D) during the AM and PM peak hours. The intersection of Knott Street and Garden Grove Boulevard will operate at a deficient LOS F during the AM peak hours. However, the project's off-site traffic impact would not be considered significant at any of the study intersections based on increase in operational delay (or V/C ratio) and level of service expected after the project. Therefore, no off-site intersection mitigation measures would be necessary for the development of this project.

The low turn volume at the at the existing northerly and southerly project driveways is not expected to cause any queuing at the driveways. Adequate sight distance is available from the driveways along the north and south directions on Knott Street.

The southerly project driveway on Knott Street should be striped for right turn in and out movement only, with a right-arrow pavement marking. A right-turn arrow sign along with a Stop sign should also be posted at this driveway for exiting vehicles.