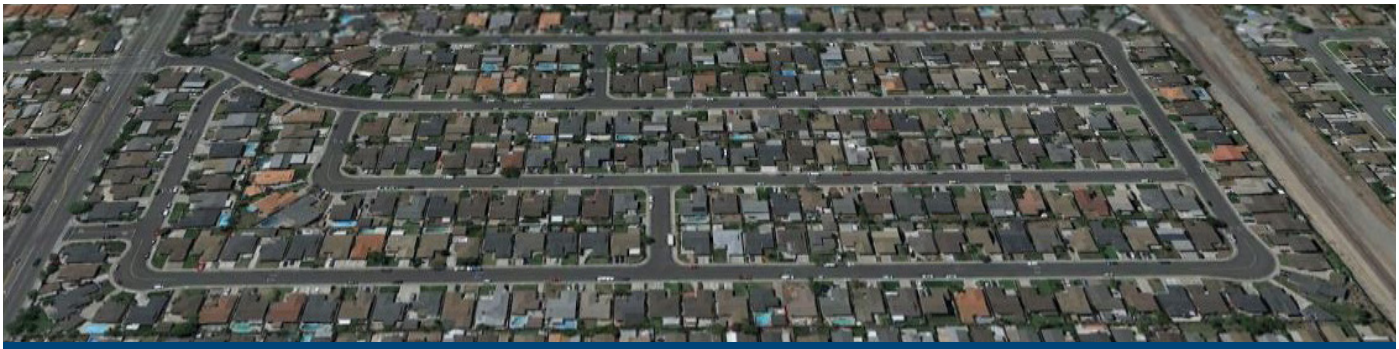
Volume II of II

DRAFT ENVIRONMENTAL IMPACT REPORT



Former Kast Property Tank Farm Site Remedial Action Plan

Carson, California

State Clearinghouse No. 2014031053

(Appendix C to Appendix G)

Prepared for the California Regional Water Quality Control Board, Los Angeles Region by PCR Services Corporation

November 2014

Volume II of II

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Prepared For:

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November 2014

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RAP - FORMER KAST PROPERTY

Draft EIR

Appendix C: Air Quality Assessment

Provided by PCR Services Corporation

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Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/10/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*10-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\10 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-10-14

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Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

	Street Work (Hours/day)					
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding I	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Trucl	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided
Trenching/pipe installation	10	people	Information provided
Air-vac borehole clearance	3	people	Information provided
Drilling and SVE well install	4	people	Information provided
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	32	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.

Kast Air Emissions Calculations

Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff
Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.

Kast Air Emissions Calculations

Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 237 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 237 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,764	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	1.05	8.4	134	991	991
Green Waste - Truck Trips	1	59	0.50	4.0	32	237	237
Excavation - Truck Trips	15	889	1.86	14.9	1,787	3,530	13,238
SVE Well/Piping - Truck Trips	1	59	0.13	1.1	9	63	63
Subslab Vent - Truck Trips	1	59	0.00	0.0	0	0	0
Backfill/Compact - Truck Trips	12	711	1.99	15.9	1,529	3,776	11,327
Slurry Backfill - Truck Trips	7	415	0.64	5.1	287	1,214	2,124
Site Resto. - Truck Trips	10	593	0.37	3.0	237	702	1,755
Worker Trips	49	1,256	4.00	32	12,544	8,032	40,192
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	12	100	1,599	11,840	11,840
Excavation	7	209	25,024	49,423	185,336
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	23	186	17,818	43,988	131,964
Slurry Backfill	12	93	5,216	22,077	38,634
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.12	1	178	178
Excavation - Truck Trips	0.4	3	600	600
Slurry Backfill - Truck Trips	0.4	3	556	556
Restoration - Truck Trips	0.1	1	113	113
Pipe Delivery - Truck Trips	0.1	1	180	180
Worker Trips	5.3	42	7,560	7,560

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	1	11	2,060	2,060
Excavation	6	45	8,100	8,100
Slurry Backfill	3	28	5,000	5,000
Restoration	1	7	1,308	1,308

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.13	1.0	63	63
Drilling and SVE Well Installation - Truck Trips	0.13	1.0	63	63
Waste Collection - Truck Trips	0.25	2.0	126	126
Waste Transport to Offsite Disposal - Truck Trips	0.12	1.0	60	60
Worker Trips	4.88	39	2,457	2,457

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	3	24	1,512	1,512
Waste Transport to Offsite Disposal	1.4	12	725	725

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Street Grinding Units	Street Paving Value	Street Paving Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

IV. On-Site Haul Roads - Re-entrained Dust

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site haul roads at the residential homes. The on-site haul roads consist of off-road equipment transporting soil to-and-from the dump truck.

$$E = k(s/12)^a(W/3)^b$$

Where:
E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
a = empirical constant
b = empirical constant
k = empirical constant
Source: AP-42 13.2.2-4, Equation (1a)

Assumptions Parameters	Value	Unites	Notes
s (silt content)	6.4	%	Western Governors' Association, Western Regional Air Partnership (WRAP) Fugitive Dust Handbook, Table 6-2. Average silt content for gravel/crushed limestone road surface material.
W (vehicle weight)	18,000	lbs	Weight of excavator
a (empirical constant)	0.9	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
b (empirical constant)	0.45	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
k (empirical constant) - PM10	1.5	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10)
k (empirical constant) - PM2.5	0.15	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM2.5)
Shovel Load (soil) Bobcat	1.25	cy	volume of soil a bucket can hold, http://www.bobcat.com/attachments/bucket_loader_general
Shovel Load (soil) Excavator	1.75	cy	volume of soil a bucket can hold
Weight of a bobcat	3.11	tons	Based on spec information from a S185 Skide-Steer Loader, http://www.bobcat.com/loaders/models/skidsteer/s185
Mitigation (% Reduction)	84%	%	Apply dust suppressants on inactive areas. SCAQMD mitigation measures examples. Table X1-A.
Haul Route length	200	ft	Assumed distance soil would have to be hauled on each property

Option 1 Phases	Hourly Round Trips	Daily Round Trips	8 Home Clusters	Annual Round Trips	Equipment Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT
Demo	1.0	8	134	991	Bobcat	3.11	0.08	0.08	2.53
Excavation	1.9	15	14,300	28,242	Excavator	9	0.08	0.14	4.51
SVE Well/Piping	0.1	1	0	0	0	0	0	0	0.00
Subslab Vent	0.0	0	0	0	0	0	0	0	0.00
Backfill/Compact	2.0	16	10,182	25,136	Excavator	9	0.08	0.15	4.83
Site Resto.	0.0	3	0	0	0	0	0	0	0.00

Emission Calculation

Daily:

Option 1 Phases	Daily VMT (SCAB)	W (tons)	k (PM10)	k (PM2.5)	Mitigation %	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)
Demo	2.5	3.11	1.5	0.15	84%	0.87	0.09	0.35	0.04
Excavation	4.5	9	1.5	0.15	84%	1.40	0.14	1.01	0.10
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	4.8	9	1.5	0.15	84%	1.40	0.14	1.08	0.11
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

V. Fugitive Dust Emissions During Soil Excavation and Handling

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site soil handling and excavation at the residential homes and during street trenching. The on-site soil handing and excavation consists of two parts: 1) Excavating soil 2)Dropping soil

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

Where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

Source: AP-42 13.2.4-3, Equation (1)

Assumptions Equation parameters	Value	Units	Notes
k - PM10	0.35	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
k - PM2.5	0.053	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
U	4.21	mph	Average wind speed
M	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Soil Density	3,400	lbs/CY	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
Times Soil is Handled	2	time	1) Excavating soil 2) Dropping soil

Emission Calculation (PM10)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	Daily CY	Daily (tons)	k (PM10)	U (mph)	M%	EF (lbs/ton)	Mitigation (%)	PM10 Emissions (lbs/day)
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	209	354.5	0.35	4.20556	7.9	1.31E-04	84%	1.48E-02
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	186	315.5	0.35	4.20556	7.9	1.31E-04	84%	1.32E-02
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	45	76.5	0.35	4.20556	7.9	1.31E-04	84%	3.20E-03
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Emission Calculation (PM2.5)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	**Daily CY**	**Hourly (tons)**	**k (PM2.5)**	**U (mph)**	**M%**	**EF (lbs/ton)**	**Mitigation (%)**	**PM2.5 Emissions (lbs/day)**
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	209	354.5	0.053	4.21	7.9	1.98E-05	84%	2.25E-03
SVE Well/Piping	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	186	315.5	0.053	4.21	7.9	1.98E-05	84%	2.00E-03
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	45	76.5	0.053	4.21	7.9	1.98E-05	84%	4.85E-04
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

VI. Dust Emissions during Concrete Breaking

Summary: This section calculates the dust emissions (PM2.5, PM10) during on-site concrete breaking at residential homes, street trenching and street paving. The on-site dust emissions from concrete breaking consists of two parts: 1) Mechanical dismemberment and 2) Debris loading

Mechanical Dismemberment Equations

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

U = Mean wind speed

M = material moisture content (%). The moisture contents of different materials are listed in Table 13.2.4-1 of AP 42. The program uses the moisture content of cover (12%) as default.

Where:

EF_D = emission factor (lb PM/ton of debris)

$EF_{D\text{-}PM10}$ = 0.0011 lb PM_{10}/ton of debris

$EF_{D\text{-}PM2.5}$ = 0.00017 lb $PM_{2.5}$/ton of debris

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 11

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Mean wind speed (U)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Typical Density of Concrete	150	lbs/ft^3	Information provided by project staff
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas

Phase	Hourly Weight of Concrete (tons)	Daily Weight of Concrete (tons)	Weight of Concrete per 8 Home Cluster (tons)	Annual Weight of Concrete (tons)	Total Weight of Concrete (tons)
Option 1					
Demo	25	201	3,213	23,798	23,798
Excavation	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00
Street Trenching					
Demo	3	22	0.00	4,016	4,016
Excavation	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00
Street Paving					
Street Grinding	62	374	0.00	1,872	1,872

Mechanical Dismemberment Emissions Calculations

Concrete Breaking Emissions - Daily

Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	4.20E-03	6.36E-04
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	4.67E-04	7.07E-05
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	1.31E-04	1.98E-05	84%	7.83E-03	1.19E-03

Debris Loading Equations

$$EF_L = k \times EF_{L\text{-}TSP}$$

Where:

EF_L = emission factor (lb/ton)

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 12

The default value for $EF_{L\text{-}TSP}$ is 0.058 lb/ton, the average of the two TSP factor (i.e. 0.053 and 0.063 lb/ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader.

Source: CalEEMod, Appendix A, Page 13

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Emission Factor for Total Suspended Particulates (TSP)	0.058	lb/ton	CalEEMod, Appendix A, Page 13

Debris Loading Emissions Calculations

Concrete Debris Loading - Daily Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	0.0203	0.003074	84%	6.52E-01	9.88E-02
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	0.0203	0.003074	84%	7.25E-02	1.10E-02
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	0.0203	0.003074	84%	1.22E+00	1.84E-01

Total Concrete Breaking Emissions (Mechanical Dismemberment + Debris Loading)

Total Concrete Breaking Emissions - Daily		
Phase	**Concrete Breaking Emissions for PM10 (lbs of PM10)**	**Concrete Breaking Emissions PM2.5 (lbs of PM2.5)**
Option 1		
Demo	6.56E-01	9.94E-02
Excavation	0.00	0.00
SVE Well/Piping	0.00	0.00
Subslab Vent	0.00	0.00
Backfill/Compact	0.00	0.00
Slurry Backfill	0.00	0.00
Site Resto.	0.00	0.00
Street Trenching		
Demo	7.29E-02	1.10E-02
Excavation	0.00	0.00
Backfill	0.00	0.00
Restoration	0.00	0.00
Street Paving		
Street Grinding	1.22E+00	1.85E-01
Total	1.95E+00	2.96E-01

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase												Emissions Factors (g/bhp-hr)						
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2[2]	PM10	PM2.5	SOx[2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders/Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and SOx were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations					Daily Emissions (lb)			
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations				Daily Emissions (lb)			
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions						g/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions						lbs/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data								SCAB			
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.05	8	134	991	Dump Truck	25	0.72	0.75	6	96	713
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	1.86	15	1,787	3,530	Dump Truck	25	0.72	1.34	11	1286	2541
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	0.72	0.10	0.8	6	45
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	1.99	16	1,529	3,776	Dump Truck	25	0.72	1.43	11	1101	2717
Slurry Backfill	0.64	5	287	1,214	Concrete Truck	25	0.72	0.46	4	206	874
Site Resto.	0.37	3	237	702	Concrete Truck	25	0.72	0.27	2	171	505
Street Trenching											
Demo	0.12	1	0	178	Dump Truck	25	0.72	0.09	0.7	0.00	128
Excavation	0.42	3	0	600	Dump Truck	25	0.72	0.30	2	0.00	432
Backfill	0.39	3	0	556	Dump Truck	25	0.72	0.28	2	0.00	400
Restoration	0.08	1	0	113	Concrete Truck	25	0.72	0.06	0.5	0.00	81
Pipe Delivery	0.13	1	0	180	Dump Truck	25	0.72	0.09	1	0.00	130
Well Installation											
Air Vac- Borehole Clearance	0.13	1	0	63	Air-Vac	25	0.72	0.09	1	0.00	45
Drilling and SVE Well Installation	0.13	1	0	63	Drill Rig	25	0.72	0.09	1	0.00	45
Waste Collection	0.25	2	0	126	Dump Truck	25	0.72	0.18	1	0.00	91
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	6.0	1.6E-03	1.1E-02	2.9E-02	2.1E+01	8.1E-04	7.5E-04	2.2E-04	7.9E-05	7.2E-05
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	10.7	2.9E-03	2.0E-02	5.1E-02	3.7E+01	1.4E-03	1.3E-03	4.0E-04	1.4E-04	1.3E-04
SVE Well/Piping	0.8	2.1E-04	1.5E-03	3.6E-03	2.7E+00	1.0E-04	9.5E-05	2.8E-05	1.0E-05	9.2E-06
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	11.5	3.1E-03	2.2E-02	5.4E-02	4.0E+01	1.5E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Slurry Backfill	3.7	1.0E-03	7.0E-03	1.8E-02	1.3E+01	5.0E-04	4.6E-04	1.4E-04	4.8E-05	4.4E-05
Site Resto.	2.1	5.8E-04	4.1E-03	1.0E-02	7.4E+00	2.9E-04	2.6E-04	7.9E-05	2.8E-05	2.6E-05
Street Trenching										
Demo	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.6E-05	8.8E-05	2.6E-05	9.3E-06	8.6E-06
Excavation	2.4	6.5E-04	4.6E-03	1.1E-02	8.3E+00	3.2E-04	3.0E-04	8.9E-05	3.1E-05	2.9E-05
Backfill	2.2	6.0E-04	4.2E-03	1.1E-02	7.7E+00	3.0E-04	2.8E-04	8.2E-05	2.9E-05	2.7E-05
Restoration	0.5	1.2E-04	8.6E-04	2.1E-03	1.6E+00	6.1E-05	5.6E-05	1.7E-05	5.9E-06	5.4E-06
Pipe Delivery	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Well Installation										
Air Vac- Borehole Clearance	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Drilling and SVE Well Installation	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Waste Collection	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Misc Worker Trips

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	0.72	23	3.2E-03	1.3E-01	1.4E-02	3.5E+01	1.5E-04	1.5E-05	3.6E-04	2.3E-03	9.1E-04
Street Trenching	42	0.72	30	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03
Well Installation	39	0.72	28	4.0E-03	1.6E-01	1.7E-02	4.3E+01	1.9E-04	1.9E-05	4.3E-04	2.8E-03	1.1E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIIII. On-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from on-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Heavy Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.0005	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways: http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street travel)
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
On-Site Heavy Truck	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Paved Road Average	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	SCAB Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.0	8.4	133.8	991.1	Dump Truck	25	0.72	0.8	6.0	96.3	713.3
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	0.72	0.4	2.9	23.0	170.6
Excavation	1.9	14.9	1787.5	3530.3	Dump Truck	25	0.72	1.3	10.7	1286.4	2540.7
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	0.72	0.1	0.8	6.1	45.5
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.0	15.9	1529.4	3775.8	Dump Truck	25	0.72	1.4	11.5	1100.7	2717.4
Slurry Backfill	0.6	5.1	286.8	1213.8	Concrete Truck	25	0.72	0.5	3.7	206.4	873.6
Site Resto.	0.4	3.0	237.0	702.0	Concrete Truck	25	0.72	0.3	2.1	170.5	505.2
Street Trenching											
Demo	0.1	1.0	0.00	178.0	Dump Truck	25	0.72	0.1	0.7	0.00	128.1
Excavation	0.4	3.3	0.00	600.0	Dump Truck	25	0.72	0.3	2.4	0.00	431.8
Backfill	0.4	3.1	0.00	556.0	Dump Truck	25	0.72	0.3	2.2	0.00	400.2
Restoration	0.1	0.6	0.00	113.0	Concrete Truck	25	0.72	0.1	0.5	0.00	81.3
Pipe Delivery	0.1	1.0	0.00	180.0	Dump Truck	25	0.72	0.1	0.7	0.00	129.5
Well Installation											
Air Vac-Borehole Clearance	0.1	1.0	0.00	63.0	Air-Vac	25	0.72	0.1	0.7	0.00	45.3
Drilling and SVE Well Installation	0.1	1.0	0.00	63.0	Drill Rig	25	0.72	0.1	0.7	0.00	45.3
Waste Collection	0.3	2.0	0.00	126.0	Dump Truck	25	0.72	0.2	1.4	0.00	90.7
Street Paving											
Street Grinding	2.7	16.0	0.00	80.0	Dump Truck	25	0.72	1.9	11.5	0.00	57.6
Street Paving	1.3	8.0	0.00	80.0	Dump Truck	25	0.72	1.0	5.8	0.00	57.6

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	6.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.65E-04	8.96E-05
Green Waste	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Excavation	10.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.50E-04	1.60E-04
SVE Well/Piping	0.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.65E-05	1.14E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.95E-04	1.71E-04
Slurry Backfill	3.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.24E-04	5.49E-05
Site Resto.	2.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.29E-04	3.17E-05
Street Trenching											
Demo	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.32E-05	1.06E-05
Excavation	2.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.45E-04	3.57E-05
Backfill	2.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.35E-04	3.31E-05
Restoration	0.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.74E-05	6.72E-06
Pipe Delivery	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Well Installation											
Air Vac-Borehole Clearance	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Drilling and SVE Well Installation	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Waste Collection	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.73E-05	2.14E-05
Street Paving											
Street Grinding	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.98E-04	1.71E-04
Street Paving	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-04	8.57E-05

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	32	0.72	23	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	3.42E-03	8.40E-04
Street Trenching	42	0.72	30	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.49E-03	1.10E-03
Well Installation	39	0.72	28	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.17E-03	1.02E-03
Street Paving													
Street Grinding	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04
Street Paving	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	1.0	8	134	991	Dump Truck	25	60	63	502	8,030	59,469	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	1.9	15	1,787	3,530	Dump Truck	25	150	279	2,234	268,121	529,539	50	93	745	89,374	176,513
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	100	13	107	853	6,320	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.0	16	1,529	3,776	Dump Truck	25	8	16	127	12,236	30,207	0	0	0	0	0
Slurry Backfill	0.6	5.1	286.8	1213.8	Concrete Truck	25	20	13	102	5,736	24,277	0	0	0	0	0
Site Resto.	0.4	3	237	702	Concrete Truck	25	20	7	59	4,739	14,040	0	0	0	0	0
Street Trenching																
Demo	0.1	1.0	0.00	178.0	Dump Truck	25	60	7	59	0	10,680	0	0	0	0.00	0
Excavation	0.4	3.3	0.00	600.0	Dump Truck	25	150	63	500	0	90,000	50	21	167	0.00	30,000
Slurry Backfill	0.4	3.1	0.00	556.0	Dump Truck	25	8	3	25	0	4,448	0	0	0	0.00	0
Restoration	0.1	0.6	0.00	113.0	Concrete Truck	25	20	2	13	0	2,260	0	0	0	0.00	0
Pipe Delivery	0.1	1.0	0.00	180.0	Dump Truck	25	100	13	100	0	18,000	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.1	1.0	0.00	63.0	Air-Vac	25	10	1	10	0	630	0	0	0	0.00	0
Drilling and SVE Well Installation	0.1	1.0	0.00	63.0	Drill Rig	25	10	1	10	0	630	0	0	0	0.00	0
Waste Collection	0.3	2.0	0.00	126.0	Dump Truck	25	10	3	20	0	1,260	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.1	1.0	0.00	60.4	Dump Truck	25	150	18	144	0	9,060	50	6	48	0	3,020
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Daily Truck Trip Emission Calculations (SCAB)						lbs/day (SCAB)				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	502	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.9E-02	6.6E-03	6.0E-03
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	2,234	6.1E-01	4.3E+00	1.1E+01	7.8E+03	3.0E-01	2.8E-01	8.2E-02	2.9E-02	2.7E-02
SVE Well/Piping	107	2.9E-02	2.0E-01	5.1E-01	3.7E+02	1.4E-02	1.3E-02	3.9E-03	1.4E-03	1.3E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	127	3.5E-02	2.4E-01	6.1E-01	4.4E+02	1.7E-02	1.6E-02	4.7E-03	1.7E-03	1.5E-03
Slurry Backfill	102	2.8E-02	1.9E-01	4.9E-01	3.6E+02	1.4E-02	1.3E-02	3.8E-03	1.3E-03	1.2E-03
Site Resto.	59	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.7E-04	7.1E-04
Street Trenching										
Demo	59	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.8E-04	7.1E-04
Excavation	500	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.8E-02	6.5E-03	6.0E-03
Backfill	25	6.7E-03	4.7E-02	1.2E-01	8.6E+01	3.3E-03	3.1E-03	9.1E-04	3.2E-04	3.0E-04
Restoration	13	3.4E-03	2.4E-02	6.0E-02	4.4E+01	1.7E-03	1.6E-03	4.6E-04	1.6E-04	1.5E-04
Pipe Delivery	100	2.7E-02	1.9E-01	4.8E-01	3.5E+02	1.4E-02	1.2E-02	3.7E-03	1.3E-03	1.2E-03
Well Installation										
Air Vac- Borehole Clearance	10	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04
Drilling and SVE Well Installation	10	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04
Waste Collection	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Waste Transport to Offsite Disposal	144	3.9E-02	2.7E-01	6.8E-01	5.0E+02	1.9E-02	1.8E-02	5.3E-03	1.9E-03	1.7E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)		lbs/day (MDAB)								
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	745	2.0E-01	1.4E+00	3.5E+00	2.6E+03	1.0E-01	9.3E-02	2.7E-02	9.7E-03	9.0E-03
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	167	4.5E-02	3.2E-01	7.9E-01	5.8E+02	2.3E-02	2.1E-02	6.2E-03	2.2E-03	2.0E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	48	1.3E-02	9.1E-02	2.3E-01	1.7E+02	6.5E-03	6.0E-03	1.8E-03	6.3E-04	5.8E-04
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

				lbs/day								
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	21.6	691	9.8E-02	3.8E+00	4.2E-01	1.1E+03	4.6E-03	4.6E-04	1.1E-02	6.9E-02	2.7E-02
Street Trenching	42	21.6	907	1.3E-01	5.0E+00	5.6E-01	1.4E+03	6.0E-03	6.0E-04	1.4E-02	9.0E-02	3.6E-02
Well Installation	39	21.6	842	1.2E-01	4.7E+00	5.2E-01	1.3E+03	5.6E-03	5.6E-04	1.3E-02	8.4E-02	3.3E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

XI. Off-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from off-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions				
Parameter	**Value**	**Units**	**Reference**	
Vehicle Weight (tons)		25	tons	Assumed
k (empirical constant) - PM10		0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5		0.00054	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)		0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways:
sL (Worker Vehicles)		0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and
P (averaging period)		365	days	Days per year
N (wet days)		40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
South Coast Air Basin Distance		75	miles	google maps
Mojave Desert Distance		25	miles	google maps
Employee/Worker Trip Distance		21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Paved Road Average Vehicle Weight		2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	SCAB Hourly VMT	SCAB Daily VMT	SCAB 8 Home Cluster VMT	SCAB Annual VMT	Trip length (MDAB)	MDAB Hourly VMT	MDAB Daily VMT	MDAB 8 Home Cluster VMT	MDAB Annual VMT
Option 1																
Demo	1.0	8.4	133.8	991.1	Dump Truck	25	60	63	502	8,030	59,469	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	10	5	40	320	2,370	0	0	0	0	0
Excavation	1.9	14.9	1,787.5	3,530.3	Dump Truck	25	150	279	2,234	268,121	529,539	50	93	745	89,374	176,513
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	100	13	107	853	6,320	0	0	0	0	0
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Backfill/Compact	2.0	15.9	1,529.4	3,775.8	Dump Truck	25	8	16	127	12,236	30,207	0	0	0	0	0
Slurry Backfill	0.6	5.1	286.8	1,213.8	Concrete Truck	25	20	13	102	5,736	24,277	0	0	0	0	0
Site Resto.	0.4	3.0	237.0	702.0	Concrete Truck	25	20	7	59	4,739	14,040	0	0	0	0	0
Street Trenching																
Demo	0.1	1.0	0.0	178.0	Dump Truck	25	60	7	59	0	10,680	0	0	0	0	0
Excavation	0.4	3.3	0.0	600.0	Dump Truck	25	150	63	500	0	90,000	50	21	167	0	30,000
Backfill	0.4	3.1	0.0	556.0	Dump Truck	25	8	3	25	0	4,448	0	0	0	0	0
Restoration	0.1	0.6	0.0	113.0	Concrete Truck	25	20	2	13	0	2,260	0	0	0	0	0
Pipe Delievery	0.1	1.0	0.0	180.0	Dump Truck	25	100	13	100	0	18,000	0	0	0	0	0
Well Installation																
Air Vac- Borehole Clearance	0.1	1.0	0.0	63.0	Air-Vac	25	10.0	1	10	0	630	0	0	0	0	0
Drilling and SVE Well Installation	0.1	1.0	0.0	63.0	Drill Rig	25	10.0	1	10	0	630	0	0	0	0	0
Waste Collection	0.3	2.0	0.0	126.0	Dump Truck	25.0	10.0	2.5	20.0	0.0	1,260.0	0.0	0.0	0.0	0.0	0.0
Waste Transport to Offsite Disposal	0.1	1.0	0.0	60.4	Dump Truck	25.0	150.0	18.0	143.8	0.0	9,060.0	50.0	6.0	47.9	0.0	3,020.0
Street Paving																
Street Grinding	2.7	16.0	0.0	80.0	Dump Truck	25	60	160	960	0	4,800	0	0	0	0	0
Street Paving	2.7	16.0	0.0	160.0	Dump Truck	25	100	267	1,600	0	16,000	0	0	0	0	0

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	Daily VMT (MDAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions	MDAB Pm10 Emissions	MDAB PM2.5 Emissions
Option 1														
Demo	501.8	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	8.1E-01	2.0E-01	0.0E+00	0.0E+00
Green Waste	40.0	0.0	0.02	25	0.0022	0.00054	40	366	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Excavation	2,234.3	744.8	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.6E+00	8.9E-01	1.2E+00	3.0E-01
SVE Well/Piping	106.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.7E-01	4.2E-02	0.0E+00	0.0E+00
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backfill/Compact	127.5	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.1E-01	5.1E-02	0.0E+00	0.0E+00
Slurry Backfill	102.4	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.7E-01	4.1E-02	0.0E+00	0.0E+00
Site Resto.	59.2	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	9.6E-02	2.4E-02	0.0E+00	0.0E+00
Street Trenching														
Demo	59.3	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	9.6E-02	2.4E-02	0.0E+00	0.0E+00
Excavation	500.0	166.7	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	8.1E-01	2.0E-01	2.7E-01	6.6E-02
Backfill	24.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.0E-02	9.8E-03	0.0E+00	0.0E+00
Restoration	12.6	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.0E-02	5.0E-03	0.0E+00	0.0E+00
Pipe Delievery	100.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.6E-01	4.0E-02	0.0E+00	0.0E+00
Well Installation														
Air Vac- Borehole Clearance	10.0	0.0	0.02	25	0.0022	0.00054	40	367	0.0016	0.0004	1.6E-02	4.0E-03	0.0E+00	0.0E+00
Drilling and SVE Well Installation	10.0	0.0	0.02	25	0.0022	0.00054	40	368	0.0016	0.0004	1.6E-02	4.0E-03	0.0E+00	0.0E+00
Waste Collection	20.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.2E-02	8.0E-03	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	143.8	47.9	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.3E-01	5.7E-02	7.8E-02	1.9E-02
Street Paving														
Street Grinding	960.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.6E+00	3.8E-01	0.0E+00	0.0E+00
Street Paving	1,600.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.6E+00	6.4E-01	0.0E+00	0.0E+00

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	32	21.6	691	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.0E-01	2.5E-02
Street Trenching	42	21.6	907	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.3E-01	3.3E-02
Well Installation	39	21.6	842	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.3E-01	3.1E-02
Street Paving													
Street Grinding	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02
Street Paving	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/29/2014*
Project:	Kast Remediation Project - VOC Emissions Option 1 (Hard and Softscape Excavation) **5 foot with *10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*29-Oct-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*29-Oct-14*
Brief description of analysis:	*Calculating emission rates of VOC from contaminated soil.*
Reference MXD:	S:\Shirley Pearson\!Kast\29 Oct 2014 Updates
Model used:	*EMSOFT, 2002*

Version 10-29-14

Kast VOC Emissions Calculations

I. List of VOC's Listed in the HHRA

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.30E-04	5.90E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,1,2-Trichloroethane	79-00-5	5.00E+01	7.80E-02	8.80E-06	3.70E-02	4.10E-01	3.00E-01	3.70E-04	6.10E-03
1,1-Dichloroethane	75-34-3	3.20E+01	7.40E-02	1.10E-05	2.30E-01	3.30E-01	1.90E-01	2.70E-03	5.80E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trichlorobenzene	120-82-1	1.80E+03	3.00E-02	8.20E-06	5.80E-02	1.10E+01	1.10E+01	8.40E-06	2.30E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloroethane	107-06-2	1.70E+01	1.00E-01	9.90E-06	4.00E-02	2.10E-01	1.00E-01	1.00E-03	8.10E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,3-Butadiene	106-99-0	1.90E+01	2.50E-01	1.10E-05	3.00E+00	7.80E-01	1.10E-01	5.00E-02	1.90E-02
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
1,4-Dioxane	123-91-1	1.00E+00	2.30E-01	1.00E-05	2.30E-04	1.10E-01	6.00E-03	2.60E-05	1.80E-02
2,2,4-Trimethylpentane	540-84-1	1.50E+05	1.00E-01	1.00E-05	1.80E+02	9.30E+02	9.00E+02	1.00E-03	7.80E-03
2-Hexanone	591-78-6	9.40E+00	7.50E-02	8.40E-06	3.80E-03	1.60E-01	5.70E-02	9.40E-05	5.80E-03
4-Ethyltoluene	622-96-8	1.80E+03	6.80E-02	7.30E-06	2.10E-01	1.10E+01	1.10E+01	6.70E-05	5.30E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Carbon disulfide	75-15-0	4.60E+01	1.00E-01	1.00E-05	1.20E+00	6.10E-01	2.70E-01	1.10E-02	8.10E-03
Carbon tetrachloride tetrachloride	56-23-5	1.70E+02	7.80E-02	8.80E-06	1.20E+00	1.40E+00	1.00E+00	3.60E-03	6.10E-03
Chloroform	67-66-3	4.00E+01	1.00E-01	1.00E-05	1.50E-01	3.70E-01	2.40E-01	2.20E-03	8.10E-03
Cyclohexane	110-82-7	1.70E+02	7.40E-02	8.50E-06	7.90E+00	2.60E+00	9.90E-01	1.20E-02	5.70E-03
Dibromochloromethane	124-48-1	6.30E+01	2.00E-02	1.10E-05	3.20E-02	4.80E-01	3.80E-01	6.70E-05	1.50E-03
cis-1,2-Dichloroethene	156-59-2	3.60E+01	7.40E-02	1.10E-05	1.70E-01	3.40E-01	2.10E-01	1.80E-03	5.70E-03
trans-1,2-Dichloroethene	156-60-5	5.30E+01	7.10E-02	1.20E-05	3.80E-01	4.90E-01	3.20E-01	2.90E-03	5.50E-03
trans-1,3-Dichloropropene	10061-02-6	4.60E+01	6.30E-02	1.00E-05	7.20E-01	5.10E-01	2.70E-01	4.60E-03	4.90E-03
Ethanol	64-17-5	1.00E+00	1.50E-01	1.60E-05	1.90E-04	1.10E-01	6.00E-03	1.50E-05	1.30E-02
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.40E-04	5.90E-03
Heptane	142-82-5	2.70E+02	9.30E-02	7.60E-06	8.20E+01	1.70E+01	1.60E+00	2.30E-02	7.20E-03
Hexachloro-1,3-butadiene	87-68-3	5.40E+04	5.60E-02	6.20E-06	3.30E-01	3.20E+02	3.20E+02	3.00E-06	4.40E-03
Hexane	110-54-3	4.30E+01	2.00E-01	7.80E-06	6.80E+01	1.30E+01	2.60E-01	5.40E-02	1.60E-02

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
Isopropanol	67-63-0	6.90E+00	8.00E-02	9.30E-06	3.60E-04	1.40E-01	4.20E-02	1.10E-05	6.50E-03
Isopropyl benzene (cumene)	98-82-8	4.90E+02	6.50E-02	7.10E-06	4.70E+01	1.20E+01	2.90E+00	1.30E-02	5.10E-03
Methyl ethyl ketone (2-butanone)	78-93-3	2.30E+00	8.10E-02	9.80E-06	2.30E-03	1.10E-01	1.40E-02	8.40E-05	6.30E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Methyl-tert-butyl ether	1634-04-4	7.30E+00	1.00E-01	1.10E-05	2.60E-02	1.50E-01	4.40E-02	9.10E-04	8.00E-03
Propyl benzene	103-65-1	5.60E+02	6.00E-02	7.80E-06	4.40E-01	3.60E+00	3.40E+00	3.80E-04	4.70E-03
tert-Butyl Alcohol (TBA)	75-65-0	4.20E+00	8.50E-02	9.10E-06	3.00E-03	1.30E-01	2.50E-02	1.10E-04	6.70E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Tetrahydrofuran	109-99-9	9.50E-01	9.80E-02	1.10E-05	2.90E-03	1.10E-01	5.70E-03	1.40E-04	7.70E-03
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

Kast VOC Emissions Calculations

II. Chemical Inputs for EMSOFT Model run

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	COC Concentrations (0-10 feet)		COC Concentrations (0-10 feet)	
								Units	Sitewide UCL	Units	Sitewide UCL
100-41-4	Ethylbenzene	360	7.50E-02	6.48E+03	7.80E-06	6.74E-01	3.20E-01	mg/kg	5.00E-01	ug/kg	5.00E+02
106-46-7	1,4-Dichlorobenzene	620	6.90E-02	5.96E+03	7.90E-06	6.83E-01	9.80E-02	mg/kg	5.90E-04	ug/kg	5.90E-01
107-06-2	1,2-Dichloroethane	17	1.00E-01	8.64E+03	9.90E-06	8.55E-01	4.00E-02	mg/kg	4.70E-04	ug/kg	4.70E-01
108-67-8	1,3,5-Trimethylbenzene	1400	6.00E-02	5.18E+03	8.70E-06	7.52E-01	2.40E-01	mg/kg	1.90E-01	ug/kg	1.90E+02
108-88-3	Toluene	180	8.70E-02	7.52E+03	8.60E-06	7.43E-01	2.70E-01	mg/kg	1.20E-01	ug/kg	1.20E+02
127-18-4	Tetrachloroethene	160	7.20E-02	6.22E+03	8.20E-06	7.08E-01	7.50E-01	mg/kg	1.30E-02	ug/kg	1.30E+01
129-00-0	Pyrene	110000	2.70E-02	2.33E+03	7.20E-06	6.22E-01	4.50E-04	mg/kg	1.00E+00	mg/kg	1.00E+00
1330-20-7	Xylenes, Total	390	7.70E-02	6.65E+03	8.40E-06	7.26E-01	3.10E-01	mg/kg	7.69E-01	ug/kg	7.69E+02
156-59-2	cis-1,2-Dichloroethene	36	7.40E-02	6.39E+03	1.10E-05	9.50E-01	1.70E-01	mg/kg	5.60E-04	ug/kg	5.60E-01
71-43-2	Benzene	59	8.80E-02	7.60E+03	9.80E-06	8.47E-01	2.30E-01	mg/kg	1.70E-01	ug/kg	1.70E+02
74-83-9	Bromomethane	11	7.30E-02	6.31E+03	1.20E-05	1.04E+00	2.60E-01	mg/kg	5.80E-03	ug/kg	5.80E+00
75-01-4	Vinyl Chloride	19	1.10E-01	9.50E+03	1.20E-05	1.04E+00	1.10E+00	mg/kg	2.41E-04	ug/kg	2.41E-01
75-09-2	Methylene Chloride	12	1.00E-01	8.64E+03	1.20E-05	1.04E+00	9.00E-02	mg/kg	3.20E-03	ug/kg	3.20E+00
75-27-4	Bromodichloromethane	55	3.00E-02	2.59E+03	1.10E-05	9.50E-01	6.50E-02	mg/kg	2.40E-04	ug/kg	2.40E-01
75-65-0	tert-Butyl Alcohol (TBA)	4.2	8.50E-02	7.34E+03	9.10E-06	7.86E-01	3.00E-03	mg/kg	4.80E-03	ug/kg	4.80E+00
78-87-5	1,2-Dichloropropane	44	7.80E-02	6.74E+03	8.70E-06	7.52E-01	1.10E-01	mg/kg	3.60E-04	ug/kg	3.60E-01
79-01-6	Trichloroethene	170	7.90E-02	6.83E+03	9.10E-06	7.86E-01	4.20E-01	mg/kg	7.40E-04	ug/kg	7.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	93	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.40E-02	mg/kg	4.80E-04	ug/kg	4.80E-01
90-12-0	1-Methylnaphthalene	3000	5.30E-02	4.58E+03	7.90E-06	6.83E-01	2.10E-02	mg/kg	2.60E+00	mg/kg	2.60E+00
91-20-3	Naphthalene	2000	5.90E-02	5.10E+03	7.50E-06	6.48E-01	2.00E-02	mg/kg	1.50E+00	mg/kg	1.50E+00
91-57-6	2-Methylnaphthalene	2800	5.20E-02	4.49E+03	7.80E-06	6.74E-01	2.10E-02	mg/kg	3.90E+00	mg/kg	3.90E+00
95-63-6	1,2,4-Trimethylbenzene	1400	6.10E-02	5.27E+03	7.90E-06	6.83E-01	2.50E-01	mg/kg	7.80E-01	ug/kg	7.80E+02

Kast VOC Emissions Calculations

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	Units	Sitewide UCL	Units	Sitewide UCL
96-18-4	1,2,3-Trichloropropane	22	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.70E-02	mg/kg	6.40E-04	ug/kg	6.40E-01
#N/A	2,4-Dinitrotoluene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	6.30E-02	mg/kg	6.30E-02
#N/A	Antimony	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.90E-01	mg/kg	2.90E-01
#N/A	Arsenic	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.90E+00	mg/kg	4.90E+00
#N/A	BaP TEQ	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-01	mg/kg	1.70E-01
#N/A	Benzo (a) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.10E-01	mg/kg	2.10E-01
#N/A	Benzo (a) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.20E-01	mg/kg	1.20E-01
#N/A	Benzo (b) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.80E-02	mg/kg	5.80E-02
#N/A	Benzo (k) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-02	mg/kg	1.30E-02
#N/A	Bis(2-Ethylhexyl) Phthalate	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.50E-01	mg/kg	1.50E-01
#N/A	Cadmium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	9.90E-02	mg/kg	9.90E-02
#N/A	Chromium, Hexavalent	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-01	mg/kg	1.30E-01
#N/A	Chrysene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.60E-01	mg/kg	5.60E-01
#N/A	Cobalt	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.10E+00	mg/kg	8.10E+00
#N/A	Copper	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.40E+01	mg/kg	1.40E+01
#N/A	Dibenz (a,h) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.90E-03	mg/kg	8.90E-03
#N/A	Indeno (1,2,3-c,d) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-02	mg/kg	1.70E-02
#N/A	Lead	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.10E+01	mg/kg	1.10E+01
#N/A	Thallium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E-01	mg/kg	2.20E-01
#N/A	TPH as Diesel	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E+03	mg/kg	2.20E+03
#N/A	TPH as Gasoline	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E+02	mg/kg	1.30E+02
#N/A	TPH as Motor Oil	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+03	mg/kg	3.00E+03
#N/A	Vanadium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+01	mg/kg	3.00E+01
#N/A	Zinc	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.20E+01	mg/kg	4.20E+01

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

*Chemicals with values as "#N/A" were not listed in the HHRA.

III. Soil and Layer Inputs for EMSOFT Model Run

	Calculation Options			Soil Properties				Physical Constants		Layer Properties	
	Time Period for Averaging and Printing Flux and Soil Concentration Results* (days)	Depth (D1) for Averaging Soil Concentration Results (cm)	Depth (D2) for Printing Soil Concentration Results (cm)	Fraction Organic Carbon[A,B] (unit less)	Fraction Porosity[A,B] (unit less)	Fraction Water Content[A,B] (unit less)	Bulk Density[A,B] (g/cm^3)	Porewater Flux (-=up, +=down)^c (cm/day)	Boundary Layer Thickness[D] (cm)	Cover Thickness[E] (cm)	Layer Thickness[F] (cm)
Site Wide (USEPA Screening Values for Loam)	[0.1/1]*	1	1	0.002	0.399	0.148	1.59	0	0.5	0	304.8

* 0.1 days: Shortest duration supported by EMSOFT model and used the represent the maximum hourly flux.

1 day: Used to represent the maximum daily flux

Data Sources: A. USPEA, User's Guide for Evaluation subsurface Vapor intrusion into Buildings, Table 11 - Guidance for Selection of Soil Type, (2004) 37. The soil parameters are based on soil texture classification of "lam."

B. USPEA, Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Version 3.1, Soil Properties Lookup Table, (2004).

C. USEPA, EMSOFT User's Guide, Page 38, September 2002. "If no data are available, it would be conservative for the purpose of calculating long-term volatilization rates and soil concentrations to assume a porewater flux of zero."

D. USEPA, EMSOFT User's Guide, Page 43, September 2002. "A default boundary layer thickness that may be used in EMSOFT when no other data are available is 0.5 cm.

E. Assumes contamination begins at the surface.

F. This analysis uses 10 feet (304.8 cm) throughout site.

IV. EMSOFT Volatilization Factor Out Put

CAS #	Chemical	Volatilization Factors	
		0.1 Day Average (mg/cm^2)	1 Day Average (mg/cm^2-day)
100-41-4	Ethylbenzene	2.74E-02	8.72E-03
106-46-7	1,4-Dichlorobenzene	1.36E-05	4.35E-06
107-06-2	1,2-Dichloroethane	2.68E-05	8.52E-06
108-67-8	1,3,5-Trimethylbenzene	4.32E-03	1.39E-03
108-88-3	Toluene	8.61E-03	2.74E-03
127-18-4	Tetrachloroethene	1.37E-03	4.34E-04
129-00-0	Pyrene	8.66E-06	7.21E-06
1330-20-7	Xylenes, Total	4.07E-02	1.29E-02
156-59-2	cis-1,2-Dichloroethene	4.73E-05	1.50E-05
71-43-2	Benzene	1.60E-02	5.09E-03
74-83-9	Bromomethane	6.68E-04	2.12E-04
75-01-4	Vinyl Chloride	5.03E-05	1.59E-05
75-09-2	Methylene Chloride	2.76E-04	8.78E-05
75-27-4	Bromodichloromethane	7.50E-06	2.40E-06
75-65-0	tert-Butyl Alcohol (TBA)	7.75E-05	2.50E-05
78-87-5	1,2-Dichloropropane	2.47E-05	7.84E-06
79-01-6	Trichloroethene	6.29E-05	2.00E-05
79-34-5	1,1,2,2-Tetrachloroethane	9.23E-06	2.97E-06
90-12-0	1-Methylnaphthalene	1.05E-02	5.48E-03
91-20-3	Naphthalene	8.22E-02	2.60E-03
91-57-6	2-Methylnaphthalene	1.61E-02	5.48E-03
95-63-6	1,2,4-Trimethylbenzene	1.83E-02	5.86E-03
96-18-4	1,2,3-Trichloropropane	1.94E-05	6.21E-06

V. VOC Emission Calculations

General Assumptions

Parameter	Value	Units	References
Hours per Day	8	hours	Hours of work 8am-4pm

Excavated Surface Volatilization Assumptions

Parameter	Value	Units	References
Layer Thickness	304.8	cm	10 feet of excavation
Stabilizer	91%	%	Apply stabilizer on inactive areas. Source: USEPA, Control of Air Emissions from Superfund Sites, (1992). Long-term VOC control efficiency ranges from 91 to 100%.
Work Days in year	251	days	

Excavated Surfaces VOC Emissions

Equation:

Active Area Emissions (lb/time) = tXVFXAs

None-Active Area Emissions (lb/time) = (1-MR)xtXVFXAs

Where:

MR = stabilized mitigation

t = time conversion factor (e.g. Hours/day, days/year)

VF = volatility factor output from EMSOFT model (mg/cm^2-day)

As = surface area of volatilization (cm^2)

Phase	Duration (days)	Hourly QTY Excavated (CY)	Daily QTY Excavated (CY)	Yearly QTY Excavated (CY)	Hourly Excavated/Disturbed Surface Area (cm^2)	Daily Previously Excavated/Disturbed Surface Area (cm^2)	Yearly Excavated/Disturbed Surface Area (cm^2)	Stabilized Mitigation (% Reduction)
Option 1 - Excavati	889	7	209	49,423	1.76E+04	5.23E+05	1.24E+08	91%
Street Trenching	180	6	45	8,100	1.41E+04	1.13E+05	2.03E+07	91%

Kast VOC Emissions Calculations

Volatilization Factor Calculations:

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
Option 1 - Excavation								
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.97E-12	1.99E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.59E-09	4.32E-03	3.18E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.05E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.29E-12	2.38E-11	8.66E-06	6.37E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.51E-09	4.28E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.47E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.36E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.69E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.92E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.81E-11	3.62E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.63E-11	9.25E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.83E-12	9.23E-06	6.79E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.02E-09	1.81E-08	1.05E-02	7.68E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.02E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.97E-12	1.99E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.59E-09	4.32E-03	3.18E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.05E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.29E-12	2.38E-11	8.66E-06	6.37E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.51E-09	4.28E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.47E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.36E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.69E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.92E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.81E-11	3.62E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.63E-11	9.25E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.83E-12	9.23E-06	6.79E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.02E-09	1.81E-08	1.05E-02	7.68E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.02E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

VOC Emission Calculations:

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
Option 1 - Excavation										
100-41-4	Ethylbenzene	3.54E-04	6.37E-05	4.17E-04	3.35E-03	1.36E-03	4.71E-03	1.99E+02	1.79E+01	2.17E+02
106-46-7	1,4-Dichlorobenzene	1.75E-07	3.15E-08	2.07E-07	1.67E-06	6.78E-07	2.35E-06	9.96E-02	8.96E-03	1.09E-01
107-06-2	1,2-Dichloroethane	3.46E-07	6.22E-08	4.08E-07	3.27E-06	1.33E-06	4.60E-06	1.95E-01	1.75E-02	2.12E-01
108-67-8	1,3,5-Trimethylbenzene	5.58E-05	1.00E-05	6.58E-05	5.33E-04	2.16E-04	7.49E-04	3.17E+01	2.86E+00	3.46E+01
108-88-3	Toluene	1.11E-04	2.00E-05	1.31E-04	1.05E-03	4.26E-04	1.48E-03	6.26E+01	5.63E+00	6.82E+01
127-18-4	Tetrachloroethene	1.77E-05	3.18E-06	2.08E-05	1.67E-04	6.76E-05	2.34E-04	9.93E+00	8.93E-01	1.08E+01
129-00-0	Pyrene	1.12E-07	2.01E-08	1.32E-07	2.77E-06	1.12E-06	3.89E-06	1.65E-01	1.48E-02	1.80E-01
1330-20-7	Xylenes, Total	5.25E-04	9.45E-05	6.19E-04	4.97E-03	2.01E-03	6.99E-03	2.96E+02	2.66E+01	3.23E+02
156-59-2	cis-1,2-Dichloroethene	6.10E-07	1.10E-07	7.20E-07	5.77E-06	2.34E-06	8.11E-06	3.43E-01	3.09E-02	3.74E-01
71-43-2	Benzene	2.07E-04	3.73E-05	2.44E-04	1.96E-03	7.93E-04	2.75E-03	1.16E+02	1.05E+01	1.27E+02
74-83-9	Bromomethane	8.62E-06	1.55E-06	1.02E-05	8.15E-05	3.30E-05	1.14E-04	4.85E+00	4.36E-01	5.28E+00
75-01-4	Vinyl Chloride	6.49E-07	1.17E-07	7.65E-07	6.12E-06	2.48E-06	8.60E-06	3.64E-01	3.28E-02	3.97E-01
75-09-2	Methylene Chloride	3.57E-06	6.42E-07	4.21E-06	3.37E-05	1.37E-05	4.74E-05	2.01E+00	1.81E-01	2.19E+00
75-27-4	Bromodichloromethane	9.67E-08	1.74E-08	1.14E-07	9.21E-07	3.73E-07	1.29E-06	5.48E-02	4.93E-03	5.97E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.00E-06	1.80E-07	1.18E-06	9.62E-06	3.90E-06	1.35E-05	5.72E-01	5.15E-02	6.24E-01
78-87-5	1,2-Dichloropropane	3.18E-07	5.73E-08	3.76E-07	3.01E-06	1.22E-06	4.23E-06	1.79E-01	1.61E-02	1.95E-01
79-01-6	Trichloroethene	8.12E-07	1.46E-07	9.58E-07	7.68E-06	3.11E-06	1.08E-05	4.57E-01	4.11E-02	4.98E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.19E-07	2.14E-08	1.41E-07	1.14E-06	4.63E-07	1.60E-06	6.79E-02	6.11E-03	7.41E-02
90-12-0	1-Methylnaphthalene	1.35E-04	2.43E-05	1.59E-04	2.11E-03	8.53E-04	2.96E-03	1.25E+02	1.13E+01	1.37E+02
91-20-3	Naphthalene	1.06E-03	1.91E-04	1.25E-03	9.99E-04	4.05E-04	1.40E-03	5.94E+01	5.35E+00	6.48E+01
91-57-6	2-Methylnaphthalene	2.08E-04	3.74E-05	2.45E-04	2.11E-03	8.53E-04	2.96E-03	1.25E+02	1.13E+01	1.37E+02
95-63-6	1,2,4-Trimethylbenzene	2.36E-04	4.25E-05	2.78E-04	2.25E-03	9.13E-04	3.17E-03	1.34E+02	1.21E+01	1.46E+02
96-18-4	1,2,3-Trichloropropane	2.50E-07	4.51E-08	2.96E-07	2.39E-06	9.66E-07	3.35E-06	1.42E-01	1.28E-02	1.55E-01

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
100-41-4	Ethylbenzene	2.84E-04	5.12E-05	3.35E-04	7.23E-04	2.93E-04	1.02E-03	3.27E+01	2.94E+00	3.56E+01
106-46-7	1,4-Dichlorobenzene	1.41E-07	2.53E-08	1.66E-07	3.61E-07	1.46E-07	5.07E-07	1.63E-02	1.47E-03	1.78E-02
107-06-2	1,2-Dichloroethane	2.78E-07	5.00E-08	3.28E-07	7.07E-07	2.86E-07	9.93E-07	3.19E-02	2.87E-03	3.48E-02
108-67-8	1,3,5-Trimethylbenzene	4.48E-05	8.07E-06	5.29E-05	1.15E-04	4.66E-05	1.62E-04	5.20E+00	4.68E-01	5.67E+00
108-88-3	Toluene	8.93E-05	1.61E-05	1.05E-04	2.27E-04	9.19E-05	3.19E-04	1.03E+01	9.23E-01	1.12E+01
127-18-4	Tetrachloroethene	1.42E-05	2.55E-06	1.67E-05	3.60E-05	1.46E-05	5.06E-05	1.63E+00	1.46E-01	1.77E+00
129-00-0	Pyrene	8.98E-08	1.62E-08	1.06E-07	5.98E-07	2.42E-07	8.40E-07	2.70E-02	2.43E-03	2.94E-02
1330-20-7	Xylenes, Total	4.22E-04	7.59E-05	4.98E-04	1.07E-03	4.35E-04	1.51E-03	4.85E+01	4.37E+00	5.29E+01
156-59-2	cis-1,2-Dichloroethene	4.90E-07	8.83E-08	5.79E-07	1.25E-06	5.04E-07	1.75E-06	5.63E-02	5.06E-03	6.13E-02
71-43-2	Benzene	1.66E-04	2.99E-05	1.96E-04	4.22E-04	1.71E-04	5.94E-04	1.91E+01	1.72E+00	2.08E+01
74-83-9	Bromomethane	6.93E-06	1.25E-06	8.18E-06	1.76E-05	7.12E-06	2.47E-05	7.94E-01	7.15E-02	8.66E-01
75-01-4	Vinyl Chloride	5.21E-07	9.38E-08	6.15E-07	1.32E-06	5.35E-07	1.86E-06	5.97E-02	5.37E-03	6.50E-02
75-09-2	Methylene Chloride	2.87E-06	5.16E-07	3.38E-06	7.28E-06	2.95E-06	1.02E-05	3.29E-01	2.96E-02	3.59E-01
75-27-4	Bromodichloromethane	7.77E-08	1.40E-08	9.17E-08	1.99E-07	8.05E-08	2.79E-07	8.98E-03	8.08E-04	9.79E-03
75-65-0	tert-Butyl Alcohol (TBA)	8.04E-07	1.45E-07	9.48E-07	2.08E-06	8.41E-07	2.92E-06	9.38E-02	8.44E-03	1.02E-01
78-87-5	1,2-Dichloropropane	2.56E-07	4.60E-08	3.02E-07	6.50E-07	2.63E-07	9.13E-07	2.94E-02	2.64E-03	3.20E-02
79-01-6	Trichloroethene	6.53E-07	1.17E-07	7.70E-07	1.66E-06	6.71E-07	2.33E-06	7.49E-02	6.74E-03	8.16E-02
79-34-5	1,1,2,2-Tetrachloroethane	9.57E-08	1.72E-08	1.13E-07	2.46E-07	9.98E-08	3.46E-07	1.11E-02	1.00E-03	1.21E-02
90-12-0	1-Methylnaphthalene	1.08E-04	1.95E-05	1.28E-04	4.54E-04	1.84E-04	6.38E-04	2.05E+01	1.85E+00	2.24E+01
91-20-3	Naphthalene	8.53E-04	1.53E-04	1.01E-03	2.16E-04	8.73E-05	3.03E-04	9.74E+00	8.77E-01	1.06E+01
91-57-6	2-Methylnaphthalene	1.67E-04	3.01E-05	1.97E-04	4.54E-04	1.84E-04	6.38E-04	2.05E+01	1.85E+00	2.24E+01
95-63-6	1,2,4-Trimethylbenzene	1.90E-04	3.41E-05	2.24E-04	4.86E-04	1.97E-04	6.83E-04	2.20E+01	1.98E+00	2.40E+01
96-18-4	1,2,3-Trichloropropane	2.01E-07	3.62E-08	2.38E-07	5.15E-07	2.09E-07	7.23E-07	2.33E-02	2.09E-03	2.54E-02

Summary of VOC Emissions (Base Case)

Sum of Value Row Labels	Column Labels lbs/day
1,1,2,2-Tetrachloroethane	1.95E-06
1,2,3-Trichloropropane	4.08E-06
1,2,4-Trimethylbenzene	3.85E-03
1,2-Dichloroethane	5.59E-06
1,2-Dichloropropane	5.15E-06
1,3,5-Trimethylbenzene	9.11E-04
1,4-Dichlorobenzene	2.86E-06
1-Methylnaphthalene	3.60E-03
2-Methylnaphthalene	3.60E-03
Benzene	3.34E-03
Bromodichloromethane	1.57E-06
Bromomethane	1.39E-04
cis-1,2-Dichloroethene	9.86E-06
Ethylbenzene	5.73E-03
Methylene Chloride	5.76E-05
Naphthalene	1.71E-03
Pyrene	4.73E-06
tert-Butyl Alcohol (TBA)	1.64E-05
Tetrachloroethene	2.85E-04
Toluene	1.80E-03
Trichloroethene	1.31E-05
Vinyl Chloride	1.05E-05
Xylenes, Total	8.50E-03
Grand Total	**3.36E-02**

Applicant's Proposed Remedy Calculation Files – Peak Day

- Calculation Cover Sheet and Assumptions
- On-Site Haul Roads – Re-entrained Dust
- Fugitive Dust Emissions During Soil and Excavation and Handling
- Dust Emissions during Concrete Breaking
- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- On-Site Road – Re-entrained Dust
- Off-Site Road Emissions
- Off-Site Road – Re-entrained Dust
- VOC Emissions

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/10/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*10-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\10 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-10-14

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Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

				Street Work (Hours/day)		
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Truc	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided
Trenching/pipe installation	10	people	Information provided
Air-vac borehole clearance	3	people	Information provided
Drilling and SVE well install	4	people	Information provided
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	32	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.

Kast Air Emissions Calculations

Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff
Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.

Kast Air Emissions Calculations

Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 237 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 237 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,763	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	1.67	13	214	1,584	1,584
Green Waste - Truck Trips	1	59	0.50	4	32	237	237
Excavation - Truck Trips	15	889	2.67	21	2,567	5,071	19,015
SVE Well/Piping - Truck Trips	1	59	0.39	3	25	186	186
Subslab Vent - Truck Trips	1	59	0.00	0	0	0	0
Backfill/Compact - Truck Trips	12	711	2.82	23	2,163	5,340	16,019
Slurry Backfill - Truck Trips	7	415	1.02	8	455	1,925	3,368
Site Resto. - Truck Trips	10	593	0.68	5	437	1,294	3,236
Worker Trips	49	1,256	4.00	32	12,544	8,032	40,192
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Note: PEAK Day case was described as having 30 additional trips, which were added based on the porportion from base-case trips.

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	20	160	2,554	18,917	18,917
Excavation	7	300	35,944	70,990	266,212
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	33	263	25,200	62,213	186,638
Slurry Backfill	18	148	8,272	35,008	61,264
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.19	1.5	268	268
Excavation - Truck Trips	0.6	4.5	816	816
Slurry Backfill - Truck Trips	0.6	4.5	808	808
Restoration - Truck Trips	0.2	1.5	275	275
Pipe Delivery - Truck Trips	0.2	1.5	270	270
Worker Trips	5.3	42	7,560	7,560

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	2	17	3,101	3,101
Excavation	8	61	11,016	11,016
Slurry Backfill	5	40	7,266	7,266
Restoration	2	18	3,184	3,184

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.19	1.5	95	95
Drilling and SVE Well Installation - Truck Trips	0.19	1.5	95	95
Waste Collection - Truck Trips	0.38	3.0	189	189
Waste Transport to Offsite Disposal - Truck Trips	0.18	1.5	92	92
Worker Trips	4.88	39	2,457	2,457

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	5	36	2,268	2,268
Waste Transport to Offsite Disposal	2.2	18	1,103	1,103

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Units	Street Paving Value	Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

Note: It is assumed that the scenario (including the amount of associated workers and trips) for Street Grinding and Paving will not change from Base case.

IV. On-Site Haul Roads - Re-entrained Dust

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site haul roads at the residential homes. The on-site haul roads consist of off-road equipment transporting soil to-and-from the dump truck.

$$E = k(s/12)^a(W/3)^b$$

Where:
E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
a = empirical constant
b = empirical constant
k = empirical constant
Source: AP-42 13.2.2-4, Equation (1a)

Assumptions Parameters	Value	Unites	Notes
s (silt content)	6.4	%	Western Governors' Association, Western Regional Air Partnership (WRAP) Fugitive Dust Handbook, Table 6-2. Average silt content for gravel/crushed limestone road surface material.
W (vehicle weight)	18,000	lbs	Weight of excavator
a (empirical constant)	0.9	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
b (empirical constant)	0.45	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
k (empirical constant) - PM10	1.5	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10)
k (empirical constant) - PM2.5	0.15	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM2.5)
Shovel Load (soil) Bobcat	1.25	cy	volume of soil a bucket can hold, http://www.bobcat.com/attachments/bucket_loader_general
Shovel Load (soil) Excavator	1.75	cy	volume of soil a bucket can hold
Weight of a bobcat	3.11	tons	Based on spec information from a S185 Skide-Steer Loader, http://www.bobcat.com/loaders/models/skidsteer/s185
Mitigation (% Reduction)	84%	%	Apply dust suppressants on inactive areas. SCAQMD mitigation measures examples. Table X1-A.
Haul Route length	200	ft	Assumed distance soil would have to be hauled on each property

Option 1 Phases	Hourly Round Trips	Daily Round Trips	8 Home Clusters	Annual Round Trips	Equipment Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Clusters VMT	Annual VMT
Demo	1.7	13	214	1,584	Bobcat	3.11	0.08	0.13	4.05	16	120
Excavation	2.7	21	20,540	40,566	Excavator	9	0.08	0.20	6.48	1,556	3,073
SVE Well/Piping	0.4	3	0	0	0	0	0	0	0.00	0	0
Subslab Vent	0.0	0	0	0	0	0	0	0	0.00	0	0
Backfill/Compact	2.8	23	14,400	35,550	Excavator	9	0.08	0.21	6.83	1,091	2,693
Site Resto.	0.0	5	0	0	0	0	0	0	0.00	0	0

Emission Calculation

Daily:

Option 1 Phases	Daily VMT (SCAB)	W (tons)	k (PM10)	k (PM2.5)	Mitigation %	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)
Demo	4.0	3.11	1.5	0.15	84%	0.87	0.09	0.56	0.06
Excavation	6.5	9	1.5	0.15	84%	1.40	0.14	1.45	0.14
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	6.8	9	1.5	0.15	84%	1.40	0.14	1.53	0.15
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

V. Fugitive Dust Emissions During Soil Excavation and Handling

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site soil handling and excavation at the residential homes and during street trenching. The on-site soil handing and excavation consists of two parts: 1) Excavating soil 2)Dropping soil

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

Where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

Source: AP-42 13.2.4-3, Equation (1)

Assumptions Equation parameters	Value	Units	Notes
k - PM10	0.35	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
k - PM2.5	0.053	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
U	4.21	mph	Average wind speed
M	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Soil Density	3,400	lbs/CY	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
Times Soil is Handled	2	time	1) Excavating soil 2) Dropping soil

Emission Calculation (PM10)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	Daily CY	Daily (tons)	k (PM10)	U (mph)	M%	EF (lbs/ton)	Mitigation (%)	PM10 Emissions (lbs/day)
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	300	509.2	0.35	4.20556	7.9	1.31E-04	84%	2.13E-02
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	263	446.3	0.35	4.20556	7.9	1.31E-04	84%	1.87E-02
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	61	104.0	0.35	4.20556	7.9	1.31E-04	84%	4.35E-03
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Emission Calculation (PM2.5)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	**Daily CY**	**Hourly (tons)**	**k (PM2.5)**	**U (mph)**	**M%**	**EF (lbs/ton)**	**Mitigation (%)**	**PM2.5 Emissions (lbs/day)**
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	300	509.2	0.053	4.21	7.9	1.98E-05	84%	3.23E-03
SVE Well/Piping	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	263	446.3	0.053	4.21	7.9	1.98E-05	84%	2.83E-03
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	61	104.0	0.053	4.21	7.9	1.98E-05	84%	6.59E-04
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

VI. Dust Emissions during Concrete Breaking

Summary: This section calculates the dust emissions (PM2.5, PM10) during on-site concrete breaking at residential homes, street trenching and street paving. The on-site dust emissions from concrete breaking consists of two parts: 1) Mechanical dismemberment and 2) Debris loading

Mechanical Dismemberment Equations

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

U = Mean wind speed

M = material moisture content (%). The moisture contents of different materials are listed in Table 13.2.4-1 of AP 42. The program uses the moisture content of cover (12%) as default.

Where:

EF_D = emission factor (lb PM/ton of debris)

$EF_{D\text{-}PM10}$ = 0.0011 lb PM_{10}/ton of debris

$EF_{D\text{-}PM2.5}$ = 0.00017 lb $PM_{2.5}$/ton of debris

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 11

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Mean wind speed (U)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Typical Density of Concrete	150	lbs/ft^3	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test

Phase	Hourly Weight of Concrete (tons)	Daily Weight of Concrete (tons)	Weight of Concrete per 8 Home Cluster (tons)	Annual Weight of Concrete (tons)	Total Weight of Concrete (tons)
Option 1					
Demo	40	321	5,134	38,024	38,024
Excavation	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00
Street Trenching					
Demo	4	34	0.00	6,047	6,047
Excavation	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00
Street Paving					
Street Grinding	62	374	0.00	1,872	1,872

Mechanical Dismemberment Emissions Calculations

Concrete Breaking Emissions - Daily

Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	6.71E-03	1.02E-03
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	7.03E-04	1.06E-04
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	1.31E-04	1.98E-05	84%	7.83E-03	1.19E-03

Debris Loading Equations

$$EF_L = k \times EF_{L\text{-}TSP}$$

Where:

EF_L = emission factor (lb/ton)

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 12

The default value for $EF_{L\text{-}TSP}$ is 0.058 lb/ton, the average of the two TSP factor (i.e. 0.053 and 0.063 lb/ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader.

Source: CalEEMod, Appendix A, Page 13

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Emission Factor for Total Suspended Particulates (TSP)	0.058	lb/ton	CalEEMod, Appendix A, Page 13

Debris Loading Emissions Calculations

Concrete Debris Loading - Daily Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	0.0203	0.003074	84%	1.04E+00	1.58E-01
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	0.0203	0.003074	84%	1.09E-01	1.65E-02
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	0.0203	0.003074	84%	1.22E+00	1.84E-01

Total Concrete Breaking Emissions (Mechanical Dismemberment + Debris Loading)

Total Concrete Breaking Emissions - Daily		
Phase	**Concrete Breaking Emissions for PM10 (lbs of PM10)**	**Concrete Breaking Emissions PM2.5 (lbs of PM2.5)**
Option 1		
Demo	1.05E+00	1.59E-01
Excavation	0.00	0.00
SVE Well/Piping	0.00	0.00
Subslab Vent	0.00	0.00
Backfill/Compact	0.00	0.00
Slurry Backfill	0.00	0.00
Site Resto.	0.00	0.00
Street Trenching		
Demo	1.10E-01	1.66E-02
Excavation	0.00	0.00
Backfill	0.00	0.00
Restoration	0.00	0.00
Street Paving		
Street Grinding	1.22E+00	1.85E-01
Total	2.38E+00	3.61E-01

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase															Emissions Factors (g/bhp-hr)			
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2 [2]	PM10	PM2.5	SOx [2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders /Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders /Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders /Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders /Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders /Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders /Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and Sox were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations		Daily Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations	Daily Emissions (lb)						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data									SCAB		
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.67	13	214	1,584	Dump Truck	25	0.72	1.20	10	154	1140
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	2.67	21	2,567	5,071	Dump Truck	25	0.72	1.92	15	1848	3649
SVE Well/Piping	0.4	3.1	25.1	185.8	Dump Truck	25	0.72	0.28	2.3	18	134
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.82	23	2,163	5,340	Dump Truck	25	0.72	2.03	16	1557	3843
Slurry Backfill	1.02	8	455	1,925	Concrete Truck	25	0.72	0.73	6	327	1385
Site Resto.	0.68	5	437	1,294	Concrete Truck	25	0.72	0.49	4	314	932
Street Trenching											
Demo	0.19	1	0	268	Dump Truck	25	0.72	0.13	1.1	0.00	193
Excavation	0.57	5	0	816	Dump Truck	25	0.72	0.41	3	0.00	587
Backfill	0.56	4	0	808	Dump Truck	25	0.72	0.40	3	0.00	582
Restoration	0.19	2	0	275	Concrete Truck	25	0.72	0.14	1.1	0.00	198
Pipe Delivery	0.19	2	0	270	Dump Truck	25	0.72	0.13	1	0.00	194
Well Installation											
Air Vac- Borehole Clearance	0.19	2	0	95	Air-Vac	25	0.72	0.13	1	0.00	68
Drilling and SVE Well Installation	0.19	2	0	95	Drill Rig	25	0.72	0.13	1	0.00	68
Waste Collection	0.38	3	0	189	Dump Truck	25	0.72	0.27	2	0.00	136
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	9.6	2.6E-03	1.8E-02	4.6E-02	3.3E+01	1.3E-03	1.2E-03	3.5E-04	1.3E-04	1.2E-04
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	15.4	4.2E-03	2.9E-02	7.3E-02	5.3E+01	2.1E-03	1.9E-03	5.7E-04	2.0E-04	1.9E-04
SVE Well/Piping	2.3	6.1E-04	4.3E-03	1.1E-02	7.8E+00	3.0E-04	2.8E-04	8.3E-05	2.9E-05	2.7E-05
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	16.2	4.4E-03	3.1E-02	7.7E-02	5.6E+01	2.2E-03	2.0E-03	6.0E-04	2.1E-04	1.9E-04
Slurry Backfill	5.8	1.6E-03	1.1E-02	2.8E-02	2.0E+01	7.9E-04	7.3E-04	2.2E-04	7.6E-05	7.0E-05
Site Resto.	3.9	1.1E-03	7.5E-03	1.9E-02	1.4E+01	5.3E-04	4.9E-04	1.5E-04	5.1E-05	4.7E-05
Street Trenching										
Demo	1.1	2.9E-04	2.0E-03	5.1E-03	3.7E+00	1.4E-04	1.3E-04	4.0E-05	1.4E-05	1.3E-05
Excavation	3.3	8.8E-04	6.2E-03	1.6E-02	1.1E+01	4.4E-04	4.1E-04	1.2E-04	4.3E-05	3.9E-05
Backfill	3.2	8.8E-04	6.1E-03	1.5E-02	1.1E+01	4.4E-04	4.0E-04	1.2E-04	4.2E-05	3.9E-05
Restoration	1.1	3.0E-04	2.1E-03	5.2E-03	3.8E+00	1.5E-04	1.4E-04	4.1E-05	1.4E-05	1.3E-05
Pipe Delivery	1.1	2.9E-04	2.1E-03	5.1E-03	3.8E+00	1.5E-04	1.3E-04	4.0E-05	1.4E-05	1.3E-05
Well Installation										
Air Vac- Borehole Clearance	1.1	2.9E-04	2.1E-03	5.1E-03	3.8E+00	1.5E-04	1.3E-04	4.0E-05	1.4E-05	1.3E-05
Drilling and SVE Well Installation	1.1	2.9E-04	2.1E-03	5.1E-03	3.8E+00	1.5E-04	1.3E-04	4.0E-05	1.4E-05	1.3E-05
Waste Collection	2.2	5.8E-04	4.1E-03	1.0E-02	7.5E+00	2.9E-04	2.7E-04	8.0E-05	2.8E-05	2.6E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Misc. Worker Trips

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	0.72	23	3.2E-03	1.3E-01	1.4E-02	3.5E+01	1.5E-04	1.5E-05	3.6E-04	2.3E-03	9.1E-04
Street Trenching	42	0.72	30	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03
Well Installation	39	0.72	28	4.0E-03	1.6E-01	1.7E-02	4.3E+01	1.9E-04	1.9E-05	4.3E-04	2.8E-03	1.1E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIIII. On-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from on-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)

k = particle size multiplier

sL = road surface silt loading (g/m^2)

W = mean vehicle weight (tons)

P = averaging period (365 days)

N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:

P = number of wet days

N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Heavy Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.0005	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways: http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street travel)
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
On-Site Heavy Truck Haul	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Paved Road Average Vehicle	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	SCAB Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.7	13.4	213.8	1583.6	Dump Truck	25	0.72	1.2	9.6	153.9	1139.7
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	0.72	0.4	2.9	23.0	170.6
Excavation	2.7	21.4	2567.5	5070.8	Dump Truck	25	0.72	1.9	15.4	1847.8	3649.4
SVE Well/Piping	0.4	3.1	25.1	185.8	Dump Truck	25	0.72	0.3	2.3	18.1	133.8
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.8	22.5	2162.9	5339.8	Dump Truck	25	0.72	2.0	16.2	1556.7	3843.0
Slurry Backfill	1.0	8.1	454.8	1924.8	Concrete Truck	25	0.72	0.7	5.8	327.3	1385.3
Site Resto.	0.7	5.5	437.0	1294.5	Concrete Truck	25	0.72	0.5	3.9	314.5	931.6
Street Trenching											
Demo	0.2	1.5	0.00	268.0	Dump Truck	25	0.72	0.1	1.1	0.00	192.9
Excavation	0.6	4.5	0.00	816.0	Dump Truck	25	0.72	0.4	3.3	0.00	587.3
Backfill	0.6	4.5	0.00	808.0	Dump Truck	25	0.72	0.4	3.2	0.00	581.5
Restoration	0.2	1.5	0.00	275.0	Concrete Truck	25	0.72	0.1	1.1	0.00	197.9
Pipe Delivery	0.2	1.5	0.00	270.0	Dump Truck	25	0.72	0.1	1.1	0.00	194.3
Well Installation											
Air Vac- Borehole Clearance	0.2	1.5	0.00	94.5	Air-Vac	25	0.72	0.1	1.1	0.00	68.0
Drilling and SVE Well Installation	0.2	1.5	0.00	94.5	Drill Rig	25	0.72	0.1	1.1	0.00	68.0
Waste Collection	0.4	3.0	0.00	189.0	Dump Truck	25	0.72	0.3	2.2	0.00	136.0
Street Paving											
Street Grinding	2.7	16.0	0.00	80.0	Dump Truck	25	0.72	1.9	11.5	0.00	57.6
Street Paving	1.3	8.0	0.00	80.0	Dump Truck	25	0.72	1.0	5.8	0.00	57.6

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	9.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.83E-04	1.43E-04
Green Waste	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Excavation	15.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	9.34E-04	2.29E-04
SVE Well/Piping	2.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.37E-04	3.36E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	16.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	9.83E-04	2.41E-04
Slurry Backfill	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.54E-04	8.70E-05
Site Resto.	3.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.38E-04	5.85E-05
Street Trenching											
Demo	1.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.50E-05	1.59E-05
Excavation	3.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.98E-04	4.86E-05
Backfill	3.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.96E-04	4.81E-05
Restoration	1.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.67E-05	1.64E-05
Pipe Delivery	1.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.55E-05	1.61E-05
Well Installation											
Air Vac- Borehole Clearance	1.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.55E-05	1.61E-05
Drilling and SVE Well Installation	1.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.55E-05	1.61E-05
Waste Collection	2.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.31E-04	3.21E-05
Street Paving											
Street Grinding	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.98E-04	1.71E-04
Street Paving	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-04	8.57E-05

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	32	0.72	23	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	3.42E-03	8.40E-04
Street Trenching	42	0.72	30	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.49E-03	1.10E-03
Well Installation	39	0.72	28	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.17E-03	1.02E-03
Street Paving													
Street Grinding	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04
Street Paving	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions						g/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions						lbs/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	1.7	13	214	1,584	Dump Truck	25	60	100	802	12,830	95,019	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	2.7	21	2,567	5,071	Dump Truck	25	150	401	3,209	385,121	760,614	50	134	1,070	128,374	253,538
SVE Well/Piping	0.4	3.1	25.1	185.8	Dump Truck	25	100	39	314	2,509	18,585	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.8	23	2,163	5,340	Dump Truck	25	8	23	180	17,304	42,718	0	0	0	0	0
Slurry Backfill	1.0	8.1	454.8	1924.8	Concrete Truck	25	20	20	162	9,096	38,497	0	0	0	0	0
Site Resto.	0.7	5	437	1,294	Concrete Truck	25	20	14	109	8,739	25,890	0	0	0	0	0
Street Trenching																
Demo	0.2	1.5	0.00	268.0	Dump Truck	25	60	11	89	0	16,080	0	0	0	0.00	0
Excavation	0.6	4.5	0.00	816.0	Dump Truck	25	150	85	680	0	122,400	50	28	227	0.00	40,800
Slurry Backfill	0.6	4.5	0.00	808.0	Dump Truck	25	8	4	36	0	6,464	0	0	0	0.00	0
Restoration	0.2	1.5	0.00	275.0	Concrete Truck	25	20	4	31	0	5,500	0	0	0	0.00	0
Pipe Delivery	0.2	1.5	0.00	270.0	Dump Truck	25	100	19	150	0	27,000	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.2	1.5	0.00	94.5	Air-Vac	25	10	2	15	0	945	0	0	0	0.00	0
Drilling and SVE Well Installation	0.2	1.5	0.00	94.5	Drill Rig	25	10	2	15	0	945	0	0	0	0.00	0
Waste Collection	0.4	3.0	0.00	189.0	Dump Truck	25	10	4	30	0	1,890	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.2	1.5	0.00	91.9	Dump Truck	25	150	27	219	0	13,785	50	9	73	0	4,595
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)		lbs/day (SCAB)								
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	802	2.2E-01	1.5E+00	3.8E+00	2.8E+03	1.1E-01	1.0E-01	3.0E-02	1.0E-02	9.6E-03
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	3,209	8.7E-01	6.1E+00	1.5E+01	1.1E+04	4.3E-01	4.0E-01	1.2E-01	4.2E-02	3.9E-02
SVE Well/Piping	314	8.5E-02	6.0E-01	1.5E+00	1.1E+03	4.2E-02	3.9E-02	1.2E-02	4.1E-03	3.8E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	180	4.9E-02	3.4E-01	8.6E-01	6.3E+02	2.4E-02	2.2E-02	6.7E-03	2.4E-03	2.2E-03
Slurry Backfill	162	4.4E-02	3.1E-01	7.7E-01	5.6E+02	2.2E-02	2.0E-02	6.0E-03	2.1E-03	2.0E-03
Site Resto.	109	3.0E-02	2.1E-01	5.2E-01	3.8E+02	1.5E-02	1.4E-02	4.0E-03	1.4E-03	1.3E-03
Street Trenching										
Demo	89	2.4E-02	1.7E-01	4.2E-01	3.1E+02	1.2E-02	1.1E-02	3.3E-03	1.2E-03	1.1E-03
Excavation	680	1.8E-01	1.3E+00	3.2E+00	2.4E+03	9.2E-02	8.5E-02	2.5E-02	8.9E-03	8.2E-03
Backfill	36	9.7E-03	6.8E-02	1.7E-01	1.2E+02	4.9E-03	4.5E-03	1.3E-03	4.7E-04	4.3E-04
Restoration	31	8.3E-03	5.8E-02	1.5E-01	1.1E+02	4.1E-03	3.8E-03	1.1E-03	4.0E-04	3.7E-04
Pipe Delivery	150	4.1E-02	2.9E-01	7.1E-01	5.2E+02	2.0E-02	1.9E-02	5.5E-03	2.0E-03	1.8E-03
Well Installation										
Air Vac- Borehole Clearance	15	4.1E-03	2.9E-02	7.1E-02	5.2E+01	2.0E-03	1.9E-03	5.5E-04	2.0E-04	1.8E-04
Drilling and SVE Well Installation	15	4.1E-03	2.9E-02	7.1E-02	5.2E+01	2.0E-03	1.9E-03	5.5E-04	2.0E-04	1.8E-04
Waste Collection	30	8.1E-03	5.7E-02	1.4E-01	1.0E+02	4.1E-03	3.7E-03	1.1E-03	3.9E-04	3.6E-04
Waste Transport to Offsite Disposal	219	5.9E-02	4.2E-01	1.0E+00	7.6E+02	3.0E-02	2.7E-02	8.1E-03	2.9E-03	2.6E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)		lbs/day (MDAB)								
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	1070	2.9E-01	2.0E+00	5.1E+00	3.7E+03	1.4E-01	1.3E-01	3.9E-02	1.4E-02	1.3E-02
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	227	6.1E-02	4.3E-01	1.1E+00	7.9E+02	3.1E-02	2.8E-02	8.4E-03	3.0E-03	2.7E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	73	2.0E-02	1.4E-01	3.5E-01	2.5E+02	9.9E-03	9.1E-03	2.7E-03	9.5E-04	8.8E-04
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

				lbs/day								
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	21.6	691	9.8E-02	3.8E+00	4.2E-01	1.1E+03	4.6E-03	4.6E-04	1.1E-02	6.9E-02	2.7E-02
Street Trenching	42	21.6	907	1.3E-01	5.0E+00	5.6E-01	1.4E+03	6.0E-03	6.0E-04	1.4E-02	9.0E-02	3.6E-02
Well Installation	39	21.6	842	1.2E-01	4.7E+00	5.2E-01	1.3E+03	5.6E-03	5.6E-04	1.3E-02	8.4E-02	3.3E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

XI. Off-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from off-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.00054	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways:
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
South Coast Air Basin Distance	75	miles	google maps
Mojave Desert Distance	25	miles	google maps
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Paved Road Average Vehicle Weight	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	SCAB Hourly VMT	SCAB Daily VMT	SCAB 8 Home Cluster VMT	SCAB Annual VMT	Trip length (MDAB)	MDAB Hourly VMT	MDAB Daily VMT	MDAB 8 Home Cluster VMT	MDAB Annual VMT
Option 1																
Demo	1.7	13.4	213.8	1,583.6	Dump Truck	25	60	100	802	12,830	95,019	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	10	5	40	320	2,370	0	0	0	0	0
Excavation	2.7	21.4	2,567.5	5,070.8	Dump Truck	25	150	401	3,209	385,121	760,614	50	134	1,070	128,374	253,538
SVE Well/Piping	0.4	3.1	25.1	185.8	Dump Truck	25	100	39	314	2,509	18,585	0	0	0	0	0
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Backfill/Compact	2.8	22.5	2,162.9	5,339.8	Dump Truck	25	8	23	180	17,304	42,718	0	0	0	0	0
Slurry Backfill	1.0	8.1	454.8	1,924.8	Concrete Truck	25	20	20	162	9,096	38,497	0	0	0	0	0
Site Resto.	0.7	5.5	437.0	1,294.5	Concrete Truck	25	20	14	109	8,739	25,890	0	0	0	0	0
Street Trenching																
Demo	0.2	1.5	0.0	268.0	Dump Truck	25	60	11	89	0	16,080	0	0	0	0	0
Excavation	0.6	4.5	0.0	816.0	Dump Truck	25	150	85	680	0	122,400	50	28	227	0	40,800
Backfill	0.6	4.5	0.0	808.0	Dump Truck	25	8	4	36	0	6,464	0	0	0	0	0
Restoration	0.2	1.5	0.0	275.0	Concrete Truck	25	20	4	31	0	5,500	0	0	0	0	0
Pipe Delievery	0.2	1.5	0.0	270.0	Dump Truck	25	100	19	150	0	27,000	0	0	0	0	0
Well Installation																
Air Vac- Borehole Clearance	0.2	1.5	0.0	94.5	Air-Vac	25	10.0	2	15	0	945	0	0	0	0	0
Drilling and SVE Well Installation	0.2	1.5	0.0	94.5	Drill Rig	25	10.0	2	15	0	945	0	0	0	0	0
Waste Collection	0.4	3.0	0.0	189.0	Dump Truck	25.0	10.0	3.8	30.0	0.0	1,890.0	0.0	0.0	0.0	0.0	0.0
Waste Transport to Offsite Disposal	0.2	1.5	0.0	91.9	Dump Truck	25.0	150.0	27.4	218.8	0.0	13,785.0	50.0	9.1	72.9	0.0	4,595.0
Street Paving																
Street Grinding	2.7	16.0	0.0	80.0	Dump Truck	25	60	160	960	0	4,800	0	0	0	0	0
Street Paving	2.7	16.0	0.0	160.0	Dump Truck	25	100	267	1,600	0	16,000	0	0	0	0	0

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	Daily VMT (MDAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions	MDAB Pm10 Emissions	MDAB PM2.5 Emissions
Option 1														
Demo	801.8	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.3E+00	3.2E-01	0.0E+00	0.0E+00
Green Waste	40.0	0.0	0.02	25	0.0022	0.00054	40	366	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Excavation	3,209.3	1,069.8	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	5.2E+00	1.3E+00	1.7E+00	4.3E-01
SVE Well/Piping	313.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	5.1E-01	1.2E-01	0.0E+00	0.0E+00
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backfill/Compact	180.2	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.9E-01	7.2E-02	0.0E+00	0.0E+00
Slurry Backfill	162.4	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.6E-01	6.5E-02	0.0E+00	0.0E+00
Site Resto.	109.2	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.8E-01	4.4E-02	0.0E+00	0.0E+00
Street Trenching														
Demo	89.3	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.4E-01	3.6E-02	0.0E+00	0.0E+00
Excavation	680.0	226.7	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.1E+00	2.7E-01	3.7E-01	9.0E-02
Backfill	35.9	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	5.8E-02	1.4E-02	0.0E+00	0.0E+00
Restoration	30.6	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	5.0E-02	1.2E-02	0.0E+00	0.0E+00
Pipe Delievery	150.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.4E-01	6.0E-02	0.0E+00	0.0E+00
Well Installation														
Air Vac- Borehole Clearance	15.0	0.0	0.02	25	0.0022	0.00054	40	367	0.0016	0.0004	2.4E-02	6.0E-03	0.0E+00	0.0E+00
Drilling and SVE Well Installation	15.0	0.0	0.02	25	0.0022	0.00054	40	368	0.0016	0.0004	2.4E-02	6.0E-03	0.0E+00	0.0E+00
Waste Collection	30.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.9E-02	1.2E-02	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	218.8	72.9	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.6E-01	8.7E-02	1.2E-01	2.9E-02
Street Paving														
Street Grinding	960.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.6E+00	3.8E-01	0.0E+00	0.0E+00
Street Paving	1,600.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.6E+00	6.4E-01	0.0E+00	0.0E+00

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	32	21.6	691	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.0E-01	2.5E-02
Street Trenching	42	21.6	907	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.3E-01	3.3E-02
Well Installation	39	21.6	842	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.3E-01	3.1E-02
Street Paving													
Street Grinding	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02
Street Paving	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/29/2014*
Project:	Kast Remediation Project - VOC Emissions Option 1 (Hard and Softscape Excavation) **5 foot with *10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*29-Oct-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*29-Oct-14*
Brief description of analysis:	*Calculating emission rates of VOC from contaminated soil.*
Reference MXD:	S:\Shirley Pearson\!Kast\29 Oct 2014 Update
Model used:	*EMSOFT, 2002*

Version 10-29-14

Kast VOC Emissions Calculations

I. List of VOC's Listed in the HHRA

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.30E-04	5.90E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,1,2-Trichloroethane	79-00-5	5.00E+01	7.80E-02	8.80E-06	3.70E-02	4.10E-01	3.00E-01	3.70E-04	6.10E-03
1,1-Dichloroethane	75-34-3	3.20E+01	7.40E-02	1.10E-05	2.30E-01	3.30E-01	1.90E-01	2.70E-03	5.80E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trichlorobenzene	120-82-1	1.80E+03	3.00E-02	8.20E-06	5.80E-02	1.10E+01	1.10E+01	8.40E-06	2.30E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloroethane	107-06-2	1.70E+01	1.00E-01	9.90E-06	4.00E-02	2.10E-01	1.00E-01	1.00E-03	8.10E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,3-Butadiene	106-99-0	1.90E+01	2.50E-01	1.10E-05	3.00E+00	7.80E-01	1.10E-01	5.00E-02	1.90E-02
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
1,4-Dioxane	123-91-1	1.00E+00	2.30E-01	1.00E-05	2.30E-04	1.10E-01	6.00E-03	2.60E-05	1.80E-02
2,2,4-Trimethylpentane	540-84-1	1.50E+05	1.00E-01	1.00E-05	1.80E+02	9.30E+02	9.00E+02	1.00E-03	7.80E-03
2-Hexanone	591-78-6	9.40E+00	7.50E-02	8.40E-06	3.80E-03	1.60E-01	5.70E-02	9.40E-05	5.80E-03
4-Ethyltoluene	622-96-8	1.80E+03	6.80E-02	7.30E-06	2.10E-01	1.10E+01	1.10E+01	6.70E-05	5.30E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Carbon disulfide	75-15-0	4.60E+01	1.00E-01	1.00E-05	1.20E+00	6.10E-01	2.70E-01	1.10E-02	8.10E-03
Carbon tetrachloride tetrachloride	56-23-5	1.70E+02	7.80E-02	8.80E-06	1.20E+00	1.40E+00	1.00E+00	3.60E-03	6.10E-03
Chloroform	67-66-3	4.00E+01	1.00E-01	1.00E-05	1.50E-01	3.70E-01	2.40E-01	2.20E-03	8.10E-03
Cyclohexane	110-82-7	1.70E+02	7.40E-02	8.50E-06	7.90E+00	2.60E+00	9.90E-01	1.20E-02	5.70E-03
Dibromochloromethane	124-48-1	6.30E+01	2.00E-02	1.10E-05	3.20E-02	4.80E-01	3.80E-01	6.70E-05	1.50E-03
cis-1,2-Dichloroethene	156-59-2	3.60E+01	7.40E-02	1.10E-05	1.70E-01	3.40E-01	2.10E-01	1.80E-03	5.70E-03
trans-1,2-Dichloroethene	156-60-5	5.30E+01	7.10E-02	1.20E-05	3.80E-01	4.90E-01	3.20E-01	2.90E-03	5.50E-03
trans-1,3-Dichloropropene	10061-02-6	4.60E+01	6.30E-02	1.00E-05	7.20E-01	5.10E-01	2.70E-01	4.60E-03	4.90E-03
Ethanol	64-17-5	1.00E+00	1.50E-01	1.60E-05	1.90E-04	1.10E-01	6.00E-03	1.50E-05	1.30E-02
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.40E-04	5.90E-03
Heptane	142-82-5	2.70E+02	9.30E-02	7.60E-06	8.20E+01	1.70E+01	1.60E+00	2.30E-02	7.20E-03
Hexachloro-1,3-butadiene	87-68-3	5.40E+04	5.60E-02	6.20E-06	3.30E-01	3.20E+02	3.20E+02	3.00E-06	4.40E-03
Hexane	110-54-3	4.30E+01	2.00E-01	7.80E-06	6.80E+01	1.30E+01	2.60E-01	5.40E-02	1.60E-02
Isopropanol	67-63-0	6.90E+00	8.00E-02	9.30E-06	3.60E-04	1.40E-01	4.20E-02	1.10E-05	6.50E-03
Isopropyl benzene (cumene)	98-82-8	4.90E+02	6.50E-02	7.10E-06	4.70E+01	1.20E+01	2.90E+00	1.30E-02	5.10E-03
Methyl ethyl ketone (2-butanone)	78-93-3	2.30E+00	8.10E-02	9.80E-06	2.30E-03	1.10E-01	1.40E-02	8.40E-05	6.30E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Methyl-tert-butyl ether	1634-04-4	7.30E+00	1.00E-01	1.10E-05	2.60E-02	1.50E-01	4.40E-02	9.10E-04	8.00E-03
Propyl benzene	103-65-1	5.60E+02	6.00E-02	7.80E-06	4.40E-01	3.60E+00	3.40E+00	3.80E-04	4.70E-03
tert-Butyl Alcohol (TBA)	75-65-0	4.20E+00	8.50E-02	9.10E-06	3.00E-03	1.30E-01	2.50E-02	1.10E-04	6.70E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Tetrahydrofuran	109-99-9	9.50E-01	9.80E-02	1.10E-05	2.90E-03	1.10E-01	5.70E-03	1.40E-04	7.70E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

Kast VOC Emissions Calculations

II. Chemical Inputs for EMSOFT Model run

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	COC Concentrations (0-10 feet)		COC Concentrations (0-10 feet)	
								Units	Sitewide UCL	Units	Sitewide UCL
100-41-4	Ethylbenzene	360	7.50E-02	6.48E+03	7.80E-06	6.74E-01	3.20E-01	mg/kg	5.00E-01	ug/kg	5.00E+02
106-46-7	1,4-Dichlorobenzene	620	6.90E-02	5.96E+03	7.90E-06	6.83E-01	9.80E-02	mg/kg	5.90E-04	ug/kg	5.90E-01
107-06-2	1,2-Dichloroethane	17	1.00E-01	8.64E+03	9.90E-06	8.55E-01	4.00E-02	mg/kg	4.70E-04	ug/kg	4.70E-01
108-67-8	1,3,5-Trimethylbenzene	1400	6.00E-02	5.18E+03	8.70E-06	7.52E-01	2.40E-01	mg/kg	1.90E-01	ug/kg	1.90E+02
108-88-3	Toluene	180	8.70E-02	7.52E+03	8.60E-06	7.43E-01	2.70E-01	mg/kg	1.20E-01	ug/kg	1.20E+02
127-18-4	Tetrachloroethene	160	7.20E-02	6.22E+03	8.20E-06	7.08E-01	7.50E-01	mg/kg	1.30E-02	ug/kg	1.30E+01
129-00-0	Pyrene	110000	2.70E-02	2.33E+03	7.20E-06	6.22E-01	4.50E-04	mg/kg	1.00E+00	mg/kg	1.00E+00
1330-20-7	Xylenes, Total	390	7.70E-02	6.65E+03	8.40E-06	7.26E-01	3.10E-01	mg/kg	7.69E-01	ug/kg	7.69E+02
156-59-2	cis-1,2-Dichloroethene	36	7.40E-02	6.39E+03	1.10E-05	9.50E-01	1.70E-01	mg/kg	5.60E-04	ug/kg	5.60E-01
71-43-2	Benzene	59	8.80E-02	7.60E+03	9.80E-06	8.47E-01	2.30E-01	mg/kg	1.70E-01	ug/kg	1.70E+02
74-83-9	Bromomethane	11	7.30E-02	6.31E+03	1.20E-05	1.04E+00	2.60E-01	mg/kg	5.80E-03	ug/kg	5.80E+00
75-01-4	Vinyl Chloride	19	1.10E-01	9.50E+03	1.20E-05	1.04E+00	1.10E+00	mg/kg	2.41E-04	ug/kg	2.41E-01
75-09-2	Methylene Chloride	12	1.00E-01	8.64E+03	1.20E-05	1.04E+00	9.00E-02	mg/kg	3.20E-03	ug/kg	3.20E+00
75-27-4	Bromodichloromethane	55	3.00E-02	2.59E+03	1.10E-05	9.50E-01	6.50E-02	mg/kg	2.40E-04	ug/kg	2.40E-01
75-65-0	tert-Butyl Alcohol (TBA)	4.2	8.50E-02	7.34E+03	9.10E-06	7.86E-01	3.00E-03	mg/kg	4.80E-03	ug/kg	4.80E+00
78-87-5	1,2-Dichloropropane	44	7.80E-02	6.74E+03	8.70E-06	7.52E-01	1.10E-01	mg/kg	3.60E-04	ug/kg	3.60E-01
79-01-6	Trichloroethene	170	7.90E-02	6.83E+03	9.10E-06	7.86E-01	4.20E-01	mg/kg	7.40E-04	ug/kg	7.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	93	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.40E-02	mg/kg	4.80E-04	ug/kg	4.80E-01
90-12-0	1-Methylnaphthalene	3000	5.30E-02	4.58E+03	7.90E-06	6.83E-01	2.10E-02	mg/kg	2.60E+00	mg/kg	2.60E+00
91-20-3	Naphthalene	2000	5.90E-02	5.10E+03	7.50E-06	6.48E-01	2.00E-02	mg/kg	1.50E+00	mg/kg	1.50E+00
91-57-6	2-Methylnaphthalene	2800	5.20E-02	4.49E+03	7.80E-06	6.74E-01	2.10E-02	mg/kg	3.90E+00	mg/kg	3.90E+00
95-63-6	1,2,4-Trimethylbenzene	1400	6.10E-02	5.27E+03	7.90E-06	6.83E-01	2.50E-01	mg/kg	7.80E-01	ug/kg	7.80E+02
96-18-4	1,2,3-Trichloropropane	22	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.70E-02	mg/kg	6.40E-04	ug/kg	6.40E-01
#N/A	2,4-Dinitrotoluene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	6.30E-02	mg/kg	6.30E-02

Kast VOC Emissions Calculations

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	Units	Sitewide UCL	Units	Sitewide UCL
#N/A	Antimony	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.90E-01	mg/kg	2.90E-01
#N/A	Arsenic	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.90E+00	mg/kg	4.90E+00
#N/A	BaP TEQ	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-01	mg/kg	1.70E-01
#N/A	Benzo (a) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.10E-01	mg/kg	2.10E-01
#N/A	Benzo (a) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.20E-01	mg/kg	1.20E-01
#N/A	Benzo (b) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.80E-02	mg/kg	5.80E-02
#N/A	Benzo (k) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-02	mg/kg	1.30E-02
#N/A	Bis(2-Ethylhexyl) Phthalate	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.50E-01	mg/kg	1.50E-01
#N/A	Cadmium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	9.90E-02	mg/kg	9.90E-02
#N/A	Chromium, Hexavalent	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-01	mg/kg	1.30E-01
#N/A	Chrysene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.60E-01	mg/kg	5.60E-01
#N/A	Cobalt	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.10E+00	mg/kg	8.10E+00
#N/A	Copper	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.40E+01	mg/kg	1.40E+01
#N/A	Dibenz (a,h) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.90E-03	mg/kg	8.90E-03
#N/A	Indeno (1,2,3-c,d) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-02	mg/kg	1.70E-02
#N/A	Lead	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.10E+01	mg/kg	1.10E+01
#N/A	Thallium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E-01	mg/kg	2.20E-01
#N/A	TPH as Diesel	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E+03	mg/kg	2.20E+03
#N/A	TPH as Gasoline	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E+02	mg/kg	1.30E+02
#N/A	TPH as Motor Oil	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+03	mg/kg	3.00E+03
#N/A	Vanadium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+01	mg/kg	3.00E+01
#N/A	Zinc	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.20E+01	mg/kg	4.20E+01

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

*Chemicals with values as "#N/A" were not listed in the HHRA.

III. Soil and Layer Inputs for EMSOFT Model Run

	Calculation Options			Soil Properties				Physical Constants		Layer Properties	
	Time Period for Averaging and Printing Flux and Soil Concentration Results* (days)	Depth (D1) for Averaging Soil Concentration Results (cm)	Depth (D2) for Printing Soil Concentration Results (cm)	Fraction Organic Carbon[A,B] (unit less)	Fraction Porosity[A,B] (unit less)	Fraction Water Content[A,B] (unit less)	Bulk Density[A,B] (g/cm^3)	Porewater Flux (-=up, +=down)^c (cm/day)	Boundary Layer Thickness[D] (cm)	Cover Thickness[E] (cm)	Layer Thickness[F] (cm)
Site Wide (USEPA Screening Values for Loam)	[0.1/1]*	1	1	0.002	0.399	0.148	1.59	0	0.5	0	304.8

* 0.1 days: Shortest duration supported by EMSOFT model and used the represent the maximum hourly flux.

1 day: Used to represent the maximum daily flux

Data Sources: A. USPEA, User's Guide for Evaluation subsurface Vapor intrusion into Buildings, Table 11 - Guidance for Selection of Soil Type, (2004) 37. The soil parameters are based on soil texture classification of "lam."

B. USPEA, Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Version 3.1, Soil Properties Lookup Table, (2004).

C. USEPA, EMSOFT User's Guide, Page 38, September 2002. "If no data are available, it would be conservative for the purpose of calculating long-term volatilization rates and soil concentrations to assume a porewater flux of zero."

D. USEPA, EMSOFT User's Guide, Page 43, September 2002. "A default boundary layer thickness that may be used in EMSOFT when no other data are available is 0.5 cm.

E. Assumes contamination begins at the surface.

F. This analysis uses 10 feet (304.8 cm) throughout site.

IV. EMSOFT Volatilization Factor Out Put

CAS #	Chemical	Volatilization Factors	
		0.1 Day Average (mg/cm^2)	1 Day Average (mg/cm^2-day)
100-41-4	Ethylbenzene	2.74E-02	8.72E-03
106-46-7	1,4-Dichlorobenzene	1.36E-05	4.35E-06
107-06-2	1,2-Dichloroethane	2.68E-05	8.52E-06
108-67-8	1,3,5-Trimethylbenzene	4.32E-03	1.39E-03
108-88-3	Toluene	8.61E-03	2.74E-03
127-18-4	Tetrachloroethene	1.37E-03	4.34E-04
129-00-0	Pyrene	8.66E-06	7.21E-06
1330-20-7	Xylenes, Total	4.07E-02	1.29E-02
156-59-2	cis-1,2-Dichloroethene	4.73E-05	1.50E-05
71-43-2	Benzene	1.60E-02	5.09E-03
74-83-9	Bromomethane	6.68E-04	2.12E-04
75-01-4	Vinyl Chloride	5.03E-05	1.59E-05
75-09-2	Methylene Chloride	2.76E-04	8.78E-05
75-27-4	Bromodichloromethane	7.50E-06	2.40E-06
75-65-0	tert-Butyl Alcohol (TBA)	7.75E-05	2.50E-05
78-87-5	1,2-Dichloropropane	2.47E-05	7.84E-06
79-01-6	Trichloroethene	6.29E-05	2.00E-05
79-34-5	1,1,2,2-Tetrachloroethane	9.23E-06	2.97E-06
90-12-0	1-Methylnaphthalene	1.05E-02	5.48E-03
91-20-3	Naphthalene	8.22E-02	2.60E-03
91-57-6	2-Methylnaphthalene	1.61E-02	5.48E-03
95-63-6	1,2,4-Trimethylbenzene	1.83E-02	5.86E-03
96-18-4	1,2,3-Trichloropropane	1.94E-05	6.21E-06

V. VOC Emission Calculations

General Assumptions

Parameter	Value	Units	References
Hours per Day	8	hours	Hours of work 8am-4pm

Excavated Surface Volatilization Assumptions

Parameter	Value	Units	References
Layer Thickness	304.8	cm	10 feet of excavation
Stabilizer	91%	%	Apply stabilizer on inactive areas. Source: USEPA, Control of Air Emissions from Superfund Sites, (1992). Long-term VOC control efficiency ranges from 91 to 100%.
Work Days in year	251	days	

Excavated Surfaces VOC Emissions

Equation:

Active Area Emissions (lb/time) = tXVFXAs

None-Active Area Emissions (lb/time) = (1-MR)xtXVFXAs

Where:

MR = stabilized mitigation

t = time conversion factor (e.g. Hours/day, days/year)

VF = volatility factor output from EMSOFT model (mg/cm^2-day)

As = surface area of volatilization (cm^2)

Phase	Duration (days)	Hourly QTY Excavated (CY)	Daily QTY Excavated (CY)	Yearly QTY Excavated (CY)	Hourly Excavated/Disturbed Surface Area (cm^2)	Daily Previously Excavated/Disturbed Surface Area (cm^2)	Yearly Excavated/Disturbed Surface Area (cm^2)	Stabilized Mitigation (% Reduction)
Option 1 - Excavati	889	7	300	70,990	1.76E+04	7.51E+05	1.78E+08	91%
Street Trenching	180	8	61	11,016	1.92E+04	1.54E+05	2.76E+07	91%

Kast VOC Emissions Calculations

Volatilization Factor Calculations:

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
Option 1 - Excavation								
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

VOC Emission Calculations:

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
Option 1 - Excavation										
100-41-4	Ethylbenzene	3.54E-04	6.36E-05	4.17E-04	4.81E-03	1.95E-03	6.76E-03	2.86E+02	2.58E+01	3.12E+02
106-46-7	1,4-Dichlorobenzene	1.75E-07	3.16E-08	2.07E-07	2.40E-06	9.73E-07	3.37E-06	1.43E-01	1.29E-02	1.56E-01
107-06-2	1,2-Dichloroethane	3.46E-07	6.22E-08	4.08E-07	4.70E-06	1.91E-06	6.61E-06	2.80E-01	2.52E-02	3.05E-01
108-67-8	1,3,5-Trimethylbenzene	5.57E-05	1.00E-05	6.58E-05	7.67E-04	3.11E-04	1.08E-03	4.57E+01	4.11E+00	4.98E+01
108-88-3	Toluene	1.11E-04	2.00E-05	1.31E-04	1.51E-03	6.13E-04	2.13E-03	9.00E+01	8.10E+00	9.81E+01
127-18-4	Tetrachloroethene	1.77E-05	3.18E-06	2.09E-05	2.40E-04	9.71E-05	3.37E-04	1.43E+01	1.28E+00	1.55E+01
129-00-0	Pyrene	1.12E-07	2.01E-08	1.32E-07	3.98E-06	1.61E-06	5.59E-06	2.37E-01	2.13E-02	2.58E-01
1330-20-7	Xylenes, Total	5.25E-04	9.45E-05	6.20E-04	7.12E-03	2.88E-03	1.00E-02	4.24E+02	3.81E+01	4.62E+02
156-59-2	cis-1,2-Dichloroethene	6.10E-07	1.10E-07	7.20E-07	8.28E-06	3.35E-06	1.16E-05	4.93E-01	4.43E-02	5.37E-01
71-43-2	Benzene	2.06E-04	3.72E-05	2.44E-04	2.81E-03	1.14E-03	3.95E-03	1.67E+02	1.50E+01	1.82E+02
74-83-9	Bromomethane	8.62E-06	1.55E-06	1.02E-05	1.17E-04	4.74E-05	1.64E-04	6.96E+00	6.27E-01	7.59E+00
75-01-4	Vinyl Chloride	6.49E-07	1.17E-07	7.66E-07	8.78E-06	3.56E-06	1.23E-05	5.22E-01	4.70E-02	5.69E-01
75-09-2	Methylene Chloride	3.56E-06	6.41E-07	4.20E-06	4.85E-05	1.96E-05	6.81E-05	2.88E+00	2.60E-01	3.14E+00
75-27-4	Bromodichloromethane	9.68E-08	1.74E-08	1.14E-07	1.33E-06	5.37E-07	1.86E-06	7.88E-02	7.09E-03	8.59E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.00E-06	1.80E-07	1.18E-06	1.38E-05	5.59E-06	1.94E-05	8.21E-01	7.39E-02	8.95E-01
78-87-5	1,2-Dichloropropane	3.19E-07	5.74E-08	3.76E-07	4.33E-06	1.75E-06	6.08E-06	2.58E-01	2.32E-02	2.81E-01
79-01-6	Trichloroethene	8.12E-07	1.46E-07	9.58E-07	1.10E-05	4.47E-06	1.55E-05	6.57E-01	5.91E-02	7.16E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.19E-07	2.14E-08	1.41E-07	1.64E-06	6.64E-07	2.30E-06	9.76E-02	8.78E-03	1.06E-01
90-12-0	1-Methylnaphthalene	1.35E-04	2.44E-05	1.60E-04	3.03E-03	1.23E-03	4.25E-03	1.80E+02	1.62E+01	1.96E+02
91-20-3	Naphthalene	1.06E-03	1.91E-04	1.25E-03	1.44E-03	5.81E-04	2.02E-03	8.54E+01	7.69E+00	9.31E+01
91-57-6	2-Methylnaphthalene	2.08E-04	3.74E-05	2.45E-04	3.03E-03	1.23E-03	4.25E-03	1.80E+02	1.62E+01	1.96E+02
95-63-6	1,2,4-Trimethylbenzene	2.36E-04	4.25E-05	2.79E-04	3.24E-03	1.31E-03	4.55E-03	1.92E+02	1.73E+01	2.10E+02
96-18-4	1,2,3-Trichloropropane	2.50E-07	4.51E-08	2.95E-07	3.43E-06	1.39E-06	4.82E-06	2.04E-01	1.84E-02	2.22E-01

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
100-41-4	Ethylbenzene	3.86E-04	6.95E-05	4.56E-04	9.84E-04	3.98E-04	1.38E-03	4.44E+01	4.00E+00	4.84E+01
106-46-7	1,4-Dichlorobenzene	1.92E-07	3.45E-08	2.26E-07	4.91E-07	1.99E-07	6.89E-07	2.22E-02	2.00E-03	2.42E-02
107-06-2	1,2-Dichloroethane	3.78E-07	6.80E-08	4.46E-07	9.61E-07	3.89E-07	1.35E-06	4.34E-02	3.91E-03	4.73E-02
108-67-8	1,3,5-Trimethylbenzene	6.09E-05	1.10E-05	7.19E-05	1.57E-04	6.35E-05	2.20E-04	7.08E+00	6.38E-01	7.72E+00
108-88-3	Toluene	1.21E-04	2.19E-05	1.43E-04	3.09E-04	1.25E-04	4.34E-04	1.40E+01	1.26E+00	1.52E+01
127-18-4	Tetrachloroethene	1.93E-05	3.48E-06	2.28E-05	4.90E-05	1.98E-05	6.88E-05	2.21E+00	1.99E-01	2.41E+00
129-00-0	Pyrene	1.22E-07	2.20E-08	1.44E-07	8.13E-07	3.29E-07	1.14E-06	3.67E-02	3.31E-03	4.01E-02
1330-20-7	Xylenes, Total	5.74E-04	1.03E-04	6.77E-04	1.46E-03	5.89E-04	2.04E-03	6.57E+01	5.92E+00	7.17E+01
156-59-2	cis-1,2-Dichloroethene	6.67E-07	1.20E-07	7.87E-07	1.69E-06	6.85E-07	2.38E-06	7.65E-02	6.88E-03	8.33E-02
71-43-2	Benzene	2.26E-04	4.06E-05	2.66E-04	5.74E-04	2.33E-04	8.07E-04	2.59E+01	2.33E+00	2.83E+01
74-83-9	Bromomethane	9.42E-06	1.70E-06	1.11E-05	2.39E-05	9.69E-06	3.36E-05	1.08E+00	9.72E-02	1.18E+00
75-01-4	Vinyl Chloride	7.09E-07	1.28E-07	8.37E-07	1.79E-06	7.26E-07	2.52E-06	8.10E-02	7.29E-03	8.83E-02
75-09-2	Methylene Chloride	3.89E-06	7.01E-07	4.59E-06	9.90E-06	4.01E-06	1.39E-05	4.48E-01	4.03E-02	4.88E-01
75-27-4	Bromodichloromethane	1.06E-07	1.90E-08	1.25E-07	2.71E-07	1.10E-07	3.80E-07	1.22E-02	1.10E-03	1.33E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.09E-06	1.97E-07	1.29E-06	2.82E-06	1.14E-06	3.96E-06	1.27E-01	1.15E-02	1.39E-01
78-87-5	1,2-Dichloropropane	3.48E-07	6.27E-08	4.11E-07	8.84E-07	3.58E-07	1.24E-06	4.00E-02	3.60E-03	4.36E-02
79-01-6	Trichloroethene	8.87E-07	1.60E-07	1.05E-06	2.26E-06	9.14E-07	3.17E-06	1.02E-01	9.17E-03	1.11E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.30E-07	2.34E-08	1.54E-07	3.35E-07	1.36E-07	4.71E-07	1.51E-02	1.36E-03	1.65E-02
90-12-0	1-Methylnaphthalene	1.48E-04	2.67E-05	1.75E-04	6.18E-04	2.50E-04	8.69E-04	2.79E+01	2.51E+00	3.04E+01
91-20-3	Naphthalene	1.16E-03	2.09E-04	1.37E-03	2.93E-04	1.19E-04	4.12E-04	1.33E+01	1.19E+00	1.44E+01
91-57-6	2-Methylnaphthalene	2.27E-04	4.09E-05	2.68E-04	6.18E-04	2.50E-04	8.69E-04	2.79E+01	2.51E+00	3.04E+01
95-63-6	1,2,4-Trimethylbenzene	2.58E-04	4.65E-05	3.05E-04	6.61E-04	2.68E-04	9.29E-04	2.99E+01	2.69E+00	3.26E+01
96-18-4	1,2,3-Trichloropropane	2.74E-07	4.92E-08	3.23E-07	7.01E-07	2.84E-07	9.84E-07	3.17E-02	2.85E-03	3.45E-02

Summary of VOC Emissions (Base Case- Peak)

VOC/NonVOC	VOC

Sum of Value **Row Labels**	**Column Labels** **lbs/day**
1,1,2,2-Tetrachloroethane	2.77E-06
1,2,3-Trichloropropane	5.80E-06
1,2,4-Trimethylbenzene	5.47E-03
1,2-Dichloroethane	7.96E-06
1,2-Dichloropropane	7.32E-06
1,3,5-Trimethylbenzene	1.30E-03
1,4-Dichlorobenzene	4.06E-06
1-Methylnaphthalene	5.12E-03
2-Methylnaphthalene	5.12E-03
Benzene	4.76E-03
Bromodichloromethane	2.24E-06
Bromomethane	1.98E-04
cis-1,2-Dichloroethene	1.40E-05
Ethylbenzene	8.15E-03
Methylene Chloride	8.20E-05
Naphthalene	2.43E-03
Pyrene	6.74E-06
tert-Butyl Alcohol (TBA)	2.34E-05
Tetrachloroethene	4.05E-04
Toluene	2.56E-03
Trichloroethene	1.87E-05
Vinyl Chloride	1.49E-05
Xylenes, Total	1.21E-02
Grand Total	**4.77E-02**

Expedited Implementation Option Calculation Files – Average Day

- Calculation Cover Sheet and Assumptions
- On-Site Haul Roads – Re-entrained Dust
- Fugitive Dust Emissions During Soil and Excavation and Handling
- Dust Emissions during Concrete Breaking
- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- On-Site Road – Re-entrained Dust
- Off-Site Road Emissions
- Off-Site Road – Re-entrained Dust
- VOC Emissions

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/10/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*10-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\10 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-10-14

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Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

				Street Work (Hours/day)		
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Truc	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided
Trenching/pipe installation	15	people	Information provided
Air-vac borehole clearance	7	people	Information provided
Drilling and SVE well install	10	people	Information provided
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	56	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.
Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff

Kast Air Emissions Calculations

Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.
Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 237 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 202 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,764	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Note: All loads and CY are assumed to remain the same as Base case, only the trips are expedited.

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	1.81	14	231	1,712	1,712
Green Waste - Truck Trips	1	59	0.50	4	32	237	237
Excavation - Truck Trips	15	889	3.28	26	3,153	6,227	23,352
SVE Well/Piping - Truck Trips	1	59	0.33	3	21	155	155
Subslab Vent - Truck Trips	1	59	0.00	0	0	0	0
Backfill/Compact - Truck Trips	12	711	3.51	28	2,699	6,662	19,987
Slurry Backfill - Truck Trips	7	415	1.06	9	476	2,015	3,526
Site Resto. - Truck Trips	10	593	0.82	7	523	1,550	3,876
Worker Trips	49	1,256	7.00	56	21,952	14,056	70,336
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	22	173	2,761	20,446	20,446
Excavation	7	368	44,143	87,181	326,930
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	41	328	31,440	77,618	232,853
Slurry Backfill	19	155	8,659	36,646	64,131
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.25	2.0	358	358
Excavation - Truck Trips	0.7	5.9	1,068	1,068
Slurry Backfill - Truck Trips	0.7	5.9	1,060	1,060
Restoration - Truck Trips	0.2	2.0	358	358
Pipe Delivery - Truck Trips	0.2	2.0	351	351
Worker Trips	8.9	71	12,780	12,780

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	3	23	4,143	4,143
Excavation	10	80	14,418	14,418
Slurry Backfill	7	53	9,532	9,532
Restoration	3	23	4,143	4,143

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.25	2	126	126
Drilling and SVE Well Installation - Truck Trips	0.25	2	126	126
Waste Collection - Truck Trips	0.50	4	252	252
Waste Transport to Offsite Disposal - Truck Trips	0.22	2	111	111
Worker Trips	9.13	73	4,599	4,599

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	6	48	3,024	3,024
Waste Transport to Offsite Disposal	2.6	21	1,330	1,330

Note: All loads and CY are assumed to remain the same as Base case, only the trips are expedited.

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Units	Street Paving Value	Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

Note: It is assumed that the scenario (including the amount of associated workers and trips) for Street Grinding and Paving will not change from Base case.

IV. On-Site Haul Roads - Re-entrained Dust

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site haul roads at the residential homes. The on-site haul roads consist of off-road equipment transporting soil to-and-from the dump truck.

$$E = k(s/12)^a(W/3)^b$$

Where:
E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
a = empirical constant
b = empirical constant
k = empirical constant
Source: AP-42 13.2.2-4, Equation (1a)

Assumptions Parameters	Value	Unites	Notes
s (silt content)	6.4	%	Western Governors' Association, Western Regional Air Partnership (WRAP) Fugitive Dust Handbook, Table 6-2. Average silt content for gravel/crushed limestone road surface material.
W (vehicle weight)	18,000	lbs	Weight of excavator
a (empirical constant)	0.9	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
b (empirical constant)	0.45	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
k (empirical constant) - PM10	1.5	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10)
k (empirical constant) - PM2.5	0.15	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM2.5)
Shovel Load (soil) Bobcat	1.25	cy	volume of soil a bucket can hold, http://www.bobcat.com/attachments/bucket_loader_general
Shovel Load (soil) Excavator	1.75	cy	volume of soil a bucket can hold
Weight of a bobcat	3.11	tons	Based on spec information from a S185 Skide-Steer Loader, http://www.bobcat.com/loaders/models/skidsteer/s185
Mitigation (% Reduction)	84%	%	Apply dust suppressants on inactive areas. SCAQMD mitigation measures examples. Table X1-A.
Haul Route length	200	ft	Assumed distance soil would have to be hauled on each property

Option 1 Phases	Hourly Round Trips	Daily Round Trips	8 Home Clusters	Annual Round Trips	Equipment Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Clusters VMT	Annual VMT
Demo	1.8	14	231	1,712	Bobcat	3.11	0.08	0.14	4.38	18	130
Excavation	3.3	26	25,224	49,818	Excavator	9	0.08	0.25	7.96	1,911	3,774
SVE Well/Piping	0.3	3	0	0	0	0	0	0	0.00	0	0
Subslab Vent	0.0	0	0	0	0	0	0	0	0.00	0	0
Backfill/Compact	3.5	28	17,966	44,353	Excavator	9	0.08	0.27	8.52	1,361	3,360
Site Resto.	0.0	7	0	0	0	0	0	0	0.00	0	0

Emission Calculation

Daily:

Option 1 Phases	Daily VMT (SCAB)	W (tons)	k (PM10)	k (PM2.5)	Mitigation %	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)
Demo	4.4	3.11	1.5	0.15	84%	0.87	0.09	0.61	0.06
Excavation	8.0	9	1.5	0.15	84%	1.40	0.14	1.78	0.18
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	8.5	9	1.5	0.15	84%	1.40	0.14	1.90	0.19
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

V. Fugitive Dust Emissions During Soil Excavation and Handling

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site soil handling and excavation at the residential homes and during street trenching. The on-site soil handing and excavation consists of two parts: 1) Excavating soil 2)Dropping soil

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

Where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

Source: AP-42 13.2.4-3, Equation (1)

Assumptions Equation parameters	Value	Units	Notes
k - PM10	0.35	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
k - PM2.5	0.053	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
U	4.21	mph	Average wind speed
M	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Soil Density	3,400	lbs/CY	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
Times Soil is Handled	2	time	1) Excavating soil 2) Dropping soil

Emission Calculation (PM10)

Daily Dust Emissions During Soil Excavation and Handling Phase	Daily CY	Daily (tons)	k (PM10)	U (mph)	M%	EF (lbs/ton)	Mitigation (%)	PM10 Emissions (lbs/day)
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	368	625.4	0.35	4.20556	7.9	1.31E-04	84%	2.62E-02
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	328	556.8	0.35	4.20556	7.9	1.31E-04	84%	2.33E-02
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	80	136.2	0.35	4.20556	7.9	1.31E-04	84%	5.70E-03
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Emission Calculation (PM2.5)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	**Daily CY**	**Hourly (tons)**	**k (PM2.5)**	**U (mph)**	**M%**	**EF (lbs/ton)**	**Mitigation (%)**	**PM2.5 Emissions (lbs/day)**
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	368	625.4	0.053	4.21	7.9	1.98E-05	84%	3.96E-03
SVE Well/Piping	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	328	556.8	0.053	4.21	7.9	1.98E-05	84%	3.53E-03
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	80	136.2	0.053	4.21	7.9	1.98E-05	84%	8.62E-04
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

VI. Dust Emissions during Concrete Breaking

Summary: This section calculates the dust emissions (PM2.5, PM10) during on-site concrete breaking at residential homes, street trenching and street paving. The on-site dust emissions from concrete breaking consists of two parts: 1) Mechanical dismemberment and 2) Debris loading

Mechanical Dismemberment Equations

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

U = Mean wind speed

M = material moisture content (%). The moisture contents of different materials are listed in Table 13.2.4-1 of AP 42. The program uses the moisture content of cover (12%) as default.

Where:

EF_D = emission factor (lb PM/ton of debris)

$EF_{D\text{-}PM10}$ = 0.0011 lb PM_{10}/ton of debris

$EF_{D\text{-}PM2.5}$ = 0.00017 lb $PM_{2.5}$/ton of debris

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 11

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Mean wind speed (U)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Typical Density of Concrete	150	lbs/ft^3	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test

Phase	Hourly Weight of Concrete (tons)	Daily Weight of Concrete (tons)	Weight of Concrete per 8 Home Cluster (tons)	Annual Weight of Concrete (tons)	Total Weight of Concrete (tons)
Option 1					
Demo	43	347	5,549	41,097	41,097
Excavation	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00
Street Trenching					
Demo	6	45	0.00	8,078	8,078
Excavation	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00
Street Paving					
Street Grinding	62	374	0.00	1,872	1,872

Mechanical Dismemberment Emissions Calculations

Concrete Breaking Emissions - Daily

Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	7.25E-03	1.10E-03
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	9.39E-04	1.42E-04
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	1.31E-04	1.98E-05	84%	7.83E-03	1.19E-03

Debris Loading Equations

$$EF_L = k \times EF_{L\text{-}TSP}$$

Where:

EF_L = emission factor (lb/ton)

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 12

The default value for $EF_{L\text{-}TSP}$ is 0.058 lb/ton, the average of the two TSP factor (i.e. 0.053 and 0.063 lb/ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader.

Source: CalEEMod, Appendix A, Page 13

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Emission Factor for Total Suspended Particulates (TSP)	0.058	lb/ton	CalEEMod, Appendix A, Page 13

Debris Loading Emissions Calculations

Concrete Debris Loading - Daily Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	0.0203	0.003074	84%	1.13E+00	1.71E-01
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	0.0203	0.003074	84%	1.46E-01	2.21E-02
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	0.0203	0.003074	84%	1.22E+00	1.84E-01

Total Concrete Breaking Emissions (Mechanical Dismemberment + Debris Loading)

Total Concrete Breaking Emissions - Daily		
Phase	**Concrete Breaking Emissions for PM10 (lbs of PM10)**	**Concrete Breaking Emissions PM2.5 (lbs of PM2.5)**
Option 1		
Demo	1.13E+00	1.72E-01
Excavation	0.00	0.00
SVE Well/Piping	0.00	0.00
Subslab Vent	0.00	0.00
Backfill/Compact	0.00	0.00
Slurry Backfill	0.00	0.00
Site Resto.	0.00	0.00
Street Trenching		
Demo	1.47E-01	2.22E-02
Excavation	0.00	0.00
Backfill	0.00	0.00
Restoration	0.00	0.00
Street Paving		
Street Grinding	1.22E+00	1.85E-01
Total	2.50E+00	3.79E-01

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase																Emissions Factors (g/bhp-hr)		
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2[2]	PM10	PM2.5	SOx[2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders/Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and Sox were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations		Daily Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations	Daily Emissions (lb)						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data									SCAB		
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.81	14	231	1,712	Dump Truck	25	0.72	1.30	10	166	1232
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	3.28	26	3,153	6,227	Dump Truck	25	0.72	2.36	19	2269	4482
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	0.72	0.24	1.9	15	112
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	3.51	28	2,699	6,662	Dump Truck	25	0.72	2.53	20	1942	4795
Slurry Backfill	1.06	9	476	2,015	Concrete Truck	25	0.72	0.76	6	343	1450
Site Resto.	0.82	7	523	1,550	Concrete Truck	25	0.72	0.59	5	377	1116
Street Trenching											
Demo	0.25	2	0	358	Dump Truck	25	0.72	0.18	1.4	0.00	258
Excavation	0.74	6	0	1,068	Dump Truck	25	0.72	0.53	4	0.00	769
Backfill	0.74	6	0	1,060	Dump Truck	25	0.72	0.53	4	0.00	763
Restoration	0.25	2	0	358	Concrete Truck	25	0.72	0.18	1.4	0.00	258
Pipe Delivery	0.24	2	0	351	Dump Truck	25	0.72	0.18	1	0.00	253
Well Installation											
Air Vac- Borehole Clearance	0.25	2	0	126	Air-Vac	25	0.72	0.18	1	0.00	91
Drilling and SVE Well Installation	0.25	2	0	126	Drill Rig	25	0.72	0.18	1	0.00	91
Waste Collection	0.50	4	0	252	Dump Truck	25	0.72	0.36	3	0.00	181
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	10.4	2.8E-03	2.0E-02	4.9E-02	3.6E+01	1.4E-03	1.3E-03	3.8E-04	1.4E-04	1.2E-04
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	18.9	5.1E-03	3.6E-02	9.0E-02	6.6E+01	2.6E-03	2.4E-03	7.0E-04	2.5E-04	2.3E-04
SVE Well/Piping	1.9	5.1E-04	3.6E-03	8.9E-03	6.5E+00	2.5E-04	2.3E-04	6.9E-05	2.5E-05	2.3E-05
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	20.2	5.5E-03	3.8E-02	9.6E-02	7.0E+01	2.7E-03	2.5E-03	7.5E-04	2.6E-04	2.4E-04
Slurry Backfill	6.1	1.7E-03	1.2E-02	2.9E-02	2.1E+01	8.3E-04	7.6E-04	2.3E-04	8.0E-05	7.4E-05
Site Resto.	4.7	1.3E-03	9.0E-03	2.2E-02	1.6E+01	6.4E-04	5.9E-04	1.7E-04	6.2E-05	5.7E-05
Street Trenching										
Demo	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Excavation	4.3	1.2E-03	8.1E-03	2.0E-02	1.5E+01	5.8E-04	5.3E-04	1.6E-04	5.6E-05	5.1E-05
Backfill	4.2	1.1E-03	8.1E-03	2.0E-02	1.5E+01	5.7E-04	5.3E-04	1.6E-04	5.5E-05	5.1E-05
Restoration	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Pipe Delivery	1.4	3.8E-04	2.7E-03	6.7E-03	4.9E+00	1.9E-04	1.7E-04	5.2E-05	1.8E-05	1.7E-05
Well Installation										
Air Vac- Borehole Clearance	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Drilling and SVE Well Installation	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Waste Collection	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	56	0.72	40	5.7E-03	2.2E-01	2.5E-02	6.1E+01	2.7E-04	2.7E-05	6.2E-04	4.0E-03	1.6E-03
Street Trenching	71	0.72	51	7.2E-03	2.8E-01	3.1E-02	7.8E+01	3.4E-04	3.4E-05	7.9E-04	5.1E-03	2.0E-03
Well Installation	73	0.72	53	7.4E-03	2.9E-01	3.2E-02	8.0E+01	3.5E-04	3.5E-05	8.1E-04	5.2E-03	2.1E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIIII. On-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from on-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Heavy Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.0005	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways: http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street travel)
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
On-Site Heavy Truck Haul	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Paved Road Average Vehicle	2.4	tons	CalEEMod default average vehicle weight (tons)

							SCAB				
Phase	**Hourly Round Trips**	**Daily Round Trips**	**8 Home Cluster Round Trips**	**Annual Round Trips**	**Truck Type**	**Average Vehicle Weight (tons)**	**Round Trip length (SCAB)**	**Hourly VMT**	**Daily VMT**	**8 Home Cluster VMT**	**Annual VMT**
Option 1											
Demo	1.8	14.4	231.1	1711.6	Dump Truck	25	0.72	1.3	10.4	166.3	1231.9
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	0.72	0.4	2.9	23.0	170.6
Excavation	3.3	26.3	3153.1	6227.3	Dump Truck	25	0.72	2.4	18.9	2269.3	4481.8
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	0.72	0.2	1.9	15.1	111.6
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	3.5	28.1	2698.7	6662.5	Dump Truck	25	0.72	2.5	20.2	1942.3	4795.0
Slurry Backfill	1.1	8.5	476.1	2014.9	Concrete Truck	25	0.72	0.8	6.1	342.6	1450.1
Site Resto.	0.8	6.5	523.4	1550.5	Concrete Truck	25	0.72	0.6	4.7	376.7	1115.9
Street Trenching											
Demo	0.2	2.0	0.00	358.0	Dump Truck	25	0.72	0.2	1.4	0.00	257.7
Excavation	0.7	5.9	0.00	1068.0	Dump Truck	25	0.72	0.5	4.3	0.00	768.6
Backfill	0.7	5.9	0.00	1060.0	Dump Truck	25	0.72	0.5	4.2	0.00	762.9
Restoration	0.2	2.0	0.00	357.8	Concrete Truck	25	0.72	0.2	1.4	0.00	257.5
Pipe Delivery	0.2	2.0	0.00	351.0	Dump Truck	25	0.72	0.2	1.4	0.00	252.6
Well Installation											
Air Vac- Borehole Clearance	0.3	2.0	0.00	126.0	Air-Vac	25	0.72	0.2	1.4	0.00	90.7
Drilling and SVE Well Installation	0.3	2.0	0.00	126.0	Drill Rig	25	0.72	0.2	1.4	0.00	90.7
Waste Collection	0.5	4.0	0.00	252.0	Dump Truck	25	0.72	0.4	2.9	0.00	181.4
Street Paving											
Street Grinding	2.7	16.0	0.00	80.0	Dump Truck	25	0.72	1.9	11.5	0.00	57.6
Street Paving	1.3	8.0	0.00	80.0	Dump Truck	25	0.72	1.0	5.8	0.00	57.6

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	10.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.30E-04	1.55E-04
Green Waste	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Excavation	18.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.15E-03	2.81E-04
SVE Well/Piping	1.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.14E-04	2.80E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	20.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.23E-03	3.01E-04
Slurry Backfill	6.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.71E-04	9.11E-05
Site Resto.	4.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.85E-04	7.01E-05
Street Trenching											
Demo	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.68E-05	2.13E-05
Excavation	4.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.59E-04	6.36E-05
Backfill	4.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.57E-04	6.31E-05
Restoration	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.67E-05	2.13E-05
Pipe Delivery	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.51E-05	2.09E-05
Well Installation											
Air Vac- Borehole Clearance	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.73E-05	2.14E-05
Drilling and SVE Well Installation	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.73E-05	2.14E-05
Waste Collection	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Street Paving											
Street Grinding	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.98E-04	1.71E-04
Street Paving	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-04	8.57E-05

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	56	0.72	40	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	5.99E-03	1.47E-03
Street Trenching	71	0.72	51	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	7.59E-03	1.86E-03
Well Installation	73	0.72	53	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	7.81E-03	1.92E-03
Street Paving													
Street Grinding	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04
Street Paving	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions											g/mi
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions											lbs/mi
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	1.8	14	231	1,712	Dump Truck	25	60	108	867	13,866	102,698	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	3.3	26	3,153	6,227	Dump Truck	25	150	493	3,941	472,961	934,098	50	164	1,314	157,654	311,366
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	100	33	262	2,093	15,504	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	3.5	28	2,699	6,662	Dump Truck	25	8	28	225	21,590	53,300	0	0	0	0	0
Slurry Backfill	1.1	8.5	476.1	2014.9	Concrete Truck	25	20	21	170	9,522	40,298	0	0	0	0	0
Site Resto.	0.8	7	523	1,550	Concrete Truck	25	20	16	131	10,467	31,009	0	0	0	0	0
Street Trenching																
Demo	0.2	2.0	0.00	358.0	Dump Truck	25	60	15	119	0	21,480	0	0	0	0.00	0
Excavation	0.7	5.9	0.00	1068.0	Dump Truck	25	150	111	890	0	160,200	50	37	297	0.00	53,400
Slurry Backfill	0.7	5.9	0.00	1060.0	Dump Truck	25	8	6	47	0	8,480	0	0	0	0.00	0
Restoration	0.2	2.0	0.00	357.8	Concrete Truck	25	20	5	40	0	7,156	0	0	0	0.00	0
Pipe Delivery	0.2	2.0	0.00	351.0	Dump Truck	25	100	24	195	0	35,100	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.3	2.0	0.00	126.0	Air-Vac	25	10	3	20	0	1,260	0	0	0	0.00	0
Drilling and SVE Well Installation	0.3	2.0	0.00	126.0	Drill Rig	25	10	3	20	0	1,260	0	0	0	0.00	0
Waste Collection	0.5	4.0	0.00	252.0	Dump Truck	25	10	5	40	0	2,520	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.2	1.8	0.00	110.8	Dump Truck	25	150	33	264	0	16,620	50	11	88	0	5,540
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)		lbs/day (SCAB)								
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	867	2.3E-01	1.6E+00	4.1E+00	3.0E+03	1.2E-01	1.1E-01	3.2E-02	1.1E-02	1.0E-02
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	3,941	1.1E+00	7.5E+00	1.9E+01	1.4E+04	5.3E-01	4.9E-01	1.5E-01	5.2E-02	4.7E-02
SVE Well/Piping	262	7.1E-02	5.0E-01	1.2E+00	9.1E+02	3.5E-02	3.3E-02	9.7E-03	3.4E-03	3.1E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	225	6.1E-02	4.3E-01	1.1E+00	7.8E+02	3.0E-02	2.8E-02	8.3E-03	2.9E-03	2.7E-03
Slurry Backfill	170	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.0E-03
Site Resto.	131	3.5E-02	2.5E-01	6.2E-01	4.5E+02	1.8E-02	1.6E-02	4.8E-03	1.7E-03	1.6E-03
Street Trenching										
Demo	119	3.2E-02	2.3E-01	5.7E-01	4.1E+02	1.6E-02	1.5E-02	4.4E-03	1.6E-03	1.4E-03
Excavation	890	2.4E-01	1.7E+00	4.2E+00	3.1E+03	1.2E-01	1.1E-01	3.3E-02	1.2E-02	1.1E-02
Backfill	47	1.3E-02	9.0E-02	2.2E-01	1.6E+02	6.4E-03	5.9E-03	1.7E-03	6.2E-04	5.7E-04
Restoration	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	4.9E-03	1.5E-03	5.2E-04	4.8E-04
Pipe Delivery	195	5.3E-02	3.7E-01	9.3E-01	6.8E+02	2.6E-02	2.4E-02	7.2E-03	2.5E-03	2.3E-03
Well Installation										
Air Vac- Borehole Clearance	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Drilling and SVE Well Installation	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Waste Collection	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Waste Transport to Offsite Disposal	264	7.1E-02	5.0E-01	1.3E+00	9.2E+02	3.6E-02	3.3E-02	9.7E-03	3.4E-03	3.2E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)		lbs/day (MDAB)								
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	1314	3.6E-01	2.5E+00	6.2E+00	4.6E+03	1.8E-01	1.6E-01	4.8E-02	1.7E-02	1.6E-02
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	297	8.0E-02	5.6E-01	1.4E+00	1.0E+03	4.0E-02	3.7E-02	1.1E-02	3.9E-03	3.6E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	88	2.4E-02	1.7E-01	4.2E-01	3.1E+02	1.2E-02	1.1E-02	3.2E-03	1.1E-03	1.1E-03
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

				lbs/day								
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	56	21.6	1210	1.7E-01	6.7E+00	7.4E-01	1.8E+03	8.0E-03	8.0E-04	1.9E-02	1.2E-01	4.8E-02
Street Trenching	71	21.6	1534	2.2E-01	8.5E+00	9.4E-01	2.3E+03	1.0E-02	1.0E-03	2.4E-02	1.5E-01	6.1E-02
Well Installation	73	21.6	1577	2.2E-01	8.7E+00	9.7E-01	2.4E+03	1.0E-02	1.0E-03	2.4E-02	1.6E-01	6.3E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

XI. Off-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from off-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.00054	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways:
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
South Coast Air Basin Distance	75	miles	google maps
Mojave Desert Distance	25	miles	google maps
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Paved Road Average Vehicle Weight	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	SCAB Hourly VMT	SCAB Daily VMT	SCAB 8 Home Cluster VMT	SCAB Annual VMT	Trip length (MDAB)	MDAB Hourly VMT	MDAB Daily VMT	MDAB 8 Home Cluster VMT	MDAB Annual VMT
Option 1																
Demo	1.8	14.4	231.1	1,711.6	Dump Truck	25	60	108	867	13,866	102,698	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	10	5	40	320	2,370	0	0	0	0	0
Excavation	3.3	26.3	3,153.1	6,227.3	Dump Truck	25	150	493	3,941	472,961	934,098	50	164	1,314	157,654	311,366
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	100	33	262	2,093	15,504	0	0	0	0	0
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Backfill/Compact	3.5	28.1	2,698.7	6,662.5	Dump Truck	25	8	28	225	21,590	53,300	0	0	0	0	0
Slurry Backfill	1.1	8.5	476.1	2,014.9	Concrete Truck	25	20	21	170	9,522	40,298	0	0	0	0	0
Site Resto.	0.8	6.5	523.4	1,550.5	Concrete Truck	25	20	16	131	10,467	31,009	0	0	0	0	0
Street Trenching																
Demo	0.2	2.0	0.0	358.0	Dump Truck	25	60	15	119	0	21,480	0	0	0	0	0
Excavation	0.7	5.9	0.0	1,068.0	Dump Truck	25	150	111	890	0	160,200	50	37	297	0	53,400
Backfill	0.7	5.9	0.0	1,060.0	Dump Truck	25	8	6	47	0	8,480	0	0	0	0	0
Restoration	0.2	2.0	0.0	357.8	Concrete Truck	25	20	5	40	0	7,156	0	0	0	0	0
Pipe Delievery	0.2	2.0	0.0	351.0	Dump Truck	25	100	24	195	0	35,100	0	0	0	0	0
Well Installation																
Air Vac- Borehole Clearance	0.3	2.0	0.0	126.0	Air-Vac	25	10.0	3	20	0	1,260	0	0	0	0	0
Drilling and SVE Well Installation	0.3	2.0	0.0	126.0	Drill Rig	25	10.0	3	20	0	1,260	0	0	0	0	0
Waste Collection	0.5	4.0	0.0	252.0	Dump Truck	25.0	10.0	5.0	40.0	0.0	2,520.0	0.0	0.0	0.0	0.0	0.0
Waste Transport to Offsite Disposal	0.2	1.8	0.0	110.8	Dump Truck	25.0	150.0	33.0	263.8	0.0	16,620.0	50.0	11.0	87.9	0.0	5,540.0
Street Paving																
Street Grinding	2.7	16.0	0.0	80.0	Dump Truck	25	60	160	960	0	4,800	0	0	0	0	0
Street Paving	2.7	16.0	0.0	160.0	Dump Truck	25	100	267	1,600	0	16,000	0	0	0	0	0

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	Daily VMT (MDAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions	MDAB Pm10 Emissions	MDAB PM2.5 Emissions
Option 1														
Demo	866.6	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.4E+00	3.5E-01	0.0E+00	0.0E+00
Green Waste	40.0	0.0	0.02	25	0.0022	0.00054	40	366	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Excavation	3,941.3	1,313.8	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	6.4E+00	1.6E+00	2.1E+00	5.2E-01
SVE Well/Piping	261.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.2E-01	1.0E-01	0.0E+00	0.0E+00
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backfill/Compact	224.9	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.6E-01	9.0E-02	0.0E+00	0.0E+00
Slurry Backfill	170.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.8E-01	6.8E-02	0.0E+00	0.0E+00
Site Resto.	130.8	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.1E-01	5.2E-02	0.0E+00	0.0E+00
Street Trenching														
Demo	119.3	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.9E-01	4.8E-02	0.0E+00	0.0E+00
Excavation	890.0	296.7	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.4E+00	3.5E-01	4.8E-01	1.2E-01
Backfill	47.1	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	7.6E-02	1.9E-02	0.0E+00	0.0E+00
Restoration	39.8	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Pipe Delievery	195.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.2E-01	7.8E-02	0.0E+00	0.0E+00
Well Installation														
Air Vac- Borehole Clearance	20.0	0.0	0.02	25	0.0022	0.00054	40	367	0.0016	0.0004	3.2E-02	8.0E-03	0.0E+00	0.0E+00
Drilling and SVE Well Installation	20.0	0.0	0.02	25	0.0022	0.00054	40	368	0.0016	0.0004	3.2E-02	8.0E-03	0.0E+00	0.0E+00
Waste Collection	40.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	263.8	87.9	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.3E-01	1.1E-01	1.4E-01	3.5E-02
Street Paving														
Street Grinding	960.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.6E+00	3.8E-01	0.0E+00	0.0E+00
Street Paving	1,600.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.6E+00	6.4E-01	0.0E+00	0.0E+00

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	56	21.6	1,210	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.8E-01	4.4E-02
Street Trenching	71	21.6	1,534	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	2.3E-01	5.6E-02
Well Installation	73	21.6	1,577	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	2.3E-01	5.8E-02
Street Paving													
Street Grinding	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02
Street Paving	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/29/2014*
Project:	Kast Remediation Project - VOC Emissions Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*29-Oct-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*29-Oct-14*
Brief description of analysis:	*Calculating emission rates of VOC from contaminated soil.*
Reference MXD:	S:\Shirley Pearson\!Kast\29 Oct 2014 Updates
Model used:	*EMSOFT, 2002*

Version 10-29-14

Kast VOC Emissions Calculations

I. List of VOC's Listed in the HHRA

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.30E-04	5.90E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,1,2-Trichloroethane	79-00-5	5.00E+01	7.80E-02	8.80E-06	3.70E-02	4.10E-01	3.00E-01	3.70E-04	6.10E-03
1,1-Dichloroethane	75-34-3	3.20E+01	7.40E-02	1.10E-05	2.30E-01	3.30E-01	1.90E-01	2.70E-03	5.80E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trichlorobenzene	120-82-1	1.80E+03	3.00E-02	8.20E-06	5.80E-02	1.10E+01	1.10E+01	8.40E-06	2.30E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloroethane	107-06-2	1.70E+01	1.00E-01	9.90E-06	4.00E-02	2.10E-01	1.00E-01	1.00E-03	8.10E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,3-Butadiene	106-99-0	1.90E+01	2.50E-01	1.10E-05	3.00E+00	7.80E-01	1.10E-01	5.00E-02	1.90E-02
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
1,4-Dioxane	123-91-1	1.00E+00	2.30E-01	1.00E-05	2.30E-04	1.10E-01	6.00E-03	2.60E-05	1.80E-02
2,2,4-Trimethylpentane	540-84-1	1.50E+05	1.00E-01	1.00E-05	1.80E+02	9.30E+02	9.00E+02	1.00E-03	7.80E-03
2-Hexanone	591-78-6	9.40E+00	7.50E-02	8.40E-06	3.80E-03	1.60E-01	5.70E-02	9.40E-05	5.80E-03
4-Ethyltoluene	622-96-8	1.80E+03	6.80E-02	7.30E-06	2.10E-01	1.10E+01	1.10E+01	6.70E-05	5.30E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Carbon disulfide	75-15-0	4.60E+01	1.00E-01	1.00E-05	1.20E+00	6.10E-01	2.70E-01	1.10E-02	8.10E-03
Carbon tetrachloride tetrachloride	56-23-5	1.70E+02	7.80E-02	8.80E-06	1.20E+00	1.40E+00	1.00E+00	3.60E-03	6.10E-03
Chloroform	67-66-3	4.00E+01	1.00E-01	1.00E-05	1.50E-01	3.70E-01	2.40E-01	2.20E-03	8.10E-03
Cyclohexane	110-82-7	1.70E+02	7.40E-02	8.50E-06	7.90E+00	2.60E+00	9.90E-01	1.20E-02	5.70E-03
Dibromochloromethane	124-48-1	6.30E+01	2.00E-02	1.10E-05	3.20E-02	4.80E-01	3.80E-01	6.70E-05	1.50E-03
cis-1,2-Dichloroethene	156-59-2	3.60E+01	7.40E-02	1.10E-05	1.70E-01	3.40E-01	2.10E-01	1.80E-03	5.70E-03
trans-1,2-Dichloroethene	156-60-5	5.30E+01	7.10E-02	1.20E-05	3.80E-01	4.90E-01	3.20E-01	2.90E-03	5.50E-03
trans-1,3-Dichloropropene	10061-02-6	4.60E+01	6.30E-02	1.00E-05	7.20E-01	5.10E-01	2.70E-01	4.60E-03	4.90E-03
Ethanol	64-17-5	1.00E+00	1.50E-01	1.60E-05	1.90E-04	1.10E-01	6.00E-03	1.50E-05	1.30E-02
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.40E-04	5.90E-03
Heptane	142-82-5	2.70E+02	9.30E-02	7.60E-06	8.20E+01	1.70E+01	1.60E+00	2.30E-02	7.20E-03
Hexachloro-1,3-butadiene	87-68-3	5.40E+04	5.60E-02	6.20E-06	3.30E-01	3.20E+02	3.20E+02	3.00E-06	4.40E-03
Hexane	110-54-3	4.30E+01	2.00E-01	7.80E-06	6.80E+01	1.30E+01	2.60E-01	5.40E-02	1.60E-02
Isopropanol	67-63-0	6.90E+00	8.00E-02	9.30E-06	3.60E-04	1.40E-01	4.20E-02	1.10E-05	6.50E-03
Isopropyl benzene (cumene)	98-82-8	4.90E+02	6.50E-02	7.10E-06	4.70E+01	1.20E+01	2.90E+00	1.30E-02	5.10E-03
Methyl ethyl ketone (2-butanone)	78-93-3	2.30E+00	8.10E-02	9.80E-06	2.30E-03	1.10E-01	1.40E-02	8.40E-05	6.30E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Methyl-tert-butyl ether	1634-04-4	7.30E+00	1.00E-01	1.10E-05	2.60E-02	1.50E-01	4.40E-02	9.10E-04	8.00E-03
Propyl benzene	103-65-1	5.60E+02	6.00E-02	7.80E-06	4.40E-01	3.60E+00	3.40E+00	3.80E-04	4.70E-03
tert-Butyl Alcohol (TBA)	75-65-0	4.20E+00	8.50E-02	9.10E-06	3.00E-03	1.30E-01	2.50E-02	1.10E-04	6.70E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Tetrahydrofuran	109-99-9	9.50E-01	9.80E-02	1.10E-05	2.90E-03	1.10E-01	5.70E-03	1.40E-04	7.70E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

II. Chemical Inputs for EMSOFT Model run

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	COC Concentrations (0-10 feet)		COC Concentrations (0-10 feet)	
								Units	Sitewide UCL	Units	Sitewide UCL
100-41-4	Ethylbenzene	360	7.50E-02	6.48E+03	7.80E-06	6.74E-01	3.20E-01	mg/kg	5.00E-01	ug/kg	5.00E+02
106-46-7	1,4-Dichlorobenzene	620	6.90E-02	5.96E+03	7.90E-06	6.83E-01	9.80E-02	mg/kg	5.90E-04	ug/kg	5.90E-01
107-06-2	1,2-Dichloroethane	17	1.00E-01	8.64E+03	9.90E-06	8.55E-01	4.00E-02	mg/kg	4.70E-04	ug/kg	4.70E-01
108-67-8	1,3,5-Trimethylbenzene	1400	6.00E-02	5.18E+03	8.70E-06	7.52E-01	2.40E-01	mg/kg	1.90E-01	ug/kg	1.90E+02
108-88-3	Toluene	180	8.70E-02	7.52E+03	8.60E-06	7.43E-01	2.70E-01	mg/kg	1.20E-01	ug/kg	1.20E+02
127-18-4	Tetrachloroethene	160	7.20E-02	6.22E+03	8.20E-06	7.08E-01	7.50E-01	mg/kg	1.30E-02	ug/kg	1.30E+01
129-00-0	Pyrene	110000	2.70E-02	2.33E+03	7.20E-06	6.22E-01	4.50E-04	mg/kg	1.00E+00	mg/kg	1.00E+00
1330-20-7	Xylenes, Total	390	7.70E-02	6.65E+03	8.40E-06	7.26E-01	3.10E-01	mg/kg	7.69E-01	ug/kg	7.69E+02
156-59-2	cis-1,2-Dichloroethene	36	7.40E-02	6.39E+03	1.10E-05	9.50E-01	1.70E-01	mg/kg	5.60E-04	ug/kg	5.60E-01
71-43-2	Benzene	59	8.80E-02	7.60E+03	9.80E-06	8.47E-01	2.30E-01	mg/kg	1.70E-01	ug/kg	1.70E+02
74-83-9	Bromomethane	11	7.30E-02	6.31E+03	1.20E-05	1.04E+00	2.60E-01	mg/kg	5.80E-03	ug/kg	5.80E+00
75-01-4	Vinyl Chloride	19	1.10E-01	9.50E+03	1.20E-05	1.04E+00	1.10E+00	mg/kg	2.41E-04	ug/kg	2.41E-01
75-09-2	Methylene Chloride	12	1.00E-01	8.64E+03	1.20E-05	1.04E+00	9.00E-02	mg/kg	3.20E-03	ug/kg	3.20E+00
75-27-4	Bromodichloromethane	55	3.00E-02	2.59E+03	1.10E-05	9.50E-01	6.50E-02	mg/kg	2.40E-04	ug/kg	2.40E-01
75-65-0	tert-Butyl Alcohol (TBA)	4.2	8.50E-02	7.34E+03	9.10E-06	7.86E-01	3.00E-03	mg/kg	4.80E-03	ug/kg	4.80E+00
78-87-5	1,2-Dichloropropane	44	7.80E-02	6.74E+03	8.70E-06	7.52E-01	1.10E-01	mg/kg	3.60E-04	ug/kg	3.60E-01
79-01-6	Trichloroethene	170	7.90E-02	6.83E+03	9.10E-06	7.86E-01	4.20E-01	mg/kg	7.40E-04	ug/kg	7.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	93	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.40E-02	mg/kg	4.80E-04	ug/kg	4.80E-01
90-12-0	1-Methylnaphthalene	3000	5.30E-02	4.58E+03	7.90E-06	6.83E-01	2.10E-02	mg/kg	2.60E+00	mg/kg	2.60E+00
91-20-3	Naphthalene	2000	5.90E-02	5.10E+03	7.50E-06	6.48E-01	2.00E-02	mg/kg	1.50E+00	mg/kg	1.50E+00
91-57-6	2-Methylnaphthalene	2800	5.20E-02	4.49E+03	7.80E-06	6.74E-01	2.10E-02	mg/kg	3.90E+00	mg/kg	3.90E+00
95-63-6	1,2,4-Trimethylbenzene	1400	6.10E-02	5.27E+03	7.90E-06	6.83E-01	2.50E-01	mg/kg	7.80E-01	ug/kg	7.80E+02
96-18-4	1,2,3-Trichloropropane	22	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.70E-02	mg/kg	6.40E-04	ug/kg	6.40E-01
#N/A	2,4-Dinitrotoluene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	6.30E-02	mg/kg	6.30E-02
#N/A	Antimony	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.90E-01	mg/kg	2.90E-01
#N/A	Arsenic	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.90E+00	mg/kg	4.90E+00
#N/A	BaP TEQ	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-01	mg/kg	1.70E-01
#N/A	Benzo (a) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.10E-01	mg/kg	2.10E-01
#N/A	Benzo (a) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.20E-01	mg/kg	1.20E-01
#N/A	Benzo (b) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.80E-02	mg/kg	5.80E-02
#N/A	Benzo (k) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-02	mg/kg	1.30E-02
#N/A	Bis(2-Ethylhexyl) Phthalate	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.50E-01	mg/kg	1.50E-01

Kast VOC Emissions Calculations

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	Units	Sitewide UCL	Units	Sitewide UCL
#N/A	Cadmium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	9.90E-02	mg/kg	9.90E-02
#N/A	Chromium, Hexavalent	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-01	mg/kg	1.30E-01
#N/A	Chrysene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.60E-01	mg/kg	5.60E-01
#N/A	Cobalt	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.10E+00	mg/kg	8.10E+00
#N/A	Copper	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.40E+01	mg/kg	1.40E+01
#N/A	Dibenz (a,h) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.90E-03	mg/kg	8.90E-03
#N/A	Indeno (1,2,3-c,d) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-02	mg/kg	1.70E-02
#N/A	Lead	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.10E+01	mg/kg	1.10E+01
#N/A	Thallium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E-01	mg/kg	2.20E-01
#N/A	TPH as Diesel	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E+03	mg/kg	2.20E+03
#N/A	TPH as Gasoline	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E+02	mg/kg	1.30E+02
#N/A	TPH as Motor Oil	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+03	mg/kg	3.00E+03
#N/A	Vanadium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+01	mg/kg	3.00E+01
#N/A	Zinc	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.20E+01	mg/kg	4.20E+01

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

*Chemicals with values listed as "#N/A" were not listed in the HHRA.

III. Soil and Layer Inputs for EMSOFT Model Run

	Calculation Options			Soil Properties				Physical Constants		Layer Properties	
	Time Period for Averaging and Printing Flux and Soil Concentration Results* (days)	Depth (D1) for Averaging Soil Concentration Results (cm)	Depth (D2) for Printing Soil Concentration Results (cm)	Fraction Organic Carbon[A,B] (unit less)	Fraction Porosity[A,B] (unit less)	Fraction Water Content[A,B] (unit less)	Bulk Density[A,B] (g/cm^3)	Porewater Flux (-=up, +=down)^c (cm/day)	Boundary Layer Thickness[D] (cm)	Cover Thickness[E] (cm)	Layer Thickness[F] (cm)
Site Wide (USEPA Screening Values for Loam)	[0.1/1]*	1	1	0.002	0.399	0.148	1.59	0	0.5	0	304.8

* 0.1 days: Shortest duration supported by EMSOFT model and used the represent the maximum hourly flux.

1 day: Used to represent the maximum daily flux

Data Sources: A. USPEA, User's Guide for Evaluation subsurface Vapor intrusion into Buildings, Table 11 - Guidance for Selection of Soil Type, (2004) 37. The soil parameters are based on soil texture classification of "lam."

B. USPEA, Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Version 3.1, Soil Properties Lookup Table, (2004).

C. USEPA, EMSOFT User's Guide, Page 38, September 2002. "If no data are available, it would be conservative for the purpose of calculating long-term volatilization rates and soil concentrations to assume a porewater flux of zero."

D. USEPA, EMSOFT User's Guide, Page 43, September 2002. "A default boundary layer thickness that may be used in EMSOFT when no other data are available is 0.5 cm.

E. Assumes contamination begins at the surface.

F. This analysis uses 10 feet (304.8 cm) throughout site.

IV. EMSOFT Volatilization Factor Out Put

CAS #	Chemical	Volatilization Factors	
		0.1 Day Average (mg/cm^2)	1 Day Average (mg/cm^2-day)
100-41-4	Ethylbenzene	2.74E-02	8.72E-03
106-46-7	1,4-Dichlorobenzene	1.36E-05	4.35E-06
107-06-2	1,2-Dichloroethane	2.68E-05	8.52E-06
108-67-8	1,3,5-Trimethylbenzene	4.32E-03	1.39E-03
108-88-3	Toluene	8.61E-03	2.74E-03
127-18-4	Tetrachloroethene	1.37E-03	4.34E-04
129-00-0	Pyrene	8.66E-06	7.21E-06
1330-20-7	Xylenes, Total	4.07E-02	1.29E-02
156-59-2	cis-1,2-Dichloroethene	4.73E-05	1.50E-05
71-43-2	Benzene	1.60E-02	5.09E-03
74-83-9	Bromomethane	6.68E-04	2.12E-04
75-01-4	Vinyl Chloride	5.03E-05	1.59E-05
75-09-2	Methylene Chloride	2.76E-04	8.78E-05
75-27-4	Bromodichloromethane	7.50E-06	2.40E-06
75-65-0	tert-Butyl Alcohol (TBA)	7.75E-05	2.50E-05
78-87-5	1,2-Dichloropropane	2.47E-05	7.84E-06
79-01-6	Trichloroethene	6.29E-05	2.00E-05
79-34-5	1,1,2,2-Tetrachloroethane	9.23E-06	2.97E-06
90-12-0	1-Methylnaphthalene	1.05E-02	5.48E-03
91-20-3	Naphthalene	8.22E-02	2.60E-03
91-57-6	2-Methylnaphthalene	1.61E-02	5.48E-03
95-63-6	1,2,4-Trimethylbenzene	1.83E-02	5.86E-03
96-18-4	1,2,3-Trichloropropane	1.94E-05	6.21E-06

V. VOC Emission Calculations

General Assumptions

Parameter	Value	Units	References
Hours per Day	8	hours	Hours of work 8am-4pm

Excavated Surface Volatilization Assumptions

Parameter	Value	Units	References
Layer Thickness	304.8	cm	10 feet of excavation
Stabilizer	91%	%	Apply stabilizer on inactive areas. Source: USEPA, Control of Air Emissions from Superfund Sites, (1992). Long-term VOC control efficiency ranges from 91 to 100%.
Work Days in year	251	days	

Excavated Surfaces VOC Emissions

Equation:

Active Area Emissions (lb/time) = tXVFXAs

None-Active Area Emissions (lb/time) = (1-MR)xtXVFXAs

Where:

MR = stabilized mitigation

t = time conversion factor (e.g. Hours/day, days/year)

VF = volatility factor output from EMSOFT model (mg/cm^2-day)

As = surface area of volatilization (cm^2)

Phase	Duration (days)	Hourly QTY Excavated (CY)	Daily QTY Excavated (CY)	Yearly QTY Excavated (CY)	Hourly Excavated/Disturbed Surface Area (cm^2)	Daily Previously Excavated/Disturbed Surface Area (cm^2)	Yearly Excavated/Disturbed Surface Area (cm^2)	Stabilized Mitigation (% Reduction)
Option 1 - Excavati	889	7	368	87,181	1.76E+04	9.23E+05	2.19E+08	91%
Street Trenching	180	10	80	14,418	2.51E+04	2.01E+05	3.62E+07	91%

Kast VOC Emissions Calculations

Volatilization Factor Calculations:

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
Option 1 - Excavation								
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

VOC Emission Calculations:

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
Option 1 - Excavation										
100-41-4	Ethylbenzene	3.54E-04	6.36E-05	4.17E-04	5.91E-03	2.39E-03	8.31E-03	3.52E+02	3.17E+01	3.83E+02
106-46-7	1,4-Dichlorobenzene	1.75E-07	3.16E-08	2.07E-07	2.95E-06	1.19E-06	4.14E-06	1.75E-01	1.58E-02	1.91E-01
107-06-2	1,2-Dichloroethane	3.46E-07	6.22E-08	4.08E-07	5.78E-06	2.34E-06	8.12E-06	3.44E-01	3.09E-02	3.75E-01
108-67-8	1,3,5-Trimethylbenzene	5.57E-05	1.00E-05	6.58E-05	9.43E-04	3.82E-04	1.32E-03	5.61E+01	5.05E+00	6.11E+01
108-88-3	Toluene	1.11E-04	2.00E-05	1.31E-04	1.86E-03	7.52E-04	2.61E-03	1.11E+02	9.95E+00	1.20E+02
127-18-4	Tetrachloroethene	1.77E-05	3.18E-06	2.09E-05	2.94E-04	1.19E-04	4.13E-04	1.75E+01	1.58E+00	1.91E+01
129-00-0	Pyrene	1.12E-07	2.01E-08	1.32E-07	4.89E-06	1.98E-06	6.87E-06	2.91E-01	2.62E-02	3.17E-01
1330-20-7	Xylenes, Total	5.25E-04	9.45E-05	6.20E-04	8.75E-03	3.54E-03	1.23E-02	5.20E+02	4.68E+01	5.67E+02
156-59-2	cis-1,2-Dichloroethene	6.10E-07	1.10E-07	7.20E-07	1.02E-05	4.12E-06	1.43E-05	6.05E-01	5.45E-02	6.60E-01
71-43-2	Benzene	2.06E-04	3.72E-05	2.44E-04	3.45E-03	1.40E-03	4.85E-03	2.05E+02	1.85E+01	2.24E+02
74-83-9	Bromomethane	8.62E-06	1.55E-06	1.02E-05	1.44E-04	5.82E-05	2.02E-04	8.55E+00	7.70E-01	9.32E+00
75-01-4	Vinyl Chloride	6.49E-07	1.17E-07	7.66E-07	1.08E-05	4.37E-06	1.51E-05	6.41E-01	5.77E-02	6.99E-01
75-09-2	Methylene Chloride	3.56E-06	6.41E-07	4.20E-06	5.95E-05	2.41E-05	8.36E-05	3.54E+00	3.19E-01	3.86E+00
75-27-4	Bromodichloromethane	9.68E-08	1.74E-08	1.14E-07	1.63E-06	6.59E-07	2.29E-06	9.68E-02	8.71E-03	1.06E-01
75-65-0	tert-Butyl Alcohol (TBA)	1.00E-06	1.80E-07	1.18E-06	1.70E-05	6.87E-06	2.38E-05	1.01E+00	9.08E-02	1.10E+00
78-87-5	1,2-Dichloropropane	3.19E-07	5.74E-08	3.76E-07	5.32E-06	2.15E-06	7.47E-06	3.16E-01	2.85E-02	3.45E-01
79-01-6	Trichloroethene	8.12E-07	1.46E-07	9.58E-07	1.36E-05	5.49E-06	1.91E-05	8.07E-01	7.26E-02	8.79E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.19E-07	2.14E-08	1.41E-07	2.01E-06	8.16E-07	2.83E-06	1.20E-01	1.08E-02	1.31E-01
90-12-0	1-Methylnaphthalene	1.35E-04	2.44E-05	1.60E-04	3.72E-03	1.50E-03	5.22E-03	2.21E+02	1.99E+01	2.41E+02
91-20-3	Naphthalene	1.06E-03	1.91E-04	1.25E-03	1.76E-03	7.14E-04	2.48E-03	1.05E+02	9.44E+00	1.14E+02
91-57-6	2-Methylnaphthalene	2.08E-04	3.74E-05	2.45E-04	3.72E-03	1.50E-03	5.22E-03	2.21E+02	1.99E+01	2.41E+02
95-63-6	1,2,4-Trimethylbenzene	2.36E-04	4.25E-05	2.79E-04	3.97E-03	1.61E-03	5.58E-03	2.36E+02	2.13E+01	2.58E+02
96-18-4	1,2,3-Trichloropropane	2.50E-07	4.51E-08	2.95E-07	4.21E-06	1.71E-06	5.92E-06	2.50E-01	2.25E-02	2.73E-01

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
100-41-4	Ethylbenzene	5.06E-04	9.10E-05	5.97E-04	1.29E-03	5.21E-04	1.81E-03	5.82E+01	5.24E+00	6.34E+01
106-46-7	1,4-Dichlorobenzene	2.51E-07	4.52E-08	2.96E-07	6.42E-07	2.60E-07	9.02E-07	2.90E-02	2.61E-03	3.16E-02
107-06-2	1,2-Dichloroethane	4.95E-07	8.90E-08	5.84E-07	1.26E-06	5.09E-07	1.77E-06	5.68E-02	5.12E-03	6.20E-02
108-67-8	1,3,5-Trimethylbenzene	7.97E-05	1.44E-05	9.41E-05	2.05E-04	8.31E-05	2.88E-04	9.27E+00	8.35E-01	1.01E+01
108-88-3	Toluene	1.59E-04	2.86E-05	1.88E-04	4.05E-04	1.64E-04	5.68E-04	1.83E+01	1.65E+00	1.99E+01
127-18-4	Tetrachloroethene	2.53E-05	4.55E-06	2.98E-05	6.41E-05	2.60E-05	9.00E-05	2.90E+00	2.61E-01	3.16E+00
129-00-0	Pyrene	1.60E-07	2.88E-08	1.89E-07	1.06E-06	4.31E-07	1.50E-06	4.81E-02	4.33E-03	5.24E-02
1330-20-7	Xylenes, Total	7.51E-04	1.35E-04	8.86E-04	1.90E-03	7.71E-04	2.68E-03	8.61E+01	7.74E+00	9.38E+01
156-59-2	cis-1,2-Dichloroethene	8.73E-07	1.57E-07	1.03E-06	2.21E-06	8.97E-07	3.11E-06	1.00E-01	9.01E-03	1.09E-01
71-43-2	Benzene	2.95E-04	5.32E-05	3.48E-04	7.52E-04	3.04E-04	1.06E-03	3.40E+01	3.06E+00	3.70E+01
74-83-9	Bromomethane	1.23E-05	2.22E-06	1.45E-05	3.13E-05	1.27E-05	4.40E-05	1.41E+00	1.27E-01	1.54E+00
75-01-4	Vinyl Chloride	9.28E-07	1.67E-07	1.10E-06	2.35E-06	9.51E-07	3.30E-06	1.06E-01	9.55E-03	1.16E-01
75-09-2	Methylene Chloride	5.09E-06	9.17E-07	6.01E-06	1.30E-05	5.25E-06	1.82E-05	5.86E-01	5.27E-02	6.38E-01
75-27-4	Bromodichloromethane	1.38E-07	2.49E-08	1.63E-07	3.54E-07	1.44E-07	4.98E-07	1.60E-02	1.44E-03	1.75E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.43E-06	2.57E-07	1.69E-06	3.69E-06	1.49E-06	5.19E-06	1.67E-01	1.50E-02	1.82E-01
78-87-5	1,2-Dichloropropane	4.56E-07	8.21E-08	5.38E-07	1.16E-06	4.69E-07	1.63E-06	5.23E-02	4.71E-03	5.70E-02
79-01-6	Trichloroethene	1.16E-06	2.09E-07	1.37E-06	2.95E-06	1.20E-06	4.15E-06	1.33E-01	1.20E-02	1.45E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.70E-07	3.07E-08	2.01E-07	4.39E-07	1.78E-07	6.16E-07	1.98E-02	1.78E-03	2.16E-02
90-12-0	1-Methylnaphthalene	1.94E-04	3.49E-05	2.29E-04	8.09E-04	3.28E-04	1.14E-03	3.66E+01	3.29E+00	3.98E+01
91-20-3	Naphthalene	1.52E-03	2.73E-04	1.79E-03	3.84E-04	1.55E-04	5.39E-04	1.73E+01	1.56E+00	1.89E+01
91-57-6	2-Methylnaphthalene	2.97E-04	5.35E-05	3.51E-04	8.09E-04	3.28E-04	1.14E-03	3.66E+01	3.29E+00	3.98E+01
95-63-6	1,2,4-Trimethylbenzene	3.38E-04	6.08E-05	3.99E-04	8.65E-04	3.50E-04	1.22E-03	3.91E+01	3.52E+00	4.26E+01
96-18-4	1,2,3-Trichloropropane	3.58E-07	6.45E-08	4.23E-07	9.17E-07	3.71E-07	1.29E-06	4.14E-02	3.73E-03	4.52E-02

Summary of VOC Emissions (Expedited Case)

Sum of Value Row Labels	Column Labels lbs/day
1,1,2,2-Tetrachloroethane	1.94E-06
1,2,3-Trichloropropane	4.06E-06
1,2,4-Trimethylbenzene	3.83E-03
1,2-Dichloroethane	5.57E-06
1,2-Dichloropropane	5.13E-06
1,3,5-Trimethylbenzene	9.09E-04
1,4-Dichlorobenzene	2.85E-06
1-Methylnaphthalene	3.59E-03
2-Methylnaphthalene	3.59E-03
Benzene	3.33E-03
Bromodichloromethane	1.57E-06
Bromomethane	1.39E-04
cis-1,2-Dichloroethene	9.81E-06
Ethylbenzene	5.71E-03
Methylene Chloride	5.74E-05
Naphthalene	1.70E-03
Pyrene	4.72E-06
tert-Butyl Alcohol (TBA)	1.64E-05
Tetrachloroethene	2.84E-04
Toluene	1.79E-03
Trichloroethene	1.31E-05
Vinyl Chloride	1.04E-05
Xylenes, Total	8.44E-03
Grand Total	**3.34E-02**

Expedited Implementation Option Calculation Files – Peak Day

- Calculation Cover Sheet and Assumptions
- On-Site Haul Roads – Re-entrained Dust
- Fugitive Dust Emissions During Soil and Excavation and Handling
- Dust Emissions during Concrete Breaking
- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- On-Site Road – Re-entrained Dust
- Off-Site Road Emissions
- Off-Site Road – Re-entrained Dust
- VOC Emissions

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/10/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*10-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\10 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-10-14

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Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

				Street Work (Hours/day)		
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Truc	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided.
Trenching/pipe installation	15	people	Information provided.
Air-vac borehole clearance	7	people	Information provided.
Drilling and SVE well install	10	people	Information provided.
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	42	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.
Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff

Kast Air Emissions Calculations

Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.
Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 202 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 202 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,764	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Note: All loads and CY loads are assumed to remain the same as Base case, only the trips are expedited.

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	2.40	19	307	2,275	2,275
Green Waste - Truck Trips	1	59	0.50	4	32	237	237
Excavation - Truck Trips	15	889	4.34	35	4,167	8,230	30,862
SVE Well/Piping - Truck Trips	1	59	0.33	3	21	158	158
Subslab Vent - Truck Trips	1	59	0.00	0	0	0	0
Backfill/Compact - Truck Trips	12	711	4.52	36	3,472	8,570	25,711
Slurry Backfill - Truck Trips	7	415	1.34	11	602	2,548	4,459
Site Resto. - Truck Trips	10	593	1.04	8	663	1,965	4,913
Worker Trips	49	1,256	5.25	42	16,464	10,542	52,752
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	29	229	3,669	27,170	27,170
Excavation	7	486	58,338	115,218	432,068
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	53	421	40,443	99,844	299,532
Slurry Backfill	24	196	10,951	46,345	81,103
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.31	2.5	448	448
Excavation - Truck Trips	1.0	7.6	1,374	1,374
Slurry Backfill - Truck Trips	0.9	7.6	1,366	1,366
Restoration - Truck Trips	0.3	2.5	455	455
Pipe Delivery - Truck Trips	0.3	2.5	450	450
Worker Trips	7.1	57	10,260	10,260

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	4	29	5,184	5,184
Excavation	13	103	18,549	18,549
Slurry Backfill	9	68	12,284	12,284
Restoration	4	29	5,268	5,268

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.31	2.5	158	158
Drilling and SVE Well Installation - Truck Trips	0.31	2.5	158	158
Waste Collection - Truck Trips	0.63	5	315	315
Waste Transport to Offsite Disposal - Truck Trips	0.31	2.5	155	155
Worker Trips	7.38	59	3,717	3,717

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	8	60	3,780	3,780
Waste Transport to Offsite Disposal	3.7	30	1,859	1,859

Note: All loads and CY are assumed to remain the same as Base case, only the trips are expedited.

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Units	Street Paving Value	Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

Note: *It is assumed that the Peak emissions will occur during the Excavation/Street Trenching, and Well installation due to higher base case emissions.*

IV. On-Site Haul Roads - Re-entrained Dust

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site haul roads at the residential homes. The on-site haul roads consist of off-road equipment transporting soil to-and-from the dump truck.

$$E = k(s/12)^a(W/3)^b$$

Where:
E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
a = empirical constant
b = empirical constant
k = empirical constant
Source: AP-42 13.2.2-4, Equation (1a)

Assumptions Parameters	Value	Unites	Notes
s (silt content)	6.4	%	Western Governors' Association, Western Regional Air Partnership (WRAP) Fugitive Dust Handbook, Table 6-2. Average silt content for gravel/crushed limestone road surface material.
W (vehicle weight)	18,000	lbs	Weight of excavator
a (empirical constant)	0.9	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
b (empirical constant)	0.45	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10 and PM2.5)
k (empirical constant) - PM10	1.5	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM10)
k (empirical constant) - PM2.5	0.15	-	AP-42, Chapter 13.2.2, Table 13.2.2-2. Industrial Roads (PM2.5)
Shovel Load (soil) Bobcat	1.25	cy	volume of soil a bucket can hold, http://www.bobcat.com/attachments/bucket_loader_general
Shovel Load (soil) Excavator	1.75	cy	volume of soil a bucket can hold
Weight of a bobcat	3.11	tons	Based on spec information from a S185 Skide-Steer Loader, http://www.bobcat.com/loaders/models/skidsteer/s185
Mitigation (% Reduction)	84%	%	Apply dust suppressants on inactive areas. SCAQMD mitigation measures examples. Table X1-A.
Haul Route length	200	ft	Assumed distance soil would have to be hauled on each property

Option 1 Phases	Hourly Round Trips	Daily Round Trips	8 Home Clusters	Annual Round Trips	Equipment Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Clusters VMT	Annual VMT
Demo	2.4	19	307	2,275	Bobcat	3.11	0.08	0.18	5.82	23	172
Excavation	4.3	35	33,336	65,839	Excavator	9	0.08	0.33	10.52	2,525	4,988
SVE Well/Piping	0.3	3	0	0	0	0	0	0	0.00	0	0
Subslab Vent	0.0	0	0	0	0	0	0	0	0.00	0	0
Backfill/Compact	4.5	36	23,110	57,054	Excavator	9	0.08	0.34	10.96	1,751	4,322
Site Resto.	0.0	8	0	0	0	0	0	0	0.00	0	0

Emission Calculation

Daily:

Option 1 Phases	Daily VMT (SCAB)	W (tons)	k (PM10)	k (PM2.5)	Mitigation %	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)
Demo	5.8	3.11	1.5	0.15	84%	0.87	0.09	0.81	0.08
Excavation	10.5	9	1.5	0.15	84%	1.40	0.14	2.35	0.24
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	11.0	9	1.5	0.15	84%	1.40	0.14	2.45	0.24
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

V. Fugitive Dust Emissions During Soil Excavation and Handling

Summary: This section calculates the dust emissions (PM2.5, PM10) from the on-site soil handling and excavation at the residential homes and during street trenching. The on-site soil handing and excavation consists of two parts: 1) Excavating soil 2)Dropping soil

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

Where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

Source: AP-42 13.2.4-3, Equation (1)

Assumptions Equation parameters	Value	Units	Notes
k - PM10	0.35	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
k - PM2.5	0.053	-	AP-42, Chapter 13.2.4, Page 4. Nov 2006
U	4.21	mph	Average wind speed
M	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Soil Density	3,400	lbs/CY	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701.
Times Soil is Handled	2	time	Apply dust suppressant: 84% control per CARB April 2002: for 1) Excavating soil 2) Dropping soil

Emission Calculation (PM10)

Daily Dust Emissions During Soil Excavation and Handling Phase	Daily CY	Daily (tons)	k (PM10)	U (mph)	M%	EF (lbs/ton)	Mitigation (%)	PM10 Emissions (lbs/day)
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	486	826.5	0.35	4.20556	7.9	1.31E-04	84%	3.46E-02
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	421	716.2	0.35	4.20556	7.9	1.31E-04	84%	3.00E-02
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	103	175.2	0.35	4.20556	7.9	1.31E-04	84%	7.33E-03
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Emission Calculation (PM2.5)

Daily Dust Emissions During Soil Excavation and Handling								
Phase	**Daily CY**	**Hourly (tons)**	**k (PM2.5)**	**U (mph)**	**M%**	**EF (lbs/ton)**	**Mitigation (%)**	**PM2.5 Emissions (lbs/day)**
Option 1								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	486	826.5	0.053	4.21	7.9	1.98E-05	84%	5.23E-03
SVE Well/Piping	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	421	716.2	0.053	4.21	7.9	1.98E-05	84%	4.54E-03
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching								
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	103	175.2	0.053	4.21	7.9	1.98E-05	84%	1.11E-03
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

VI. Dust Emissions during Concrete Breaking

Summary: This section calculates the dust emissions (PM2.5, PM10) during on-site concrete breaking at residential homes, street trenching and street paving. The on-site dust emissions from concrete breaking consists of two parts: 1) Mechanical dismemberment and 2) Debris loading

Mechanical Dismemberment Equations

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

U = Mean wind speed

M = material moisture content (%). The moisture contents of different materials are listed in Table 13.2.4-1 of AP 42. The program uses the moisture content of cover (12%) as default.

Where:

EF_D = emission factor (lb PM/ton of debris)

$EF_{D\text{-}PM10}$ = 0.0011 lb PM_{10}/ton of debris

$EF_{D\text{-}PM2.5}$ = 0.00017 lb $PM_{2.5}$/ton of debris

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 11

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Mean wind speed (U)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Typical Density of Concrete	150	lbs/ft^3	Information provided by project staff
Mitigation (% Reduction) - Watering	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test

Phase	Hourly Weight of Concrete (tons)	Daily Weight of Concrete (tons)	Weight of Concrete per 8 Home Cluster (tons)	Annual Weight of Concrete (tons)	Total Weight of Concrete (tons)
Option 1					
Demo	58	461	7,374	54,611	54,611
Excavation	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00
Street Trenching					
Demo	7	56	0.00	10,109	10,109
Excavation	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00
Street Paving					
Street Grinding	62	374	0.00	1,872	1,872

Mechanical Dismemberment Emissions Calculations

Concrete Breaking Emissions - Daily

Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	9.64E-03	1.46E-03
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	1.31E-04	1.98E-05	84%	1.17E-03	1.78E-04
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	1.31E-04	1.98E-05	84%	7.83E-03	1.19E-03

Debris Loading Equations

$$EF_L = k \times EF_{L\text{-}TSP}$$

Where:

EF_L = emission factor (lb/ton)

k = particle size multiplier. The AP-42 default value for PM_{10} is 0.35 and that for $PM_{2.5}$ is 0.053.

Source: CalEEMod, Appendix A, Page 12

The default value for $EF_{L\text{-}TSP}$ is 0.058 lb/ton, the average of the two TSP factor (i.e. 0.053 and 0.063 lb/ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader.

Source: CalEEMod, Appendix A, Page 13

$$E_D = EF_D \times W$$

Where:

E_D = emissions (lb of PM)

EF_D = emission factor (lb of PM/ton of debris)

W = building waste (ton of debris)

Source: CalEEMod, Appendix A, Page 12

Assumptions Equation parameters	Value	Units	Notes
Emission Factor for Total Suspended Particulates (TSP)	0.058	lb/ton	CalEEMod, Appendix A, Page 13

Debris Loading Emissions Calculations

Concrete Debris Loading - Daily Phase	Particle Size Multiplier for PM10 (k)	Particle Size Multiplier for PM2.5 (k)	Emission Factor PM10 (lb PM/Ton of Concrete)	Emission Factor for PM2.5 (lb PM/Ton of Concrete)	Mitigation (%)	Concrete Breaking Emissions for PM10 (lbs of PM10)	Concrete Breaking Emissions PM2.5 (lbs of PM2.5)
Option 1							
Demo	0.35	0.053	0.0203	0.003074	84%	1.50E+00	2.27E-01
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SVE Well/Piping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slurry Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Resto.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Trenching							
Demo	0.35	0.053	0.0203	0.003074	84%	1.82E-01	2.76E-02
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving							
Street Grinding	0.35	0.053	0.0203	0.003074	84%	1.22E+00	1.84E-01

Total Concrete Breaking Emissions (Mechanical Dismemberment + Debris Loading)

Total Concrete Breaking Emissions - Daily		
Phase	**Concrete Breaking Emissions for PM10 (lbs of PM10)**	**Concrete Breaking Emissions PM2.5 (lbs of PM2.5)**
Option 1		
Demo	1.51E+00	2.28E-01
Excavation	0.00	0.00
SVE Well/Piping	0.00	0.00
Subslab Vent	0.00	0.00
Backfill/Compact	0.00	0.00
Slurry Backfill	0.00	0.00
Site Resto.	0.00	0.00
Street Trenching		
Demo	1.84E-01	2.78E-02
Excavation	0.00	0.00
Backfill	0.00	0.00
Restoration	0.00	0.00
Street Paving		
Street Grinding	1.22E+00	1.85E-01
Total	2.91E+00	4.41E-01

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase																			Emissions Factors (g/bhp-hr)
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2 [2]	PM10	PM2.5	SOx [2]
Option 1																			
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/ Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/ Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/ Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/ Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/ Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																			
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders/ Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																			
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																			
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and Sox were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations		Daily Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations	Daily Emissions (lb)						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions										g/mi	
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions										lbs/mi	
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data									SCAB		
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	2.40	19	307	2,275	Dump Truck	25	0.72	1.73	14	221	1637
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	4.34	35	4,167	8,230	Dump Truck	25	0.72	3.12	25	2999	5923
SVE Well/Piping	0.3	2.7	21.3	158.0	Dump Truck	25	0.72	0.24	1.9	15	114
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	4.52	36	3,472	8,570	Dump Truck	25	0.72	3.25	26	2498	6168
Slurry Backfill	1.34	11	602	2,548	Concrete Truck	25	0.72	0.97	8	433	1834
Site Resto.	1.04	8	663	1,965	Concrete Truck	25	0.72	0.75	6	477	1414
Street Trenching											
Demo	0.31	2	0	448	Dump Truck	25	0.72	0.22	1.8	0.00	322
Excavation	0.95	8	0	1,374	Dump Truck	25	0.72	0.69	5	0.00	989
Backfill	0.95	8	0	1,366	Dump Truck	25	0.72	0.68	5	0.00	983
Restoration	0.32	3	0	455	Concrete Truck	25	0.72	0.23	1.8	0.00	327
Pipe Delivery	0.31	3	0	450	Dump Truck	25	0.72	0.22	2	0.00	324
Well Installation											
Air Vac- Borehole Clearance	0.31	3	0	158	Air-Vac	25	0.72	0.22	2	0.00	113
Drilling and SVE Well Installation	0.31	3	0	158	Drill Rig	25	0.72	0.22	2	0.00	113
Waste Collection	0.63	5	0	315	Dump Truck	25	0.72	0.45	4	0.00	227
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	13.8	3.7E-03	2.6E-02	6.6E-02	4.8E+01	1.9E-03	1.7E-03	5.1E-04	1.8E-04	1.7E-04
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	25.0	6.8E-03	4.8E-02	1.2E-01	8.7E+01	3.4E-03	3.1E-03	9.2E-04	3.3E-04	3.0E-04
SVE Well/Piping	1.9	5.2E-04	3.7E-03	9.1E-03	6.7E+00	2.6E-04	2.4E-04	7.1E-05	2.5E-05	2.3E-05
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	26.0	7.1E-03	5.0E-02	1.2E-01	9.0E+01	3.5E-03	3.2E-03	9.6E-04	3.4E-04	3.1E-04
Slurry Backfill	7.7	2.1E-03	1.5E-02	3.7E-02	2.7E+01	1.0E-03	9.6E-04	2.9E-04	1.0E-04	9.3E-05
Site Resto.	6.0	1.6E-03	1.1E-02	2.8E-02	2.1E+01	8.1E-04	7.4E-04	2.2E-04	7.8E-05	7.2E-05
Street Trenching										
Demo	1.8	4.9E-04	3.4E-03	8.5E-03	6.2E+00	2.4E-04	2.2E-04	6.6E-05	2.3E-05	2.2E-05
Excavation	5.5	1.5E-03	1.0E-02	2.6E-02	1.9E+01	7.4E-04	6.8E-04	2.0E-04	7.2E-05	6.6E-05
Backfill	5.5	1.5E-03	1.0E-02	2.6E-02	1.9E+01	7.4E-04	6.8E-04	2.0E-04	7.1E-05	6.6E-05
Restoration	1.8	4.9E-04	3.5E-03	8.6E-03	6.3E+00	2.5E-04	2.3E-04	6.7E-05	2.4E-05	2.2E-05
Pipe Delivery	1.8	4.9E-04	3.4E-03	8.5E-03	6.3E+00	2.4E-04	2.2E-04	6.6E-05	2.4E-05	2.2E-05
Well Installation										
Air Vac- Borehole Clearance	1.8	4.9E-04	3.4E-03	8.5E-03	6.3E+00	2.4E-04	2.2E-04	6.6E-05	2.4E-05	2.2E-05
Drilling and SVE Well Installation	1.8	4.9E-04	3.4E-03	8.5E-03	6.3E+00	2.4E-04	2.2E-04	6.6E-05	2.4E-05	2.2E-05
Waste Collection	3.6	9.7E-04	6.8E-03	1.7E-02	1.3E+01	4.9E-04	4.5E-04	1.3E-04	4.7E-05	4.3E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	42	0.72	30	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03
Street Trenching	57	0.72	41	5.8E-03	2.3E-01	2.5E-02	6.3E+01	2.7E-04	2.7E-05	6.3E-04	4.1E-03	1.6E-03
Well Installation	59	0.72	42	6.0E-03	2.3E-01	2.6E-02	6.5E+01	2.8E-04	2.8E-05	6.6E-04	4.2E-03	1.7E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIIII. On-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from on-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)

k = particle size multiplier

sL = road surface silt loading (g/m^2)

W = mean vehicle weight (tons)

P = averaging period (365 days)

N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:

P = number of wet days

N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Heavy Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5	0.0005	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways: http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street travel)
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
On-Site Heavy Truck Haul	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Paved Road Average Vehicle	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	SCAB Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	2.4	19.2	307.1	2274.5	Dump Truck	25	0.72	1.7	13.8	221.0	1637.0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	0.72	0.4	2.9	23.0	170.6
Excavation	4.3	34.7	4167.1	8230.0	Dump Truck	25	0.72	3.1	25.0	2999.0	5923.1
SVE Well/Piping	0.3	2.7	21.3	158.0	Dump Truck	25	0.72	0.2	1.9	15.4	113.7
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	4.5	36.2	3471.5	8570.3	Dump Truck	25	0.72	3.3	26.0	2498.4	6168.0
Slurry Backfill	1.3	10.8	602.1	2548.1	Concrete Truck	25	0.72	1.0	7.7	433.3	1833.9
Site Resto.	1.0	8.3	663.4	1965.2	Concrete Truck	25	0.72	0.7	6.0	477.4	1414.3
Street Trenching											
Demo	0.3	2.5	0.00	448.0	Dump Truck	25	0.72	0.2	1.8	0.00	322.4
Excavation	1.0	7.6	0.00	1374.0	Dump Truck	25	0.72	0.7	5.5	0.00	988.9
Backfill	0.9	7.6	0.00	1366.0	Dump Truck	25	0.72	0.7	5.5	0.00	983.1
Restoration	0.3	2.5	0.00	455.0	Concrete Truck	25	0.72	0.2	1.8	0.00	327.5
Pipe Delivery	0.3	2.5	0.00	450.0	Dump Truck	25	0.72	0.2	1.8	0.00	323.9
Well Installation											
Air Vac- Borehole Clearance	0.3	2.5	0.00	157.5	Air-Vac	25	0.72	0.2	1.8	0.00	113.4
Drilling and SVE Well Installation	0.3	2.5	0.00	157.5	Drill Rig	25	0.72	0.2	1.8	0.00	113.4
Waste Collection	0.6	5.0	0.00	315.0	Dump Truck	25	0.72	0.4	3.6	0.00	226.7
Street Paving											
Street Grinding	2.7	16.0	0.00	80.0	Dump Truck	25	0.72	1.9	11.5	0.00	57.6
Street Paving	1.3	8.0	0.00	80.0	Dump Truck	25	0.72	1.0	5.8	0.00	57.6

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	13.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.38E-04	2.06E-04
Green Waste	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Excavation	25.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.52E-03	3.72E-04
SVE Well/Piping	1.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.16E-04	2.86E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	26.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.58E-03	3.87E-04
Slurry Backfill	7.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.69E-04	1.15E-04
Site Resto.	6.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.62E-04	8.88E-05
Street Trenching											
Demo	1.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.09E-04	2.67E-05
Excavation	5.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.33E-04	8.18E-05
Backfill	5.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.31E-04	8.13E-05
Restoration	1.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.10E-04	2.71E-05
Pipe Delivery	1.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.09E-04	2.68E-05
Well Installation											
Air Vac- Borehole Clearance	1.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.09E-04	2.68E-05
Drilling and SVE Well Installation	1.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.09E-04	2.68E-05
Waste Collection	3.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.18E-04	5.36E-05
Street Paving											
Street Grinding	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.98E-04	1.71E-04
Street Paving	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-04	8.57E-05

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	42	0.72	30	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.49E-03	1.10E-03
Street Trenching	57	0.72	41	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	6.10E-03	1.50E-03
Well Installation	59	0.72	42	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	6.31E-03	1.55E-03
Street Paving													
Street Grinding	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04
Street Paving	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	2.4	19	307	2,275	Dump Truck	25	60	144	1,152	18,426	136,470	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	4.3	35	4,167	8,230	Dump Truck	25	150	651	5,209	625,061	1,234,495	50	217	1,736	208,354	411,498
SVE Well/Piping	0.3	2.7	21.3	158.0	Dump Truck	25	100	33	267	2,133	15,800	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	4.5	36	3,472	8,570	Dump Truck	25	8	36	289	27,772	68,563	0	0	0	0	0
Slurry Backfill	1.3	10.8	602.1	2548.1	Concrete Truck	25	20	27	215	12,042	50,963	0	0	0	0	0
Site Resto.	1.0	8	663	1,965	Concrete Truck	25	20	21	166	13,267	39,304	0	0	0	0	0
Street Trenching																
Demo	0.3	2.5	0.00	448.0	Dump Truck	25	60	19	149	0	26,880	0	0	0	0.00	0
Excavation	1.0	7.6	0.00	1374.0	Dump Truck	25	150	143	1,145	0	206,100	50	48	382	0.00	68,700
Slurry Backfill	0.9	7.6	0.00	1366.0	Dump Truck	25	8	8	61	0	10,928	0	0	0	0.00	0
Restoration	0.3	2.5	0.00	455.0	Concrete Truck	25	20	6	51	0	9,100	0	0	0	0.00	0
Pipe Delivery	0.3	2.5	0.00	450.0	Dump Truck	25	100	31	250	0	45,000	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.3	2.5	0.00	157.5	Air-Vac	25	10	3	25	0	1,575	0	0	0	0.00	0
Drilling and SVE Well Installation	0.3	2.5	0.00	157.5	Drill Rig	25	10	3	25	0	1,575	0	0	0	0.00	0
Waste Collection	0.6	5.0	0.00	315.0	Dump Truck	25	10	6	50	0	3,150	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.3	2.5	0.00	154.9	Dump Truck	25	150	46	369	0	23,235	50	15	123	0	7,745
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)						lbs/day (SCAB)				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	1,152	3.1E-01	2.2E+00	5.5E+00	4.0E+03	1.6E-01	1.4E-01	4.2E-02	1.5E-02	1.4E-02
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	5,209	1.4E+00	9.9E+00	2.5E+01	1.8E+04	7.0E-01	6.5E-01	1.9E-01	6.8E-02	6.3E-02
SVE Well/Piping	267	7.2E-02	5.1E-01	1.3E+00	9.3E+02	3.6E-02	3.3E-02	9.8E-03	3.5E-03	3.2E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	289	7.8E-02	5.5E-01	1.4E+00	1.0E+03	3.9E-02	3.6E-02	1.1E-02	3.8E-03	3.5E-03
Slurry Backfill	215	5.8E-02	4.1E-01	1.0E+00	7.5E+02	2.9E-02	2.7E-02	7.9E-03	2.8E-03	2.6E-03
Site Resto.	166	4.5E-02	3.2E-01	7.9E-01	5.8E+02	2.2E-02	2.1E-02	6.1E-03	2.2E-03	2.0E-03
Street Trenching										
Demo	149	4.0E-02	2.8E-01	7.1E-01	5.2E+02	2.0E-02	1.9E-02	5.5E-03	2.0E-03	1.8E-03
Excavation	1,145	3.1E-01	2.2E+00	5.4E+00	4.0E+03	1.5E-01	1.4E-01	4.2E-02	1.5E-02	1.4E-02
Backfill	61	1.6E-02	1.2E-01	2.9E-01	2.1E+02	8.2E-03	7.5E-03	2.2E-03	7.9E-04	7.3E-04
Restoration	51	1.4E-02	9.6E-02	2.4E-01	1.8E+02	6.8E-03	6.3E-03	1.9E-03	6.6E-04	6.1E-04
Pipe Delivery	250	6.8E-02	4.8E-01	1.2E+00	8.7E+02	3.4E-02	3.1E-02	9.2E-03	3.3E-03	3.0E-03
Well Installation										
Air Vac- Borehole Clearance	25	6.8E-03	4.8E-02	1.2E-01	8.7E+01	3.4E-03	3.1E-03	9.2E-04	3.3E-04	3.0E-04
Drilling and SVE Well Installation	25	6.8E-03	4.8E-02	1.2E-01	8.7E+01	3.4E-03	3.1E-03	9.2E-04	3.3E-04	3.0E-04
Waste Collection	50	1.4E-02	9.5E-02	2.4E-01	1.7E+02	6.8E-03	6.2E-03	1.8E-03	6.5E-04	6.0E-04
Waste Transport to Offsite Disposal	369	1.0E-01	7.0E-01	1.8E+00	1.3E+03	5.0E-02	4.6E-02	1.4E-02	4.8E-03	4.4E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)						lbs/day (MDAB)				
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	1736	4.7E-01	3.3E+00	8.2E+00	6.0E+03	2.3E-01	2.2E-01	6.4E-02	2.3E-02	2.1E-02
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	382	1.0E-01	7.3E-01	1.8E+00	1.3E+03	5.2E-02	4.7E-02	1.4E-02	5.0E-03	4.6E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	123	3.3E-02	2.3E-01	5.8E-01	4.3E+02	1.7E-02	1.5E-02	4.5E-03	1.6E-03	1.5E-03
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
				lbs/day								
Option 1	42	21.6	907	1.3E-01	5.0E+00	5.6E-01	1.4E+03	6.0E-03	6.0E-04	1.4E-02	9.0E-02	3.6E-02
Street Trenching	57	21.6	1231	1.7E-01	6.8E+00	7.5E-01	1.9E+03	8.1E-03	8.1E-04	1.9E-02	1.2E-01	4.9E-02
Well Installation	59	21.6	1274	1.8E-01	7.0E+00	7.8E-01	1.9E+03	8.4E-03	8.4E-04	2.0E-02	1.3E-01	5.1E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

XI. Off-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from off-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = mean vehicle weight (tons)
P = averaging period (365 days)
N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:
P = number of wet days
N = number of days in period

Assumptions				
Parameter	**Value**	**Units**	**Reference**	
Vehicle Weight (tons)		25	tons	Assumed
k (empirical constant) - PM10		0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10 (lbs/VMT)
k (empirical constant) - PM2.5		0.00054	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5 (lbs/VMT)
sL (Haul Trucks)		0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways:
sL (Worker Vehicles)		0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street
P (averaging period)		365	days	Days per year
N (wet days)		40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January 2011.
South Coast Air Basin Distance		75	miles	google maps
Mojave Desert Distance		25	miles	google maps
Employee/Worker Trip Distance		21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Paved Road Average Vehicle Weight		2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	SCAB Hourly VMT	SCAB Daily VMT	SCAB 8 Home Cluster VMT	SCAB Annual VMT	Trip length (MDAB)	MDAB Hourly VMT	MDAB Daily VMT	MDAB 8 Home Cluster VMT	MDAB Annual VMT
Option 1																
Demo	2.4	19.2	307.1	2,274.5	Dump Truck	25	60	144	1,152	18,426	136,470	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	10	5	40	320	2,370	0	0	0	0	0
Excavation	4.3	34.7	4,167.1	8,230.0	Dump Truck	25	150	651	5,209	625,061	1,234,495	50	217	1,736	208,354	411,498
SVE Well/Piping	0.3	2.7	21.3	158.0	Dump Truck	25	100	33	267	2,133	15,800	0	0	0	0	0
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Backfill/Compact	4.5	36.2	3,471.5	8,570.3	Dump Truck	25	8	36	289	27,772	68,563	0	0	0	0	0
Slurry Backfill	1.3	10.8	602.1	2,548.1	Concrete Truck	25	20	27	215	12,042	50,963	0	0	0	0	0
Site Resto.	1.0	8.3	663.4	1,965.2	Concrete Truck	25	20	21	166	13,267	39,304	0	0	0	0	0
Street Trenching																
Demo	0.3	2.5	0.0	448.0	Dump Truck	25	60	19	149	0	26,880	0	0	0	0	0
Excavation	1.0	7.6	0.0	1,374.0	Dump Truck	25	150	143	1,145	0	206,100	50	48	382	0	68,700
Backfill	0.9	7.6	0.0	1,366.0	Dump Truck	25	8	8	61	0	10,928	0	0	0	0	0
Restoration	0.3	2.5	0.0	455.0	Concrete Truck	25	20	6	51	0	9,100	0	0	0	0	0
Pipe Delievery	0.3	2.5	0.0	450.0	Dump Truck	25	100	31	250	0	45,000	0	0	0	0	0
Well Installation																
Air Vac- Borehole Clearance	0.3	2.5	0.0	157.5	Air-Vac	25	10.0	3	25	0	1,575	0	0	0	0	0
Drilling and SVE Well Installation	0.3	2.5	0.0	157.5	Drill Rig	25	10.0	3	25	0	1,575	0	0	0	0	0
Waste Collection	0.6	5.0	0.0	315.0	Dump Truck	25.0	10.0	6.3	50.0	0.0	3,150.0	0.0	0.0	0.0	0.0	0.0
Waste Transport to Offsite Disposal	0.3	2.5	0.0	154.9	Dump Truck	25.0	150.0	46.1	368.8	0.0	23,235.0	50.0	15.4	122.9	0.0	7,745.0
Street Paving																
Street Grinding	2.7	16.0	0.0	80.0	Dump Truck	25	60	160	960	0	4,800	0	0	0	0	0
Street Paving	2.7	16.0	0.0	160.0	Dump Truck	25	100	267	1,600	0	16,000	0	0	0	0	0

Emission Calculation

Daily:

Phase	Daily VMT (SCAB)	Daily VMT (MDAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions	MDAB Pm10 Emissions	MDAB PM2.5 Emissions
Option 1														
Demo	1,151.6	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.9E+00	4.6E-01	0.0E+00	0.0E+00
Green Waste	40.0	0.0	0.02	25	0.0022	0.00054	40	366	0.0016	0.0004	6.5E-02	1.6E-02	0.0E+00	0.0E+00
Excavation	5,208.8	1,736.3	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	8.5E+00	2.1E+00	2.8E+00	6.9E-01
SVE Well/Piping	266.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.3E-01	1.1E-01	0.0E+00	0.0E+00
Subslab Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backfill/Compact	289.3	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.7E-01	1.2E-01	0.0E+00	0.0E+00
Slurry Backfill	215.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	3.5E-01	8.6E-02	0.0E+00	0.0E+00
Site Resto.	165.8	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.7E-01	6.6E-02	0.0E+00	0.0E+00
Street Trenching														
Demo	149.3	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.4E-01	5.9E-02	0.0E+00	0.0E+00
Excavation	1,145.0	381.7	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.9E+00	4.6E-01	6.2E-01	1.5E-01
Backfill	60.7	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	9.9E-02	2.4E-02	0.0E+00	0.0E+00
Restoration	50.6	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	8.2E-02	2.0E-02	0.0E+00	0.0E+00
Pipe Delievery	250.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	4.1E-01	1.0E-01	0.0E+00	0.0E+00
Well Installation														
Air Vac- Borehole Clearance	25.0	0.0	0.02	25	0.0022	0.00054	40	367	0.0016	0.0004	4.1E-02	1.0E-02	0.0E+00	0.0E+00
Drilling and SVE Well Installation	25.0	0.0	0.02	25	0.0022	0.00054	40	368	0.0016	0.0004	4.1E-02	1.0E-02	0.0E+00	0.0E+00
Waste Collection	50.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	8.1E-02	2.0E-02	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	368.8	122.9	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	6.0E-01	1.5E-01	2.0E-01	4.9E-02
Street Paving														
Street Grinding	960.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	1.6E+00	3.8E-01	0.0E+00	0.0E+00
Street Paving	1,600.0	0.0	0.02	25	0.0022	0.00054	40	365	0.0016	0.0004	2.6E+00	6.4E-01	0.0E+00	0.0E+00

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	42	21.6	907	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.3E-01	3.3E-02
Street Trenching	57	21.6	1,231	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.8E-01	4.5E-02
Well Installation	59	21.6	1,274	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	1.9E-01	4.6E-02
Street Paving													
Street Grinding	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02
Street Paving	16	21.6	346	0.02	2.4	0.0022	0.00054	40	365	0.0001	0.0000	5.1E-02	1.3E-02

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/29/2014*
Project:	Kast Remediation Project - VOC Emissions Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*29-Oct-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*29-Oct-14*
Brief description of analysis:	*Calculating emission rates of VOC from contaminated soil.*
Reference MXD:	S:\Shirley Pearson\!Kast\29 Oct 2014 Updates
Model used:	*EMSOFT, 2002*

Version 10-29-14

Kast VOC Emissions Calculations

I. List of VOC's Listed in the HHRA

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.30E-04	5.90E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03
1,1,2,2-Tetrachloroethane	79-34-5	9.30E+01	7.10E-02	7.90E-06	1.40E-02	6.60E-01	5.60E-01	7.80E-05	5.50E-03
1,1,2-Trichloroethane	79-00-5	5.00E+01	7.80E-02	8.80E-06	3.70E-02	4.10E-01	3.00E-01	3.70E-04	6.10E-03
1,1-Dichloroethane	75-34-3	3.20E+01	7.40E-02	1.10E-05	2.30E-01	3.30E-01	1.90E-01	2.70E-03	5.80E-03
1,2,3-Trichloropropane	96-18-4	2.20E+01	7.10E-02	7.90E-06	1.70E-02	2.40E-01	1.30E-01	2.60E-04	5.50E-03
1,2,4-Trichlorobenzene	120-82-1	1.80E+03	3.00E-02	8.20E-06	5.80E-02	1.10E+01	1.10E+01	8.40E-06	2.30E-03
1,2,4-Trimethylbenzene	95-63-6	1.40E+03	6.10E-02	7.90E-06	2.50E-01	8.30E+00	8.10E+00	9.60E-05	4.70E-03
1,2-Dichloroethane	107-06-2	1.70E+01	1.00E-01	9.90E-06	4.00E-02	2.10E-01	1.00E-01	1.00E-03	8.10E-03
1,2-Dichloropropane	78-87-5	4.40E+01	7.80E-02	8.70E-06	1.10E-01	3.80E-01	2.60E-01	1.20E-03	6.10E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
1,3,5-Trimethylbenzene	108-67-8	1.40E+03	6.00E-02	8.70E-06	2.40E-01	8.30E+00	8.10E+00	9.10E-05	4.70E-03
1,3-Butadiene	106-99-0	1.90E+01	2.50E-01	1.10E-05	3.00E+00	7.80E-01	1.10E-01	5.00E-02	1.90E-02
1,4-Dichlorobenzene	106-46-7	6.20E+02	6.90E-02	7.90E-06	9.80E-02	3.80E+00	3.70E+00	9.20E-05	5.40E-03
1,4-Dioxane	123-91-1	1.00E+00	2.30E-01	1.00E-05	2.30E-04	1.10E-01	6.00E-03	2.60E-05	1.80E-02
2,2,4-Trimethylpentane	540-84-1	1.50E+05	1.00E-01	1.00E-05	1.80E+02	9.30E+02	9.00E+02	1.00E-03	7.80E-03
2-Hexanone	591-78-6	9.40E+00	7.50E-02	8.40E-06	3.80E-03	1.60E-01	5.70E-02	9.40E-05	5.80E-03
4-Ethyltoluene	622-96-8	1.80E+03	6.80E-02	7.30E-06	2.10E-01	1.10E+01	1.10E+01	6.70E-05	5.30E-03
Benzene	71-43-2	5.90E+01	8.80E-02	9.80E-06	2.30E-01	5.00E-01	3.50E-01	2.10E-03	6.90E-03
Bromodichloromethane	75-27-4	5.50E+01	3.00E-02	1.10E-05	6.50E-02	4.40E-01	3.30E-01	2.30E-04	2.30E-03
Bromomethane	74-83-9	1.10E+01	7.30E-02	1.20E-05	2.60E-01	2.10E-01	6.30E-02	4.60E-03	5.70E-03
Carbon disulfide	75-15-0	4.60E+01	1.00E-01	1.00E-05	1.20E+00	6.10E-01	2.70E-01	1.10E-02	8.10E-03
Carbon tetrachloride tetrachloride	56-23-5	1.70E+02	7.80E-02	8.80E-06	1.20E+00	1.40E+00	1.00E+00	3.60E-03	6.10E-03
Chloroform	67-66-3	4.00E+01	1.00E-01	1.00E-05	1.50E-01	3.70E-01	2.40E-01	2.20E-03	8.10E-03
Cyclohexane	110-82-7	1.70E+02	7.40E-02	8.50E-06	7.90E+00	2.60E+00	9.90E-01	1.20E-02	5.70E-03
Dibromochloromethane	124-48-1	6.30E+01	2.00E-02	1.10E-05	3.20E-02	4.80E-01	3.80E-01	6.70E-05	1.50E-03
cis-1,2-Dichloroethene	156-59-2	3.60E+01	7.40E-02	1.10E-05	1.70E-01	3.40E-01	2.10E-01	1.80E-03	5.70E-03
trans-1,2-Dichloroethene	156-60-5	5.30E+01	7.10E-02	1.20E-05	3.80E-01	4.90E-01	3.20E-01	2.90E-03	5.50E-03
trans-1,3-Dichloropropene	10061-02-6	4.60E+01	6.30E-02	1.00E-05	7.20E-01	5.10E-01	2.70E-01	4.60E-03	4.90E-03
Ethanol	64-17-5	1.00E+00	1.50E-01	1.60E-05	1.90E-04	1.10E-01	6.00E-03	1.50E-05	1.30E-02
Ethylbenzene	100-41-4	3.60E+02	7.50E-02	7.80E-06	3.20E-01	2.30E+00	2.20E+00	5.40E-04	5.90E-03
Heptane	142-82-5	2.70E+02	9.30E-02	7.60E-06	8.20E+01	1.70E+01	1.60E+00	2.30E-02	7.20E-03
Hexachloro-1,3-butadiene	87-68-3	5.40E+04	5.60E-02	6.20E-06	3.30E-01	3.20E+02	3.20E+02	3.00E-06	4.40E-03
Hexane	110-54-3	4.30E+01	2.00E-01	7.80E-06	6.80E+01	1.30E+01	2.60E-01	5.40E-02	1.60E-02
Isopropanol	67-63-0	6.90E+00	8.00E-02	9.30E-06	3.60E-04	1.40E-01	4.20E-02	1.10E-05	6.50E-03
Isopropyl benzene (cumene)	98-82-8	4.90E+02	6.50E-02	7.10E-06	4.70E+01	1.20E+01	2.90E+00	1.30E-02	5.10E-03
Methyl ethyl ketone (2-butanone)	78-93-3	2.30E+00	8.10E-02	9.80E-06	2.30E-03	1.10E-01	1.40E-02	8.40E-05	6.30E-03
Methylene chloride	75-09-2	1.20E+01	1.00E-01	1.20E-05	9.00E-02	1.90E-01	7.00E-02	2.50E-03	7.90E-03
Methyl-tert-butyl ether	1634-04-4	7.30E+00	1.00E-01	1.10E-05	2.60E-02	1.50E-01	4.40E-02	9.10E-04	8.00E-03
Propyl benzene	103-65-1	5.60E+02	6.00E-02	7.80E-06	4.40E-01	3.60E+00	3.40E+00	3.80E-04	4.70E-03
tert-Butyl Alcohol (TBA)	75-65-0	4.20E+00	8.50E-02	9.10E-06	3.00E-03	1.30E-01	2.50E-02	1.10E-04	6.70E-03
Tetrachloroethene	127-18-4	1.60E+02	7.20E-02	8.20E-06	7.50E-01	1.20E+00	9.30E-01	2.40E-03	5.60E-03
Tetrahydrofuran	109-99-9	9.50E-01	9.80E-02	1.10E-05	2.90E-03	1.10E-01	5.70E-03	1.40E-04	7.70E-03

Kast VOC Emissions Calculations

COC	CAS #	Organic Carbon partition Coefficient (Koc) (cm^3/g)	Diffusivity in Air (Dair) (cm^2/s)	Diffusivity in Water (Dwater) (cm^2/s)	Henry's Law Constant (H') (unit less)	Soil-water Partition coefficient (Ksw) (cm^3/g)	Soil-Water Partition Coefficient (kd) (cm^3/g)	Apparent Diffusivity (Da) (cm^2/s)	Effective Diffusion Coefficient (Deff) (cm^2/s)
Toluene	108-88-3	1.80E+02	8.70E-02	8.60E-06	2.70E-01	1.20E+00	1.10E+00	9.80E-04	6.80E-03
Trichloroethene	79-01-6	1.70E+02	7.90E-02	9.10E-06	4.20E-01	1.20E+00	1.00E+00	1.50E-03	6.20E-03
Vinyl chloride	75-01-4	1.90E+01	1.10E-01	1.20E-05	1.10E+00	4.20E-01	1.10E-01	1.50E-02	8.30E-03
Xylenes, total	1330-20-7	3.90E+02	7.70E-02	8.40E-06	3.10E-01	2.50E+00	2.30E+00	5.00E-04	6.00E-03
1-Methylnaphthalene	90-12-0	3.00E+03	5.30E-02	7.90E-06	2.10E-02	1.80E+01	1.80E+01	3.10E-06	4.10E-03
2-Methylnaphthalene	91-57-6	2.80E+03	5.20E-02	7.80E-06	2.10E-02	1.70E+01	1.70E+01	3.40E-06	4.10E-03
Naphthalene	91-20-3	2.00E+03	5.90E-02	7.50E-06	2.00E-02	1.20E+01	1.20E+01	5.00E-06	4.60E-03
Pyrene	129-00-0	1.10E+05	2.70E-02	7.20E-06	4.50E-04	6.30E+02	6.30E+02	1.10E-09	2.30E-03

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

Kast VOC Emissions Calculations

II. Chemical Inputs for EMSOFT Model run

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	COC Concentrations (0-10 feet)		COC Concentrations (0-10 feet)	
								Units	Sitewide UCL	Units	Sitewide UCL
100-41-4	Ethylbenzene	360	7.50E-02	6.48E+03	7.80E-06	6.74E-01	3.20E-01	mg/kg	5.00E-01	ug/kg	5.00E+02
106-46-7	1,4-Dichlorobenzene	620	6.90E-02	5.96E+03	7.90E-06	6.83E-01	9.80E-02	mg/kg	5.90E-04	ug/kg	5.90E-01
107-06-2	1,2-Dichloroethane	17	1.00E-01	8.64E+03	9.90E-06	8.55E-01	4.00E-02	mg/kg	4.70E-04	ug/kg	4.70E-01
108-67-8	1,3,5-Trimethylbenzene	1400	6.00E-02	5.18E+03	8.70E-06	7.52E-01	2.40E-01	mg/kg	1.90E-01	ug/kg	1.90E+02
108-88-3	Toluene	180	8.70E-02	7.52E+03	8.60E-06	7.43E-01	2.70E-01	mg/kg	1.20E-01	ug/kg	1.20E+02
127-18-4	Tetrachloroethene	160	7.20E-02	6.22E+03	8.20E-06	7.08E-01	7.50E-01	mg/kg	1.30E-02	ug/kg	1.30E+01
129-00-0	Pyrene	110000	2.70E-02	2.33E+03	7.20E-06	6.22E-01	4.50E-04	mg/kg	1.00E+00	mg/kg	1.00E+00
1330-20-7	Xylenes, Total	390	7.70E-02	6.65E+03	8.40E-06	7.26E-01	3.10E-01	mg/kg	7.69E-01	ug/kg	7.69E+02
156-59-2	cis-1,2-Dichloroethene	36	7.40E-02	6.39E+03	1.10E-05	9.50E-01	1.70E-01	mg/kg	5.60E-04	ug/kg	5.60E-01
71-43-2	Benzene	59	8.80E-02	7.60E+03	9.80E-06	8.47E-01	2.30E-01	mg/kg	1.70E-01	ug/kg	1.70E+02
74-83-9	Bromomethane	11	7.30E-02	6.31E+03	1.20E-05	1.04E+00	2.60E-01	mg/kg	5.80E-03	ug/kg	5.80E+00
75-01-4	Vinyl Chloride	19	1.10E-01	9.50E+03	1.20E-05	1.04E+00	1.10E+00	mg/kg	2.41E-04	ug/kg	2.41E-01
75-09-2	Methylene Chloride	12	1.00E-01	8.64E+03	1.20E-05	1.04E+00	9.00E-02	mg/kg	3.20E-03	ug/kg	3.20E+00
75-27-4	Bromodichloromethane	55	3.00E-02	2.59E+03	1.10E-05	9.50E-01	6.50E-02	mg/kg	2.40E-04	ug/kg	2.40E-01
75-65-0	tert-Butyl Alcohol (TBA)	4.2	8.50E-02	7.34E+03	9.10E-06	7.86E-01	3.00E-03	mg/kg	4.80E-03	ug/kg	4.80E+00
78-87-5	1,2-Dichloropropane	44	7.80E-02	6.74E+03	8.70E-06	7.52E-01	1.10E-01	mg/kg	3.60E-04	ug/kg	3.60E-01
79-01-6	Trichloroethene	170	7.90E-02	6.83E+03	9.10E-06	7.86E-01	4.20E-01	mg/kg	7.40E-04	ug/kg	7.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	93	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.40E-02	mg/kg	4.80E-04	ug/kg	4.80E-01
90-12-0	1-Methylnaphthalene	3000	5.30E-02	4.58E+03	7.90E-06	6.83E-01	2.10E-02	mg/kg	2.60E+00	mg/kg	2.60E+00
91-20-3	Naphthalene	2000	5.90E-02	5.10E+03	7.50E-06	6.48E-01	2.00E-02	mg/kg	1.50E+00	mg/kg	1.50E+00
91-57-6	2-Methylnaphthalene	2800	5.20E-02	4.49E+03	7.80E-06	6.74E-01	2.10E-02	mg/kg	3.90E+00	mg/kg	3.90E+00
95-63-6	1,2,4-Trimethylbenzene	1400	6.10E-02	5.27E+03	7.90E-06	6.83E-01	2.50E-01	mg/kg	7.80E-01	ug/kg	7.80E+02
96-18-4	1,2,3-Trichloropropane	22	7.10E-02	6.13E+03	7.90E-06	6.83E-01	1.70E-02	mg/kg	6.40E-04	ug/kg	6.40E-01

Kast VOC Emissions Calculations

CAS #	Chemical	Organic Carbon Partition Coefficient Koc (cm^3/g)	Air Diffusion Coefficient D'a (cm^2/s)	Air Diffusion Coefficient D'a (cm^2/day)	Aqueous Diffusion Coefficient D'w (cm^2/s)	Aqueous Diffusion Coefficient D'w (cm^2/day)	Henry's Law Constant (unit less)	Units	Sitewide UCL	Units	Sitewide UCL
#N/A	2,4-Dinitrotoluene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	6.30E-02	mg/kg	6.30E-02
#N/A	Antimony	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.90E-01	mg/kg	2.90E-01
#N/A	Arsenic	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.90E+00	mg/kg	4.90E+00
#N/A	BaP TEQ	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-01	mg/kg	1.70E-01
#N/A	Benzo (a) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.10E-01	mg/kg	2.10E-01
#N/A	Benzo (a) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.20E-01	mg/kg	1.20E-01
#N/A	Benzo (b) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.80E-02	mg/kg	5.80E-02
#N/A	Benzo (k) Fluoranthene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-02	mg/kg	1.30E-02
#N/A	Bis(2-Ethylhexyl) Phthalate	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.50E-01	mg/kg	1.50E-01
#N/A	Cadmium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	9.90E-02	mg/kg	9.90E-02
#N/A	Chromium, Hexavalent	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E-01	mg/kg	1.30E-01
#N/A	Chrysene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	5.60E-01	mg/kg	5.60E-01
#N/A	Cobalt	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.10E+00	mg/kg	8.10E+00
#N/A	Copper	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.40E+01	mg/kg	1.40E+01
#N/A	Dibenz (a,h) Anthracene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	8.90E-03	mg/kg	8.90E-03
#N/A	Indeno (1,2,3-c,d) Pyrene	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.70E-02	mg/kg	1.70E-02
#N/A	Lead	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.10E+01	mg/kg	1.10E+01
#N/A	Thallium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E-01	mg/kg	2.20E-01
#N/A	TPH as Diesel	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	2.20E+03	mg/kg	2.20E+03
#N/A	TPH as Gasoline	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	1.30E+02	mg/kg	1.30E+02
#N/A	TPH as Motor Oil	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+03	mg/kg	3.00E+03
#N/A	Vanadium	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	3.00E+01	mg/kg	3.00E+01
#N/A	Zinc	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	mg/kg	4.20E+01	mg/kg	4.20E+01

Data Source: Geosyntec Consultants, Human Health Risk Assessment Report Former Kast Property Carson, California, March 10, 2014

*Chemicals with values listed as "#N/A" were not listed in the HHRA.

III. Soil and Layer Inputs for EMSOFT Model Run

	Calculation Options			Soil Properties				Physical Constants		Layer Properties	
	Time Period for Averaging and Printing Flux and Soil Concentration Results* (days)	Depth (D1) for Averaging Soil Concentration Results (cm)	Depth (D2) for Printing Soil Concentration Results (cm)	Fraction Organic Carbon[A,B] (unit less)	Fraction Porosity[A,B] (unit less)	Fraction Water Content[A,B] (unit less)	Bulk Density[A,B] (g/cm^3)	Porewater Flux (-=up, +=down)^c (cm/day)	Boundary Layer Thickness[D] (cm)	Cover Thickness[E] (cm)	Layer Thickness[F] (cm)
Site Wide (USEPA Screening Values for Loam)	[0.1/1]*	1	1	0.002	0.399	0.148	1.59	0	0.5	0	304.8

* 0.1 days: Shortest duration supported by EMSOFT model and used the represent the maximum hourly flux.

1 day: Used to represent the maximum daily flux

Data Sources: A. USPEA, User's Guide for Evaluation subsurface Vapor intrusion into Buildings, Table 11 - Guidance for Selection of Soil Type, (2004) 37. The soil parameters are based on soil texture classification of "lam."

B. USPEA, Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Version 3.1, Soil Properties Lookup Table, (2004).

C. USEPA, EMSOFT User's Guide, Page 38, September 2002. "If no data are available, it would be conservative for the purpose of calculating long-term volatilization rates and soil concentrations to assume a porewater flux of zero."

D. USEPA, EMSOFT User's Guide, Page 43, September 2002. "A default boundary layer thickness that may be used in EMSOFT when no other data are available is 0.5 cm.

E. Assumes contamination begins at the surface.

F. This analysis uses 10 feet (304.8 cm) throughout site.

IV. EMSOFT Volatilization Factor Out Put

CAS #	Chemical	Volatilization Factors	
		0.1 Day Average (mg/cm^2)	1 Day Average (mg/cm^2-day)
100-41-4	Ethylbenzene	2.74E-02	8.72E-03
106-46-7	1,4-Dichlorobenzene	1.36E-05	4.35E-06
107-06-2	1,2-Dichloroethane	2.68E-05	8.52E-06
108-67-8	1,3,5-Trimethylbenzene	4.32E-03	1.39E-03
108-88-3	Toluene	8.61E-03	2.74E-03
127-18-4	Tetrachloroethene	1.37E-03	4.34E-04
129-00-0	Pyrene	8.66E-06	7.21E-06
1330-20-7	Xylenes, Total	4.07E-02	1.29E-02
156-59-2	cis-1,2-Dichloroethene	4.73E-05	1.50E-05
71-43-2	Benzene	1.60E-02	5.09E-03
74-83-9	Bromomethane	6.68E-04	2.12E-04
75-01-4	Vinyl Chloride	5.03E-05	1.59E-05
75-09-2	Methylene Chloride	2.76E-04	8.78E-05
75-27-4	Bromodichloromethane	7.50E-06	2.40E-06
75-65-0	tert-Butyl Alcohol (TBA)	7.75E-05	2.50E-05
78-87-5	1,2-Dichloropropane	2.47E-05	7.84E-06
79-01-6	Trichloroethene	6.29E-05	2.00E-05
79-34-5	1,1,2,2-Tetrachloroethane	9.23E-06	2.97E-06
90-12-0	1-Methylnaphthalene	1.05E-02	5.48E-03
91-20-3	Naphthalene	8.22E-02	2.60E-03
91-57-6	2-Methylnaphthalene	1.61E-02	5.48E-03
95-63-6	1,2,4-Trimethylbenzene	1.83E-02	5.86E-03
96-18-4	1,2,3-Trichloropropane	1.94E-05	6.21E-06

V. VOC Emission Calculations

General Assumptions

Parameter	Value	Units	References
Hours per Day	8	hours	Hours of work 8am-4pm

Excavated Surface Volatilization Assumptions

Parameter	Value	Units	References
Layer Thickness	304.8	cm	10 feet of excavation
Stabilizer	91%	%	Apply stabilizer on inactive areas. Source: USEPA, Control of Air Emissions from Superfund Sites, (1992). Long-term VOC control efficiency ranges from 91 to 100%.
Work Days in year	251	days	

Excavated Surfaces VOC Emissions

Equation:

Active Area Emissions (lb/time) = tXVFXAs

None-Active Area Emissions (lb/time) = (1-MR)xtXVFXAs

Where:

MR = stabilized mitigation

t = time conversion factor (e.g. Hours/day, days/year)

VF = volatility factor output from EMSOFT model (mg/cm^2-day)

As = surface area of volatilization (cm^2)

Phase	Duration (days)	Hourly QTY Excavated (CY)	Daily QTY Excavated (CY)	Yearly QTY Excavated (CY)	Hourly Excavated/Disturbed Surface Area (cm^2)	Daily Previously Excavated/Disturbed Surface Area (cm^2)	Yearly Excavated/Disturbed Surface Area (cm^2)	Stabilized Mitigation (% Reduction)
Option 1 - Excavati	889	22	173	20,446	5.41E+04	4.33E+05	5.13E+07	91%
Street Trenching	180	10	80	14,418	2.51E+04	2.01E+05	3.62E+07	91%

Kast VOC Emissions Calculations

Volatilization Factor Calculations:

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
Option 1 - Excavation								
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.99E-12	2.00E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.60E-09	4.32E-03	3.17E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.06E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.30E-12	2.38E-11	8.66E-06	6.36E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.48E-09	4.27E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.48E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.35E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.70E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.94E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.82E-11	3.63E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.62E-11	9.24E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.82E-12	9.23E-06	6.78E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.03E-09	1.81E-08	1.05E-02	7.72E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.03E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

VOC Emission Calculations:

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
Option 1 - Excavation										
100-41-4	Ethylbenzene	1.09E-03	1.96E-04	1.29E-03	2.77E-03	1.12E-03	3.90E-03	8.25E+01	7.42E+00	8.99E+01
106-46-7	1,4-Dichlorobenzene	5.41E-07	9.73E-08	6.38E-07	1.38E-06	5.60E-07	1.94E-06	4.12E-02	3.70E-03	4.49E-02
107-06-2	1,2-Dichloroethane	1.07E-06	1.92E-07	1.26E-06	2.71E-06	1.10E-06	3.81E-06	8.06E-02	7.25E-03	8.79E-02
108-67-8	1,3,5-Trimethylbenzene	1.72E-04	3.09E-05	2.03E-04	4.42E-04	1.79E-04	6.21E-04	1.31E+01	1.18E+00	1.43E+01
108-88-3	Toluene	3.42E-04	6.16E-05	4.04E-04	8.71E-04	3.53E-04	1.22E-03	2.59E+01	2.33E+00	2.83E+01
127-18-4	Tetrachloroethene	5.45E-05	9.80E-06	6.43E-05	1.38E-04	5.59E-05	1.94E-04	4.11E+00	3.70E-01	4.48E+00
129-00-0	Pyrene	3.44E-07	6.20E-08	4.06E-07	2.29E-06	9.29E-07	3.22E-06	6.82E-02	6.14E-03	7.43E-02
1330-20-7	Xylenes, Total	1.62E-03	2.91E-04	1.91E-03	4.10E-03	1.66E-03	5.76E-03	1.22E+02	1.10E+01	1.33E+02
156-59-2	cis-1,2-Dichloroethene	1.88E-06	3.38E-07	2.22E-06	4.77E-06	1.93E-06	6.70E-06	1.42E-01	1.28E-02	1.55E-01
71-43-2	Benzene	6.36E-04	1.14E-04	7.51E-04	1.62E-03	6.56E-04	2.27E-03	4.82E+01	4.33E+00	5.25E+01
74-83-9	Bromomethane	2.66E-05	4.78E-06	3.13E-05	6.74E-05	2.73E-05	9.47E-05	2.01E+00	1.80E-01	2.19E+00
75-01-4	Vinyl Chloride	2.00E-06	3.60E-07	2.36E-06	5.06E-06	2.05E-06	7.11E-06	1.50E-01	1.35E-02	1.64E-01
75-09-2	Methylene Chloride	1.10E-05	1.98E-06	1.29E-05	2.79E-05	1.13E-05	3.92E-05	8.31E-01	7.48E-02	9.05E-01
75-27-4	Bromodichloromethane	2.98E-07	5.37E-08	3.52E-07	7.63E-07	3.09E-07	1.07E-06	2.27E-02	2.04E-03	2.47E-02
75-65-0	tert-Butyl Alcohol (TBA)	3.08E-06	5.55E-07	3.64E-06	7.95E-06	3.22E-06	1.12E-05	2.36E-01	2.13E-02	2.58E-01
78-87-5	1,2-Dichloropropane	9.82E-07	1.77E-07	1.16E-06	2.49E-06	1.01E-06	3.50E-06	7.42E-02	6.67E-03	8.08E-02
79-01-6	Trichloroethene	2.50E-06	4.50E-07	2.95E-06	6.36E-06	2.58E-06	8.94E-06	1.89E-01	1.70E-02	2.06E-01
79-34-5	1,1,2,2-Tetrachloroethane	3.67E-07	6.61E-08	4.33E-07	9.45E-07	3.83E-07	1.33E-06	2.81E-02	2.53E-03	3.06E-02
90-12-0	1-Methylnaphthalene	4.17E-04	7.51E-05	4.93E-04	1.74E-03	7.06E-04	2.45E-03	5.18E+01	4.67E+00	5.65E+01
91-20-3	Naphthalene	3.27E-03	5.88E-04	3.86E-03	8.27E-04	3.35E-04	1.16E-03	2.46E+01	2.21E+00	2.68E+01
91-57-6	2-Methylnaphthalene	6.40E-04	1.15E-04	7.55E-04	1.74E-03	7.06E-04	2.45E-03	5.18E+01	4.67E+00	5.65E+01
95-63-6	1,2,4-Trimethylbenzene	7.28E-04	1.31E-04	8.59E-04	1.86E-03	7.55E-04	2.62E-03	5.54E+01	4.99E+00	6.04E+01
96-18-4	1,2,3-Trichloropropane	7.71E-07	1.39E-07	9.10E-07	1.98E-06	8.00E-07	2.78E-06	5.87E-02	5.29E-03	6.40E-02

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
100-41-4	Ethylbenzene	5.06E-04	9.10E-05	5.97E-04	1.29E-03	5.21E-04	1.81E-03	5.82E+01	5.24E+00	6.34E+01
106-46-7	1,4-Dichlorobenzene	2.51E-07	4.52E-08	2.96E-07	6.42E-07	2.60E-07	9.02E-07	2.90E-02	2.61E-03	3.16E-02
107-06-2	1,2-Dichloroethane	4.95E-07	8.90E-08	5.84E-07	1.26E-06	5.09E-07	1.77E-06	5.68E-02	5.12E-03	6.20E-02
108-67-8	1,3,5-Trimethylbenzene	7.97E-05	1.44E-05	9.41E-05	2.05E-04	8.31E-05	2.88E-04	9.27E+00	8.35E-01	1.01E+01
108-88-3	Toluene	1.59E-04	2.86E-05	1.88E-04	4.05E-04	1.64E-04	5.68E-04	1.83E+01	1.65E+00	1.99E+01
127-18-4	Tetrachloroethene	2.53E-05	4.55E-06	2.98E-05	6.41E-05	2.60E-05	9.00E-05	2.90E+00	2.61E-01	3.16E+00
129-00-0	Pyrene	1.60E-07	2.88E-08	1.89E-07	1.06E-06	4.31E-07	1.50E-06	4.81E-02	4.33E-03	5.24E-02
1330-20-7	Xylenes, Total	7.51E-04	1.35E-04	8.86E-04	1.90E-03	7.71E-04	2.68E-03	8.61E+01	7.74E+00	9.38E+01
156-59-2	cis-1,2-Dichloroethene	8.73E-07	1.57E-07	1.03E-06	2.21E-06	8.97E-07	3.11E-06	1.00E-01	9.01E-03	1.09E-01
71-43-2	Benzene	2.95E-04	5.32E-05	3.48E-04	7.52E-04	3.04E-04	1.06E-03	3.40E+01	3.06E+00	3.70E+01
74-83-9	Bromomethane	1.23E-05	2.22E-06	1.45E-05	3.13E-05	1.27E-05	4.40E-05	1.41E+00	1.27E-01	1.54E+00
75-01-4	Vinyl Chloride	9.28E-07	1.67E-07	1.10E-06	2.35E-06	9.51E-07	3.30E-06	1.06E-01	9.55E-03	1.16E-01
75-09-2	Methylene Chloride	5.09E-06	9.17E-07	6.01E-06	1.30E-05	5.25E-06	1.82E-05	5.86E-01	5.27E-02	6.38E-01
75-27-4	Bromodichloromethane	1.38E-07	2.49E-08	1.63E-07	3.54E-07	1.44E-07	4.98E-07	1.60E-02	1.44E-03	1.75E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.43E-06	2.57E-07	1.69E-06	3.69E-06	1.49E-06	5.19E-06	1.67E-01	1.50E-02	1.82E-01
78-87-5	1,2-Dichloropropane	4.56E-07	8.21E-08	5.38E-07	1.16E-06	4.69E-07	1.63E-06	5.23E-02	4.71E-03	5.70E-02
79-01-6	Trichloroethene	1.16E-06	2.09E-07	1.37E-06	2.95E-06	1.20E-06	4.15E-06	1.33E-01	1.20E-02	1.45E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.70E-07	3.07E-08	2.01E-07	4.39E-07	1.78E-07	6.16E-07	1.98E-02	1.78E-03	2.16E-02
90-12-0	1-Methylnaphthalene	1.94E-04	3.49E-05	2.29E-04	8.09E-04	3.28E-04	1.14E-03	3.66E+01	3.29E+00	3.98E+01
91-20-3	Naphthalene	1.52E-03	2.73E-04	1.79E-03	3.84E-04	1.55E-04	5.39E-04	1.73E+01	1.56E+00	1.89E+01
91-57-6	2-Methylnaphthalene	2.97E-04	5.35E-05	3.51E-04	8.09E-04	3.28E-04	1.14E-03	3.66E+01	3.29E+00	3.98E+01
95-63-6	1,2,4-Trimethylbenzene	3.38E-04	6.08E-05	3.99E-04	8.65E-04	3.50E-04	1.22E-03	3.91E+01	3.52E+00	4.26E+01
96-18-4	1,2,3-Trichloropropane	3.58E-07	6.45E-08	4.23E-07	9.17E-07	3.71E-07	1.29E-06	4.14E-02	3.73E-03	4.52E-02

Summary of VOC Emissions (Expedited Case)

Sum of Value Row Labels	Column Labels lbs/day
1,1,2,2-Tetrachloroethane	3.45E-06
1,2,3-Trichloropropane	7.20E-06
1,2,4-Trimethylbenzene	6.80E-03
1,2-Dichloroethane	9.88E-06
1,2-Dichloropropane	9.10E-06
1,3,5-Trimethylbenzene	1.61E-03
1,4-Dichlorobenzene	5.05E-06
1-Methylnaphthalene	6.36E-03
2-Methylnaphthalene	6.36E-03
Benzene	5.91E-03
Bromodichloromethane	2.78E-06
Bromomethane	2.46E-04
cis-1,2-Dichloroethene	1.74E-05
Ethylbenzene	1.01E-02
Methylene Chloride	1.02E-04
Naphthalene	3.02E-03
Pyrene	8.36E-06
tert-Butyl Alcohol (TBA)	2.90E-05
Tetrachloroethene	5.04E-04
Toluene	3.18E-03
Trichloroethene	2.32E-05
Vinyl Chloride	1.84E-05
Xylenes, Total	1.50E-02
Grand Total	**5.93E-02**

Appendix D: Greenhouse Gas Worksheets

RAP - FORMER KAST PROPERTY

Draft EIR

Appendix D: Greenhouse Gas Assessment

Provided by PCR Services Corporation

- Applicant's Proposed Remedy Calculation Files
  - Calculation Cover Sheet and Assumptions
  - On-Site Construction Equipment Emissions
  - On-Site Road Emissions
  - Off-Site Road Emissions
  - GHG Emissions Summary

- Expedited Implementation Option Calculation Files
  - Calculation Cover Sheet and Assumptions
  - On-Site Construction Equipment Emissions
  - On-Site Road Emissions
  - Off-Site Road Emissions
  - GHG Emissions Summary

- Energy Estimates for the Applicant's Proposed Remedy

- Energy Estimates for Alternative 2

- Energy Estimates for Alternative 3

Applicant's Proposed Remedy Calculation Files

- Calculation Cover Sheet and Assumptions
- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- Off-Site Road Emissions
- GHG Emissions Summary

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/2/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*2-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\2 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-02-14

Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

	Street Work (Hours/day)					
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding I	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Trucl	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided
Trenching/pipe installation	10	people	Information provided
Air-vac borehole clearance	3	people	Information provided
Drilling and SVE well install	4	people	Information provided
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	32	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.

Kast Air Emissions Calculations

Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff
Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.

Kast Air Emissions Calculations

Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 237 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 237 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,764	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	1.05	8.4	134	991	991
Green Waste - Truck Trips	1	59	0.50	4.0	32	237	237
Excavation - Truck Trips	15	889	1.86	14.9	1,787	3,530	13,238
SVE Well/Piping - Truck Trips	1	59	0.13	1.1	9	63	63
Subslab Vent - Truck Trips	1	59	0.00	0.0	0	0	0
Backfill/Compact - Truck Trips	12	711	1.99	15.9	1,529	3,776	11,327
Slurry Backfill - Truck Trips	7	415	0.64	5.1	287	1,214	2,124
Site Resto. - Truck Trips	10	593	0.37	3.0	237	702	1,755
Worker Trips	49	1,256	4.00	32	12,544	8,032	40,192
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	12	100	1,599	11,840	11,840
Excavation	7	209	25,024	49,423	185,336
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	23	186	17,818	43,988	131,964
Slurry Backfill	12	93	5,216	22,077	38,634
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.12	1	178	178
Excavation - Truck Trips	0.4	3	600	600
Slurry Backfill - Truck Trips	0.4	3	556	556
Restoration - Truck Trips	0.1	1	113	113
Pipe Delivery - Truck Trips	0.1	1	180	180
Worker Trips	5.3	42	7,560	7,560

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	1	11	2,060	2,060
Excavation	6	45	8,100	8,100
Slurry Backfill	3	28	5,000	5,000
Restoration	1	7	1,308	1,308

Kast Air Emissions Calculations

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.13	1.0	63	63
Drilling and SVE Well Installation - Truck Trips	0.13	1.0	63	63
Waste Collection - Truck Trips	0.25	2.0	126	126
Waste Transport to Offsite Disposal - Truck Trips	0.12	1.0	60	60
Worker Trips	4.88	39	2,457	2,457

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	3	24	1,512	1,512
Waste Transport to Offsite Disposal	1.4	12	725	725

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Street Grinding Units	Street Paving Value	Street Paving Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase												Emissions Factors (g/bhp-hr)						
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2[2]	PM10	PM2.5	SOx[2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders/Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and SOx were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations					Daily Emissions (lb)			
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations				Daily Emissions (lb)			
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VII. On-Site Construction Equipment Emissions

** Insert data from "On-Site Const. Equip. Emissions" tab*

	lbs/day							lbs/yr						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1														
Demo	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03	1.3E+00	3.7E+01	2.5E+01	4.3E+03	2.3E+00	2.3E+00	3.8E-02
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03	2.2E+01	6.2E+02	4.2E+02	7.2E+04	3.8E+01	3.8E+01	6.3E-01
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04	1.8E-01	5.1E+00	3.5E+00	5.9E+02	3.1E-01	3.1E-01	5.2E-03
Subslab Vent	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04	1.7E-01	4.7E+00	3.2E+00	5.4E+02	2.8E-01	2.8E-01	4.7E-03
Backfill/Compact	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04	3.8E+00	1.1E+02	7.1E+01	1.2E+04	6.4E+00	6.4E+00	1.1E-01
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04	1.4E+00	4.0E+01	2.7E+01	4.7E+03	2.5E+00	2.5E+00	4.1E-02
Site Resto.	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04	4.7E-01	1.3E+01	9.0E+00	1.5E+03	8.1E-01	8.1E-01	1.4E-02
Street Trenching								0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03	2.6E+00	4.5E+01	4.9E+01	9.8E+03	5.2E+00	5.2E+00	8.6E-02
Well Installation								0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SVE Well/Drilling	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03	1.0E+01	2.6E+02	1.9E+02	3.6E+04	1.9E+01	1.9E+01	3.2E-01
Street Paving								0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02	9.6E-01	1.7E+01	1.8E+01	3.6E+03	1.9E+00	1.9E+00	3.2E-02

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions						g/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions						lbs/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data								SCAB			
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.05	8	134	991	Dump Truck	25	0.72	0.75	6	96	713
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	1.86	15	1,787	3,530	Dump Truck	25	0.72	1.34	11	1286	2541
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	0.72	0.10	0.8	6	45
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	1.99	16	1,529	3,776	Dump Truck	25	0.72	1.43	11	1101	2717
Slurry Backfill	0.64	5	287	1,214	Concrete Truck	25	0.72	0.46	4	206	874
Site Resto.	0.37	3	237	702	Concrete Truck	25	0.72	0.27	2	171	505
Street Trenching											
Demo	0.12	1	0	178	Dump Truck	25	0.72	0.09	0.7	0.00	128
Excavation	0.42	3	0	600	Dump Truck	25	0.72	0.30	2	0.00	432
Backfill	0.39	3	0	556	Dump Truck	25	0.72	0.28	2	0.00	400
Restoration	0.08	1	0	113	Concrete Truck	25	0.72	0.06	0.5	0.00	81
Pipe Delivery	0.13	1	0	180	Dump Truck	25	0.72	0.09	1	0.00	130
Well Installation											
Air Vac- Borehole Clearance	0.13	1	0	63	Air-Vac	25	0.72	0.09	1	0.00	45
Drilling and SVE Well Installation	0.13	1	0	63	Drill Rig	25	0.72	0.09	1	0.00	45
Waste Collection	0.25	2	0	126	Dump Truck	25	0.72	0.18	1	0.00	91
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	6.0	1.6E-03	1.1E-02	2.9E-02	2.1E+01	8.1E-04	7.5E-04	2.2E-04	7.9E-05	7.2E-05
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	10.7	2.9E-03	2.0E-02	5.1E-02	3.7E+01	1.4E-03	1.3E-03	4.0E-04	1.4E-04	1.3E-04
SVE Well/Piping	0.8	2.1E-04	1.5E-03	3.6E-03	2.7E+00	1.0E-04	9.5E-05	2.8E-05	1.0E-05	9.2E-06
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	11.5	3.1E-03	2.2E-02	5.4E-02	4.0E+01	1.5E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Slurry Backfill	3.7	1.0E-03	7.0E-03	1.8E-02	1.3E+01	5.0E-04	4.6E-04	1.4E-04	4.8E-05	4.4E-05
Site Resto.	2.1	5.8E-04	4.1E-03	1.0E-02	7.4E+00	2.9E-04	2.6E-04	7.9E-05	2.8E-05	2.6E-05
Street Trenching										
Demo	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.6E-05	8.8E-05	2.6E-05	9.3E-06	8.6E-06
Excavation	2.4	6.5E-04	4.6E-03	1.1E-02	8.3E+00	3.2E-04	3.0E-04	8.9E-05	3.1E-05	2.9E-05
Backfill	2.2	6.0E-04	4.2E-03	1.1E-02	7.7E+00	3.0E-04	2.8E-04	8.2E-05	2.9E-05	2.7E-05
Restoration	0.5	1.2E-04	8.6E-04	2.1E-03	1.6E+00	6.1E-05	5.6E-05	1.7E-05	5.9E-06	5.4E-06
Pipe Delivery	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Well Installation										
Air Vac- Borehole Clearance	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Drilling and SVE Well Installation	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Waste Collection	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Misc Worker Trips

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	0.72	23	3.2E-03	1.3E-01	1.4E-02	3.5E+01	1.5E-04	1.5E-05	3.6E-04	2.3E-03	9.1E-04
Street Trenching	42	0.72	30	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03
Well Installation	39	0.72	28	4.0E-03	1.6E-01	1.7E-02	4.3E+01	1.9E-04	1.9E-05	4.3E-04	2.8E-03	1.1E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIII. On-Site Road Emissions

** Insert data from "On-Site Road Emissions" tab*

Truck Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	1.6E-03	1.1E-02	2.9E-02	2.1E+01	8.1E-04	7.5E-04	2.2E-04	7.9E-05	7.2E-05	1.9E-01	1.4E+00	3.4E+00	2.5E+03	9.6E-02	8.9E-02	2.6E-02	9.3E-03	8.6E-03
Green Waste	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.1E-03
Excavation	2.9E-03	2.0E-02	5.1E-02	3.7E+01	1.4E-03	1.3E-03	4.0E-04	1.4E-04	1.3E-04	6.9E-01	4.8E+00	1.2E+01	8.8E+03	3.4E-01	3.2E-01	9.4E-02	3.3E-02	3.1E-02
SVE Well/Piping	2.1E-04	1.5E-03	3.6E-03	2.7E+00	1.0E-04	9.5E-05	2.8E-05	1.0E-05	9.2E-06	1.2E-02	8.7E-02	2.2E-01	1.6E+02	6.1E-03	5.7E-03	1.7E-03	5.9E-04	5.5E-04
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	3.1E-03	2.2E-02	5.4E-02	4.0E+01	1.5E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04	7.4E-01	5.2E+00	1.3E+01	9.4E+03	3.7E-01	3.4E-01	1.0E-01	3.6E-02	3.3E-02
Slurry Backfill	1.0E-03	7.0E-03	1.8E-02	1.3E+01	5.0E-04	4.6E-04	1.4E-04	4.8E-05	4.4E-05	2.4E-01	1.7E+00	4.2E+00	3.0E+03	1.2E-01	1.1E-01	3.2E-02	1.1E-02	1.1E-02
Site Resto.	5.8E-04	4.1E-03	1.0E-02	7.4E+00	2.9E-04	2.6E-04	7.9E-05	2.8E-05	2.6E-05	1.4E-01	9.6E-01	2.4E+00	1.8E+03	6.8E-02	6.3E-02	1.9E-02	6.6E-03	6.1E-03
Street Trenching																		
Demo	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.6E-05	8.8E-05	2.6E-05	9.3E-06	8.6E-06	3.5E-02	2.4E-01	6.1E-01	4.5E+02	1.7E-02	1.6E-02	4.7E-03	1.7E-03	1.5E-03
Excavation	6.5E-04	4.6E-03	1.1E-02	8.3E+00	3.2E-04	3.0E-04	8.9E-05	3.1E-05	2.9E-05	1.2E-01	8.2E-01	2.1E+00	1.5E+03	5.8E-02	5.4E-02	1.6E-02	5.6E-03	5.2E-03
Backfill	6.0E-04	4.2E-03	1.1E-02	7.7E+00	3.0E-04	2.8E-04	8.2E-05	2.9E-05	2.7E-05	1.1E-01	7.6E-01	1.9E+00	1.4E+03	5.4E-02	5.0E-02	1.5E-02	5.2E-03	4.8E-03
Restoration	1.2E-04	8.6E-04	2.1E-03	1.6E+00	6.1E-05	5.6E-05	1.7E-05	5.9E-06	5.4E-06	2.2E-02	1.5E-01	3.9E-01	2.8E+02	1.1E-02	1.0E-02	3.0E-03	1.1E-03	9.8E-04
Pipe Delivery	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06	3.5E-02	2.5E-01	6.2E-01	4.5E+02	1.8E-02	1.6E-02	4.8E-03	1.7E-03	1.6E-03
Well Installation																		
Air Vac- Borehole	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06	1.2E-02	8.6E-02	2.2E-01	1.6E+02	6.1E-03	5.6E-03	1.7E-03	5.9E-04	5.5E-04
SVE Well/Drilling	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06	1.2E-02	8.6E-02	2.2E-01	1.6E+02	6.1E-03	5.6E-03	1.7E-03	5.9E-04	5.5E-04
Waste Collection	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05	2.5E-02	1.7E-01	4.3E-01	3.2E+02	1.2E-02	1.1E-02	3.3E-03	1.2E-03	1.1E-03
Street Paving																		
Street Grinding	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Street Paving	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Visitor Trips																		
Passenger Vehicle	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04	2.3E-01	9.0E+00	1.0E+00	2.5E+03	1.1E-02	1.1E-03	2.5E-02	1.6E-01	6.5E-02

Worker Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1	3.2E-03	1.3E-01	1.4E-02	3.5E+01	1.5E-04	1.5E-05	3.6E-04	2.3E-03	9.1E-04	8.2E-01	3.2E+01	3.5E+00	8.8E+03	3.8E-02	3.8E-03	8.9E-02	5.7E-01	2.3E-01
Street Trenching	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03	7.7E-01	3.0E+01	3.3E+00	8.3E+03	3.6E-02	3.6E-03	8.4E-02	5.4E-01	2.2E-01
Well Installation	4.0E-03	1.6E-01	1.7E-02	4.3E+01	1.9E-04	1.9E-05	4.3E-04	2.8E-03	1.1E-03	2.5E-01	9.8E+00	1.1E+00	2.7E+03	1.2E-02	1.2E-03	2.7E-02	1.8E-01	7.0E-02
Street Paving																		
Street Grinding	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04	8.1E-03	3.2E-01	3.5E-02	8.8E+01	3.8E-04	3.8E-05	8.9E-04	5.7E-03	2.3E-03
Street Paving	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04	1.6E-02	6.4E-01	7.1E-02	1.8E+02	7.6E-04	7.6E-05	1.8E-03	1.1E-02	4.6E-03

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	1.0	8	134	991	Dump Truck	25	60	63	502	8,030	59,469	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	1.9	15	1,787	3,530	Dump Truck	25	150	279	2,234	268,121	529,539	50	93	745	89,374	176,513
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	100	13	107	853	6,320	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.0	16	1,529	3,776	Dump Truck	25	8	16	127	12,236	30,207	0	0	0	0	0
Slurry Backfill	0.6	5.1	286.8	1213.8	Concrete Truck	25	20	13	102	5,736	24,277	0	0	0	0	0
Site Resto.	0.4	3	237	702	Concrete Truck	25	20	7	59	4,739	14,040	0	0	0	0	0
Street Trenching																
Demo	0.1	1.0	0.00	178.0	Dump Truck	25	60	7	59	0	10,680	0	0	0	0.00	0
Excavation	0.4	3.3	0.00	600.0	Dump Truck	25	150	63	500	0	90,000	50	21	167	0.00	30,000
Slurry Backfill	0.4	3.1	0.00	556.0	Dump Truck	25	8	3	25	0	4,448	0	0	0	0.00	0
Restoration	0.1	0.6	0.00	113.0	Concrete Truck	25	20	2	13	0	2,260	0	0	0	0.00	0
Pipe Delivery	0.1	1.0	0.00	180.0	Dump Truck	25	100	13	100	0	18,000	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.1	1.0	0.00	63.0	Air-Vac	25	10	1	10	0	630	0	0	0	0.00	0
Drilling and SVE Well Installation	0.1	1.0	0.00	63.0	Drill Rig	25	10	1	10	0	630	0	0	0	0.00	0
Waste Collection	0.3	2.0	0.00	126.0	Dump Truck	25	10	3	20	0	1,260	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.1	1.0	0.00	60.4	Dump Truck	25	150	18	144	0	9,060	50	6	48	0	3,020
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Daily Truck Trip Emission Calculations (SCAB)						lbs/day (SCAB)				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	502	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.9E-02	6.6E-03	6.0E-03
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	2,234	6.1E-01	4.3E+00	1.1E+01	7.8E+03	3.0E-01	2.8E-01	8.2E-02	2.9E-02	2.7E-02
SVE Well/Piping	107	2.9E-02	2.0E-01	5.1E-01	3.7E+02	1.4E-02	1.3E-02	3.9E-03	1.4E-03	1.3E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	127	3.5E-02	2.4E-01	6.1E-01	4.4E+02	1.7E-02	1.6E-02	4.7E-03	1.7E-03	1.5E-03
Slurry Backfill	102	2.8E-02	1.9E-01	4.9E-01	3.6E+02	1.4E-02	1.3E-02	3.8E-03	1.3E-03	1.2E-03
Site Resto.	59	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.7E-04	7.1E-04
Street Trenching										
Demo	59	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.8E-04	7.1E-04
Excavation	500	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.8E-02	6.5E-03	6.0E-03
Backfill	25	6.7E-03	4.7E-02	1.2E-01	8.6E+01	3.3E-03	3.1E-03	9.1E-04	3.2E-04	3.0E-04
Restoration	13	3.4E-03	2.4E-02	6.0E-02	4.4E+01	1.7E-03	1.6E-03	4.6E-04	1.6E-04	1.5E-04
Pipe Delivery	100	2.7E-02	1.9E-01	4.8E-01	3.5E+02	1.4E-02	1.2E-02	3.7E-03	1.3E-03	1.2E-03
Well Installation										
Air Vac- Borehole Clearance	10	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04
Drilling and SVE Well Installation	10	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04
Waste Collection	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Waste Transport to Offsite Disposal	144	3.9E-02	2.7E-01	6.8E-01	5.0E+02	1.9E-02	1.8E-02	5.3E-03	1.9E-03	1.7E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)		lbs/day (MDAB)								
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	745	2.0E-01	1.4E+00	3.5E+00	2.6E+03	1.0E-01	9.3E-02	2.7E-02	9.7E-03	9.0E-03
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	167	4.5E-02	3.2E-01	7.9E-01	5.8E+02	2.3E-02	2.1E-02	6.2E-03	2.2E-03	2.0E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	48	1.3E-02	9.1E-02	2.3E-01	1.7E+02	6.5E-03	6.0E-03	1.8E-03	6.3E-04	5.8E-04
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

				lbs/day								
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	32	21.6	691	9.8E-02	3.8E+00	4.2E-01	1.1E+03	4.6E-03	4.6E-04	1.1E-02	6.9E-02	2.7E-02
Street Trenching	42	21.6	907	1.3E-01	5.0E+00	5.6E-01	1.4E+03	6.0E-03	6.0E-04	1.4E-02	9.0E-02	3.6E-02
Well Installation	39	21.6	842	1.2E-01	4.7E+00	5.2E-01	1.3E+03	5.6E-03	5.6E-04	1.3E-02	8.4E-02	3.3E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

X. Off-Site Road Emissions (SCAB)

** Insert data from "Off-Site Road Emissions" tab*

Truck Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.9E-02	6.6E-03	6.0E-03	1.6E+01	1.1E+02	2.8E+02	2.1E+05	8.0E+00	7.4E+00	2.2E+00	7.8E-01	7.1E-01
Green Waste	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04	6.4E-01	4.5E+00	1.1E+01	8.2E+03	3.2E-01	2.9E-01	8.7E-02	3.1E-02	2.8E-02
Excavation	6.1E-01	4.3E+00	1.1E+01	7.8E+03	3.0E-01	2.8E-01	8.2E-02	2.9E-02	2.7E-02	1.4E+02	1.0E+03	2.5E+03	1.8E+06	7.2E+01	6.6E+01	2.0E+01	6.9E+00	6.4E+00
SVE Well/Piping	2.9E-02	2.0E-01	5.1E-01	3.7E+02	1.4E-02	1.3E-02	3.9E-03	1.4E-03	1.3E-03	1.7E+00	1.2E+01	3.0E+01	2.2E+04	8.5E-01	7.9E-01	2.3E-01	8.3E-02	7.6E-02
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	3.5E-02	2.4E-01	6.1E-01	4.4E+02	1.7E-02	1.6E-02	4.7E-03	1.7E-03	1.5E-03	8.2E+00	5.7E+01	1.4E+02	1.0E+05	4.1E+00	3.8E+00	1.1E+00	3.9E-01	3.6E-01
Slurry Backfill	2.8E-02	1.9E-01	4.9E-01	3.6E+02	1.4E-02	1.3E-02	3.8E-03	1.3E-03	1.2E-03	6.6E+00	4.6E+01	1.2E+02	8.4E+04	3.3E+00	3.0E+00	9.0E-01	3.2E-01	2.9E-01
Site Resto.	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.7E-04	7.1E-04	3.8E+00	2.7E+01	6.7E+01	4.9E+04	1.9E+00	1.7E+00	5.2E-01	1.8E-01	1.7E-01
Street Trenching																		
Demo	1.6E-02	1.1E-01	2.8E-01	2.1E+02	8.0E-03	7.4E-03	2.2E-03	7.8E-04	7.1E-04	2.9E+00	2.0E+01	5.1E+01	3.7E+04	1.4E+00	1.3E+00	3.9E-01	1.4E-01	1.3E-01
Excavation	1.4E-01	9.5E-01	2.4E+00	1.7E+03	6.8E-02	6.2E-02	1.8E-02	6.5E-03	6.0E-03	2.4E+01	1.7E+02	4.3E+02	3.1E+05	1.2E+01	1.1E+01	3.3E+00	1.2E+00	1.1E+00
Backfill	6.7E-03	4.7E-02	1.2E-01	8.6E+01	3.3E-03	3.1E-03	9.1E-04	3.2E-04	3.0E-04	1.2E+00	8.5E+00	2.1E+01	1.5E+04	6.0E-01	5.5E-01	1.6E-01	5.8E-02	5.3E-02
Restoration	3.4E-03	2.4E-02	6.0E-02	4.4E+01	1.7E-03	1.6E-03	4.6E-04	1.6E-04	1.5E-04	6.1E-01	4.3E+00	1.1E+01	7.9E+03	3.1E-01	2.8E-01	8.3E-02	3.0E-02	2.7E-02
Pipe Delivery	2.7E-02	1.9E-01	4.8E-01	3.5E+02	1.4E-02	1.2E-02	3.7E-03	1.3E-03	1.2E-03	4.9E+00	3.4E+01	8.6E+01	6.3E+04	2.4E+00	2.2E+00	6.6E-01	2.4E-01	2.2E-01
Well Installation																		
Air Vac- Borehole Clea	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04	1.7E-01	1.2E+00	3.0E+00	2.2E+03	8.5E-02	7.8E-02	2.3E-02	8.2E-03	7.6E-03
Drilling and SVE Well I	2.7E-03	1.9E-02	4.8E-02	3.5E+01	1.4E-03	1.2E-03	3.7E-04	1.3E-04	1.2E-04	1.7E-01	1.2E+00	3.0E+00	2.2E+03	8.5E-02	7.8E-02	2.3E-02	8.2E-03	7.6E-03
Waste Collection	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04	3.4E-01	2.4E+00	6.0E+00	4.4E+03	1.7E-01	1.6E-01	4.6E-02	1.6E-02	1.5E-02
Waste Transport to O	3.9E-02	2.7E-01	6.8E-01	5.0E+02	1.9E-02	1.8E-02	5.3E-03	1.9E-03	1.7E-03	2.5E+00	1.7E+01	4.3E+01	3.1E+04	1.2E+00	1.1E+00	3.3E-01	1.2E-01	1.1E-01
Street Paving																		
Street Grinding	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03	1.3E+00	9.1E+00	2.3E+01	1.7E+04	6.5E-01	6.0E-01	1.8E-01	6.3E-02	5.8E-02
Street Paving	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02	2.2E+00	1.5E+01	3.8E+01	2.8E+04	1.1E+00	9.9E-01	3.0E-01	1.0E-01	9.6E-02

Worker Trips (SCAQMD)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1	9.8E-02	3.8E+00	4.2E-01	1.1E+03	4.6E-03	4.6E-04	1.1E-02	6.9E-02	2.7E-02	2.4E+01	9.6E+02	1.1E+02	2.6E+05	1.1E+00	1.1E-01	2.7E+00	1.7E+01	6.9E+00
Street Trenching	1.3E-01	5.0E+00	5.6E-01	1.4E+03	6.0E-03	6.0E-04	1.4E-02	9.0E-02	3.6E-02	2.3E+01	9.0E+02	1.0E+02	2.5E+05	1.1E+00	1.1E-01	2.5E+00	1.6E+01	6.5E+00
Well Installation	1.2E-01	4.7E+00	5.2E-01	1.3E+03	5.6E-03	5.6E-04	1.3E-02	8.4E-02	3.3E-02	7.5E+00	2.9E+02	3.3E+01	8.1E+04	3.5E-01	3.5E-02	8.2E-01	5.3E+00	2.1E+00
Street Paving																		
Street Grinding	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02	2.4E-01	9.5E+00	1.1E+00	2.6E+03	1.1E-02	1.1E-03	2.7E-02	1.7E-01	6.9E-02
Street Paving	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02	4.9E-01	1.9E+01	2.1E+00	5.3E+03	2.3E-02	2.3E-03	5.3E-02	3.4E-01	1.4E-01

X. Off-Site Road Emissions (MDAB)

** Insert data from "Off-Site Road Emissions" tab*

Truck Trips (MDAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	2.0E-01	1.4E+00	3.5E+00	2.6E+03	1.0E-01	9.3E-02	2.7E-02	9.7E-03	9.0E-03	4.8E+01	3.4E+02	8.4E+02	6.1E+05	2.4E+01	2.2E+01	6.5E+00	2.3E+00	2.1E+00
SVE Well/Piping	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching																		
Demo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	4.5E-02	3.2E-01	7.9E-01	5.8E+02	2.3E-02	2.1E-02	6.2E-03	2.2E-03	2.0E-03	8.1E+00	5.7E+01	1.4E+02	1.0E+05	4.1E+00	3.7E+00	1.1E+00	3.9E-01	3.6E-01
Backfill	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation																		
Air Vac- Borehole Clea	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well I	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to O	1.3E-02	9.1E-02	2.3E-01	1.7E+02	6.5E-03	6.0E-03	1.8E-03	6.3E-04	5.8E-04	8.2E-01	5.7E+00	1.4E+01	1.0E+04	4.1E-01	3.8E-01	1.1E-01	3.9E-02	3.6E-02
Street Paving																		
Street Grinding	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

GHG Emissions Summary

Unit	lbs/yr
Emission Type	(All)

Sum of Value	**Column Labels**	
Row Labels	**CO2**	**Grand Total**
Option 1	3,273,922	3,273,922
Street Paving	60,901	60,901
Street Trenching	805,054	805,054
Visitor Trips	2,480	2,480
Well Installation	170,026	170,026
Grand Total	**4,312,383**	**4,312,383**
MTCO2	**1,956**	**1,956**
MTCO2e	**1,976**	**1,976**

(assumes 99% of emission consist of CO2)

Expedited Implementation Option Calculation Files

- Calculation Cover Sheet and Assumptions
- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- Off-Site Road Emissions
- GHG Emissions Summary

Calculation Delivery Cover Sheet

URS Santa Ana Air Quality Group

Date:	*10/2/2014*
Project:	Kast Remediation Project - Option 1 (Hard and Softscape Excavation) ***5 foot with 10 foot Excavation, 4 Houses at a Time, Phase Overlap***
Project number:	*49194119*
Requestor:	*PCR Consulting*
Project manager:	*Roy Patterson*
Air Quality originator:	*Irma Buenrostro*
Air Quality project lead:	*Shirley Pearson*
Air Quality internal reviewer:	*Shirley Pearson*
Date review completed:	*19-Sep-14*
Detail check internal reviewer:	*Irma Buenrostro*
Date review completed:	*2-Oct-14*
Brief description of analysis:	*Calculating emission rates of criteria pollutants and toxic air contaminates during excavating activities at the former Kast property. Calculations will be used to assess air quality impacts in the form of an Environmental Impact Report.*
Reference MXD:	S:\Shirley Pearson\!Kast\2 Oct 2014 Updates
Model used:	*AP-42 equations and assumptions were used.*

Version 10-2-14

Kast Air Emissions Calculations

I. Project Phasing

				Hours/Task per House									
#	Equipment	Engine Type	HP	Demo	Excavation	SVE Well/Piping Instal	Subslab Vent Install	Backfill/Comp.	Slurry Backfill	Site Resto.	Total Hrs./ House	Houses	Total Hrs.
2	15,000 lbs Excavator	D	60	0	87	0	0	0		0	87	237	20,619
1	Dump Truck	D	450	4	45	0	0	69		0	118	237	27,966
2	Bobcat	D	22	12	87	4	4	69		0	176	237	41,712
1	Bucket Auger	D	65	0	30	0	0	0		0	30	237	7,110
1	6000 Watt Generato	G	10	2	45	1	1	0		2	51	237	12,087
1	Water Pump	G	5	6	45	0	0	69		0	120	237	28,440
1	Chain Saw	G	0.5	2	0	0	0	0		0	2	237	474
1	Small Compactor (W	G	3	0	0	0	0	69		0	69	237	16,353
1	Concrete Mix Truck	D	450	0	0	0	0	0	20	6	26	237	6,162
1	Concrete Pump	D	80	0	0	0	0	0	20	6	26	237	6,162
2	Pickup Truck	G	200										
1	Flatbed Truck	D	350										

				Street Work (Hours/day)		
#	Equipment	Engine Type	HP	Trenching/Pipe Installation	Street Grinding	Street Paving
1	Backhoe	D	350	1		
1	Compressor	G	49	1		
1	Generator	G	10	1		
1	Concrete Saw	D	13	1		
1	Vacuum Excavator	D	155	6		
1	Drill Rig	D	250	6		
1	Cold Plane Grinding	D	600		6	
1	Dump Truck	D	450		6	
1	Street Sweeper	G	200		6	
1	Paving Machine	D	150			6
1	Super 10 Dump Truc	D	450			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6
1	Steam Roller	D	50			6
1	Street Sweeper	G	200			6

II. General Assumptions

General Assumptions			
Parameter	**Value**	**Units**	**Reference**
Number of Homes Yards Excavated at a Time	4	Yards	Information provided by project staff
Number of Homes	237	Homes	Information provided by project staff
Hours of Operation	8	Hours	working hours 8AM - 3PM, from project description
Duration (phase overlap)	253	weeks	Information provided by project staff
Days of Operation per Week	5	days	Monday - Friday
Number of Holidays per Year	9	days	Based on URS' holiday schedule
Number of people at houses	15	people	Information provided
Trenching/pipe installation	15	people	Information provided
Air-vac borehole clearance	7	people	Information provided
Drilling and SVE well install	10	people	Information provided
Number of people during street grinding	10	people	Information provided
Number of people during street paving	12	people	Information provided
Worker trips for various reasons	56	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)
Mitigation (% Reduction)	84%	%	WARP Fugitive Dust Handbook, September 2006, Table 3-7. Apply water every 1 hour: 74% control per MRI, April 2001, test series 701. Apply dust suppressant: 84% control per CARB April 2002; for actively disturbed areas
U (mean wind speed)	1.88	m/s	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
U (mean wind speed)	4.21	mph	Based on mean wind speed met data from the SCAQMD Long Beach Station from 2006 to 2011.
s (silt content) - Overburden	6.9	%	AP-42, Chapter 11.9, Table 11.9-3. Bulldozer Overburden Silt Content.
s (silt content) - Paved road	3.4	%	AP-42, Chapter 13.2.1.1, Table 13.2.1-3
M (material moisture content)	7.9	%	AP-42 Chapter 11.9-9. Table 11.9-3. Overburden default value.
Silt Content Range	0.44-19	%	AP-42, Chapter 13.2.4, Page 4. Assumed range. No adjustments required.
Soil Density	3,400	lbs/cy	Information provided by project staff
Density of Asphalt	3,915	lbs/cy	Information provided by project staff
Density of Asphalt	1.95	Tons/cy	Information provided by project staff
Typical Density of Concrete	150	lbs/cf	Information provided by project staff
Typical Density of Concrete	2.01	ton/cy	Information provided by project staff

Kast Air Emissions Calculations

Max Depth of Excavation at Residential Homes	10	ft	Information provided by project staff
Concrete Removed per House	35	cy	Information provided by project staff. 1,675 SF and 6 inches thick concrete slab.
Concrete Removed per Day during Street Trenching	810	cy	Information provided by project staff. Assumed 100 feet of trench per day, trench would be 5 feet in width and asphalt is 6 inches thick.
Debris Disposal Haul Route Total Length, One Way	30	miles	Google maps, address destination 12017 Greenstone, Santa Fe Springs, CA 90670
Offsite Disposal Route total Length, One Way	100	miles	Google maps, address destination 12328 Hibiscus Rd, Adelanto
Backfill Import Route Total Length, One Way	4	miles	Google maps, address destination 26311 Palos Verdes Dr. East, Rolling Hilles Estates, CA 90274
Concrete Batch Plant Route Total Length, One Way	10	miles	Google maps, address destination 2521 E. Artesia Blvd., Long Beach, CA 90805
Plastic Pipe Company, Chino, CA, One Way	50	miles	Google maps, destination Chino, CA
All American Asphalt, Corona, CA, One Way	50	miles	Google maps, destination Corona, CA
Green Waste Disposal, One Way	5	Miles	Google maps, 321 Francisco Street, Carson, CA
Distance of project within South Coast Air Basin	75	miles	Based on informational maps obtained from CARB and distance estimate from Google maps.
Distance of project activities within Mojave Desert Distance	25	miles	Based on furthest trip outside of SCAB/within MDAB, informational maps obtained from CARB, and distance estimate from Google maps.
Average On-Site Haul Route Distance	1,900	feet	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip Distance	21.6	miles	CalEEMod Default Construction Worker Trip (Round Trip)
Passenger Vehicle Trips	9	trips	Visitor trips/traffic adjustment provided by project staff
Street Grinding and Paving Worker trips for various reasons	16	trips	Assumed value (e.g., shuttling workers to site, workers going to lunch, mgt. going to and from site)

III. Cubic Yard and Trip Estimates

Cubic Yard and Trip Estimates during Yard Excavation

Parameter	Option 1 - Hard&Softscape Value	Units
Duration	253	weeks (Phase Overlap)
Work Hours	8	hours
Total Work Days - 8 Homes	42	days
Total Work Days - 237 Homes	1,256	days
Total Work Days in Year	251	days
Total Houses	237	homes
Number of Homes at a time	4	homes
Total Volume Soil - 202 Homes	177,000	cy
Passenger Vehicle Trips	9	trips/day
Demo	11,599	cy
Excavation	177,000	cy
Subslab Vent	0	cy
Backfill/Compact	148,700	cy
Slurry Backfill	28,300	cy
Site Resto.	8,295	cy
Concrete Removed per Home	35	CY
Total Loads -Debris Disposal	971	loads
Total Loads -Debris Disposal (green waste only)	237	loads
Total Loads -Offsite Disposal	12,643	loads
Total Loads -Backfill Import	12,764	loads
Total Loads -Concrete Batch Plant	4,057	loads
Slurry Backfill	1,556	loads
Site Resto.	884	loads
Total Loads -Flatbed Truck	474	loads
Total Loads -Pipe Delivery	40	loads
Demo	12	cy/load
Excavation	14	cy/load
SVE Well/Piping	0	cy/load
Subslab Vent	0	cy/load
Backfill/Compact	12	cy/load
Slurry Backfill	18	cy/load
Site Resto.	0	cy/load

Note: All loads and CY are assumed to remain the same as Base case, only the trips are expedited.

Kast Air Emissions Calculations

Option 1 Phase	Duration to Complete One Home (days)	Phase Duration (days)	Round Trips Hourly	Daily	8 Home Clusters	Annually	Project
Demo - Truck Trips	2	119	1.81	14	231	1,712	1,712
Green Waste - Truck Trips	1	59	0.50	4	32	237	237
Excavation - Truck Trips	15	889	3.28	26	3,153	6,227	23,352
SVE Well/Piping - Truck Trips	1	59	0.33	3	21	155	155
Subslab Vent - Truck Trips	1	59	0.00	0	0	0	0
Backfill/Compact - Truck Trips	12	711	3.51	28	2,699	6,662	19,987
Slurry Backfill - Truck Trips	7	415	1.06	9	476	2,015	3,526
Site Resto. - Truck Trips	10	593	0.82	7	523	1,550	3,876
Worker Trips	49	1,256	7.00	56	21,952	14,056	70,336
Passenger Vehicle Trips	1	1,256	1.13	9	0	2,259	11,304

Option 1 Phase	Cubic Yard (CY) of Soil/Material Moved Hourly	Daily	8 Home Clusters	Annually	Project
Demo	22	173	2,761	20,446	20,446
Excavation	7	368	44,143	87,181	326,930
SVE Well/Piping[1]	0	0	0	0	0
Subslab Vent[1]	0	0	0	0	0
Backfill/Compact	41	328	31,440	77,618	232,853
Slurry Backfill	19	155	8,659	36,646	64,131
Site Resto.[1]	0	0	0	0	0

Note: 1 - No soil excavation associated with SVE Well/Piping, Subslab Vent or Site Restoration phases

Cubic Yard and Trip Estimates during Street Trenching/Pipe Installation

Parameter	Street Trenching Value	Units
Duration	36	weeks
Work Hours	8	hours
Total Work Days	180	days
Total Work Days in Year	251	days
Trenching per day	100	feet
Linear feet of trenching	8,715	feet
Total Volume Soil	8,100	cy
Total Volume of Asphalt	810	cy
Demo	810	cy
Excavation	8,100	cy
Slurry Backfill	5,000	cy
Restoration	1,100	cy
Total Loads -Debris Disposal	70	loads
Total Loads -Offsite Disposal	600	loads
Total Loads -Backfill Import	0	loads
Total Loads -Concrete Batch Plant	556	loads
Pipe Delivery	180	loads
Total Loads - Restoration	95	loads
Demo - Asphalt	12	cy/load
Excavation	14	cy/load
Slurry Backfill	9	cy/load
Restoration - Asphalt	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Street Trenching	Round Trips			
Phase	Hourly	Daily	Annually	Project
Demo - Truck Trips	0.25	2.0	358	358
Excavation - Truck Trips	0.7	5.9	1,068	1,068
Slurry Backfill - Truck Trips	0.7	5.9	1,060	1,060
Restoration - Truck Trips	0.2	2.0	358	358
Pipe Delivery - Truck Trips	0.2	2.0	351	351
Worker Trips	8.9	71	12,780	12,780

Street Trenching	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Demo	3	23	4,143	4,143
Excavation	10	80	14,418	14,418
Slurry Backfill	7	53	9,532	9,532
Restoration	3	23	4,143	4,143

Cubic Yard and Trip Estimates during Well Installation

Parameter	Street Trenching Value	Units
Work Hours	8	hours
Total Work Days	63	days
Total Work Days in Year	63	days
Total round trips to Wilmington soil storage area	126	Trips
Total trips from Wilmington soil storage area to	10	Trips
Waste Collection	12	cy/load

Note: All loads and CY (highlighted yellow) are assumed to remain the same as Base case, only the trips are expedited.

Well Installation Phase	Round Trips Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance - Truck Trips	0.25	2	126	126
Drilling and SVE Well Installation - Truck Trips	0.25	2	126	126
Waste Collection - Truck Trips	0.50	4	252	252
Waste Transport to Offsite Disposal - Truck Trips	0.22	2	111	111
Worker Trips	9.13	73	4,599	4,599

Well Installation Phase	Cubic Yard (CY) of Soil/Material Hourly	Daily	Annually	Project
Air Vac- Borehole Clearance	0	0	0	0
Drilling and SVE Well Installation	0	0	0	0
Waste Collection	6	48	3,024	3,024
Waste Transport to Offsite Disposal	2.6	21	1,330	1,330

Note: All loads and CY are assumed to remain the same as Base case, only the trips are expedited.

Cubic Yard and Trip Estimates during Street Paving

Parameter	Street Grinding Value	Units	Street Paving Value	Units
Duration	5	days	10	days
Work Hours	6	hours	6	hours
Trucks per day	14	Dump Trucks	7	Dump Trucks
Total Mass of Asphalt	2,000	tons	2,000	tons
Total Volume of Asphalt	1,025	cy	1,025	cy
Total Loads -Debris Disposal	80	loads	0	loads
Total Loads - Asphalt Delivery	0	loads	80	loads
Cubic Yard per Load	12	cy/load	12	cy/load

Street Paving	Round Trips			
Phase	Hourly	Daily	Annually	Project
Street Grinding - Truck Trips	3	16	80	80
Street Paving - Truck Trips	1	8	80	80
Worker Trips - Grinding	3	16	80	80
Worker Trips - Paving	3	16	160	160

Street Paving	Cubic Yard (CY) of Soil/Material			
Phase	Hourly	Daily	Annually	Project
Street Grinding	32	192	960	960
Street Paving	16	96	960	960

Note: It is assumed that the scenario (including the amount of associated workers and trips) for Street Grinding and Paving will not change from Base case.

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Equipment List by Phase																Emissions Factors (g/bhp-hr)		
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2[2]	PM10	PM2.5	SOx[2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/Loaders/Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/Loaders/Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and Sox were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables.

Off-Road Emissions Calculations		Daily Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Off-Road Emissions Calculations	Daily Emissions (lb)						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

VII. On-Site Construction Equipment Emissions

** Insert data from "On-Site Const. Equip. Emissions" tab*

	lbs/day							lbs/yr						
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1														
Demo	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03	1	37	25	4,319	2	2	0.04
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03	22	619	420	71,781	38	38	0.63
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04	0	5	3	593	0	0	0.01
Subslab Vent	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04	0	5	3	540	0	0	0.00
Backfill/Compact	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04	4	105	71	12,192	6	6	0.11
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04	1	40	27	4,658	2	2	0.04
Site Resto.	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04	0	13	9	1,538	1	1	0.01
Street Trenching														
Pipe Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03	3	45	49	9,788	5	5	0.09
Well Installation														
SVE Well/Drilling	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03	10	260	192	35,899	19	19	0.32
Street Paving														
Street Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02	1	18	20	3,889	2	2	0.03
Street Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02	1	17	18	3,648	2	2	0.03

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data									SCAB		
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.81	14	231	1,712	Dump Truck	25	0.72	1.30	10	166	1232
Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	3.28	26	3,153	6,227	Dump Truck	25	0.72	2.36	19	2269	4482
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	0.72	0.24	1.9	15	112
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	3.51	28	2,699	6,662	Dump Truck	25	0.72	2.53	20	1942	4795
Slurry Backfill	1.06	9	476	2,015	Concrete Truck	25	0.72	0.76	6	343	1450
Site Resto.	0.82	7	523	1,550	Concrete Truck	25	0.72	0.59	5	377	1116
Street Trenching											
Demo	0.25	2	0	358	Dump Truck	25	0.72	0.18	1.4	0.00	258
Excavation	0.74	6	0	1,068	Dump Truck	25	0.72	0.53	4	0.00	769
Backfill	0.74	6	0	1,060	Dump Truck	25	0.72	0.53	4	0.00	763
Restoration	0.25	2	0	358	Concrete Truck	25	0.72	0.18	1.4	0.00	258
Pipe Delivery	0.24	2	0	351	Dump Truck	25	0.72	0.18	1	0.00	253
Well Installation											
Air Vac- Borehole Clearance	0.25	2	0	126	Air-Vac	25	0.72	0.18	1	0.00	91
Drilling and SVE Well Installation	0.25	2	0	126	Drill Rig	25	0.72	0.18	1	0.00	91
Waste Collection	0.50	4	0	252	Dump Truck	25	0.72	0.36	3	0.00	181
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58
Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)						lbs/day				
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	10.4	2.8E-03	2.0E-02	4.9E-02	3.6E+01	1.4E-03	1.3E-03	3.8E-04	1.4E-04	1.2E-04
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	18.9	5.1E-03	3.6E-02	9.0E-02	6.6E+01	2.6E-03	2.4E-03	7.0E-04	2.5E-04	2.3E-04
SVE Well/Piping	1.9	5.1E-04	3.6E-03	8.9E-03	6.5E+00	2.5E-04	2.3E-04	6.9E-05	2.5E-05	2.3E-05
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	20.2	5.5E-03	3.8E-02	9.6E-02	7.0E+01	2.7E-03	2.5E-03	7.5E-04	2.6E-04	2.4E-04
Slurry Backfill	6.1	1.7E-03	1.2E-02	2.9E-02	2.1E+01	8.3E-04	7.6E-04	2.3E-04	8.0E-05	7.4E-05
Site Resto.	4.7	1.3E-03	9.0E-03	2.2E-02	1.6E+01	6.4E-04	5.9E-04	1.7E-04	6.2E-05	5.7E-05
Street Trenching										
Demo	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Excavation	4.3	1.2E-03	8.1E-03	2.0E-02	1.5E+01	5.8E-04	5.3E-04	1.6E-04	5.6E-05	5.1E-05
Backfill	4.2	1.1E-03	8.1E-03	2.0E-02	1.5E+01	5.7E-04	5.3E-04	1.6E-04	5.5E-05	5.1E-05
Restoration	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Pipe Delivery	1.4	3.8E-04	2.7E-03	6.7E-03	4.9E+00	1.9E-04	1.7E-04	5.2E-05	1.8E-05	1.7E-05
Well Installation										
Air Vac- Borehole Clearance	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Drilling and SVE Well Installation	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Waste Collection	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

Worker Trip Emission Calculations (SCAB)							lbs/day					
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	56	0.72	40	5.7E-03	2.2E-01	2.5E-02	6.1E+01	2.7E-04	2.7E-05	6.2E-04	4.0E-03	1.6E-03
Street Trenching	71	0.72	51	7.2E-03	2.8E-01	3.1E-02	7.8E+01	3.4E-04	3.4E-05	7.9E-04	5.1E-03	2.0E-03
Well Installation	73	0.72	53	7.4E-03	2.9E-01	3.2E-02	8.0E+01	3.5E-04	3.5E-05	8.1E-04	5.2E-03	2.1E-03
Street Paving												
Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

VIII. On-Site Road Emissions

** Insert data from "On-Site Road Emissions" tab*

Truck Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	2.8E-03	2.0E-02	4.9E-02	3.6E+01	1.4E-03	1.3E-03	3.8E-04	1.4E-04	1.2E-04	3.3E-01	2.3E+00	5.9E+00	4.3E+03	1.7E-01	1.5E-01	4.5E-02	1.6E-02	1.5E-02
Green Waste	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.1E-03
Excavation	5.1E-03	3.6E-02	9.0E-02	6.6E+01	2.6E-03	2.4E-03	7.0E-04	2.5E-04	2.3E-04	1.2E+00	8.5E+00	2.1E+01	1.6E+04	6.1E-01	5.6E-01	1.7E-01	5.9E-02	5.4E-02
SVE Well/Piping	5.1E-04	3.6E-03	8.9E-03	6.5E+00	2.5E-04	2.3E-04	6.9E-05	2.5E-05	2.3E-05	3.0E-02	2.1E-01	5.3E-01	3.9E+02	1.5E-02	1.4E-02	4.1E-03	1.5E-03	1.3E-03
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	5.5E-03	3.8E-02	9.6E-02	7.0E+01	2.7E-03	2.5E-03	7.5E-04	2.6E-04	2.4E-04	1.3E+00	9.1E+00	2.3E+01	1.7E+04	6.5E-01	6.0E-01	1.8E-01	6.3E-02	5.8E-02
Slurry Backfill	1.7E-03	1.2E-02	2.9E-02	2.1E+01	8.3E-04	7.6E-04	2.3E-04	8.0E-05	7.4E-05	3.9E-01	2.8E+00	6.9E+00	5.0E+03	2.0E-01	1.8E-01	5.4E-02	1.9E-02	1.7E-02
Site Resto.	1.3E-03	9.0E-03	2.2E-02	1.6E+01	6.4E-04	5.9E-04	1.7E-04	6.2E-05	5.7E-05	3.0E-01	2.1E+00	5.3E+00	3.9E+03	1.5E-01	1.4E-01	4.1E-02	1.5E-02	1.3E-02
Street Trenching																		
Demo	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05	7.0E-02	4.9E-01	1.2E+00	9.0E+02	3.5E-02	3.2E-02	9.5E-03	3.4E-03	3.1E-03
Excavation	1.2E-03	8.1E-03	2.0E-02	1.5E+01	5.8E-04	5.3E-04	1.6E-04	5.6E-05	5.1E-05	2.1E-01	1.5E+00	3.7E+00	2.7E+03	1.0E-01	9.6E-02	2.8E-02	1.0E-02	9.2E-03
Backfill	1.1E-03	8.1E-03	2.0E-02	1.5E+01	5.7E-04	5.3E-04	1.6E-04	5.5E-05	5.1E-05	2.1E-01	1.5E+00	3.6E+00	2.7E+03	1.0E-01	9.5E-02	2.8E-02	1.0E-02	9.2E-03
Restoration	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05	7.0E-02	4.9E-01	1.2E+00	8.9E+02	3.5E-02	3.2E-02	9.5E-03	3.4E-03	3.1E-03
Pipe Delivery	3.8E-04	2.7E-03	6.7E-03	4.9E+00	1.9E-04	1.7E-04	5.2E-05	1.8E-05	1.7E-05	6.8E-02	4.8E-01	1.2E+00	8.8E+02	3.4E-02	3.1E-02	9.3E-03	3.3E-03	3.0E-03
Well Installation																		
Air Vac- Borehole	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05	2.5E-02	1.7E-01	4.3E-01	3.2E+02	1.2E-02	1.1E-02	3.3E-03	1.2E-03	1.1E-03
SVE Well/Drilling	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05	2.5E-02	1.7E-01	4.3E-01	3.2E+02	1.2E-02	1.1E-02	3.3E-03	1.2E-03	1.1E-03
Waste Collection	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05	4.9E-02	3.5E-01	8.6E-01	6.3E+02	2.5E-02	2.3E-02	6.7E-03	2.4E-03	2.2E-03
Street Paving																		
Street Grinding	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Street Paving	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Visitor Trips																		
Passenger Vehicle	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04	2.3E-01	9.0E+00	1.0E+00	2.5E+03	1.1E-02	1.1E-03	2.5E-02	1.6E-01	6.5E-02

Worker Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1	5.7E-03	2.2E-01	2.5E-02	6.1E+01	2.7E-04	2.7E-05	6.2E-04	4.0E-03	1.6E-03	1.4E+00	5.6E+01	6.2E+00	1.5E+04	6.7E-02	6.7E-03	1.6E-01	1.0E+00	4.0E-01
Street Trenching	7.2E-03	2.8E-01	3.1E-02	7.8E+01	3.4E-04	3.4E-05	7.9E-04	5.1E-03	2.0E-03	1.3E+00	5.1E+01	5.6E+00	1.4E+04	6.1E-02	6.1E-03	1.4E-01	9.1E-01	3.6E-01
Well Installation	7.4E-03	2.9E-01	3.2E-02	8.0E+01	3.5E-04	3.5E-05	8.1E-04	5.2E-03	2.1E-03	4.7E-01	1.8E+01	2.0E+00	5.0E+03	2.2E-02	2.2E-03	5.1E-02	3.3E-01	1.3E-01
Street Paving																		
Street Grinding	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04	8.1E-03	3.2E-01	3.5E-02	8.8E+01	3.8E-04	3.8E-05	8.9E-04	5.7E-03	2.3E-03
Street Paving	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04	1.6E-02	6.4E-01	7.1E-02	1.8E+02	7.6E-04	7.6E-05	1.8E-03	1.1E-02	4.6E-03

X. Off-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved roads.

Emissions Factors

Running Emissions											g/mi
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions											lbs/mi
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data																
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT	Trip length (MDAB)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1																
Demo	1.8	14	231	1,712	Dump Truck	25	60	108	867	13,866	102,698	0	0	0	0	0
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	10.0	5	40	320	2,370	0	0	0	0	0
Excavation	3.3	26	3,153	6,227	Dump Truck	25	150	493	3,941	472,961	934,098	50	164	1,314	157,654	311,366
SVE Well/Piping	0.3	2.6	20.9	155.0	Dump Truck	25	100	33	262	2,093	15,504	0	0	0	0	0
Subslab Vent	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	3.5	28	2,699	6,662	Dump Truck	25	8	28	225	21,590	53,300	0	0	0	0	0
Slurry Backfill	1.1	8.5	476.1	2014.9	Concrete Truck	25	20	21	170	9,522	40,298	0	0	0	0	0
Site Resto.	0.8	7	523	1,550	Concrete Truck	25	20	16	131	10,467	31,009	0	0	0	0	0
Street Trenching																
Demo	0.2	2.0	0.00	358.0	Dump Truck	25	60	15	119	0	21,480	0	0	0	0.00	0
Excavation	0.7	5.9	0.00	1068.0	Dump Truck	25	150	111	890	0	160,200	50	37	297	0.00	53,400
Slurry Backfill	0.7	5.9	0.00	1060.0	Dump Truck	25	8	6	47	0	8,480	0	0	0	0.00	0
Restoration	0.2	2.0	0.00	357.8	Concrete Truck	25	20	5	40	0	7,156	0	0	0	0.00	0
Pipe Delivery	0.2	2.0	0.00	351.0	Dump Truck	25	100	24	195	0	35,100	0	0	0	0.00	0
Well Installation																
Air Vac- Borehole Clearance	0.3	2.0	0.00	126.0	Air-Vac	25	10	3	20	0	1,260	0	0	0	0.00	0
Drilling and SVE Well Installation	0.3	2.0	0.00	126.0	Drill Rig	25	10	3	20	0	1,260	0	0	0	0.00	0
Waste Collection	0.5	4.0	0.00	252.0	Dump Truck	25	10	5	40	0	2,520	0	0	0	0.00	0
Waste Transport to Offsite Disposal	0.2	1.8	0.00	110.8	Dump Truck	25	150	33	264	0	16,620	50	11	88	0	5,540
Street Paving																
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	60	160	480	0	4,800	0	0	0	0.00	0
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	100	133	1,600	0	8,000	0	0	0	0.00	0

Emissions Calculations

Daily Truck Trip Emission Calculations (SCAB)		lbs/day (SCAB)								
Phase	Daily VMT (SCAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	867	2.3E-01	1.6E+00	4.1E+00	3.0E+03	1.2E-01	1.1E-01	3.2E-02	1.1E-02	1.0E-02
Green Waste	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Excavation	3,941	1.1E+00	7.5E+00	1.9E+01	1.4E+04	5.3E-01	4.9E-01	1.5E-01	5.2E-02	4.7E-02
SVE Well/Piping	262	7.1E-02	5.0E-01	1.2E+00	9.1E+02	3.5E-02	3.3E-02	9.7E-03	3.4E-03	3.1E-03
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	225	6.1E-02	4.3E-01	1.1E+00	7.8E+02	3.0E-02	2.8E-02	8.3E-03	2.9E-03	2.7E-03
Slurry Backfill	170	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.0E-03
Site Resto.	131	3.5E-02	2.5E-01	6.2E-01	4.5E+02	1.8E-02	1.6E-02	4.8E-03	1.7E-03	1.6E-03
Street Trenching										
Demo	119	3.2E-02	2.3E-01	5.7E-01	4.1E+02	1.6E-02	1.5E-02	4.4E-03	1.6E-03	1.4E-03
Excavation	890	2.4E-01	1.7E+00	4.2E+00	3.1E+03	1.2E-01	1.1E-01	3.3E-02	1.2E-02	1.1E-02
Backfill	47	1.3E-02	9.0E-02	2.2E-01	1.6E+02	6.4E-03	5.9E-03	1.7E-03	6.2E-04	5.7E-04
Restoration	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	4.9E-03	1.5E-03	5.2E-04	4.8E-04
Pipe Delivery	195	5.3E-02	3.7E-01	9.3E-01	6.8E+02	2.6E-02	2.4E-02	7.2E-03	2.5E-03	2.3E-03
Well Installation										
Air Vac- Borehole Clearance	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Drilling and SVE Well Installation	20	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04
Waste Collection	40	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04
Waste Transport to Offsite Disposal	264	7.1E-02	5.0E-01	1.3E+00	9.2E+02	3.6E-02	3.3E-02	9.7E-03	3.4E-03	3.2E-03
Street Paving										
Street Grinding	480	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03
Street Paving	1,600	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02

Daily Truck Trip Emission Calculations (MDAB)		lbs/day (MDAB)								
Phase	Daily VMT (MDAB)	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	1314	3.6E-01	2.5E+00	6.2E+00	4.6E+03	1.8E-01	1.6E-01	4.8E-02	1.7E-02	1.6E-02
SVE Well/Piping	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching										
Demo	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	297	8.0E-02	5.6E-01	1.4E+00	1.0E+03	4.0E-02	3.7E-02	1.1E-02	3.9E-03	3.6E-03
Backfill	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation										
Air Vac- Borehole Clearance	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	88	2.4E-02	1.7E-01	4.2E-01	3.1E+02	1.2E-02	1.1E-02	3.2E-03	1.1E-03	1.1E-03
Street Paving										
Street Grinding	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

				lbs/day								
Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	Sox	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	56	21.6	1210	1.7E-01	6.7E+00	7.4E-01	1.8E+03	8.0E-03	8.0E-04	1.9E-02	1.2E-01	4.8E-02
Street Trenching	71	21.6	1534	2.2E-01	8.5E+00	9.4E-01	2.3E+03	1.0E-02	1.0E-03	2.4E-02	1.5E-01	6.1E-02
Well Installation	73	21.6	1577	2.2E-01	8.7E+00	9.7E-01	2.4E+03	1.0E-02	1.0E-03	2.4E-02	1.6E-01	6.3E-02
Street Paving												
Street Grinding	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02
Street Paving	16	21.6	346	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02

*Used worker distances from CalEEMod Assumptions

X. Off-Site Road Emissions (SCAB)

** Insert data from "Off-Site Road Emissions" tab*

Truck Trips (SCAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	2.3E-01	1.6E+00	4.1E+00	3.0E+03	1.2E-01	1.1E-01	3.2E-02	1.1E-02	1.0E-02	2.8E+01	2.0E+02	4.9E+02	3.6E+05	1.4E+01	1.3E+01	3.8E+00	1.3E+00	1.2E+00
Green Waste	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04	6.4E-01	4.5E+00	1.1E+01	8.2E+03	3.2E-01	2.9E-01	8.7E-02	3.1E-02	2.8E-02
Excavation	1.1E+00	7.5E+00	1.9E+01	1.4E+04	5.3E-01	4.9E-01	1.5E-01	5.2E-02	4.7E-02	2.5E+02	1.8E+03	4.4E+03	3.2E+06	1.3E+02	1.2E+02	3.4E+01	1.2E+01	1.1E+01
SVE Well/Piping	7.1E-02	5.0E-01	1.2E+00	9.1E+02	3.5E-02	3.3E-02	9.7E-03	3.4E-03	3.1E-03	4.2E+00	2.9E+01	7.4E+01	5.4E+04	2.1E+00	1.9E+00	5.7E-01	2.0E-01	1.9E-01
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	6.1E-02	4.3E-01	1.1E+00	7.8E+02	3.0E-02	2.8E-02	8.3E-03	2.9E-03	2.7E-03	1.4E+01	1.0E+02	2.5E+02	1.9E+05	7.2E+00	6.6E+00	2.0E+00	7.0E-01	6.4E-01
Slurry Backfill	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.0E-03	1.1E+01	7.7E+01	1.9E+02	1.4E+05	5.4E+00	5.0E+00	1.5E+00	5.3E-01	4.8E-01
Site Resto.	3.5E-02	2.5E-01	6.2E-01	4.5E+02	1.8E-02	1.6E-02	4.8E-03	1.7E-03	1.6E-03	8.4E+00	5.9E+01	1.5E+02	1.1E+05	4.2E+00	3.9E+00	1.1E+00	4.1E-01	3.7E-01
Street Trenching																		
Demo	3.2E-02	2.3E-01	5.7E-01	4.1E+02	1.6E-02	1.5E-02	4.4E-03	1.6E-03	1.4E-03	5.8E+00	4.1E+01	1.0E+02	7.5E+04	2.9E+00	2.7E+00	7.9E-01	2.8E-01	2.6E-01
Excavation	2.4E-01	1.7E+00	4.2E+00	3.1E+03	1.2E-01	1.1E-01	3.3E-02	1.2E-02	1.1E-02	4.3E+01	3.0E+02	7.6E+02	5.6E+05	2.2E+01	2.0E+01	5.9E+00	2.1E+00	1.9E+00
Backfill	1.3E-02	9.0E-02	2.2E-01	1.6E+02	6.4E-03	5.9E-03	1.7E-03	6.2E-04	5.7E-04	2.3E+00	1.6E+01	4.0E+01	2.9E+04	1.1E+00	1.1E+00	3.1E-01	1.1E-01	1.0E-01
Restoration	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	4.9E-03	1.5E-03	5.2E-04	4.8E-04	1.9E+00	1.4E+01	3.4E+01	2.5E+04	9.7E-01	8.9E-01	2.6E-01	9.4E-02	8.6E-02
Pipe Delivery	5.3E-02	3.7E-01	9.3E-01	6.8E+02	2.6E-02	2.4E-02	7.2E-03	2.5E-03	2.3E-03	9.5E+00	6.7E+01	1.7E+02	1.2E+05	4.7E+00	4.4E+00	1.3E+00	4.6E-01	4.2E-01
Well Installation																		
Air Vac- Borehole Clearance	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04	3.4E-01	2.4E+00	6.0E+00	4.4E+03	1.7E-01	1.6E-01	4.6E-02	1.6E-02	1.5E-02
Drilling and SVE Well Installation	5.4E-03	3.8E-02	9.5E-02	6.9E+01	2.7E-03	2.5E-03	7.4E-04	2.6E-04	2.4E-04	3.4E-01	2.4E+00	6.0E+00	4.4E+03	1.7E-01	1.6E-01	4.6E-02	1.6E-02	1.5E-02
Waste Collection	1.1E-02	7.6E-02	1.9E-01	1.4E+02	5.4E-03	5.0E-03	1.5E-03	5.2E-04	4.8E-04	6.8E-01	4.8E+00	1.2E+01	8.8E+03	3.4E-01	3.1E-01	9.3E-02	3.3E-02	3.0E-02
Waste Transport to Offsite Disposal	7.1E-02	5.0E-01	1.3E+00	9.2E+02	3.6E-02	3.3E-02	9.7E-03	3.4E-03	3.2E-03	4.5E+00	3.2E+01	7.9E+01	5.8E+04	2.2E+00	2.1E+00	6.1E-01	2.2E-01	2.0E-01
Street Paving																		
Street Grinding	1.3E-01	9.1E-01	2.3E+00	1.7E+03	6.5E-02	6.0E-02	1.8E-02	6.3E-03	5.8E-03	1.3E+00	9.1E+00	2.3E+01	1.7E+04	6.5E-01	6.0E-01	1.8E-01	6.3E-02	5.8E-02
Street Paving	4.3E-01	3.0E+00	7.6E+00	5.6E+03	2.2E-01	2.0E-01	5.9E-02	2.1E-02	1.9E-02	2.2E+00	1.5E+01	3.8E+01	2.8E+04	1.1E+00	9.9E-01	3.0E-01	1.0E-01	9.6E-02

Worker Trips (SCAQMD)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1	1.7E-01	6.7E+00	7.4E-01	1.8E+03	8.0E-03	8.0E-04	1.9E-02	1.2E-01	4.8E-02	4.3E+01	1.7E+03	1.9E+02	4.6E+05	2.0E+00	2.0E-01	4.7E+00	3.0E+01	1.2E+01
Street Trenching	2.2E-01	8.5E+00	9.4E-01	2.3E+03	1.0E-02	1.0E-03	2.4E-02	1.5E-01	6.1E-02	3.9E+01	1.5E+03	1.7E+02	4.2E+05	1.8E+00	1.8E-01	4.3E+00	2.7E+01	1.1E+01
Well Installation	2.2E-01	8.7E+00	9.7E-01	2.4E+03	1.0E-02	1.0E-03	2.4E-02	1.6E-01	6.3E-02	1.4E+01	5.5E+02	6.1E+01	1.5E+05	6.6E-01	6.6E-02	1.5E+00	9.9E+00	3.9E+00
Street Paving																		
Street Grinding	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02	2.4E-01	9.5E+00	1.1E+00	2.6E+03	1.1E-02	1.1E-03	2.7E-02	1.7E-01	6.9E-02
Street Paving	4.9E-02	1.9E+00	2.1E-01	5.3E+02	2.3E-03	2.3E-04	5.3E-03	3.4E-02	1.4E-02	4.9E-01	1.9E+01	2.1E+00	5.3E+03	2.3E-02	2.3E-03	5.3E-02	3.4E-01	1.4E-01

X. Off-Site Road Emissions (MDAB)

** Insert data from "Off-Site Road Emissions" tab*

Truck Trips (MDAB)	lbs/day							Tire & Break Wear		lbs/yr							Tire & Break Wear	
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	PM10	PM2.5
Option 1																		
Demo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Green Waste	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	3.6E-01	2.5E+00	6.2E+00	4.6E+03	1.8E-01	1.6E-01	4.8E-02	1.7E-02	1.6E-02	8.4E+01	5.9E+02	1.5E+03	1.1E+06	4.2E+01	3.9E+01	1.1E+01	4.1E+00	3.7E+00
SVE Well/Piping	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Subslab Vent	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Slurry Backfill	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Site Resto.	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Trenching																		
Demo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Excavation	8.0E-02	5.6E-01	1.4E+00	1.0E+03	4.0E-02	3.7E-02	1.1E-02	3.9E-03	3.6E-03	1.4E+01	1.0E+02	2.5E+02	1.9E+05	7.2E+00	6.6E+00	2.0E+00	7.0E-01	6.4E-01
Backfill	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Restoration	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Pipe Delivery	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation																		
Air Vac- Borehole Clearance	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Drilling and SVE Well Installation	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Collection	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Waste Transport to Offsite Disposal	2.4E-02	1.7E-01	4.2E-01	3.1E+02	1.2E-02	1.1E-02	3.2E-03	1.1E-03	1.1E-03	1.5E+00	1.1E+01	2.6E+01	1.9E+04	7.5E-01	6.9E-01	2.0E-01	7.2E-02	6.7E-02
Street Paving																		
Street Grinding	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

GHG Emissions Summary

Emission Type	(All)
Unit	lbs/yr

Sum of Value	**Column Labels**
Row Labels	**CO2**
Option 1	5,798,863
Street Paving	60,373
Street Trenching	1,445,734
Visitor Trips	2,480
Well Installation	288,210
Grand Total	**7,595,660**

MTCO2	**3,445**
MTCO2e	**3,480**

(assumes 99% of emissions consist of CO2)

Energy Estimates for the Applicant's Proposed Remedy

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term)

Off-Road Equipment

Equipment ≤ 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, ≤ 50 hp):	0.408	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0577	gal/hp-hr
Total hp-hr for equipment ≤ 50 hp:	241,503	hp-hr
Total diesel gallons:	13,937	gal
Equipment > 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, > 50 hp):	0.367	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0519	gal/hp-hr
Total hp-hr for equipment > 50 hp:	338,826	hp-hr
Total diesel gallons:	17,588	gal
Total diesel gallons (off-road equipment):	**31,525**	**gal**

Phase	Equipment	Number	Hrs/Day	HP	Load	Days	Total hp-hr
Option 1							
Demolition	Bobcat (Bobcat S510)	1	8	22	0.57	119	11,888
Demolition	6000 Watt Generator	1	2	10	0.74	119	1,754
Demolition	Chain Saw	1	2	1	0.73	119	87
Demolition	Water Pump	1	8	5	0.74	119	3,508
Excavation	18,000 lbs Excavator (Kubota KX80-4)	1	8	70	0.38	889	189,126
Excavation	Bobcat (Bobcat S510)	1	8	22	0.37	889	57,875
Excavation	6000 Watt Generator	1	2	10	0.74	889	13,154
Excavation	Water Pump	1	8	5	0.74	889	26,307
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
SVE Well Installation	6000 Watt Generator	1	1	10	0.74	59	438
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
Subslab Vent Installation	6000 Watt Generator	1	1	10	0.38	59	225
Backfill and Compaction	Bobcat (Bobcat S510)	1	8	22	0.37	415	27,009
Backfill and Compaction	Small Compactor (Wacker)	1	4	3	0.43	593	3,057
Backfill and Compaction	Water Pump	1	4	5	0.74	1,256	18,589
Slurry Backfill	Concrete Pump	1	8	2	0.74	415	4,911
Site Restoration	6000 Watt Generator	1	1	10	0.74	593	4,385
Site Restoration	Concrete Pump	1	2	2	0.74	593	1,754
Street Trenching							
Street Trenching/Pipe installation	Backhoe	1	8	100	0.57	180	82,080
Street Trenching/Pipe installation	Compressor	1	8	49	0.74	180	52,214
Street Trenching/Pipe installation	Generator	1	2	10	0.74	180	2,664
Street Trenching/Pipe installation	Concrete Saw	1	1	48	0.73	180	6,307
Well Installation							
Drilling and SVE Well Installation	Drill Rig	1	8	155	0.50	63	39,060
Street Paving							
Street - Grinding	Cold Plane Grinding Machine	1	8	600	0.48	5	11,520
Street - Grinding	Street Sweeper	1	8	200	0.50	5	4,000
Street - Paving	Paving Machine	1	8	150	0.42	10	5,040
Street - Paving	Steam Roller	1	8	50	0.38	10	1,520
Street - Paving	Street Sweeper	1	8	200	0.50	10	8,000
						Total hp-hr for equipment ≤ 50 hp:	241,503
						Total hp-hr for equipment > 50 hp:	338,826

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term)

On-Road Trucks (e.g., Haul Trucks and Vendors)

EMFAC2011 Diesel Fuel Consumption Factor:[1]	0.1734	gallons/mile
Total on-road on-site truck miles traveled:	45,737	miles
Total on-road off-site truck miles traveled:	2,637,269	miles
Total truck miles traveled:	2,683,006	miles
Total diesel gallons (on-road trucks):	465,200	gal

1. Based on EMFAC2011 model run for the following parameters: SCAQMD, calendar year 2015, T7 single, T7 single construction, T7 tractor, and T7 tractor construction.

On-Site Trucks

Phase	Truck Type	Daily RT	Days	Trip length (miles)	Total distance (miles)
Option 1					
Demo	Dump Truck	8.4	119	0.72	1,427
Green Waste	Dump Truck	4.0	59	0.72	341
Excavation	Dump Truck	14.9	889	0.72	19,055
SVE Well/Piping	Dump Truck	1.1	59	0.72	91
Subslab Vent		-	59	-	-
Backfill/Compact	Dump Truck	15.9	711	0.72	16,305
Slurry Backfill	Concrete Truck	5.1	415	0.72	3,058
Site Resto.	Concrete Truck	3.0	593	0.72	2,526
Street Trenching					
Demo	Dump Truck	1.0	180	0.72	256
Excavation	Dump Truck	3.3	180	0.72	864
Backfill	Dump Truck	3.1	180	0.72	800
Restoration	Concrete Truck	0.6	180	0.72	163
Pipe Delivery	Dump Truck	1.0	180	0.72	259
Well Installation					
Air Vac- Borehole Clearance	Air-Vac	1.0	63	0.72	91
Drilling and SVE Well Installation	Drill Rig	1.0	63	0.72	91
Waste Collection	Dump Truck	2.0	63	0.72	181
Street Paving					
Street Grinding	Dump Truck	16.0	5	0.72	115
Street Paving	Dump Truck	8.0	10	0.72	115
		Total on-road on-site truck miles traveled:			45,737

Off-Site Trucks

Phase	Truck Type	Daily RT	Days	Trip length (miles)		Total distance (miles)
				SoCAB	MDAB	
Option 1						
Demo	Dump Truck	8.4	101	60	-	50,686
Green Waste	Dump Truck	4.0	101	10	-	4,040
Excavation	Dump Truck	14.9	758	150	50	2,258,173
SVE Well/Piping	Dump Truck	1.1	51	100	-	5,440
Subslab Vent		-	51	-	-	-
Backfill/Compact	Dump Truck	15.9	505	8	-	64,364
Slurry Backfill	Concrete Truck	5.1	354	20	-	36,261
Site Resto.	Concrete Truck	3.0	505	20	-	29,916
Street Trenching						
Demo	Dump Truck	1.0	180	60	-	10,680
Excavation	Dump Truck	3.3	180	150	50	120,000
Slurry Backfill	Dump Truck	3.1	180	8	-	4,448
Restoration	Concrete Truck	0.6	180	20	-	2,260
Pipe Delivery	Dump Truck	1.0	180	100	-	18,000
Well Installation						
Air Vac- Borehole Clearance	Air-Vac	1.0	63	10	-	630
Drilling and SVE Well Installation	Drill Rig	1.0	63	10	-	630
Waste Collection	Dump Truck	2.0	63	10	-	1,260
Waste Transport to Offsite Disposal	Dump Truck	1.0	63	150	50	12,080
Street Paving						
Street Grinding	Dump Truck	8.0	5	60	-	2,400
Street Paving	Dump Truck	16.0	10	100	-	16,000
			Total on-road off-site truck miles traveled:			2,637,269

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term)

Construction Workers

Fuel Consumption Factor:[1]	0.0551	gallons/mile
Total Worker Round Trips:	61,753	round trips
Trip Distance (CalEEMod assumed value):	21.6	miles/trip
Total gallons (workers):	73,560	gal
Assuming 82% of the fuel is gasoline:[2,3]	60,319	gal gasoline
Assuming 18% of the fuel is diesel:[2,3]	13,241	gal diesel

1. A 2009 study by the California Department of Transportation found that the statewide average fuel economy for all vehicle types (automobiles, trucks, and motorcycles) was 18.133 miles per gallon. California Department of Transportation, 2008 California Motor Vehicle Stock, Travel and Fuel Forecast, http://www.dot.ca.gov/hq/tsip/otfa/tab/documents/mvstaff/mvstaff08.pdf. Accessed July 2014.

2. In 2012, California consumed a total of 337,666 thousand barrels of gasoline for transportation, which is equivalent to a total annual consumption of 14.1 billion gallons by the transportation sector. U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=US. Accessed July 2014.

3. For diesel, California consumed a total of 72,945 thousand barrels for transportation, which equivalent to a total annual consumption of 3 billion gallons by the transportation sector. U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_df.html&sid=US. Accessed July 2014.

Phase	Total RT
Option 1	
Worker Trips	40,192
Demolition	*8,038*
Excavation	*10,718*
Slurry Backfill	*2,679*
Backfill	*8,038*
Site Restoration	*5,359*
Other	*5,359*
Passenger Vehicle Trips	11,304
Street Trenching	
Worker Trips	7,560
Well Installation	
Worker Trips	2,457
Street Paving	
Worker Trips - Grinding	80
Worker Trips - Paving	160
Total Round Trips	61,753

Energy Estimates for Alternative 2

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 2)

Off-Road Equipment

Equipment ≤ 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, ≤ 50 hp):	0.408	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0577	gal/hp-hr
Total hp-hr for equipment ≤ 50 hp:	342,600	hp-hr
Total diesel gallons:	19,771	gal
Equipment > 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, > 50 hp):	0.367	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0519	gal/hp-hr
Total hp-hr for equipment > 50 hp:	465,528	hp-hr
Total diesel gallons:	24,165	gal
Total diesel gallons (off-road equipment):	**43,936**	**gal**

Phase	Equipment	Number	Hrs/Day	HP	Load	Days	Total hp-hr
Option 1							
Demolition	Bobcat (Bobcat S510)	1	8	22	0.57	119	11,888
Demolition	6000 Watt Generator	1	2	10	0.74	119	1,754
Demolition	Chain Saw	1	2	1	0.73	119	87
Demolition	Water Pump	1	8	5	0.74	119	3,508
Excavation	18,000 lbs Excavator (Kubota KX80-4)	1	8	70	0.38	1,484	315,828
Excavation	Bobcat (Bobcat S510)	1	8	22	0.37	1,484	96,648
Excavation	6000 Watt Generator	1	2	10	0.74	1,484	21,966
Excavation	Water Pump	1	8	5	0.74	1,484	43,931
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
SVE Well Installation	6000 Watt Generator	1	1	10	0.74	59	438
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
Subslab Vent Installation	6000 Watt Generator	1	1	10	0.38	59	225
Backfill and Compaction	Bobcat (Bobcat S510)	1	8	22	0.37	693	45,105
Backfill and Compaction	Small Compactor (Wacker)	1	4	3	0.43	989	5,105
Backfill and Compaction	Water Pump	1	4	5	0.74	2,097	31,042
Slurry Backfill	Concrete Pump	1	8	2	0.74	693	8,200
Site Restoration	6000 Watt Generator	1	1	10	0.74	593	4,385
Site Restoration	Concrete Pump	1	2	2	0.74	593	1,754
Street Trenching							
Street Trenching/Pipe installation	Backhoe	1	8	100	0.57	180	82,080
Street Trenching/Pipe installation	Compressor	1	8	49	0.74	180	52,214
Street Trenching/Pipe installation	Generator	1	2	10	0.74	180	2,664
Street Trenching/Pipe installation	Concrete Saw	1	1	48	0.73	180	6,307
Well Installation							
Drilling and SVE Well Installation	Drill Rig	1	8	155	0.50	63	39,060
Street Paving							
Street - Grinding	Cold Plane Grinding Machine	1	8	600	0.48	5	11,520
Street - Grinding	Street Sweeper	1	8	200	0.50	5	4,000
Street - Paving	Paving Machine	1	8	150	0.42	10	5,040
Street - Paving	Steam Roller	1	8	50	0.38	10	1,520
Street - Paving	Street Sweeper	1	8	200	0.50	10	8,000
						Total hp-hr for equipment ≤ 50 hp:	342,600
						Total hp-hr for equipment > 50 hp:	465,528

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 2)

On-Road Trucks (e.g., Haul Trucks and Vendors)

EMFAC2011 Diesel Fuel Consumption Factor:[1]	0.1734	gallons/mile
Total on-road on-site truck miles traveled:	71,475	miles
Total on-road off-site truck miles traveled:	4,217,511	miles
Total truck miles traveled:	4,288,986	miles
Total diesel gallons (on-road trucks):	743,657	gal

1. Based on EMFAC2011 model run for the following parameters: SCAQMD, calendar year 2015, T7 single, T7 single construction, T7 tractor, and T7 tractor construction.

On-Site Trucks

Phase	Truck Type	Daily RT	Days	Trip length (miles)	Total distance (miles)
Option 1					
Demo	Dump Truck	8.4	119	0.72	1,427
Green Waste	Dump Truck	4.0	59	0.72	341
Excavation	Dump Truck	14.9	1,484	0.72	31,821
SVE Well/Piping	Dump Truck	1.1	59	0.72	91
Subslab Vent		-	59	-	-
Backfill/Compact	Dump Truck	15.9	1,187	0.72	27,228
Slurry Backfill	Concrete Truck	5.1	693	0.72	5,106
Site Resto.	Concrete Truck	3.0	593	0.72	2,526
Street Trenching					
Demo	Dump Truck	1.0	180	0.72	256
Excavation	Dump Truck	3.3	180	0.72	864
Backfill	Dump Truck	3.1	180	0.72	800
Restoration	Concrete Truck	0.6	180	0.72	163
Pipe Delivery	Dump Truck	1.0	180	0.72	259
Well Installation					
Air Vac- Borehole Clearance	Air-Vac	1.0	63	0.72	91
Drilling and SVE Well Installation	Drill Rig	1.0	63	0.72	91
Waste Collection	Dump Truck	2.0	63	0.72	181
Street Paving					
Street Grinding	Dump Truck	16.0	5	0.72	115
Street Paving	Dump Truck	8.0	10	0.72	115
		Total on-road on-site truck miles traveled:			71,475

Off-Site Trucks

Phase	Truck Type		Daily RT	Days	Trip length (miles) SoCAB	Trip length (miles) MDAB	Total distance (miles)
Option 1							
Demo	Dump Truck		8.4	101	60	-	50,686
Green Waste	Dump Truck		4.0	101	10	-	4,040
Excavation	Dump Truck		14.9	1,266	150	50	3,771,002
SVE Well/Piping	Dump Truck		1.1	51	100	-	5,440
Subslab Vent		0	-	51	-	-	-
Backfill/Compact	Dump Truck		15.9	843	8	-	107,484
Slurry Backfill	Concrete Truck		5.1	591	20	-	60,554
Site Resto.	Concrete Truck		3.0	505	20	-	29,916
Street Trenching							
Demo	Dump Truck		1.0	180	60	-	10,680
Excavation	Dump Truck		3.3	180	150	50	120,000
Slurry Backfill	Dump Truck		3.1	180	8	-	4,448
Restoration	Concrete Truck		0.6	180	20	-	2,260
Pipe Delivery	Dump Truck		1.0	180	100	-	18,000
Well Installation							
Air Vac- Borehole Clearance	Air-Vac		1.0	63	10	-	630
Drilling and SVE Well Installation	Drill Rig		1.0	63	10	-	630
Waste Collection	Dump Truck		2.0	63	10	-	1,260
Waste Transport to Offsite Disposal	Dump Truck		1.0	63	150	50	12,080
Street Paving							
Street Grinding	Dump Truck		8.0	5	60	-	2,400
Street Paving	Dump Truck		16.0	10	100	-	16,000
					Total on-road off-site truck miles traveled:		4,217,511

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 2)

Construction Workers

Fuel Consumption Factor:[1]	0.0551	gallons/mile
Total Worker Round Trips:	77,621	round trips
Trip Distance (CalEEMod assumed value):	21.6	miles/trip
Total gallons (workers):	92,462	gal
Assuming 82% of the fuel is gasoline:[2,3]	75,819	gal gasoline
Assuming 18% of the fuel is diesel:[2,3]	16,643	gal diesel

1. A 2009 study by the California Department of Transportation found that the statewide average fuel economy for all vehicle types (automobiles, trucks, and motorcycles) was 18.133 miles per gall
California Department of Transportation, 2008 California Motor Vehicle Stock, Travel and Fuel Forecast,
http://www.dot.ca.gov/hq/tsip/otfa/tab/documents/mvstaff/mvstaff08.pdf. Accessed July 2014.

2. In 2012, California consumed a total of 337,666 thousand barrels of gasoline for transportation, which is equivalent to a total annual consumption of 14.1 billion gallons by the transportation sect
U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012,
http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=US. Accessed July 2014.

3. For diesel, California consumed a total of 72,945 thousand barrels for transportation, which equivalent to a total annual consumption of 3 billion gallons by the transportation sector.
U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012,
http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_df.html&sid=US. Accessed July 2014.

Phase	Total RT
Option 1	
Worker Trips	54,553
Demolition	*8,038*
Excavation	*17,898*
Slurry Backfill	*4,475*
Backfill	*13,424*
Site Restoration	*5,359*
Other	*5,359*
Passenger Vehicle Trips	12,811
Street Trenching	
Worker Trips	7,560
Well Installation	
Worker Trips	2,457
Street Paving	
Worker Trips - Grinding	80
Worker Trips - Paving	160
Total Round Trips	77,621

Energy Estimates for Alternative 3

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 3)

Off-Road Equipment

Equipment ≤ 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, ≤ 50 hp):	0.408	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0577	gal/hp-hr
Total hp-hr for equipment ≤ 50 hp:	133,577	hp-hr
Total diesel gallons:	7,709	gal
Equipment > 50 hp		
pounds fuel/hp-hr (OFFROAD2011 model, > 50 hp):	0.367	lb/hp-hr
diesel pounds/gallon (CARB assumption):	7.07	lb/gal
diesel gallons/hp-hr:	0.0519	gal/hp-hr
Total hp-hr for equipment > 50 hp:	227,253	hp-hr
Total diesel gallons:	11,797	gal
Total diesel gallons (off-road equipment):	**19,505**	**gal**

Phase	Equipment	Number	Hrs/Day	HP	Load	Days	Total hp-hr
Option 1							
Demolition	Bobcat (Bobcat S510)	1	8	22	0.57	-	-
Demolition	6000 Watt Generator	1	2	10	0.74	-	-
Demolition	Chain Saw	1	2	1	0.73	119	87
Demolition	Water Pump	1	8	5	0.74	-	-
Excavation	18,000 lbs Excavator (Kubota KX80-4)	1	8	70	0.38	364	77,553
Excavation	Bobcat (Bobcat S510)	1	8	22	0.37	364	23,732
Excavation	6000 Watt Generator	1	2	10	0.74	364	5,394
Excavation	Water Pump	1	8	5	0.74	364	10,787
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
SVE Well Installation	6000 Watt Generator	1	1	10	0.74	59	438
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1	4	22	0.37	59	1,929
Subslab Vent Installation	6000 Watt Generator	1	1	10	0.38	59	225
Backfill and Compaction	Bobcat (Bobcat S510)	1	8	22	0.37	170	11,075
Backfill and Compaction	Small Compactor (Wacker)	1	4	3	0.43	243	1,254
Backfill and Compaction	Water Pump	1	4	5	0.74	515	7,623
Slurry Backfill	Concrete Pump	1	8	2	0.74	170	2,014
Site Restoration	6000 Watt Generator	1	1	10	0.74	593	4,385
Site Restoration	Concrete Pump	1	2	2	0.74	-	-
Street Trenching							
Street Trenching/Pipe installation	Backhoe	1	8	100	0.57	180	82,080
Street Trenching/Pipe installation	Compressor	1	8	49	0.74	180	52,214
Street Trenching/Pipe installation	Generator	1	2	10	0.74	180	2,664
Street Trenching/Pipe installation	Concrete Saw	1	1	48	0.73	180	6,307
Well Installation							
Drilling and SVE Well Installation	Drill Rig	1	8	155	0.50	63	39,060
Street Paving							
Street - Grinding	Cold Plane Grinding Machine	1	8	600	0.48	5	11,520
Street - Grinding	Street Sweeper	1	8	200	0.50	5	4,000
Street - Paving	Paving Machine	1	8	150	0.42	10	5,040
Street - Paving	Steam Roller	1	8	50	0.38	10	1,520
Street - Paving	Street Sweeper	1	8	200	0.50	10	8,000
						Total hp-hr for equipment ≤ 50 hp:	133,577
						Total hp-hr for equipment > 50 hp:	227,253

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 3)

On-Road Trucks (e.g., Haul Trucks and Vendors)

EMFAC2011 Diesel Fuel Consumption Factor:[1]	0.1734	gallons/mile
Total on-road on-site truck miles traveled:	19,121	miles
Total on-road off-site truck miles traveled:	1,165,101	miles
Total truck miles traveled:	1,184,222	miles
Total diesel gallons (on-road trucks):	205,329	gal

1. Based on EMFAC2011 model run for the following parameters: SCAQMD, calendar year 2015, T7 single, T7 single construction, T7 tractor, and T7 tractor construction.

On-Site Trucks

Phase	Truck Type	Daily RT	Days	Trip length (miles)	Total distance (miles)
Option 1					
Demo	Dump Truck	8.4		0.72	-
Green Waste	Dump Truck	4.0	59	0.72	341
Excavation	Dump Truck	14.9	364	0.72	7,814
SVE Well/Piping	Dump Truck	1.1	59	0.72	91
Subslab Vent		-	59	-	-
Backfill/Compact	Dump Truck	15.9	292	0.72	6,686
Slurry Backfill	Concrete Truck	5.1	170	0.72	1,254
Site Resto.	Concrete Truck	3.0		0.72	-
Street Trenching					
Demo	Dump Truck	1.0	180	0.72	256
Excavation	Dump Truck	3.3	180	0.72	864
Backfill	Dump Truck	3.1	180	0.72	800
Restoration	Concrete Truck	0.6	180	0.72	163
Pipe Delivery	Dump Truck	1.0	180	0.72	259
Well Installation					
Air Vac- Borehole Clearance	Air-Vac	1.0	63	0.72	91
Drilling and SVE Well Installation	Drill Rig	1.0	63	0.72	91
Waste Collection	Dump Truck	2.0	63	0.72	181
Street Paving					
Street Grinding	Dump Truck	16.0	5	0.72	115
Street Paving	Dump Truck	8.0	10	0.72	115
		Total on-road on-site truck miles traveled:			19,121

Off-Site Trucks

Phase	Truck Type		Daily RT	Days	Trip length (miles) SoCAB	Trip length (miles) MDAB	Total distance (miles)
Option 1							
Demo	Dump Truck		8.4		60	-	-
Green Waste	Dump Truck		4.0	101	10	-	4,040
Excavation	Dump Truck		14.9	311	150	50	925,970
SVE Well/Piping	Dump Truck		1.1	51	100	-	5,440
Subslab Vent		0	-	51	-	-	-
Backfill/Compact	Dump Truck		15.9	207	8	-	26,394
Slurry Backfill	Concrete Truck		5.1	145	20	-	14,870
Site Resto.	Concrete Truck		3.0		20	-	-
Street Trenching							
Demo	Dump Truck		1.0	180	60	-	10,680
Excavation	Dump Truck		3.3	180	150	50	120,000
Slurry Backfill	Dump Truck		3.1	180	8	-	4,448
Restoration	Concrete Truck		0.6	180	20	-	2,260
Pipe Delivery	Dump Truck		1.0	180	100	-	18,000
Well Installation							
Air Vac- Borehole Clearance	Air-Vac		1.0	63	10	-	630
Drilling and SVE Well Installation	Drill Rig		1.0	63	10	-	630
Waste Collection	Dump Truck		2.0	63	10	-	1,260
Waste Transport to Offsite Disposal	Dump Truck		1.0	63	150	50	12,080
Street Paving							
Street Grinding	Dump Truck		8.0	5	60	-	2,400
Street Paving	Dump Truck		16.0	10	100	-	16,000
					Total on-road off-site truck miles traveled:		1,165,101

Former Kast Property Tank Farm Site Remediation Project
Heavy-Duty Equipment, Haul and Delivery Truck, and Worker Trip Fuel Estimates (Short-Term) (Alternative 3)

Construction Workers

Fuel Consumption Factor:[1]	0.0551	gallons/mile
Total Worker Round Trips:	36,631	round trips
Trip Distance (CalEEMod assumed value):	21.6	miles/trip
Total gallons (workers):	43,635	gal
Assuming 82% of the fuel is gasoline:[2,3]	35,781	gal gasoline
Assuming 18% of the fuel is diesel:[2,3]	7,854	gal diesel

1. A 2009 study by the California Department of Transportation found that the statewide average fuel economy for all vehicle types (automobiles, trucks, and motorcycles) was 18.133 miles per gallon. California Department of Transportation, 2008 California Motor Vehicle Stock, Travel and Fuel Forecast, http://www.dot.ca.gov/hq/tsip/otfa/tab/documents/mvstaff/mvstaff08.pdf. Accessed July 2014.

2. In 2012, California consumed a total of 337,666 thousand barrels of gasoline for transportation, which is equivalent to a total annual consumption of 14.1 billion gallons by the transportation sector. U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=US. Accessed July 2014.

3. For diesel, California consumed a total of 72,945 thousand barrels for transportation, which equivalent to a total annual consumption of 3 billion gallons by the transportation sector. U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_df.html&sid=US. Accessed July 2014.

Phase	Total RT
Option 1	
Worker Trips	18,838
Demolition	*2,010*
Excavation	*4,395*
Slurry Backfill	*1,099*
Backfill	*3,296*
Site Restoration	*2,679*
Other	*5,359*
Passenger Vehicle Trips	7,536
Street Trenching	
Worker Trips	7,560
Well Installation	
Worker Trips	2,457
Street Paving	
Worker Trips - Grinding	80
Worker Trips - Paving	160
Total Round Trips	36,631

Appendix E: Health Risk Assessment

RAP - FORMER KAST PROPERTY

Draft EIR

Appendix E: Health Risk Assessment

Provided by PCR Services Corporation

- Applicant's Proposed Remedy Calculation Files – Average Day
  - On-Site Construction Equipment Emissions
  - On-Site Road Emissions
  - VOC Emissions

- Emissions Inventory Files
  - Crystalline Silica Releases
  - Haul Road Diesel Particulate Emissions
  - HARP Unmitigated Emissions Input – Average Day

- Health Risk Assessment Files – Unmitigated
  - HARP Output Cancer Risk Summary
  - HARP Output Chronic Risk Summary
  - HARP Output Acute Risk Summary
  - Supplemental Health Risk Calculations

Applicant's Proposed Remedy Calculation Files – Average Day

- On-Site Construction Equipment Emissions
- On-Site Road Emissions
- VOC Emissions

VII. On-Site Construction Equipment Emissions

Summary: This section calculates the emissions of criteria pollutants from off-road equipment.

Emission Equation

Emission (Off-road Construction Equipment) = E x bhp-hr

Where:

E = size-specific emission factor (g/bhp-hr)

Source:

EMFAC2011

Assumptions	Value	Value	Units	Notes
Equipment Engine Tier		3	-	Refers to EPA emission standards (Tier 1-4) for Off-road equipment

Off-road Engine Emission Ratings

USEPA TABLE I - EPA Tier 1-3 Nonroad Diesel Engine Emission Standards (g/bhp-hr)

Engine Power		Tier	CO
(25 ≤ hp < 50)	50	1	4.9
(25 ≤ hp < 50)	50	2	4.9
(50 ≤ hp < 100)	100	1	-
(50 ≤ hp < 100)	100	2	3.7
(50 ≤ hp < 100)	100	3	3.7
(100 ≤ hp < 175)	175	1	-
(100 ≤ hp < 175)	175	2	3.7
(100 ≤ hp < 175)	175	3	3.7
(175 ≤ hp < 300)	300	1	8.5
(175 ≤ hp < 300)	300	2	2.6
(175 ≤ hp < 300)	300	3	2.6
(300 ≤ hp < 600)	600	1	8.5
(300 ≤ hp < 600)	600	2	2.6
(300 ≤ hp < 600)	600	3	2.6

Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

HP Range	Tier	Nox	ROG	PM
75 - 99	1	6.9	1.19	0.552
100 - 174	1	6.9	0.82	0.304
175 - 299	1	6.9	1	0.4
300 - 600	1	6.9	1	0.4
75 - 99	2	5.32	0.28	0.3
100 - 174	2	4.655	0.245	0.22
175 - 299	2	4.655	0.245	0.15
300 - 600	2	4.56	0.24	0.15
75 - 99	3	3.325	0.175	0.3
100 - 174	3	2.85	0.15	0.22
175 - 299	3	2.85	0.15	0.15
300 - 600	3	2.85	0.15	0.15
75 - 99	4	2.5	0.14	0.015
100 - 174	4	2.5	0.14	0.015
175 - 299	4	1.5	0.14	0.015
300 - 600	4	1.5	0.14	0.015

Note: Based on SCAQMD Table II-B Tiers 1, 2,3 &4 Off-Road Engine Emission Standards

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:
1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Kast Air Emissions Calculations

Equipment List by Phase												Emissions Factors (g/bhp-hr)						
Phase	Phase Duration (days)	Hours per Day	Equipment	HP/Size	CalEEMod Category	Load Factor[1]	Output (bhp-hour)	Output (bhp-day)	Engine Size Class	Engine Size Class (CO)	Engine Tier	ROG	CO	NOx	CO2[2]	PM10	PM2.5	SOx[2]
Option 1																		
Demolition	119	8	Bobcat (Bobcat S510)	22	Tractors/ Loaders/ Backhoes	0.57	12.54	100.32	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	2	Chain Saw	0.5	Concrete/ Industrial Saws	0.73	0.365	0.73	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Demolition	119	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	18,000 lbs Excavator (Kubota KX80-4)	70	Excavator	0.38	26.6	212.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Bobcat (Bobcat S510)	22	Tractors/ Loaders/ Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	2	6000 Watt Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Excavation	889	8	Water Pump	5	Pumps	0.74	3.7	29.6	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/ Loaders/ Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
SVE Well Installation	59	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	4	Bobcat with Auger (Bobcat S510)	22	Tractors/ Loaders/ Backhoes	0.37	8.14	32.56	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Subslab Vent Installation	59	1	6000 Watt Generator	10	Generator Sets	0.38	3.8	3.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	415	8	Bobcat (Bobcat S510)	22	Tractors/ Loaders/ Backhoes	0.37	8.14	65.12	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	593	4	Small Compactor (Wacker)	3	Plate compactors	0.43	1.29	5.16	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Backfill and Compaction	1256	4	Water Pump	5	Pumps	0.74	3.7	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050

Slurry Backfill	415	8	Concrete Pump	2	Pumps	0.74	1.48	11.84	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	1	6000 Watt Generator	10	Generator Sets	0.74	7.4	7.4	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Site Restoration	593	2	Concrete Pump	2	Pumps	0.74	1.48	2.96	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050

Kast Air Emissions Calculations

Street Trenching																		
Street Trenching/Pipe installation	180	8	Backhoe	100	Tractors/ Loaders/ Backhoes	0.57	57	456	100-174	100<hp<175	3	0.15	3.7	2.85	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	8	Compressor	49	Generator Sets	0.74	36.26	290.08	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	2	Generator	10	Generator Sets	0.74	7.4	14.8	75-99	50<hp<100	3	0.175	4.9	3.325	568.3	0.3	0.3	0.0050
Street Trenching/Pipe installation	180	1	Concrete Saw	48	Concrete/ Industrial Saws	0.73	35.04	35.04	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Well Installation																		
Drilling and SVE Well Installation	63	8	Drill Rig	155	Bore/Drill Rigs	0.5	77.5	620	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street Paving																		
Street - Grinding	5	8	Cold Plane Grinding Machine	600	Scrapers	0.48	288	2304	300-600	300<hp<600	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Grinding	5	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Paving Machine	150	Other Construction Equipment	0.42	63	504	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Steam Roller	50	Rollers	0.38	19	152	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050
Street - Paving	10	8	Street Sweeper	200	Crawler Tractors	0.5	100	800	175-299	175<hp<300	3	0.15	2.6	2.85	568.3	0.3	0.3	0.0050

1 - Load Factor obtained from CalEEMod Appendix D Defaults

2- Emission factors for CO2 and Sox were obtained from Table 3.4, Off-road Equipment Emission Factors, CalEEMod Appendix D Default Data Tables

Kast Air Emissions Calculations

Off-Road Emissions Calculations		Hourly Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	4.8E-03	1.4E-01	9.2E-02	1.6E+01	8.3E-03	8.3E-03	1.4E-04
Demolition	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Demolition	Chain Saw	1.4E-04	3.9E-03	2.7E-03	4.6E-01	2.4E-04	2.4E-04	4.0E-06
Demolition	Water Pump	1.4E-03	4.0E-02	2.7E-02	4.6E+00	2.4E-03	2.4E-03	4.1E-05
Excavation	18,000 lbs Excavator (Kubota KX80-4)	1.0E-02	2.9E-01	1.9E-01	3.3E+01	1.8E-02	1.8E-02	2.9E-04
Excavation	Bobcat (Bobcat S510)	3.1E-03	8.8E-02	6.0E-02	1.0E+01	5.4E-03	5.4E-03	9.0E-05
Excavation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Excavation	Water Pump	1.4E-03	4.0E-02	2.7E-02	4.6E+00	2.4E-03	2.4E-03	4.1E-05
SVE Well Installation	Bobcat with Auger (Bobcat S510)	3.1E-03	8.8E-02	6.0E-02	1.0E+01	5.4E-03	5.4E-03	9.0E-05
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	3.1E-03	8.8E-02	6.0E-02	1.0E+01	5.4E-03	5.4E-03	9.0E-05
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	3.1E-03	8.8E-02	6.0E-02	1.0E+01	5.4E-03	5.4E-03	9.0E-05

Backfill and Compaction	Small Compactor (Wacker)	5.0E-04	1.4E-02	9.5E-03	1.6E+00	8.5E-04	8.5E-04	1.4E-05
Backfill and Compaction	Water Pump	1.4E-03	4.0E-02	2.7E-02	4.6E+00	2.4E-03	2.4E-03	4.1E-05
Slurry Backfill	Concrete Pump	5.7E-04	1.6E-02	1.1E-02	1.9E+00	9.8E-04	9.8E-04	1.6E-05
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	5.7E-04	1.6E-02	1.1E-02	1.9E+00	9.8E-04	9.8E-04	1.6E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.9E-02	4.6E-01	3.6E-01	7.1E+01	3.8E-02	3.8E-02	6.3E-04
Street Trenching/Pipe installation	Compressor	1.4E-02	3.9E-01	2.7E-01	4.5E+01	2.4E-02	2.4E-02	4.0E-04
Street Trenching/Pipe installation	Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.6E-02	4.4E-01	4.9E-01	9.7E+01	5.1E-02	5.1E-02	8.5E-04
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	9.5E-02	1.7E+00	1.8E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street - Grinding	Street Sweeper	3.3E-02	5.7E-01	6.3E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Street - Paving	Paving Machine	2.1E-02	3.6E-01	4.0E-01	7.9E+01	4.2E-02	4.2E-02	6.9E-04
Street - Paving	Steam Roller	6.3E-03	1.1E-01	1.2E-01	2.4E+01	1.3E-02	1.3E-02	2.1E-04
Street - Paving	Street Sweeper	3.3E-02	5.7E-01	6.3E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03

Kast Air Emissions Calculations

Off-Road Emissions Calculations		Daily Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04

Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Kast Air Emissions Calculations

Off-Road Emissions Calculations		8 Home Cluster Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	3.9E-02	1.1E+00	7.4E-01	1.3E+02	6.6E-02	6.6E-02	1.1E-03
Demolition	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Demolition	Chain Saw	2.8E-04	7.9E-03	5.4E-03	9.1E-01	4.8E-04	4.8E-04	8.0E-06
Demolition	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
Excavation	18,000 lbs Excavator (Kubota KX80-4)	8.2E-02	2.3E+00	1.6E+00	2.7E+02	1.4E-01	1.4E-01	2.3E-03
Excavation	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Excavation	6000 Watt Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Excavation	Water Pump	1.1E-02	3.2E-01	2.2E-01	3.7E+01	2.0E-02	2.0E-02	3.3E-04
SVE Well Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
SVE Well Installation	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	1.3E-02	3.5E-01	2.4E-01	4.1E+01	2.2E-02	2.2E-02	3.6E-04
Subslab Vent Installation	6000 Watt Generator	1.5E-03	4.1E-02	2.8E-02	4.8E+00	2.5E-03	2.5E-03	4.2E-05
Backfill and Compaction	Bobcat (Bobcat S510)	2.5E-02	7.0E-01	4.8E-01	8.2E+01	4.3E-02	4.3E-02	7.2E-04
Backfill and Compaction	Small Compactor (Wacker)	2.0E-03	5.6E-02	3.8E-02	6.5E+00	3.4E-03	3.4E-03	5.7E-05
Backfill and Compaction	Water Pump	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Slurry Backfill	Concrete Pump	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	6000 Watt Generator	2.9E-03	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05

Site Restoration	Concrete Pump	1.1E-03	3.2E-02	2.2E-02	3.7E+00	2.0E-03	2.0E-03	3.3E-05
Street Trenching								
Street Trenching/Pipe installation	Backhoe	1.5E-01	3.7E+00	2.9E+00	5.7E+02	3.0E-01	3.0E-01	5.0E-03
Street Trenching/Pipe installation	Compressor	1.1E-01	3.1E+00	2.1E+00	3.6E+02	1.9E-01	1.9E-01	3.2E-03
Street Trenching/Pipe installation	Generator	5.7E-03	1.6E-01	1.1E-01	1.9E+01	9.8E-03	9.8E-03	1.6E-04
Street Trenching/Pipe installation	Concrete Saw	1.2E-02	2.0E-01	2.2E-01	4.4E+01	2.3E-02	2.3E-02	3.9E-04
Well Installation								
Drilling and SVE Well Installation	Drill Rig	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	7.6E-01	1.3E+01	1.4E+01	2.9E+03	1.5E+00	1.5E+00	2.5E-02
Street - Grinding	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street - Paving	Paving Machine	1.7E-01	2.9E+00	3.2E+00	6.3E+02	3.3E-01	3.3E-01	5.6E-03
Street - Paving	Steam Roller	5.0E-02	8.7E-01	9.6E-01	1.9E+02	1.0E-01	1.0E-01	1.7E-03
Street - Paving	Street Sweeper	2.6E-01	4.6E+00	5.0E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03

Kast Air Emissions Calculations

Off-Road Emissions Calculations		Annual Emissions (lb)						
Phase	Equipment	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1								
Demolition	Bobcat (Bobcat S510)	4.6E+00	1.3E+02	8.7E+01	1.5E+04	7.9E+00	7.9E+00	1.3E-01
Demolition	6000 Watt Generator	6.8E-01	1.9E+01	1.3E+01	2.2E+03	1.2E+00	1.2E+00	1.9E-02
Demolition	Chain Saw	3.3E-02	9.3E-01	6.3E-01	1.1E+02	5.7E-02	5.7E-02	9.5E-04
Demolition	Water Pump	1.4E+00	3.8E+01	2.6E+01	4.4E+03	2.3E+00	2.3E+00	3.9E-02
Excavation	18,000 lbs Excavator (Kubota KX80-4)	7.3E+01	2.0E+03	1.4E+03	2.4E+05	1.3E+02	1.3E+02	2.1E+00
Excavation	Bobcat (Bobcat S510)	2.2E+01	6.3E+02	4.2E+02	7.3E+04	3.8E+01	3.8E+01	6.4E-01
Excavation	6000 Watt Generator	5.1E+00	1.4E+02	9.6E+01	1.6E+04	8.7E+00	8.7E+00	1.4E-01
Excavation	Water Pump	1.0E+01	2.8E+02	1.9E+02	3.3E+04	1.7E+01	1.7E+01	2.9E-01
SVE Well Installation	Bobcat with Auger (Bobcat S510)	7.4E-01	2.1E+01	1.4E+01	2.4E+03	1.3E+00	1.3E+00	2.1E-02
SVE Well Installation	6000 Watt Generator	1.7E-01	4.7E+00	3.2E+00	5.5E+02	2.9E-01	2.9E-01	4.8E-03
Subslab Vent Installation	Bobcat with Auger (Bobcat S510)	7.4E-01	2.1E+01	1.4E+01	2.4E+03	1.3E+00	1.3E+00	2.1E-02
Subslab Vent Installation	6000 Watt Generator	8.7E-02	2.4E+00	1.7E+00	2.8E+02	1.5E-01	1.5E-01	2.5E-03
Backfill and Compaction	Bobcat (Bobcat S510)	1.0E+01	2.9E+02	2.0E+02	3.4E+04	1.8E+01	1.8E+01	3.0E-01
Backfill and Compaction	Small Compactor (Wacker)	1.2E+00	3.3E+01	2.2E+01	3.8E+03	2.0E+00	2.0E+00	3.4E-02
Backfill and Compaction	Water Pump	7.2E+00	2.0E+02	1.4E+02	2.3E+04	1.2E+01	1.2E+01	2.0E-01
Slurry Backfill	Concrete Pump	7.2E+00	2.0E+02	1.4E+02	2.3E+04	1.2E+01	1.2E+01	2.0E-01
Site Restoration	6000 Watt Generator	1.7E+00	4.7E+01	3.2E+01	5.5E+03	2.9E+00	2.9E+00	4.8E-02

Site Restoration	Concrete Pump	6.8E-01	1.9E+01	1.3E+01	2.2E+03	1.2E+00	1.2E+00	1.9E-02
Street Trenching								
Street Trenching/Pipe installation	Backhoe	2.7E+01	6.7E+02	5.2E+02	1.0E+05	5.4E+01	5.4E+01	9.0E-01
Street Trenching/Pipe installation	Compressor	2.0E+01	5.6E+02	3.8E+02	6.5E+04	3.5E+01	3.5E+01	5.8E-01
Street Trenching/Pipe installation	Generator	1.0E+00	2.9E+01	2.0E+01	3.3E+03	1.8E+00	1.8E+00	2.9E-02
Street Trenching/Pipe installation	Concrete Saw	2.1E+00	3.6E+01	4.0E+01	7.9E+03	4.2E+00	4.2E+00	7.0E-02
Well Installation								
Drilling and SVE Well Installation	Drill Rig	1.3E+01	2.2E+02	2.5E+02	4.9E+04	2.6E+01	2.6E+01	4.3E-01
Street Paving								
Street - Grinding	Cold Plane Grinding Machine	3.8E+00	6.6E+01	7.2E+01	1.4E+04	7.6E+00	7.6E+00	1.3E-01
Street - Grinding	Street Sweeper	1.3E+00	2.3E+01	2.5E+01	5.0E+03	2.6E+00	2.6E+00	4.4E-02
Street - Paving	Paving Machine	1.7E+00	2.9E+01	3.2E+01	6.3E+03	3.3E+00	3.3E+00	5.6E-02
Street - Paving	Steam Roller	5.0E-01	8.7E+00	9.6E+00	1.9E+03	1.0E+00	1.0E+00	1.7E-02
Street - Paving	Street Sweeper	2.6E+00	4.6E+01	5.0E+01	1.0E+04	5.3E+00	5.3E+00	8.8E-02

Kast Air Emissions Calculations

Off-Road Emissions Calculations`				Hourly Emissions (lb)			
Phase	ROG	CO	Nox	CO2	PM10	PM2.5	Sox
Option 1							
Demolition	9.3E-03	2.6E-01	1.8E-01	3.0E+01	1.6E-02	1.6E-02	2.6E-04
Excavation	1.8E-02	5.0E-01	3.4E-01	5.7E+01	3.0E-02	3.0E-02	5.1E-04
SVE Well/Piping	6.0E-03	1.7E-01	1.1E-01	1.9E+01	1.0E-02	1.0E-02	1.7E-04
Subslab Vent Installation	4.6E-03	1.3E-01	8.8E-02	1.5E+01	7.9E-03	7.9E-03	1.3E-04
Backfill and Compaction	5.1E-03	1.4E-01	9.6E-02	1.6E+01	8.7E-03	8.7E-03	1.4E-04
Slurry Backfill	5.7E-04	1.6E-02	1.1E-02	1.9E+00	9.8E-04	9.8E-04	1.6E-05
Site Restoration	3.4E-03	9.6E-02	6.5E-02	1.1E+01	5.9E-03	5.9E-03	9.8E-05
Street Trenching							
Street Trenching/Pipe installation	4.7E-02	1.1E+00	9.0E-01	1.7E+02	9.0E-02	9.0E-02	1.5E-03
Well Installation							
Drilling and SVE Well Installation	2.6E-02	4.4E-01	4.9E-01	9.7E+01	5.1E-02	5.1E-02	8.5E-04
Street Paving							
Street - Grinding	1.3E-01	2.2E+00	2.4E+00	4.9E+02	2.6E-01	2.6E-01	4.3E-03
Street - Paving	6.0E-02	1.0E+00	1.1E+00	2.3E+02	1.2E-01	1.2E-01	2.0E-03

Off-Road Emissions Calculations				Daily Emissions (lb)			
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	9.2E-01	6.2E-01	1.1E+02	5.6E-02	5.6E-02	9.4E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	3.6E+00	3.9E+00	7.8E+02	4.1E-01	4.1E-01	6.8E-03
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

Kast Air Emissions Calculations

Off-Road Emissions Calculations			8 Home Cluster Emissions (lb)				
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	5.6E-02	1.6E+00	1.1E+00	1.8E+02	9.6E-02	9.6E-02	1.6E-03
Excavation	1.2E-01	3.5E+00	2.4E+00	4.0E+02	2.1E-01	2.1E-01	3.6E-03
SVE Well/Piping	1.5E-02	4.3E-01	2.9E-01	5.0E+01	2.6E-02	2.6E-02	4.4E-04
Subslab Vent Installation	1.4E-02	3.9E-01	2.7E-01	4.6E+01	2.4E-02	2.4E-02	4.0E-04
Backfill and Compaction	3.3E-02	7.6E-01	5.2E-01	8.8E+01	4.6E-02	4.6E-02	7.7E-04
Slurry Backfill	4.6E-03	1.3E-01	8.7E-02	1.5E+01	7.8E-03	7.8E-03	1.3E-04
Site Restoration	4.0E-03	1.1E-01	7.6E-02	1.3E+01	6.9E-03	6.9E-03	1.1E-04
Well Installation							
Drilling and SVE Well Installation	2.1E-01	8.0E-02	5.4E-02	9.3E+00	4.9E-03	4.9E-03	8.2E-05
Street Trenching							
Street Trenching/Pipe installation	2.8E-01	7.2E+00	5.3E+00	1.0E+03	5.3E-01	5.3E-01	8.8E-03
Street Paving							
Street - Grinding	1.0E+00	1.8E+01	2.0E+01	3.9E+03	2.1E+00	2.1E+00	3.4E-02
Street - Paving	4.8E-01	8.3E+00	9.1E+00	1.8E+03	9.6E-01	9.6E-01	1.6E-02

Off-Road Emissions Calculations			Annual Emissions (lb)				
Phase	ROG	CO	NOx	CO2	PM10	PM2.5	SOx
Option 1							
Demolition	6.6E+00	1.9E+02	1.3E+02	2.2E+04	1.1E+01	1.1E+01	1.9E-01
Excavation	1.1E+02	3.1E+03	2.1E+03	3.6E+05	1.9E+02	1.9E+02	3.2E+00
SVE Well/Piping	9.1E-01	2.6E+01	1.7E+01	3.0E+03	1.6E+00	1.6E+00	2.6E-02
Subslab Vent Installation	8.3E-01	2.3E+01	1.6E+01	2.7E+03	1.4E+00	1.4E+00	2.4E-02
Backfill and Compaction	1.9E+01	5.3E+02	3.6E+02	6.1E+04	3.2E+01	3.2E+01	5.4E-01
Slurry Backfill	7.2E+00	2.0E+02	1.4E+02	2.3E+04	1.2E+01	1.2E+01	2.0E-01
Site Restoration	2.4E+00	6.6E+01	4.5E+01	7.7E+03	4.1E+00	4.1E+00	6.8E-02
Well Installation							
Drilling and SVE Well Installation	1.3E+01	2.2E+02	2.5E+02	4.9E+04	2.6E+01	2.6E+01	4.3E-01
Street Trenching							
Street Trenching/Pipe installation	5.0E+01	1.3E+03	9.6E+02	1.8E+05	9.5E+01	9.5E+01	1.6E+00
Street Paving							
Street - Grinding	5.1E+00	8.9E+01	9.8E+01	1.9E+04	1.0E+01	1.0E+01	1.7E-01
Street - Paving	4.8E+00	8.3E+01	9.1E+01	1.8E+04	9.6E+00	9.6E+00	1.6E-01

VIII. On-Site Road Emissions

Summary: This section calculates the emissions of criteria pollutants from on-site paved roads.

Emissions Factors

Running Emissions						g/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions						lbs/mi					
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data								SCAB			
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.05	8	134	991	Dump Truck	25	0.72	0.75	6	96	713

Green Waste	0.50	4	32	237	Dump Truck	25	0.72	0.36	3	23	171
Excavation	1.86	15	1,787	3,530	Dump Truck	25	0.72	1.34	11	1286	2541
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	0.72	0.10	0.8	6	45
Subslab Vent	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	1.99	16	1,529	3,776	Dump Truck	25	0.72	1.43	11	1101	2717
Slurry Backfill	0.64	5	287	1,214	Concrete Truck	25	0.72	0.46	4	206	874
Site Resto.	0.37	3	237	702	Concrete Truck	25	0.72	0.27	2	171	505
Street Trenching											
Demo	0.12	1	0	178	Dump Truck	25	0.72	0.09	0.7	0.00	128
Excavation	0.42	3	0	600	Dump Truck	25	0.72	0.30	2	0.00	432
Backfill	0.39	3	0	556	Dump Truck	25	0.72	0.28	2	0.00	400
Restoration	0.08	1	0	113	Concrete Truck	25	0.72	0.06	0.5	0.00	81
Pipe Delivery	0.13	1	0	180	Dump Truck	25	0.72	0.09	1	0.00	130
Well Installation											
Air Vac- Borehole Clearance	0.13	1	0	63	Air-Vac	25	0.72	0.09	1	0.00	45
Drilling and SVE Well Installation	0.13	1	0	63	Drill Rig	25	0.72	0.09	1	0.00	45
Waste Collection	0.25	2	0	126	Dump Truck	25	0.72	0.18	1	0.00	91
Street Paving											
Street Grinding	3	16	0	80	Dump Truck	25	0.72	1.92	12	0.00	58

Street Paving	1	8	0	80	Dump Truck	25	0.72	0.96	6	0.00	58
Visitor Trips											
Passenger Vehicle Trips	1.13	9	0	2,259	Passenger Vehicle	25	0.72	0.81	6	0	1626

Emissions Calculations

Hourly Truck Trip Emission Calculations (SCAB)					**lbs/hour**					
Phase	**Hourly VMT (SCAB)**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1										
Demo	0.75	2.0E-04	1.4E-03	3.6E-03	2.6E+00	1.0E-04	9.4E-05	2.8E-05	9.8E-06	9.0E-06
Green Waste	0.36	9.7E-05	6.8E-04	1.7E-03	1.3E+00	4.9E-05	4.5E-05	1.3E-05	4.7E-06	4.3E-06
Excavation	1.34	3.6E-04	2.5E-03	6.4E-03	4.7E+00	1.8E-04	1.7E-04	4.9E-05	1.8E-05	1.6E-05
SVE Well/Piping	0.10	2.6E-05	1.8E-04	4.6E-04	3.3E-01	1.3E-05	1.2E-05	3.5E-06	1.3E-06	1.2E-06
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	1.43	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Slurry Backfill	0.46	1.2E-04	8.8E-04	2.2E-03	1.6E+00	6.2E-05	5.7E-05	1.7E-05	6.0E-06	5.5E-06
Site Resto.	0.27	7.2E-05	5.1E-04	1.3E-03	9.3E-01	3.6E-05	3.3E-05	9.8E-06	3.5E-06	3.2E-06
Street Trenching										
Demo	0.09	2.4E-05	1.7E-04	4.2E-04	3.1E-01	1.2E-05	1.1E-05	3.3E-06	1.2E-06	1.1E-06
Excavation	0.30	8.1E-05	5.7E-04	1.4E-03	1.0E+00	4.1E-05	3.7E-05	1.1E-05	3.9E-06	3.6E-06
Backfill	0.28	7.5E-05	5.3E-04	1.3E-03	9.7E-01	3.8E-05	3.5E-05	1.0E-05	3.6E-06	3.3E-06
Restoration	0.06	1.5E-05	1.1E-04	2.7E-04	2.0E-01	7.6E-06	7.0E-06	2.1E-06	7.4E-07	6.8E-07
Pipe Delivery	0.09	2.4E-05	1.7E-04	4.3E-04	3.1E-01	1.2E-05	1.1E-05	3.3E-06	1.2E-06	1.1E-06
Well Installation										
Air Vac- Borehole Clearance	0.09	2.4E-05	1.7E-04	4.3E-04	3.1E-01	1.2E-05	1.1E-05	3.3E-06	1.2E-06	1.1E-06

Drilling and SVE Well Installation	0.09	2.4E-05	1.7E-04	4.3E-04	3.1E-01	1.2E-05	1.1E-05	3.3E-06	1.2E-06	1.1E-06
Waste Collection	0.18	4.9E-05	3.4E-04	8.5E-04	6.3E-01	2.4E-05	2.2E-05	6.6E-06	2.4E-06	2.2E-06
Street Paving										
Street Grinding	1.92	5.2E-04	3.7E-03	9.1E-03	6.7E+00	2.6E-04	2.4E-04	7.1E-05	2.5E-05	2.3E-05
Street Paving	0.96	2.6E-04	1.8E-03	4.6E-03	3.3E+00	1.3E-04	1.2E-04	3.5E-05	1.3E-05	1.2E-05
Visitor Trips										
Passenger Vehicle Trips	0.81	1.1E-04	4.5E-03	5.0E-04	1.2E+00	5.4E-06	5.4E-07	1.2E-05	8.0E-05	3.2E-05

Daily Truck Trip Emission Calculations (SCAB)					**lbs/day**					
Phase	**Daily VMT (SCAB)**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1										
Demo	6.0	1.6E-03	1.1E-02	2.9E-02	2.1E+01	8.1E-04	7.5E-04	2.2E-04	7.9E-05	7.2E-05
Green Waste	2.9	7.8E-04	5.5E-03	1.4E-02	1.0E+01	3.9E-04	3.6E-04	1.1E-04	3.8E-05	3.5E-05
Excavation	10.7	2.9E-03	2.0E-02	5.1E-02	3.7E+01	1.4E-03	1.3E-03	4.0E-04	1.4E-04	1.3E-04
SVE Well/Piping	0.8	2.1E-04	1.5E-03	3.6E-03	2.7E+00	1.0E-04	9.5E-05	2.8E-05	1.0E-05	9.2E-06
Subslab Vent	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	11.5	3.1E-03	2.2E-02	5.4E-02	4.0E+01	1.5E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Slurry Backfill	3.7	1.0E-03	7.0E-03	1.8E-02	1.3E+01	5.0E-04	4.6E-04	1.4E-04	4.8E-05	4.4E-05
Site Resto.	2.1	5.8E-04	4.1E-03	1.0E-02	7.4E+00	2.9E-04	2.6E-04	7.9E-05	2.8E-05	2.6E-05
Street Trenching										
Demo	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.6E-05	8.8E-05	2.6E-05	9.3E-06	8.6E-06
Excavation	2.4	6.5E-04	4.6E-03	1.1E-02	8.3E+00	3.2E-04	3.0E-04	8.9E-05	3.1E-05	2.9E-05
Backfill	2.2	6.0E-04	4.2E-03	1.1E-02	7.7E+00	3.0E-04	2.8E-04	8.2E-05	2.9E-05	2.7E-05
Restoration	0.5	1.2E-04	8.6E-04	2.1E-03	1.6E+00	6.1E-05	5.6E-05	1.7E-05	5.9E-06	5.4E-06
Pipe Delivery	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Well Installation										
Air Vac- Borehole Clearance	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06

Drilling and SVE Well Installation	0.7	1.9E-04	1.4E-03	3.4E-03	2.5E+00	9.7E-05	8.9E-05	2.7E-05	9.4E-06	8.7E-06
Waste Collection	1.4	3.9E-04	2.7E-03	6.8E-03	5.0E+00	1.9E-04	1.8E-04	5.3E-05	1.9E-05	1.7E-05
Street Paving										
Street Grinding	11.5	3.1E-03	2.2E-02	5.5E-02	4.0E+01	1.6E-03	1.4E-03	4.2E-04	1.5E-04	1.4E-04
Street Paving	5.8	1.6E-03	1.1E-02	2.7E-02	2.0E+01	7.8E-04	7.2E-04	2.1E-04	7.5E-05	6.9E-05
Visitor Trips										
Passenger Vehicle Trips	6.5	9.1E-04	3.6E-02	4.0E-03	9.9E+00	4.3E-05	4.3E-06	1.0E-04	6.4E-04	2.6E-04

8 Home Cluster Truck Trip Emission Calculations (SCAB)					**lbs/8 Home Cluster**					
Phase	**8 Home Cluster VMT (SCAB)**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1										
Demo	96	2.6E-02	1.8E-01	4.6E-01	3.3E+02	1.3E-02	1.2E-02	3.6E-03	1.3E-03	1.2E-03
Green Waste	23	6.2E-03	4.4E-02	1.1E-01	8.0E+01	3.1E-03	2.9E-03	8.5E-04	3.0E-04	2.8E-04
Excavation	1286	3.5E-01	2.4E+00	6.1E+00	4.5E+03	1.7E-01	1.6E-01	4.7E-02	1.7E-02	1.5E-02
SVE Well/Piping	6	1.7E-03	1.2E-02	2.9E-02	2.1E+01	8.3E-04	7.6E-04	2.3E-04	8.0E-05	7.4E-05
Subslab Vent	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	1101	3.0E-01	2.1E+00	5.2E+00	3.8E+03	1.5E-01	1.4E-01	4.1E-02	1.4E-02	1.3E-02
Slurry Backfill	206	5.6E-02	3.9E-01	9.8E-01	7.2E+02	2.8E-02	2.6E-02	7.6E-03	2.7E-03	2.5E-03
Site Resto.	171	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.1E-03
Street Trenching										
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Installation										
Air Vac- Borehole Clearance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drilling and SVE Well Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Collection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving										
Street Grinding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Visitor Trips										
Passenger Vehicle Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual Truck Trip Emission Calculations (SCAB)					**lbs/year**					
Phase	**Annual VMT (SCAB)**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1										
Demo	713	1.9E-01	1.4E+00	3.4E+00	2.5E+03	9.6E-02	8.9E-02	2.6E-02	9.3E-03	8.6E-03
Green Waste	171	4.6E-02	3.2E-01	8.1E-01	5.9E+02	2.3E-02	2.1E-02	6.3E-03	2.2E-03	2.1E-03
Excavation	2541	6.9E-01	4.8E+00	1.2E+01	8.8E+03	3.4E-01	3.2E-01	9.4E-02	3.3E-02	3.1E-02
SVE Well/Piping	45	1.2E-02	8.7E-02	2.2E-01	1.6E+02	6.1E-03	5.7E-03	1.7E-03	5.9E-04	5.5E-04
Subslab Vent	0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Backfill/Compact	2717	7.4E-01	5.2E+00	1.3E+01	9.4E+03	3.7E-01	3.4E-01	1.0E-01	3.6E-02	3.3E-02
Slurry Backfill	874	2.4E-01	1.7E+00	4.2E+00	3.0E+03	1.2E-01	1.1E-01	3.2E-02	1.1E-02	1.1E-02
Site Resto.	505	1.4E-01	9.6E-01	2.4E+00	1.8E+03	6.8E-02	6.3E-02	1.9E-02	6.6E-03	6.1E-03
Street Trenching										
Demo	128	3.5E-02	2.4E-01	6.1E-01	4.5E+02	1.7E-02	1.6E-02	4.7E-03	1.7E-03	1.5E-03
Excavation	432	1.2E-01	8.2E-01	2.1E+00	1.5E+03	5.8E-02	5.4E-02	1.6E-02	5.6E-03	5.2E-03
Backfill	400	1.1E-01	7.6E-01	1.9E+00	1.4E+03	5.4E-02	5.0E-02	1.5E-02	5.2E-03	4.8E-03
Restoration	81	2.2E-02	1.5E-01	3.9E-01	2.8E+02	1.1E-02	1.0E-02	3.0E-03	1.1E-03	9.8E-04
Pipe Delivery	130	3.5E-02	2.5E-01	6.2E-01	4.5E+02	1.8E-02	1.6E-02	4.8E-03	1.7E-03	1.6E-03
Well Installation										
Air Vac- Borehole Clearance	45	1.2E-02	8.6E-02	2.2E-01	1.6E+02	6.1E-03	5.6E-03	1.7E-03	5.9E-04	5.5E-04

Drilling and SVE Well Installation	45	1.2E-02	8.6E-02	2.2E-01	1.6E+02	6.1E-03	5.6E-03	1.7E-03	5.9E-04	5.5E-04
Waste Collection	91	2.5E-02	1.7E-01	4.3E-01	3.2E+02	1.2E-02	1.1E-02	3.3E-03	1.2E-03	1.1E-03
Street Paving										
Street Grinding	58	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Street Paving	58	1.6E-02	1.1E-01	2.7E-01	2.0E+02	7.8E-03	7.2E-03	2.1E-03	7.5E-04	6.9E-04
Visitor Trips										
Passenger Vehicle Trips	1626	2.3E-01	9.0E+00	1.0E+00	2.5E+03	1.1E-02	1.1E-03	2.5E-02	1.6E-01	6.5E-02

Misc Worker Trips

Worker Trip Emission Calculations (SCAB)							**lbs/hour**					
Phase	**Worker Round Trips per hour**	**Roundtrip Distance per Worker (mi)**	**VMT per Hour**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1	4	0.72	3	4.1E-04	1.6E-02	1.8E-03	4.4E+00	1.9E-05	1.9E-06	4.4E-05	2.9E-04	1.1E-04
Street Trenching	5.25	0.72	4	5.3E-04	2.1E-02	2.3E-03	5.8E+00	2.5E-05	2.5E-06	5.8E-05	3.7E-04	1.5E-04
Well Installation	5	0.72	4	5.0E-04	1.9E-02	2.2E-03	5.4E+00	2.3E-05	2.3E-06	5.4E-05	3.5E-04	1.4E-04
Street Paving												
Street Grinding	3	0.72	2	2.7E-04	1.1E-02	1.2E-03	2.9E+00	1.3E-05	1.3E-06	3.0E-05	1.9E-04	7.6E-05
Street Paving	3	0.72	2	2.7E-04	1.1E-02	1.2E-03	2.9E+00	1.3E-05	1.3E-06	3.0E-05	1.9E-04	7.6E-05

Worker Trip Emission Calculations (SCAB)							**lbs/day**					
Phase	**Worker Round Trips per day**	**Roundtrip Distance per Worker (mi)**	**VMT per Day**	**ROG**	**CO**	**NOx**	**CO2**	**PM10**	**PM2.5**	**SOx**	**Tire & Brake Wear PM10**	**Tire & Brake Wear PM2.5**
Option 1	32	0.72	23	3.2E-03	1.3E-01	1.4E-02	3.5E+01	1.5E-04	1.5E-05	3.6E-04	2.3E-03	9.1E-04
Street Trenching	42	0.72	30	4.3E-03	1.7E-01	1.9E-02	4.6E+01	2.0E-04	2.0E-05	4.7E-04	3.0E-03	1.2E-03
Well Installation	39	0.72	28	4.0E-03	1.6E-01	1.7E-02	4.3E+01	1.9E-04	1.9E-05	4.3E-04	2.8E-03	1.1E-03
Street Paving												

Street Grinding	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04
Street Paving	16	0.72	12	1.6E-03	6.4E-02	7.1E-03	1.8E+01	7.6E-05	7.6E-06	1.8E-04	1.1E-03	4.6E-04

Worker Trip Emission Calculations (SCAB) — **lbs/8 Home Cluster**

Phase	Worker Round Trips per day	Roundtrip Distance per Worker (mi)	VMT per Day	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	12,544	0.72	9028	1.3E+00	5.0E+01	5.5E+00	1.4E+04	6.0E-02	6.0E-03	1.4E-01	9.0E-01	3.6E-01
Street Trenching	0.00	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Well Installation	0.00	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving												
Street Grinding	0.00	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Street Paving	0.00	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Worker Trip Emission Calculations (SCAB) — **lbs/year**

Phase	Worker Round Trips per year	Roundtrip Distance per Worker (mi)	VMT per Year	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
Option 1	8,032	0.72	5781	8.2E-01	3.2E+01	3.5E+00	8.8E+03	3.8E-02	3.8E-03	8.9E-02	5.7E-01	2.3E-01
Street Trenching	7,560	0.72	5441	7.7E-01	3.0E+01	3.3E+00	8.3E+03	3.6E-02	3.6E-03	8.4E-02	5.4E-01	2.2E-01
Well Installation	2,457	0.72	1768	2.5E-01	9.8E+00	1.1E+00	2.7E+03	1.2E-02	1.2E-03	2.7E-02	1.8E-01	7.0E-02
Street Paving												
Street Grinding	80	0.72	58	8.1E-03	3.2E-01	3.5E-02	8.8E+01	3.8E-04	3.8E-05	8.9E-04	5.7E-03	2.3E-03
Street Paving	160	0.72	115	1.6E-02	6.4E-01	7.1E-02	1.8E+02	7.6E-04	7.6E-05	1.8E-03	1.1E-02	4.6E-03

VIIII. On-Site Road - Reentrained Dust

Summary: This section calculates the emissions of re-entrained dust from on-site on road vehicles on paved roads.

$$E = [k(sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

E = size-specific emission factor (lb/VMT)

k = particle size multiplier

sL = road surface silt loading (g/m^2)

W = mean vehicle weight (tons)

P = averaging period (365 days)

N = number of "wet" days (>0.01 in of precipitation)

Source: AP-42 13.2.1-2, Equation (1). January 2011.

Correction:

P = number of wet days

N = number of days in period

Assumptions			
Parameter	**Value**	**Units**	**Reference**
Heavy Vehicle Weight (tons)	25	tons	Assumed
k (empirical constant) - PM10	0.0022	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM10
k (empirical constant) -	0.00054	-	AP-42, Chapter 13.2.1, Table 13.2.1-1. PM2.5
sL (Haul Trucks)	0.02	g/m2	CARB Entrained Paved Road Dust. (1997) Silt loading for freeways:
sL (Worker Vehicles)	0.1	g/m2	CalEEMod Default for Worker trips (Assumes mix of freeway and surface street travel)
P (averaging period)	365	days	Days per year
N (wet days)	40	days	AP-42, Chapter 13.2.1, Figure 13.2.1-2. January
On-Site Heavy Truck Haul	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Employee/Worker Trip	0.72	miles	Measured distance from the furthest northern and southern homes in the community.
Paved Road Average Vehicle	2.4	tons	CalEEMod default average vehicle weight (tons)

Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	SCAB Round Trip length (SCAB)	Hourly VMT	Daily VMT	8 Home Cluster VMT	Annual VMT
Option 1											
Demo	1.0	8.4	133.8	991.1	Dump Truck	25	0.72	0.8	6.0	96.3	713.3
Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25	0.72	0.4	2.9	23.0	170.6
Excavation	1.9	14.9	1787.5	3530.3	Dump Truck	25	0.72	1.3	10.7	1286.4	2540.7
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	0.72	0.1	0.8	6.1	45.5
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2.0	15.9	1529.4	3775.8	Dump Truck	25	0.72	1.4	11.5	1100.7	2717.4
Slurry Backfill	0.6	5.1	286.8	1213.8	Concrete Truck	25	0.72	0.5	3.7	206.4	873.6
Site Resto.	0.4	3.0	237.0	702.0	Concrete Truck	25	0.72	0.3	2.1	170.5	505.2
Street Trenching											
Demo	0.1	1.0	0.00	178.0	Dump Truck	25	0.72	0.1	0.7	0.00	128.1
Excavation	0.4	3.3	0.00	600.0	Dump Truck	25	0.72	0.3	2.4	0.00	431.8
Backfill	0.4	3.1	0.00	556.0	Dump Truck	25	0.72	0.3	2.2	0.00	400.2
Restoration	0.1	0.6	0.00	113.0	Concrete Truck	25	0.72	0.1	0.5	0.00	81.3
Pipe Delivery	0.1	1.0	0.00	180.0	Dump Truck	25	0.72	0.1	0.7	0.00	129.5
Well Installation											
Air Vac- Borehole Clearance	0.1	1.0	0.00	63.0	Air-Vac	25	0.72	0.1	0.7	0.00	45.3
Drilling and SVE Well Installation	0.1	1.0	0.00	63.0	Drill Rig	25	0.72	0.1	0.7	0.00	45.3

Waste Collection	0.3	2.0	0.00	126.0	Dump Truck	25	0.72	0.2	1.4	0.00	90.7
Street Paving											
Street Grinding	2.7	16.0	0.00	80.0	Dump Truck	25	0.72	1.9	11.5	0.00	57.6
Street Paving	1.3	8.0	0.00	80.0	Dump Truck	25	0.72	1.0	5.8	0.00	57.6

Emission Calculation

Hourly:

Phase	Hourly VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	0.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.56E-05	1.12E-05
Green Waste	0.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.18E-05	5.36E-06
Excavation	1.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.13E-05	1.99E-05
SVE Well/Piping	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.82E-06	1.43E-06
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.69E-05	2.13E-05
Slurry Backfill	0.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.79E-05	6.86E-06
Site Resto.	0.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.62E-05	3.97E-06
Street Trenching											
Demo	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.39E-06	1.32E-06
Excavation	0.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.82E-05	4.46E-06
Backfill	0.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.68E-05	4.14E-06
Restoration	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.42E-06	8.41E-07
Pipe Delivery	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.46E-06	1.34E-06
Well Installation											
Air Vac- Borehole Clearance	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.46E-06	1.34E-06
Drilling and SVE Well Installation	0.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.46E-06	1.34E-06
Waste Collection	0.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.09E-05	2.68E-06

Street Paving											
Street Grinding	1.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.16E-04	2.86E-05
Street Paving	1.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.82E-05	1.43E-05

Daily:

Phase	Daily VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	6.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.65E-04	8.96E-05
Green Waste	2.9	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.75E-04	4.28E-05
Excavation	10.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.50E-04	1.60E-04
SVE Well/Piping	0.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.65E-05	1.14E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.95E-04	1.71E-04
Slurry Backfill	3.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.24E-04	5.49E-05
Site Resto.	2.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.29E-04	3.17E-05
Street Trenching											
Demo	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.32E-05	1.06E-05
Excavation	2.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.45E-04	3.57E-05
Backfill	2.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.35E-04	3.31E-05
Restoration	0.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.74E-05	6.72E-06
Pipe Delivery	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Well Installation											
Air Vac- Borehole Clearance	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Drilling and SVE Well Installation	0.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.36E-05	1.07E-05
Waste Collection	1.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	8.73E-05	2.14E-05
Street Paving											
Street Grinding	11.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.98E-04	1.71E-04
Street Paving	5.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-04	8.57E-05

8 Home Cluster:

Phase	Annual VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	96.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.84E-03	1.43E-03
Green Waste	23.0	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.40E-03	3.43E-04
Excavation	1286.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	7.80E-02	1.91E-02
SVE Well/Piping	6.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.72E-04	9.14E-05
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	1100.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	6.67E-02	1.64E-02
Slurry Backfill	206.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.25E-02	3.07E-03
Site Resto.	170.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.03E-02	2.54E-03
Street Trenching											
Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Installation											
Air Vac- Borehole Clearance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drilling and SVE Well Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Collection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving											
Street Grinding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Street Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual:

Phase	Annual VMT (SCAB)	sL (g/M^2)	W (tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. Period	PM10 EF (lbs/mi.)	PM2.5 EF (lbs/mi.)	SCAB Pm10 Emissions	SCAB PM2.5 Emissions
Option 1											
Demo	713.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.33E-02	1.06E-02
Green Waste	170.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.03E-02	2.54E-03
Excavation	2540.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.54E-01	3.78E-02
SVE Well/Piping	45.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.76E-03	6.77E-04
Subslab Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backfill/Compact	2717.4	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	1.65E-01	4.04E-02
Slurry Backfill	873.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.30E-02	1.30E-02
Site Resto.	505.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.06E-02	7.52E-03
Street Trenching											
Demo	128.1	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	7.77E-03	1.91E-03
Excavation	431.8	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.62E-02	6.43E-03
Backfill	400.2	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.43E-02	5.96E-03
Restoration	81.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	4.93E-03	1.21E-03
Pipe Delivery	129.5	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	7.86E-03	1.93E-03
Well Installation											
Air Vac- Borehole Clearance	45.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.75E-03	6.75E-04
Drilling and SVE Well Installation	45.3	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	2.75E-03	6.75E-04
Waste Collection	90.7	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	5.50E-03	1.35E-03
Street Paving											
Street Grinding	57.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-03	8.57E-04
Street Paving	57.6	0.00054	25	0.0022	0.00054	40	365	6.06E-05	1.49E-05	3.49E-03	8.57E-04

Hourly Worker Trip Emissions:

Phase	Worker Trips per Hour	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	4	0.72	3	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.28E-04	1.05E-04
Street Trenching	5	0.72	4	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	5.62E-04	1.38E-04
Well Installation	5	0.72	4	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	5.21E-04	1.28E-04
Street Paving													
Street Grinding	3	0.72	2	0.02	2.40	0.0022	0.00054	40	368	1.49E-04	3.65E-05	2.85E-04	7.00E-05
Street Paving	3	0.72	2	0.02	2.40	0.0022	0.00054	40	369	1.49E-04	3.65E-05	2.85E-04	7.00E-05

Daily Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	32	0.72	23	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	3.42E-03	8.40E-04
Street Trenching	42	0.72	30	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.49E-03	1.10E-03
Well Installation	39	0.72	28	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	4.17E-03	1.02E-03
Street Paving													
Street Grinding	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04
Street Paving	16	0.72	12	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-03	4.20E-04

8 Home Cluster Worker Trip Emissions:

Phase	Worker Trips per Day	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	12544	0.72	9028	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.34E+00	3.29E-01
Street Trenching	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
Well Installation	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
Street Paving													
Street Grinding	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
Street Paving	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

Annual Worker Trip Emissions:

Phase	Worker Trips per Year	Round Trip per Worker (mile)	VMT per Hour	SL (g/m^2)	W (Tons)	k (PM10)	k (PM2.5)	Wet Days	Avg. period	PM10 EF lbs/mi	PM2.5 EF lbs/mi	SCAB PM10 Emissions	SCAB PM2.5 Emissions
Option 1	8,032	0.72	5781	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	8.59E-01	2.11E-01
Street Trenching	7,560	0.72	5441	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	8.09E-01	1.98E-01
Well Installation	2,457	0.72	1768	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	2.63E-01	6.45E-02
Street Paving													
Street Grinding	80	0.72	58	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	8.56E-03	2.10E-03
Street Paving	160	0.72	115	0.02	2.40	0.0022	0.00054	40	365	1.49E-04	3.65E-05	1.71E-02	4.20E-03

V. VOC Emission Calculations

General Assumptions

Parameter	Value	Units	References
Hours per Day	8	hours	Hours of work 8am-4pm

Excavated Surface Volatilization Assumptions

Parameter	Value	Units	References
Layer Thickness	304.8	cm	10 feet of excavation
Stabilizer	91%	%	Apply stabilizer on inactive areas. Source: USEPA, Control of Air Emissions from Superfund Sites, (1992). Long-term VOC control efficiency ranges from 91 to 100%.
Work Days in year	251	days	

Excavated Surfaces VOC Emissions

Equation:

Active Area Emissions (lb/time) = tXVFXAs

None-Active Area Emissions (lb/time) = (1-MR)xtXVFXAs

Where:

MR = stabilized mitigation

t = time conversion factor (e.g. Hours/day, days/year)

VF = volatility factor output from EMSOFT model (mg/cm^2-day)

As = surface area of volatilization (cm^2)

Phase	Duration (days)	Hourly QTY Excavated (CY)	Daily QTY Excavated (CY)	Yearly QTY Excavated (CY)	Hourly Excavated/Disturbed Surface Area (cm^2)	Daily Previously Excavated/Disturbed Surface Area (cm^2)	Yearly Excavated/Disturbed Surface Area (cm^2)	Stabilized Mitigation (% Reduction)
Option 1 - Excavati	889	7	209	49,423	1.76E+04	5.23E+05	1.24E+08	91%
Street Trenching	180	6	45	8,100	1.41E+04	1.13E+05	2.03E+07	91%

Kast VOC Emissions Calculations

Volatilization Factor Calculations:

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
Option 1 - Excavation								
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.97E-12	1.99E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.59E-09	4.32E-03	3.18E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.05E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.29E-12	2.38E-11	8.66E-06	6.37E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.51E-09	4.28E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.47E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.36E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.69E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.92E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.81E-11	3.62E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.63E-11	9.25E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.83E-12	9.23E-06	6.79E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.02E-09	1.81E-08	1.05E-02	7.68E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.02E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	Chemical UCL Concentration (mg/kg)	Volatilization Factors					
			VF1day [1 day avg.] (mg/cm^2-day)	VF1day [workday] (lbs/cm^2-day)	VF1day [off-workday] (lbs/cm^2-day)	VF1hr [0.1 day avg.] (mg/cm^2-day)	VF1hr [workday] (lbs/cm^2-day)	VF1hr [off-workday] (lbs/cm^2-day)
100-41-4	Ethylbenzene	5.00E-01	8.72E-03	6.41E-09	2.88E-08	2.74E-02	2.01E-08	4.03E-08
106-46-7	1,4-Dichlorobenzene	5.90E-04	4.35E-06	3.20E-12	1.44E-11	1.36E-05	9.97E-12	1.99E-11
107-06-2	1,2-Dichloroethane	4.70E-04	8.52E-06	6.26E-12	2.82E-11	2.68E-05	1.97E-11	3.94E-11
108-67-8	1,3,5-Trimethylbenzene	1.90E-01	1.39E-03	1.02E-09	4.59E-09	4.32E-03	3.18E-09	6.35E-09
108-88-3	Toluene	1.20E-01	2.74E-03	2.01E-09	9.05E-09	8.61E-03	6.33E-09	1.27E-08
127-18-4	Tetrachloroethene	1.30E-02	4.34E-04	3.19E-10	1.44E-09	1.37E-03	1.01E-09	2.01E-09
129-00-0	Pyrene	1.00E+00	7.21E-06	5.29E-12	2.38E-11	8.66E-06	6.37E-12	1.27E-11
1330-20-7	Xylenes, Total	7.69E-01	1.29E-02	9.51E-09	4.28E-08	4.07E-02	2.99E-08	5.98E-08
156-59-2	cis-1,2-Dichloroethene	5.60E-04	1.50E-05	1.10E-11	4.96E-11	4.73E-05	3.47E-11	6.95E-11
71-43-2	Benzene	1.70E-01	5.09E-03	3.74E-09	1.68E-08	1.60E-02	1.18E-08	2.36E-08
74-83-9	Bromomethane	5.80E-03	2.12E-04	1.56E-10	7.01E-10	6.68E-04	4.91E-10	9.82E-10
75-01-4	Vinyl Chloride	2.41E-04	1.59E-05	1.17E-11	5.26E-11	5.03E-05	3.69E-11	7.39E-11
75-09-2	Methylene Chloride	3.20E-03	8.78E-05	6.45E-11	2.90E-10	2.76E-04	2.03E-10	4.06E-10
75-27-4	Bromodichloromethane	2.40E-04	2.40E-06	1.76E-12	7.92E-12	7.50E-06	5.51E-12	1.10E-11
75-65-0	tert-Butyl Alcohol (TBA)	4.80E-03	2.50E-05	1.84E-11	8.27E-11	7.75E-05	5.70E-11	1.14E-10
78-87-5	1,2-Dichloropropane	3.60E-04	7.84E-06	5.76E-12	2.59E-11	2.47E-05	1.81E-11	3.62E-11
79-01-6	Trichloroethene	7.40E-04	2.00E-05	1.47E-11	6.61E-11	6.29E-05	4.63E-11	9.25E-11
79-34-5	1,1,2,2-Tetrachloroethane	4.80E-04	2.97E-06	2.18E-12	9.83E-12	9.23E-06	6.79E-12	1.36E-11
90-12-0	1-Methylnaphthalene	2.60E+00	5.48E-03	4.02E-09	1.81E-08	1.05E-02	7.68E-09	1.54E-08
91-20-3	Naphthalene	1.50E+00	2.60E-03	1.91E-09	8.60E-09	8.22E-02	6.04E-08	1.21E-07
91-57-6	2-Methylnaphthalene	3.90E+00	5.48E-03	4.02E-09	1.81E-08	1.61E-02	1.18E-08	2.37E-08
95-63-6	1,2,4-Trimethylbenzene	7.80E-01	5.86E-03	4.31E-09	1.94E-08	1.83E-02	1.34E-08	2.69E-08
96-18-4	1,2,3-Trichloropropane	6.40E-04	6.21E-06	4.56E-12	2.05E-11	1.94E-05	1.43E-11	2.85E-11

Kast VOC Emissions Calculations

VOC Emission Calculations:

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
Option 1 - Excavation										
100-41-4	Ethylbenzene	3.54E-04	6.37E-05	4.17E-04	3.35E-03	1.36E-03	4.71E-03	1.99E+02	1.79E+01	2.17E+02
106-46-7	1,4-Dichlorobenzene	1.75E-07	3.15E-08	2.07E-07	1.67E-06	6.78E-07	2.35E-06	9.96E-02	8.96E-03	1.09E-01
107-06-2	1,2-Dichloroethane	3.46E-07	6.22E-08	4.08E-07	3.27E-06	1.33E-06	4.60E-06	1.95E-01	1.75E-02	2.12E-01
108-67-8	1,3,5-Trimethylbenzene	5.58E-05	1.00E-05	6.58E-05	5.33E-04	2.16E-04	7.49E-04	3.17E+01	2.86E+00	3.46E+01
108-88-3	Toluene	1.11E-04	2.00E-05	1.31E-04	1.05E-03	4.26E-04	1.48E-03	6.26E+01	5.63E+00	6.82E+01
127-18-4	Tetrachloroethene	1.77E-05	3.18E-06	2.08E-05	1.67E-04	6.76E-05	2.34E-04	9.93E+00	8.93E-01	1.08E+01
129-00-0	Pyrene	1.12E-07	2.01E-08	1.32E-07	2.77E-06	1.12E-06	3.89E-06	1.65E-01	1.48E-02	1.80E-01
1330-20-7	Xylenes, Total	5.25E-04	9.45E-05	6.19E-04	4.97E-03	2.01E-03	6.99E-03	2.96E+02	2.66E+01	3.23E+02
156-59-2	cis-1,2-Dichloroethene	6.10E-07	1.10E-07	7.20E-07	5.77E-06	2.34E-06	8.11E-06	3.43E-01	3.09E-02	3.74E-01
71-43-2	Benzene	2.07E-04	3.73E-05	2.44E-04	1.96E-03	7.93E-04	2.75E-03	1.16E+02	1.05E+01	1.27E+02
74-83-9	Bromomethane	8.62E-06	1.55E-06	1.02E-05	8.15E-05	3.30E-05	1.14E-04	4.85E+00	4.36E-01	5.28E+00
75-01-4	Vinyl Chloride	6.49E-07	1.17E-07	7.65E-07	6.12E-06	2.48E-06	8.60E-06	3.64E-01	3.28E-02	3.97E-01
75-09-2	Methylene Chloride	3.57E-06	6.42E-07	4.21E-06	3.37E-05	1.37E-05	4.74E-05	2.01E+00	1.81E-01	2.19E+00
75-27-4	Bromodichloromethane	9.67E-08	1.74E-08	1.14E-07	9.21E-07	3.73E-07	1.29E-06	5.48E-02	4.93E-03	5.97E-02
75-65-0	tert-Butyl Alcohol (TBA)	1.00E-06	1.80E-07	1.18E-06	9.62E-06	3.90E-06	1.35E-05	5.72E-01	5.15E-02	6.24E-01
78-87-5	1,2-Dichloropropane	3.18E-07	5.73E-08	3.76E-07	3.01E-06	1.22E-06	4.23E-06	1.79E-01	1.61E-02	1.95E-01
79-01-6	Trichloroethene	8.12E-07	1.46E-07	9.58E-07	7.68E-06	3.11E-06	1.08E-05	4.57E-01	4.11E-02	4.98E-01
79-34-5	1,1,2,2-Tetrachloroethane	1.19E-07	2.14E-08	1.41E-07	1.14E-06	4.63E-07	1.60E-06	6.79E-02	6.11E-03	7.41E-02
90-12-0	1-Methylnaphthalene	1.35E-04	2.43E-05	1.59E-04	2.11E-03	8.53E-04	2.96E-03	1.25E+02	1.13E+01	1.37E+02
91-20-3	Naphthalene	1.06E-03	1.91E-04	1.25E-03	9.99E-04	4.05E-04	1.40E-03	5.94E+01	5.35E+00	6.48E+01
91-57-6	2-Methylnaphthalene	2.08E-04	3.74E-05	2.45E-04	2.11E-03	8.53E-04	2.96E-03	1.25E+02	1.13E+01	1.37E+02
95-63-6	1,2,4-Trimethylbenzene	2.36E-04	4.25E-05	2.78E-04	2.25E-03	9.13E-04	3.17E-03	1.34E+02	1.21E+01	1.46E+02
96-18-4	1,2,3-Trichloropropane	2.50E-07	4.51E-08	2.96E-07	2.39E-06	9.66E-07	3.35E-06	1.42E-01	1.28E-02	1.55E-01

Kast VOC Emissions Calculations

Street Trenching - Excavation

CAS #	Chemical	VOC Emission Rates								
		Active Area Emissions (lbs/hour)	Non-Active Area Emissions (lbs/hour)	Total Area Emissions (lbs/hour)	Active Area Emissions (lbs/day)	Non-Active Area Emissions (lbs/day)	Total Area Emissions (lbs/day)	Active Area Emissions (lbs/year)	Non-Active Area Emissions (lbs/year)	Total Area Emissions (lbs/year)
100-41-4	Ethylbenzene	2.84E-04	5.12E-05	3.35E-04	7.23E-04	2.93E-04	1.02E-03	3.27E+01	2.94E+00	3.56E+01
106-46-7	1,4-Dichlorobenzene	1.41E-07	2.53E-08	1.66E-07	3.61E-07	1.46E-07	5.07E-07	1.63E-02	1.47E-03	1.78E-02
107-06-2	1,2-Dichloroethane	2.78E-07	5.00E-08	3.28E-07	7.07E-07	2.86E-07	9.93E-07	3.19E-02	2.87E-03	3.48E-02
108-67-8	1,3,5-Trimethylbenzene	4.48E-05	8.07E-06	5.29E-05	1.15E-04	4.66E-05	1.62E-04	5.20E+00	4.68E-01	5.67E+00
108-88-3	Toluene	8.93E-05	1.61E-05	1.05E-04	2.27E-04	9.19E-05	3.19E-04	1.03E+01	9.23E-01	1.12E+01
127-18-4	Tetrachloroethene	1.42E-05	2.55E-06	1.67E-05	3.60E-05	1.46E-05	5.06E-05	1.63E+00	1.46E-01	1.77E+00
129-00-0	Pyrene	8.98E-08	1.62E-08	1.06E-07	5.98E-07	2.42E-07	8.40E-07	2.70E-02	2.43E-03	2.94E-02
1330-20-7	Xylenes, Total	4.22E-04	7.59E-05	4.98E-04	1.07E-03	4.35E-04	1.51E-03	4.85E+01	4.37E+00	5.29E+01
156-59-2	cis-1,2-Dichloroethene	4.90E-07	8.83E-08	5.79E-07	1.25E-06	5.04E-07	1.75E-06	5.63E-02	5.06E-03	6.13E-02
71-43-2	Benzene	1.66E-04	2.99E-05	1.96E-04	4.22E-04	1.71E-04	5.94E-04	1.91E+01	1.72E+00	2.08E+01
74-83-9	Bromomethane	6.93E-06	1.25E-06	8.18E-06	1.76E-05	7.12E-06	2.47E-05	7.94E-01	7.15E-02	8.66E-01
75-01-4	Vinyl Chloride	5.21E-07	9.38E-08	6.15E-07	1.32E-06	5.35E-07	1.86E-06	5.97E-02	5.37E-03	6.50E-02
75-09-2	Methylene Chloride	2.87E-06	5.16E-07	3.38E-06	7.28E-06	2.95E-06	1.02E-05	3.29E-01	2.96E-02	3.59E-01
75-27-4	Bromodichloromethane	7.77E-08	1.40E-08	9.17E-08	1.99E-07	8.05E-08	2.79E-07	8.98E-03	8.08E-04	9.79E-03
75-65-0	tert-Butyl Alcohol (TBA)	8.04E-07	1.45E-07	9.48E-07	2.08E-06	8.41E-07	2.92E-06	9.38E-02	8.44E-03	1.02E-01
78-87-5	1,2-Dichloropropane	2.56E-07	4.60E-08	3.02E-07	6.50E-07	2.63E-07	9.13E-07	2.94E-02	2.64E-03	3.20E-02
79-01-6	Trichloroethene	6.53E-07	1.17E-07	7.70E-07	1.66E-06	6.71E-07	2.33E-06	7.49E-02	6.74E-03	8.16E-02
79-34-5	1,1,2,2-Tetrachloroethane	9.57E-08	1.72E-08	1.13E-07	2.46E-07	9.98E-08	3.46E-07	1.11E-02	1.00E-03	1.21E-02
90-12-0	1-Methylnaphthalene	1.08E-04	1.95E-05	1.28E-04	4.54E-04	1.84E-04	6.38E-04	2.05E+01	1.85E+00	2.24E+01
91-20-3	Naphthalene	8.53E-04	1.53E-04	1.01E-03	2.16E-04	8.73E-05	3.03E-04	9.74E+00	8.77E-01	1.06E+01
91-57-6	2-Methylnaphthalene	1.67E-04	3.01E-05	1.97E-04	4.54E-04	1.84E-04	6.38E-04	2.05E+01	1.85E+00	2.24E+01
95-63-6	1,2,4-Trimethylbenzene	1.90E-04	3.41E-05	2.24E-04	4.86E-04	1.97E-04	6.83E-04	2.20E+01	1.98E+00	2.40E+01
96-18-4	1,2,3-Trichloropropane	2.01E-07	3.62E-08	2.38E-07	5.15E-07	2.09E-07	7.23E-07	2.33E-02	2.09E-03	2.54E-02

Kast VOC Emissions Calculations

VI. Non-VOC Emissions

Dust Emissions:

Dust Sources	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year	PM2.5 Emissions (lbs/year)
Option 1						
On-site haul road re-entrained dust	3.15E-02	3.15E-03	1.01E+00	1.01E-01	4.78E+02	4.78E+01
On-site excavation dust	4.98E-04	7.54E-05	1.48E-02	2.25E-03	3.51E+00	5.32E-01
On-site on road re-entrained dust	8.13E-05	1.99E-05	6.50E-04	1.60E-04	1.54E-01	3.78E-02
Street Trenching						
On-site excavation dust	4.00E-04	6.06E-05	3.20E-03	4.85E-04	5.76E-01	8.72E-02
On-site on road re-entrained dust	1.82E-05	4.46E-06	1.45E-04	3.57E-05	2.62E-02	6.43E-03

Kast VOC Emissions Calculations

Non-VOC COC Emission Calculations:

Chemical	Chemical UCL Concentration (mg/kg)	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year)	PM2.5 Emissions (lbs/year)
Option 1 - On-site off road re-entrained dust							
2,4-Dinitrotoluene	6.30E-02	1.99E-09	1.99E-10	6.35E-08	6.35E-09	3.01E-05	3.01E-06
Antimony	2.90E-01	9.14E-09	9.14E-10	2.93E-07	2.93E-08	1.39E-04	1.39E-05
Arsenic	4.90E+00	1.54E-07	1.54E-08	4.94E-06	4.94E-07	2.34E-03	2.34E-04
BaP TEQ	1.70E-01	5.36E-09	5.36E-10	1.71E-07	1.71E-08	8.13E-05	8.13E-06
Benzo (a) Anthracene	2.10E-01	6.62E-09	6.62E-10	2.12E-07	2.12E-08	1.00E-04	1.00E-05
Benzo (a) Pyrene	1.20E-01	3.78E-09	3.78E-10	1.21E-07	1.21E-08	5.74E-05	5.74E-06
Benzo (b) Fluoranthene	5.80E-02	1.83E-09	1.83E-10	5.85E-08	5.85E-09	2.77E-05	2.77E-06
Benzo (k) Fluoranthene	1.30E-02	4.10E-10	4.10E-11	1.31E-08	1.31E-09	6.22E-06	6.22E-07
Bis(2-Ethylhexyl) Phthalate	1.50E-01	4.73E-09	4.73E-10	1.51E-07	1.51E-08	7.17E-05	7.17E-06
Cadmium	9.90E-02	3.12E-09	3.12E-10	9.99E-08	9.99E-09	4.73E-05	4.73E-06
Chromium, Hexavalent	1.30E-01	4.10E-09	4.10E-10	1.31E-07	1.31E-08	6.22E-05	6.22E-06
Chrysene	5.60E-01	1.77E-08	1.77E-09	5.65E-07	5.65E-08	2.68E-04	2.68E-05
Cobalt	8.10E+00	2.55E-07	2.55E-08	8.17E-06	8.17E-07	3.87E-03	3.87E-04
Copper	1.40E+01	4.41E-07	4.41E-08	1.41E-05	1.41E-06	6.69E-03	6.69E-04
Dibenz (a,h) Anthracene	8.90E-03	2.81E-10	2.81E-11	8.98E-09	8.98E-10	4.26E-06	4.26E-07
Indeno (1,2,3-c,d) Pyrene	1.70E-02	5.36E-10	5.36E-11	1.71E-08	1.71E-09	8.13E-06	8.13E-07
Lead	1.10E+01	3.47E-07	3.47E-08	1.11E-05	1.11E-06	5.26E-03	5.26E-04
Thallium	2.20E-01	6.93E-09	6.93E-10	2.22E-07	2.22E-08	1.05E-04	1.05E-05
TPH as Diesel	2.20E+03	6.93E-05	6.93E-06	2.22E-03	2.22E-04	1.05E+00	1.05E-01
TPH as Gasoline	1.30E+02	4.10E-06	4.10E-07	1.31E-04	1.31E-05	6.22E-02	6.22E-03
TPH as Motor Oil	3.00E+03	9.46E-05	9.46E-06	3.03E-03	3.03E-04	1.43E+00	1.43E-01
Vanadium	3.00E+01	9.46E-07	9.46E-08	3.03E-05	3.03E-06	1.43E-02	1.43E-03
Zinc	4.20E+01	1.32E-06	1.32E-07	4.24E-05	4.24E-06	2.01E-02	2.01E-03

Kast VOC Emissions Calculations

Chemical	Chemical UCL Concentration (mg/kg)	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year)	PM2.5 Emissions (lbs/year)
Option 1 - On-site excavation dust							
2,4-Dinitrotoluene	6.30E-02	3.14E-11	4.75E-12	9.34E-10	1.41E-10	2.21E-07	3.35E-08
Antimony	2.90E-01	1.44E-10	2.19E-11	4.30E-09	6.51E-10	1.02E-06	1.54E-07
Arsenic	4.90E+00	2.44E-09	3.69E-10	7.27E-08	1.10E-08	1.72E-05	2.61E-06
BaP TEQ	1.70E-01	8.46E-11	1.28E-11	2.52E-09	3.82E-10	5.97E-07	9.05E-08
Benzo (a) Anthracene	2.10E-01	1.05E-10	1.58E-11	3.11E-09	4.72E-10	7.38E-07	1.12E-07
Benzo (a) Pyrene	1.20E-01	5.97E-11	9.04E-12	1.78E-09	2.69E-10	4.22E-07	6.39E-08
Benzo (b) Fluoranthene	5.80E-02	2.89E-11	4.37E-12	8.60E-10	1.30E-10	2.04E-07	3.09E-08
Benzo (k) Fluoranthene	1.30E-02	6.47E-12	9.80E-13	1.93E-10	2.92E-11	4.57E-08	6.92E-09
Bis(2-Ethylhexyl) Phthalate	1.50E-01	7.47E-11	1.13E-11	2.22E-09	3.37E-10	5.27E-07	7.98E-08
Cadmium	9.90E-02	4.93E-11	7.46E-12	1.47E-09	2.22E-10	3.48E-07	5.27E-08
Chromium, Hexavalent	1.30E-01	6.47E-11	9.80E-12	1.93E-09	2.92E-10	4.57E-07	6.92E-08
Chrysene	5.60E-01	2.79E-10	4.22E-11	8.30E-09	1.26E-09	1.97E-06	2.98E-07
Cobalt	8.10E+00	4.03E-09	6.10E-10	1.20E-07	1.82E-08	2.85E-05	4.31E-06
Copper	1.40E+01	6.97E-09	1.06E-09	2.08E-07	3.14E-08	4.92E-05	7.45E-06
Dibenz (a,h) Anthracene	8.90E-03	4.43E-12	6.71E-13	1.32E-10	2.00E-11	3.13E-08	4.74E-09
Indeno (1,2,3-c,d) Pyrene	1.70E-02	8.46E-12	1.28E-12	2.52E-10	3.82E-11	5.97E-08	9.05E-09
Lead	1.10E+01	5.47E-09	8.29E-10	1.63E-07	2.47E-08	3.87E-05	5.85E-06
Thallium	2.20E-01	1.09E-10	1.66E-11	3.26E-09	4.94E-10	7.73E-07	1.17E-07
TPH as Diesel	2.20E+03	1.09E-06	1.66E-07	3.26E-05	4.94E-06	7.73E-03	1.17E-03
TPH as Gasoline	1.30E+02	6.47E-08	9.80E-09	1.93E-06	2.92E-07	4.57E-04	6.92E-05
TPH as Motor Oil	3.00E+03	1.49E-06	2.26E-07	4.45E-05	6.74E-06	1.05E-02	1.60E-03
Vanadium	3.00E+01	1.49E-08	2.26E-09	4.45E-07	6.74E-08	1.05E-04	1.60E-05
Zinc	4.20E+01	2.09E-08	3.17E-09	6.23E-07	9.43E-08	1.48E-04	2.23E-05

Kast VOC Emissions Calculations

Chemical	Chemical UCL Concentration (mg/kg)	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year)	PM2.5 Emissions (lbs/year)
Option 1 - On-site on road re-entrained dust							
2,4-Dinitrotoluene	6.30E-02	5.12E-12	1.26E-12	4.10E-11	1.01E-11	9.71E-09	2.38E-09
Antimony	2.90E-01	2.36E-11	5.78E-12	1.89E-10	4.63E-11	4.47E-08	1.10E-08
Arsenic	4.90E+00	3.98E-10	9.77E-11	3.19E-09	7.82E-10	7.55E-07	1.85E-07
BaP TEQ	1.70E-01	1.38E-11	3.39E-12	1.11E-10	2.71E-11	2.62E-08	6.43E-09
Benzo (a) Anthracene	2.10E-01	1.71E-11	4.19E-12	1.37E-10	3.35E-11	3.24E-08	7.94E-09
Benzo (a) Pyrene	1.20E-01	9.75E-12	2.39E-12	7.80E-11	1.91E-11	1.85E-08	4.54E-09
Benzo (b) Fluoranthene	5.80E-02	4.71E-12	1.16E-12	3.77E-11	9.25E-12	8.94E-09	2.19E-09
Benzo (k) Fluoranthene	1.30E-02	1.06E-12	2.59E-13	8.45E-12	2.07E-12	2.00E-09	4.92E-10
Bis(2-Ethylhexyl) Phthalate	1.50E-01	1.22E-11	2.99E-12	9.75E-11	2.39E-11	2.31E-08	5.67E-09
Cadmium	9.90E-02	8.04E-12	1.97E-12	6.44E-11	1.58E-11	1.53E-08	3.74E-09
Chromium, Hexavalent	1.30E-01	1.06E-11	2.59E-12	8.45E-11	2.07E-11	2.00E-08	4.92E-09
Chrysene	5.60E-01	4.55E-11	1.12E-11	3.64E-10	8.94E-11	8.63E-08	2.12E-08
Cobalt	8.10E+00	6.58E-10	1.62E-10	5.27E-09	1.29E-09	1.25E-06	3.06E-07
Copper	1.40E+01	1.14E-09	2.79E-10	9.10E-09	2.23E-09	2.16E-06	5.29E-07
Dibenz (a,h) Anthracene	8.90E-03	7.23E-13	1.78E-13	5.79E-12	1.42E-12	1.37E-09	3.37E-10
Indeno (1,2,3-c,d) Pyrene	1.70E-02	1.38E-12	3.39E-13	1.11E-11	2.71E-12	2.62E-09	6.43E-10
Lead	1.10E+01	8.94E-10	2.19E-10	7.15E-09	1.76E-09	1.69E-06	4.16E-07
Thallium	2.20E-01	1.79E-11	4.39E-12	1.43E-10	3.51E-11	3.39E-08	8.32E-09
TPH as Diesel	2.20E+03	1.79E-07	4.39E-08	1.43E-06	3.51E-07	3.39E-04	8.32E-05
TPH as Gasoline	1.30E+02	1.06E-08	2.59E-09	8.45E-08	2.07E-08	2.00E-05	4.92E-06
TPH as Motor Oil	3.00E+03	2.44E-07	5.98E-08	1.95E-06	4.79E-07	4.62E-04	1.13E-04
Vanadium	3.00E+01	2.44E-09	5.98E-10	1.95E-08	4.79E-09	4.62E-06	1.13E-06
Zinc	4.20E+01	3.41E-09	8.38E-10	2.73E-08	6.70E-09	6.47E-06	1.59E-06

Kast VOC Emissions Calculations

Chemical	Chemical UCL Concentration (mg/kg)	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year)	PM2.5 Emissions (lbs/year)
Street Trenching - On-site excavation dust							
2,4-Dinitrotoluene	6.30E-02	2.52E-11	3.82E-12	2.02E-10	3.05E-11	3.63E-08	5.49E-09
Antimony	2.90E-01	1.16E-10	1.76E-11	9.28E-10	1.41E-10	1.67E-07	2.53E-08
Arsenic	4.90E+00	1.96E-09	2.97E-10	1.57E-08	2.37E-09	2.82E-06	4.27E-07
BaP TEQ	1.70E-01	6.80E-11	1.03E-11	5.44E-10	8.24E-11	9.79E-08	1.48E-08
Benzo (a) Anthracene	2.10E-01	8.40E-11	1.27E-11	6.72E-10	1.02E-10	1.21E-07	1.83E-08
Benzo (a) Pyrene	1.20E-01	4.80E-11	7.27E-12	3.84E-10	5.81E-11	6.91E-08	1.05E-08
Benzo (b) Fluoranthene	5.80E-02	2.32E-11	3.51E-12	1.86E-10	2.81E-11	3.34E-08	5.06E-09
Benzo (k) Fluoranthene	1.30E-02	5.20E-12	7.87E-13	4.16E-11	6.30E-12	7.49E-09	1.13E-09
Bis(2-Ethylhexyl) Phthalate	1.50E-01	6.00E-11	9.08E-12	4.80E-10	7.27E-11	8.64E-08	1.31E-08
Cadmium	9.90E-02	3.96E-11	6.00E-12	3.17E-10	4.80E-11	5.70E-08	8.63E-09
Chromium, Hexavalent	1.30E-01	5.20E-11	7.87E-12	4.16E-10	6.30E-11	7.49E-08	1.13E-08
Chrysene	5.60E-01	2.24E-10	3.39E-11	1.79E-09	2.71E-10	3.23E-07	4.88E-08
Cobalt	8.10E+00	3.24E-09	4.91E-10	2.59E-08	3.92E-09	4.67E-06	7.06E-07
Copper	1.40E+01	5.60E-09	8.48E-10	4.48E-08	6.78E-09	8.06E-06	1.22E-06
Dibenz (a,h) Anthracene	8.90E-03	3.56E-12	5.39E-13	2.85E-11	4.31E-12	5.13E-09	7.76E-10
Indeno (1,2,3-c,d) Pyrene	1.70E-02	6.80E-12	1.03E-12	5.44E-11	8.24E-12	9.79E-09	1.48E-09
Lead	1.10E+01	4.40E-09	6.66E-10	3.52E-08	5.33E-09	6.34E-06	9.59E-07
Thallium	2.20E-01	8.80E-11	1.33E-11	7.04E-10	1.07E-10	1.27E-07	1.92E-08
TPH as Diesel	2.20E+03	8.80E-07	1.33E-07	7.04E-06	1.07E-06	1.27E-03	1.92E-04
TPH as Gasoline	1.30E+02	5.20E-08	7.87E-09	4.16E-07	6.30E-08	7.49E-05	1.13E-05
TPH as Motor Oil	3.00E+03	1.20E-06	1.82E-07	9.60E-06	1.45E-06	1.73E-03	2.62E-04
Vanadium	3.00E+01	1.20E-08	1.82E-09	9.60E-08	1.45E-08	1.73E-05	2.62E-06
Zinc	4.20E+01	1.68E-08	2.54E-09	1.34E-07	2.03E-08	2.42E-05	3.66E-06

Kast VOC Emissions Calculations

Chemical	Chemical UCL Concentration (mg/kg)	PM10 Emissions (lbs/hour)	PM2.5 Emissions (lbs/hour)	PM10 Emissions (lbs/day)	PM2.5 Emissions (lbs/day)	PM10 Emissions (lbs/year)	PM2.5 Emissions (lbs/year)
Street Trenching- On-site on road re-entrained dust							
2,4-Dinitrotoluene	6.30E-02	1.15E-12	2.81E-13	9.16E-12	2.25E-12	1.65E-09	4.05E-10
Antimony	2.90E-01	5.27E-12	1.29E-12	4.22E-11	1.04E-11	7.59E-09	1.86E-09
Arsenic	4.90E+00	8.91E-11	2.19E-11	7.13E-10	1.75E-10	1.28E-07	3.15E-08
BaP TEQ	1.70E-01	3.09E-12	7.59E-13	2.47E-11	6.07E-12	4.45E-09	1.09E-09
Benzo (a) Anthracene	2.10E-01	3.82E-12	9.37E-13	3.05E-11	7.50E-12	5.50E-09	1.35E-09
Benzo (a) Pyrene	1.20E-01	2.18E-12	5.36E-13	1.75E-11	4.28E-12	3.14E-09	7.71E-10
Benzo (b) Fluoranthene	5.80E-02	1.05E-12	2.59E-13	8.44E-12	2.07E-12	1.52E-09	3.73E-10
Benzo (k) Fluoranthene	1.30E-02	2.36E-13	5.80E-14	1.89E-12	4.64E-13	3.40E-10	8.36E-11
Bis(2-Ethylhexyl) Phthalate	1.50E-01	2.73E-12	6.69E-13	2.18E-11	5.36E-12	3.93E-09	9.64E-10
Cadmium	9.90E-02	1.80E-12	4.42E-13	1.44E-11	3.53E-12	2.59E-09	6.36E-10
Chromium, Hexavalent	1.30E-01	2.36E-12	5.80E-13	1.89E-11	4.64E-12	3.40E-09	8.36E-10
Chrysene	5.60E-01	1.02E-11	2.50E-12	8.15E-11	2.00E-11	1.47E-08	3.60E-09
Cobalt	8.10E+00	1.47E-10	3.62E-11	1.18E-09	2.89E-10	2.12E-07	5.21E-08
Copper	1.40E+01	2.55E-10	6.25E-11	2.04E-09	5.00E-10	3.67E-07	9.00E-08
Dibenz (a,h) Anthracene	8.90E-03	1.62E-13	3.97E-14	1.29E-12	3.18E-13	2.33E-10	5.72E-11
Indeno (1,2,3-c,d) Pyrene	1.70E-02	3.09E-13	7.59E-14	2.47E-12	6.07E-13	4.45E-10	1.09E-10
Lead	1.10E+01	2.00E-10	4.91E-11	1.60E-09	3.93E-10	2.88E-07	7.07E-08
Thallium	2.20E-01	4.00E-12	9.82E-13	3.20E-11	7.86E-12	5.76E-09	1.41E-09
TPH as Diesel	2.20E+03	4.00E-08	9.82E-09	3.20E-07	7.86E-08	5.76E-05	1.41E-05
TPH as Gasoline	1.30E+02	2.36E-09	5.80E-10	1.89E-08	4.64E-09	3.40E-06	8.36E-07
TPH as Motor Oil	3.00E+03	5.46E-08	1.34E-08	4.36E-07	1.07E-07	7.86E-05	1.93E-05
Vanadium	3.00E+01	5.46E-10	1.34E-10	4.36E-09	1.07E-09	7.86E-07	1.93E-07
Zinc	4.20E+01	7.64E-10	1.87E-10	6.11E-09	1.50E-09	1.10E-06	2.70E-07

Emissions Inventory Files

- Crystalline Silica Releases
- Haul Road Diesel Particulate Emissions
- HARP Unmitigated Emissions Input – Average Day

Kast Shell Emissions Inventory

Crystalline Silica Releases

Given

Concrete Breaking PM10 Emissions	97	lbs/yr
Concrete Breaking PM10 Emissions	1.98	lbs/yr-receptor

Assumption

Crystalline Silica Content in Concrete	28%

Calculation

Crystalline Silica Released by Year	27.16	lbs/yr
Crystalline Silica Released by Receptor	0.55	lbs/yr-receptor

Kast Shell Emissions Inventory

Haul Road - Diesel Particulate Emissions

Summary: This section calculates the emissions of criteria pollutants from off-site paved haul road.

Emissions Factors

Running Emissions							g/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	6.4E-02	2.5E+00	2.8E-01	6.9E+02	3.0E-03	3.0E-04	7.0E-03	4.5E-02	1.8E-02
HHDT	DSL	All	7.8E-01	4.0E+00	1.4E+01	1.6E+03	8.0E-01	7.4E-01	1.7E-02	7.8E-02	3.1E-02
HHDT	DSL	2007	1.2E-01	8.6E-01	2.2E+00	1.6E+03	6.1E-02	5.6E-02	1.7E-02	5.9E-03	5.5E-03

Source: EMFAC 2011

Running Emissions							lbs/mi				
Veh Class	Fuel	MdlYr	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	Tire & Brake Wear PM10	Tire & Brake Wear PM2.5
LDA/LDT	All	All	1.4E-04	5.5E-03	6.1E-04	1.5E+00	6.6E-06	6.6E-07	1.5E-05	9.9E-05	4.0E-05
HHDT	DSL	All	1.7E-03	8.8E-03	3.1E-02	3.6E+00	1.8E-03	1.6E-03	3.7E-05	1.7E-04	6.8E-05
HHDT	DSL	2007	2.7E-04	1.9E-03	4.8E-03	3.5E+00	1.4E-04	1.2E-04	3.7E-05	1.3E-05	1.2E-05

Source: EMFAC 2011

Heavy Truck Trip Data												
Phase	Hourly Round Trips	Daily Round Trips	8 Home Cluster Round Trips	Annual Round Trips	Truck Type	Average Vehicle Weight (tons)	Round Trip length (miles)	Hourly VMT	Daily VMT	8 Home Cluster Round Trips	Annual VMT
Option 1											
Demo	1.0	8	134	991	Dump Truck	25	2	2	17	268	1,982

Green Waste	0.5	4.0	32.0	237.0	Dump Truck	25.0	2	1	8	64	474
Excavation	1.9	15	1,787	3,530	Dump Truck	25	2	4	30	3,575	7,061
SVE Well/Piping	0.1	1.1	8.5	63.2	Dump Truck	25	2	0	2	17	126
Subslab Vent	0.0	0	0	0	0.00	0.00	2	0.00	0.00	0.00	0.00
Backfill/Compact	2.0	16	1,529	3,776	Dump Truck	25	2	4	32	3,059	7,552
Slurry Backfill	0.6	5.1	286.8	1213.8	Concrete Truck	25	2	1	10	574	2,428
Site Resto.	0.4	3	237	702	Concrete Truck	25	2	1	6	474	1,404
Street Trenching											
Demo	0.1	1.0	0.00	178.0	Dump Truck	25	2	0	2	0	356
Excavation	0.4	3.3	0.00	600.0	Dump Truck	25	2	1	7	0	1,200
Slurry Backfill	0.4	3.1	0.00	556.0	Dump Truck	25	2	1	6	0	1,112
Restoration	0.1	0.6	0.00	113.0	Concrete Truck	25	2	0	1	0	226
Pipe Delivery	0.1	1.0	0.00	180.0	Dump Truck	25	2	0	2	0	360
Well Installation											
Air Vac- Borehole Clearance	0.1	1.0	0.00	63.0	Air-Vac	25	2	0	2	0	126
Drilling and SVE Well Installation	0.1	1.0	0.00	63.0	Drill Rig	25	2	0	2	0	126
Waste Collection	0.3	2.0	0.00	126.0	Dump Truck	25	2	1	4	0	252

Waste Transport to Offsite Disposal	0.1	1.0	0.00	60.4	Dump Truck	25	2	0	2	0	121
Street Paving											
Street Grinding	2.7	8.0	0.00	80.0	Dump Truck	25	2	5	16	0	160
Street Paving	1.3	16.0	0.00	80.0	Dump Truck	25	2	3	32	0	160

Emissions Calculations

Hourly Truck Trip Emission Calculations (SCAB)		**lbs/hour (SCAB)**
Phase	**Hourly VMT (SCAB)**	**PM10**
Option 1		
Demo	2.1	2.8E-04
Green Waste	1.0	1.4E-04
Excavation	3.7	5.0E-04
SVE Well/Piping	0.3	3.6E-05
Subslab Vent	0.00	0.0E+00
Backfill/Compact	4.0	5.4E-04
Slurry Backfill	1.3	1.7E-04
Site Resto.	0.7	1.0E-04
Street Trenching		
Demo	0.2	3.3E-05
Excavation	0.8	1.1E-04
Backfill	0.8	1.0E-04
Restoration	0.2	2.1E-05
Pipe Delivery	0.3	3.4E-05
Well Installation		
Air Vac- Borehole Clearance	0.3	3.4E-05
Drilling and SVE Well Installation	0.3	3.4E-05

Waste Collection	0.5	6.8E-05
Waste Transport to Offsite Disposal	0.2	3.2E-05
Street Paving		
Street Grinding	5.3	7.2E-04
Street Paving	2.7	3.6E-04
TOTAL		**3.32E-03**

Annual Truck Trip Emission Calculations (SCAB)		lbs/year (SCAB)
Phase	**Annual VMT (SCAB)**	**PM10**
Option 1		**2.84**
Demo	1,982	2.7E-01
Green Waste	474	6.4E-02
Excavation	7,061	9.5E-01
SVE Well/Piping	126	1.7E-02
Subslab Vent	0.00	0.0E+00
Backfill/Compact	7,552	1.0E+00
Slurry Backfill	2,428	3.3E-01
Site Resto.	1,404	1.9E-01
Street Trenching		**0.44**
Demo	356	4.8E-02
Excavation	1,200	1.6E-01
Backfill	1,112	1.5E-01
Restoration	226	3.1E-02
Pipe Delivery	360	4.9E-02
Well Installation		**0.08**
Air Vac- Borehole Clearance	126	1.7E-02
Drilling and SVE Well Installation	126	1.7E-02
Waste Collection	252	3.4E-02
Waste Transport to Offsite Disposal	121	1.6E-02
Street Paving		**0.04**
Street Grinding	160	2.2E-02
Street Paving	160	2.2E-02
TOTAL		**3.98**

Kast Shell Emissions Inventory

HARP Unmitigated Emissions Input - Average Day

Chem No.	CAS	Chem Name	Emissions by Receptor (lbs/year)	Sum of Hourly Emissions (lbs/hr)
1	96184	1,2,3-Trichloropropane	3.67E-03	5.33E-07
2	95636	1,2,4-Trimethylbenzene	3.47E+00	5.02E-04
3	78875	1,2-Dichloropropane	4.64E-03	6.77E-07
4	121142	2,4-Dinitrotoluene	5.20E-09	4.75E-12
5	91576	2-Methyl naphthalene	3.24E+00	4.42E-04
6	7440360	Antimony	3.14E-06	1.04E-08
7	7440382	Arsenic	5.31E-05	1.76E-07
8	56553	Benz[a]anthracene	2.28E-06	7.52E-09
9	71432	Benzene	3.02E+00	4.41E-04
10	50328	Benzo[a]pyrene	3.14E-06	1.04E-08
11	205992	Benzo[b]fluoranthene	6.28E-07	2.08E-09
12	207089	Benzo[k]fluoranthene	1.41E-07	4.66E-10
13	75274	Bromodichloromethane	1.42E-03	2.06E-07
14	7440439	Cadmium	1.07E-06	3.55E-09
15	18540299	Chromium, hexavalent (& compounds)	1.41E-06	4.66E-09
16	218019	Chrysene	6.07E-06	2.01E-08
17	7440484	Cobalt	8.78E-05	2.90E-07
18	7440508	Copper	1.52E-04	5.02E-07
19	117817	Di(2-ethylhexyl) phthalate	1.63E-06	5.37E-09
20	53703	Dibenz[a,h]anthracene	9.64E-08	3.19E-10
21	100414	Ethyl benzene	5.16E+00	7.53E-04
22	107062	Ethylene dichloride {EDC}	5.04E-03	7.35E-07
23	193395	Indeno[1,2,3-cd]pyrene	1.84E-07	6.09E-10
24	7439921	Lead	1.19E-04	3.94E-07
25	74839	Methyl bromide {Bromomethane}	1.25E-01	1.84E-05
26	75092	Methylene chloride {Dichloromethane}	5.20E-02	7.59E-06
27	91203	Naphthalene	1.54E+00	2.26E-03
28	106467	p-Dichlorobenzene	2.58E-03	3.73E-07
29	127184	Perchloroethylene {Tetrachloroethene}	2.57E-01	3.76E-05
30	129000	Pyrene	4.27E-03	2.38E-07
31	75650	tert-Butyl alcohol	1.48E-02	2.13E-06
32	7440280	Thallium	2.38E-06	7.88E-09
33	108883	Toluene	1.62E+00	2.36E-04
34	79016	Trichloroethylene	1.18E-02	1.73E-06
35	25551137	Trimethylbenzenes	8.21E-01	1.19E-04
36	7440622	Vanadium (fume or dust)	3.25E-04	1.07E-06
37	75014	Vinyl Chloride	9.43E-03	1.38E-06
38	1330207	Xylenes (mixed)	7.66E+00	1.12E-03
39	7440666	Zinc	4.55E-04	1.50E-06
40	1175	Silica, crystalline (respirable)	5.54E-01	
41	9901	DPM	1.63E+00	

Health Risk Assessment Files

- HARP Output Cancer Risk Summary
- HARP Output Chronic Risk Summary
- HARP Output Acute Risk Summary
- Supplemental Health Risk Calculations

Kast Shell HRA

HARP Cancer Risk Summary

No.	Receptor	Total Risk (in a million)
791	On-Site Residential	0.81
2017	Off-Site Residential	0.59
2051	Worker	0.09
2746	School	0.11

No.	Receptor	CAS	Chemical Name	% Contribution	Risk (in a million)
791	On-Site Residential	9901	Diesel engine exhaust, particulate matter (Diesel PM)	77%	0.62
		71432	Benzene	13%	0.10
		91203	Naphthalene	8%	0.06
2017	Off-Site Residential	9901	Diesel engine exhaust, particulate matter (Diesel PM)	77%	0.46
		71432	Benzene	13%	0.08
		91203	Naphthalene	8%	0.05
2051	Worker	9901	Diesel engine exhaust, particulate matter (Diesel PM)	77%	0.07
		71432	Benzene	13%	0.01
		91203	Naphthalene	8%	0.01
2746	School	9901	Diesel engine exhaust, particulate matter (Diesel PM)	85%	0.09
		71432	Benzene	9%	0.01
		91203	Naphthalene	5%	0.01

Kast Shell HRA

HARP Chronic Risk Summary

No.	Receptor	Max Chronic Risk
791	On-Site Residential	0.01
2017	Off-Site Residential	0.01
2051	Worker	0.01
2746	School	0.001

No.	Receptor	CAS	Chemical Name	Chronic Risk	% of Total
791	On-Site Residential	71432	Benzene	1.29E-02	100.00%
		18540299	Chromium, hexavalent (& compounds)	4.26E-09	0.00%
		9901	Diesel engine exhaust, particulate matter (Diesel PM)	0.00E+00	0.00%
2017	Off-Site Residential	71432	Benzene	9.42E-03	100.00%
		18540299	Chromium, hexavalent (& compounds)	3.12E-09	0.00%
		9901	Diesel engine exhaust, particulate matter (Diesel PM)	0.00E+00	0.00%
2051	Worker	9901	Benzene	9.69E-03	100.00%
		1175	Chromium, hexavalent (& compounds)	2.50E-09	0.00%
		91203	Diesel engine exhaust, particulate matter (Diesel PM)	0.00E+00	0.00%
2746	School	71432	Benzene	1.19E-03	100.00%
		18540299	Chromium, hexavalent (& compounds)	3.94E-10	0.00%
		9901	Diesel engine exhaust, particulate matter (Diesel PM)	0.00E+00	0.00%

Kast Shell HRA

HARP Acute Risk Summary

No.	Receptor	Source No.	Max. Acute Risk
639	On-Site Residential	25	0.01
1966	Off-Site Residential	47	0.01
2085	Worker	44	0.01
2746	School	40	0.001

No.	Receptor	Source No.	CAS	Chemical Name	Acute Risk	% of Total
639	On-Site Residential	25	71432	Benzene	5.31E-03	96.4%
			7440382	Arsenic	2.01E-04	3.6%
			1330207	Xylenes (mixed)	1.65E-05	0.3%
1966	Off-Site Residential	47	71432	Benzene	8.04E-03	96.4%
			7440382	Arsenic	3.04E-04	3.6%
			1330207	Xylenes (mixed)	2.50E-05	0.3%
2085	Worker	44	71432	Benzene	7.83E-03	96.3%
			7440382	Arsenic	2.96E-04	3.6%
			1330207	Xylenes (mixed)	2.44E-05	0.3%
2746	School	40	71432	Benzene	1.27E-03	96.2%
			7440382	Arsenic	4.81E-05	3.6%
			1330207	Xylenes (mixed)	3.96E-06	0.3%

Kast Shell HRA

Supplemental Health Risk Calculations

					Total Concentration (ug/m3)				Cancer Risk				Chronic Risk			
CAS	**Chemical Name**	**CPF (mg/kg-day)**	**RfC (ug/m^3)**	**Receptor -->**	791	2017	2051	2046	791	2017	2051	2046	791	2017	2051	2046
90-12-0	1-Methylnaphthalene	0	0		2.04E+00	1.49E+00	1.53E+00	2.38E-01								
156-59-2	cis-1,2-Dichloroethene	0	7.00E+00		5.58E-03	4.09E-03	4.20E-03	6.51E-04					7.97E-04	5.84E-04	6.00E-04	9.31E-05
NA	TPH as Diesel	0	3.00E+02		3.62E-02	2.66E-02	2.73E-02	4.23E-03					1.21E-04	8.85E-05	9.10E-05	1.41E-05
NA	TPH as Gasoline	0	7.00E+02		3.62E-02	2.66E-02	2.73E-02	4.23E-03					5.18E-05	3.79E-05	3.90E-05	6.05E-06
NA	TPH as Motor Oil	0	--		3.62E-02	2.66E-02	2.73E-02	4.23E-03								
Total	**Total/Max Risk**								**0**	**0**	**0**	**0**	**9.70E-04**	**7.11E-04**	**7.30E-04**	**1.13E-04**

Exposure factors used to calculate contaminant intake[a]

exposure frequency (days/year)	360
exposure duration (years)	5
daily breathing rate (L/kg BW-day)	393.0
average body weight (kg)	70
averaging time(cancer) (days)	25550
averaging time(noncancer) (days)	25550

[a] The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Page 5-16. Office of Environmental Health and Hazard Assessment. August 2003.
[b] Cancer Potency Factor. Please refer to List of Chemicals for source.
[c] Reference Concentration. Please refer to List of Chemicals for source.

Appendix F: Noise Worksheets

Kast Site RAP
Draft EIR
Appendix F, Noise and Vibration Worksheets

F-1 Ambient Noise Data

F-2 Construction Noise Calculations at Off-Site Sensitive Receptor Locations

F-3 Construction Noise Calculations at On-Site Sensitive Receptor Locations

F-4 Haul Truck Noise Levels (L_{eq}) Calculations at Off-Site Sensitive Receiver Locations

F-5 Expedited Implementation Option Off-Site Truck Trip Noise Calculations

F-6 Noise Measurement Results – Excavation Operations at 24612 Neptune Avenue

F-7 Noise Measurement Results – Excavation Operations at 24533 Ravenna Avenue

F-8 75 dBA and 65 dBA Noise Contours

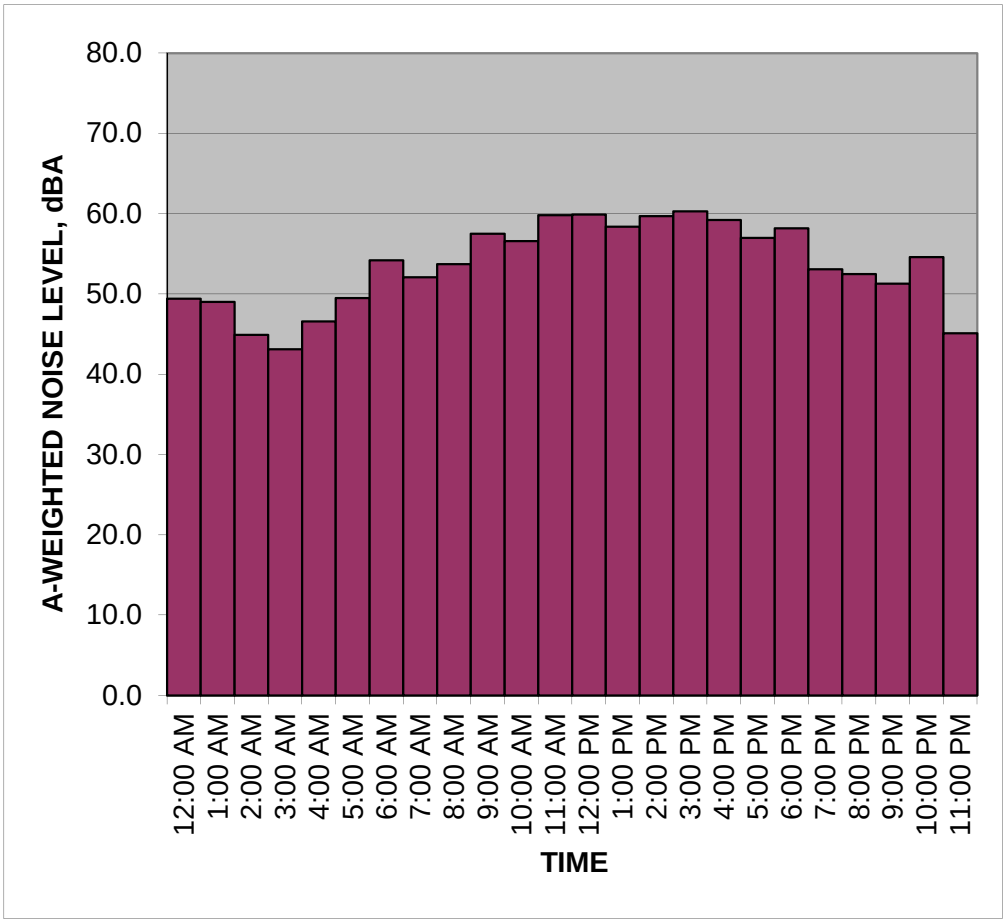
Appendix F-1
Ambient Noise Data

Measured Ambient Noise Levels

Project: Kast RAP
Location: R1 - Along Marbella Avenue
Sources: Ambient

Date: March 26, 2014

TIME	HNL, dB(A)
12:00 AM	49.4
1:00 AM	49.0
2:00 AM	44.9
3:00 AM	43.1
4:00 AM	46.6
5:00 AM	49.5
6:00 AM	54.2
7:00 AM	52.1
8:00 AM	53.7
9:00 AM	57.5
10:00 AM	56.6
11:00 AM	59.8
12:00 PM	59.9
1:00 PM	58.4
2:00 PM	59.7
3:00 PM	60.3
4:00 PM	59.2
5:00 PM	57.0
6:00 PM	58.2
7:00 PM	53.1
8:00 PM	52.5
9:00 PM	51.3
10:00 PM	54.6
11:00 PM	45.1
***L dn*, dB(A):**	**58.7**



NOTES:

fieldcnel.xls

Appendix F-2

Construction Noise Calculations at Off-Site Sensitive Receptor Locations

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	450	10
Air Compressor	1	78	50%	450	10
Concrete Saw	1	90	20%	450	10
Generator Sets	1	81	50%	450	10

Receptor: ***R3***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **61**
Leq: **56**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	450	10

Receptor: ***R3***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **56**
Leq: **49**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	450	10
Roller	1	80	20%	450	10
Vacuum Street Sweeper	1	82	10%	450	10

Receptor: ***R3***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **53**
Leq: **49**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	200	10
Air Compressor	1	78	50%	200	10
Concrete Saw	1	90	20%	200	10
Generator Sets	1	81	50%	200	10

Receptor: ***R4***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **68**
Leq: **63**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	110	10

Receptor: ***R4***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **68**
Leq: **61**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	200	10
Roller	1	80	20%	200	10
Vacuum Street Sweeper	1	82	10%	200	10

Receptor: ***R4***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **60**
Leq: **56**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	110	10
Air Compressor	1	78	50%	110	10
Concrete Saw	1	90	20%	110	10
Generator Sets	1	81	50%	110	10

Receptor: ***R5***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **73**
Leq: **68**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	25	16

Receptor: ***R5***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **75**
Leq: **68**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	110	10
Roller	1	80	20%	110	10
Vacuum Street Sweeper	1	82	10%	110	10

Receptor: ***R5***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **65**
Leq: **61**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	250	10
Air Compressor	1	78	50%	250	10
Concrete Saw	1	90	20%	250	10
Generator Sets	1	81	50%	250	10

Receptor: ***R7***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **66**
Leq: **61**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	150	5

Receptor: ***R7***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **70**
Leq: **63**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	110	10
Roller	1	80	20%	110	10
Vacuum Street Sweeper	1	82	10%	110	10

Receptor: ***R7***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **65**
Leq: **61**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	30	5
Air Compressor	1	78	50%	30	5
Concrete Saw	1	90	20%	30	5
Generator Sets	1	81	50%	30	5

Receptor: ***M1***

Construction Hour:

9 Hours during daytime (7:30 am to 4:40 pm)
0 Hours during evening (7 pm to 10 pm)
0 Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **89**
Leq: **85**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	25	16

Receptor: ***M1***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **75**
Leq: **68**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	30	5
Roller	1	80	20%	30	5
Vacuum Street Sweeper	1	82	10%	30	5

Receptor: ***M1***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **81**
Leq: **77**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Appendix F-3

Construction Noise Calculations at On-Site Sensitive Receptor Locations

Kast Site RAP

Residential Remediation Noise Levels Based on the Pilot Studies

Excavation Noise Levels at On-Site Sensitive Receiver Locations

Combined Noise Levels

Receiver Locations	N1	N2	N3
	68	71	77
	62	69	75
	64	67	69
	53	55	58
Combined Noise Levels, dBA, Leq	**70**	**74**	**80**

Receptor Location	N1
Excavation Noise Level Table 8 at location 1 on Neptune Memo	74
Reference Distance	25
Distance to next House	50
	-6
Noise Level at N1	68

Receptor Location	N2
Excavation Noise Level Table 5 at location 4 of Neptune Memo	71
Reference Distance	67
Distance to House Acrosss Street	67
	0
Noise Level at N2	71

Receptor Location	N3
Excavation Noise Level Table 4 at location 2 of Neptune Memo	77
Reference Distance	67
Distance to House Acrosss Street	67
	0
Noise Level at N3	77

Excavation Noise Level Table 8 at location 1 on Neptune Memo	74
Reference Distance	25
Distance to 2nd house	100
	-12
Noise Level at N1	62

Excavation Noise Level Table 5 at location 4 of Neptune Memo	71
Reference Distance	67
Distance to House Across Street from 2nd house	80
	-2
Noise Level at N2	69

Excavation Noise Level Table 4 at location 2 of Neptune Memo	77
Reference Distance	67
Distance to House Across Street from 2nd house	80
	-2
Noise Level at N3	75

Restoration Noise Level Table 5 at location 4 of Neptune Memo	71
Reference Distance	67
Distance to 3rd house	150
	-7
Noise Level at N1	64

Restoration Noise Level Table 5 at location 4 of Neptune Memo	71
Reference Distance	67
Distance to House Across Street from 3rd house	110
	-4
Noise Level at N2	67

Restoration Noise Level Table 5 at location 4 of Neptune Memo	71
Reference Distance	67
Distance to House Across Street from 2nd house	80
	-2
Noise Level at N3	69

Demolition Noise Level Table 2 at location 5a of Neptune Memo	62
Reference Distance	67
Distance to 4th house	200
	-9
Noise Level at N1	53

Demolition Noise Level Table 2 at location 5a of Neptune Memo	62
Reference Distance	67
Distance to House Across Street from 4th house	150
	-7
Noise Level at N2	55

Demolition Noise Level Table 2 at location 5a of Neptune Memo	62
Reference Distance	67
Distance to House Across Street from 3rd house	110
	-4
Noise Level at N3	58

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	20	5
Air Compressor	1	78	50%	20	5
Concrete Saw	1	90	20%	20	5
Generator Sets	1	81	50%	20	5

Receptor: ***N1***

Construction Hour:

9 Hours during daytime (7:30 am to 4:40 pm)
0 Hours during evening (7 pm to 10 pm)
0 Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **93**
Leq: **88**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	50	0

Receptor: ***N1***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **85**
Leq: **78**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	20	5
Roller	1	80	20%	20	5
Vacuum Street Sweeper	1	82	10%	20	5

Receptor: ***N1***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **85**
Leq: **81**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	20	5
Air Compressor	1	78	50%	20	5
Concrete Saw	1	90	20%	20	5
Generator Sets	1	81	50%	20	5

Receptor: ***N2***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **93**
Leq: **88**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	80	0

Receptor: ***N2***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **81**
Leq: **74**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	20	5
Roller	1	80	20%	20	5
Vacuum Street Sweeper	1	82	10%	20	5

Receptor: ***N2***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **85**
Leq: **81**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 3**
Street Trenching

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Backhoe	1	80	40%	20	5
Air Compressor	1	78	50%	20	5
Concrete Saw	1	90	20%	20	5
Generator Sets	1	81	50%	20	5

Receptor: ***N3***

Construction Hour:

9 Hours during daytime (7:30 am to 4:40 pm)
0 Hours during evening (7 pm to 10 pm)
0 Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **93**
Leq: **88**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 4**
SVE Well Installation

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Auger Drill Rig	1	85	20%	67	0

Receptor: ***N3***

Construction Hour:

12	Hours during daytime (7 am to 7 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **82**
Leq: **75**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Project: Kast RAP

Construction Phase: **Phase 5**
Street Paving

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paver	1	77	50%	20	5
Roller	1	80	20%	20	5
Vacuum Street Sweeper	1	82	10%	20	5

Receptor: ***N3***

Construction Hour:

9	Hours during daytime (7:30 am to 4:40 pm)
0	Hours during evening (7 pm to 10 pm)
0	Hours during nighttime (10 pm to 7 am)

Results:

Lmax: **85**
Leq: **81**

Source for Ref. Noise Levels: LA CEQA Guides, 2006 & FHWA RCNM, 2005

Appendix F-4

Haul Truck Noise Levels (Leq) Calculations at Off-Site Sensitive Receiver Locations

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2015	2224	0	71.5	69.2	67.7	72.7	70.4	68.9
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	1946	2232	0	71.5	69.2	67.7	72.7	70.4	69.0
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1429	1732	0	70.4	68.1	66.6	71.6	69.3	67.9
Figueroa Street n/o Sepulveda Blvd	40	798	973	0	67.9	65.6	64.1	69.1	66.8	65.3
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1169	1229	0	69.8	67.1	65.5	71.0	68.4	66.7
Future No Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2098	2322	0	71.7	69.4	67.9	72.9	70.6	69.1
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	2028	2329	0	71.7	69.4	67.9	72.9	70.6	69.1
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1445	1812	0	70.6	68.3	66.8	71.8	69.5	68.0
Figueroa Street n/o Sepulveda Blvd	40	1000	1124	0	68.5	66.2	64.8	69.7	67.5	66.0
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1241	1327	0	70.1	67.5	65.8	71.4	68.7	67.1
Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2140	2364	0	71.7	69.5	68.0	73.0	70.7	69.2
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	2067	2332	0	71.7	69.4	67.9	72.9	70.6	69.1
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1493	1812	0	70.6	68.3	66.8	71.8	69.5	68.0
Figueroa Street n/o Sepulveda Blvd	40	1000	1124	0	68.5	66.2	64.8	69.7	67.5	66.0
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1245	1304	0	70.1	67.4	65.8	71.3	68.6	67.0

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Sepulveda Boulevard, between Figueroa St. and Main St.	0.1	0.3	0.1	0.3
Sepulveda Boulevard, between Main St. and Avalon Blvd	0.0	0.2	0.0	0.2
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	0.0	0.2	0.0	0.2
Figueroa Street n/o Sepulveda Blvd	0.0	0.7	0.0	0.6
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	-0.1	0.2	-0.1	0.3

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2075	2239	0	71.5	69.2	67.8	72.7	70.5	69.0
Lomita Boulevard between Main St. and Neptune Ave.	40	2119	1986	0	71.3	69.0	67.5	72.5	70.2	68.7
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2129	1896	0	71.3	69.0	67.5	72.5	70.2	68.7
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2148	1896	0	71.3	69.1	67.6	72.5	70.3	68.8
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1434	1249	0	69.6	67.3	65.8	70.8	68.5	67.0
Future No Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2168	2348	0	71.7	69.4	68.0	72.9	70.7	69.2
Lomita Boulevard between Main St. and Neptune Ave.	40	2213	2085	0	71.5	69.2	67.7	72.7	70.4	68.9
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2224	1993	0	71.5	69.2	67.7	72.7	70.4	68.9
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2243	1993	0	71.5	69.2	67.8	72.7	70.5	69.0
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1503	1322	0	69.8	67.5	66.0	71.0	68.7	67.2
Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2168	2348	0	71.7	69.4	68.0	72.9	70.7	69.2
Lomita Boulevard between Main St. and Neptune Ave.	40	2216	2124	0	71.5	69.2	67.7	72.7	70.4	68.9
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2259	2006	0	71.5	69.3	67.8	72.8	70.5	69.0
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2286	2000	0	71.6	69.3	67.8	72.8	70.5	69.1
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1507	1299	0	69.8	67.5	66.0	71.0	68.7	67.2

Summary	CNEL			
	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Lomita Boulevard w/o Main St.	0.0	0.2	0.0	0.2
Lomita Boulevard between Main St. and Neptune Ave.	0.0	0.2	0.0	0.2
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	0.1	0.3	0.1	0.3
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	0.0	0.2	0.1	0.3
Lomita Boulevard between Avalon Blvd and Wilmington Ave	0.0	0.2	0.0	0.2

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1381	1487	0	70.6	68.0	66.3	71.9	69.2	67.5
Neptune Avenue n/o Lomita Blvd	30	158	154	0	59.1	56.2	54.4	60.4	57.4	55.6
Lagoon Ave n/o Lomita Blvd	30	43	57	0	54.7	51.7	50.0	55.9	52.9	51.2
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1315	1522	0	70.7	68.1	66.4	72.0	69.3	67.6
0	0			0	-	-	-	-	-	-

Future No Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1429	1865	0	71.6	69.0	67.3	72.8	70.2	68.5
Neptune Avenue n/o Lomita Blvd	30	164	159	0	59.3	56.3	54.6	60.5	57.5	55.8
Lagoon Ave n/o Lomita Blvd	30	44	59	0	54.9	51.9	50.1	56.1	53.1	51.3
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1605	2127	0	72.2	69.5	67.9	73.4	70.7	69.1
0	0			0	-	-	-	-	-	-

Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1432	1904	0	71.7	69.0	67.4	72.9	70.3	68.6
Neptune Avenue n/o Lomita Blvd	30	164	159	0	59.3	56.3	54.6	60.5	57.5	55.8
Lagoon Ave n/o Lomita Blvd	30	44	59	0	54.9	51.9	50.1	56.1	53.1	51.3
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1634	2130	0	72.2	69.5	67.9	73.4	70.7	69.1
0	0			0	-	-	-	-	-	-

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Main Street between Sepulveda Blvd and Lomita Blvd	0.1	1.1	0.1	1.0
Neptune Avenue n/o Lomita Blvd	0.0	0.1	0.0	0.1
Lagoon Ave n/o Lomita Blvd	0.0	0.2	0.0	0.2
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	0.0	1.4	0.0	1.4
0	-	-	-	-

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2015	2224	0	71.5	69.2	67.7	72.7	70.4	68.9
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	1946	2232	0	71.5	69.2	67.7	72.7	70.4	69.0
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1429	1732	0	70.4	68.1	66.6	71.6	69.3	67.9
Figueroa Street n/o Sepulveda Blvd	40	798	973	0	67.9	65.6	64.1	69.1	66.8	65.3
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1169	1229	0	69.8	67.1	65.5	71.0	68.4	66.7
Future No Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2057	2266	0	71.6	69.3	67.8	72.8	70.5	69.0
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	1985	2235	0	71.5	69.2	67.7	72.7	70.4	69.0
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1429	1732	0	70.4	68.1	66.6	71.6	69.3	67.9
Figueroa Street n/o Sepulveda Blvd	40	798	973	0	67.9	65.6	64.1	69.1	66.8	65.3
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1173	1233	0	69.8	67.2	65.5	71.0	68.4	66.7
Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.	40	2140	2364	0	71.7	69.5	68.0	73.0	70.7	69.2
Sepulveda Boulevard, between Main St. and Avalon Blvd	40	2067	2332	0	71.7	69.4	67.9	72.9	70.6	69.1
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	40	1493	1812	0	70.6	68.3	66.8	71.8	69.5	68.0
Figueroa Street n/o Sepulveda Blvd	40	1000	1124	0	68.5	66.2	64.8	69.7	67.5	66.0
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	40	1245	1304	0	70.1	67.4	65.8	71.3	68.6	67.0

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Sepulveda Boulevard, between Figueroa St. and Main St.	0.1	0.3	0.1	0.3
Sepulveda Boulevard, between Main St. and Avalon Blvd	0.0	0.2	0.0	0.2
Sepulveda Boulevard, between Avalon Blvd and Wilmington Ave.	0.0	0.2	0.0	0.2
Figueroa Street n/o Sepulveda Blvd	0.0	0.7	0.0	0.6
Wilmington Avenue between Sepulveda Blvd and Lomita Blvd	0.0	0.2	0.0	0.3

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2075	2239	0	71.5	69.2	67.8	72.7	70.5	69.0
Lomita Boulevard between Main St. and Neptune Ave.	40	2119	1986	0	71.3	69.0	67.5	72.5	70.2	68.7
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2129	1896	0	71.3	69.0	67.5	72.5	70.2	68.7
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2148	1896	0	71.3	69.1	67.6	72.5	70.3	68.8
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1434	1249	0	69.6	67.3	65.8	70.8	68.5	67.0
Future No Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2075	2239	0	71.5	69.2	67.8	72.7	70.5	69.0
Lomita Boulevard between Main St. and Neptune Ave.	40	2122	2025	0	71.3	69.0	67.5	72.5	70.2	68.7
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2164	1909	0	71.4	69.1	67.6	72.6	70.3	68.8
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2191	1903	0	71.4	69.1	67.7	72.6	70.4	68.9
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1438	1253	0	69.6	67.3	65.8	70.8	68.5	67.0
Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Lomita Boulevard w/o Main St.	40	2168	2348	0	71.7	69.4	68.0	72.9	70.7	69.2
Lomita Boulevard between Main St. and Neptune Ave.	40	2216	2124	0	71.5	69.2	67.7	72.7	70.4	68.9
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	40	2259	2006	0	71.5	69.3	67.8	72.8	70.5	69.0
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	40	2286	2000	0	71.6	69.3	67.8	72.8	70.5	69.1
Lomita Boulevard between Avalon Blvd and Wilmington Ave	40	1507	1299	0	69.8	67.5	66.0	71.0	68.7	67.2

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Lomita Boulevard w/o Main St.	0.0	0.2	0.0	0.2
Lomita Boulevard between Main St. and Neptune Ave.	0.0	0.2	0.0	0.2
Lomita Boulevard between Neptune Ave. and Lagoon Ave.	0.1	0.3	0.1	0.3
Lomita Boulevard between Lagoon Ave. and Avalon Blvd	0.1	0.2	0.1	0.3
Lomita Boulevard between Avalon Blvd and Wilmington Ave	0.0	0.2	0.0	0.2

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Project: Kast Site RAP

Existing										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1381	1487	0	70.6	68.0	66.3	71.9	69.2	67.5
Neptune Avenue n/o Lomita Blvd	30	158	154	0	59.1	56.2	54.4	60.4	57.4	55.6
Lagoon Ave n/o Lomita Blvd	30	43	57	0	54.7	51.7	50.0	55.9	52.9	51.2
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1315	1522	0	70.7	68.1	66.4	72.0	69.3	67.6
0	0			0	-	-	-	-	-	-

Existing With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1384	1526	0	70.7	68.1	66.4	72.0	69.3	67.7
Neptune Avenue n/o Lomita Blvd	30	158	154	0	59.1	56.2	54.4	60.4	57.4	55.6
Lagoon Ave n/o Lomita Blvd	30	43	57	0	54.7	51.7	50.0	55.9	52.9	51.2
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1354	1525	0	70.7	68.1	66.4	72.0	69.3	67.7
0	0			0	-	-	-	-	-	-

Future With Project										
	Speed	Traffic Volumes			Leq			CNEL		
Roadway/Segment	MPH	AM	PM	ADT	ROW	25 Feet	50 Feet	ROW	25 Feet	50 Feet
Main Street between Sepulveda Blvd and Lomita Blvd	40	1432	1904	0	71.7	69.0	67.4	72.9	70.3	68.6
Neptune Avenue n/o Lomita Blvd	30	164	159	0	59.3	56.3	54.6	60.5	57.5	55.8
Lagoon Ave n/o Lomita Blvd	30	44	59	0	54.9	51.9	50.1	56.1	53.1	51.3
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	40	1634	2130	0	72.2	69.5	67.9	73.4	70.7	69.1
0	0			0	-	-	-	-	-	-

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Main Street between Sepulveda Blvd and Lomita Blvd	0.1	1.1	0.1	1.0
Neptune Avenue n/o Lomita Blvd	0.0	0.1	0.0	0.1
Lagoon Ave n/o Lomita Blvd	0.0	0.2	0.0	0.2
Avalon Boulevard between Sepulveda Blvd and Lomita Blvd	0.0	1.4	0.0	1.4
0	-	-	-	-

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

Appendix F-5

Expedited Implementation Option
Off-Site Truck Trip Noise Calculations

Expedited Implementation Option Off-Site Truck Trip Noise

Roadway/Segment	Traffic Volumes AM	Traffic Volumes PM	Traffic Volumes ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.			151	62.2	60.0	58.5	59.2	57.0	55.5
Lomita Boulevard between Main Street and Neptune Avenue			151	62.2	60.0	58.5	59.2	57.0	55.5
Main Street between Sepulveda Blvd and Lomita Blvd			151	63.1	60.5	58.8	60.1	57.5	55.8
Neptune Avenue n/o Lomita Blvd			151	64.1	61.2	59.4	61.1	58.2	56.4
0			0	-	-	-	-	-	-

Future No Project

Roadway/Segment	Traffic Volumes AM	Traffic Volumes PM	Traffic Volumes ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.			0	-	-	-	-	-	-
Lomita Boulevard between Main Street and Neptune Avenue			0	-	-	-	-	-	-
Main Street between Sepulveda Blvd and Lomita Blvd			0	-	-	-	-	-	-
Neptune Avenue n/o Lomita Blvd			0	-	-	-	-	-	-
0			0	-	-	-	-	-	-

Future With Project

Roadway/Segment	Traffic Volumes AM	Traffic Volumes PM	Traffic Volumes ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet
Sepulveda Boulevard, between Figueroa St. and Main St.			0	-	-	-	-	-	-
Lomita Boulevard between Main Street and Neptune Avenue			0	-	-	-	-	-	-
Main Street between Sepulveda Blvd and Lomita Blvd			0	-	-	-	-	-	-
Neptune Avenue n/o Lomita Blvd			0	-	-	-	-	-	-
0			0	-	-	-	-	-	-

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Sepulveda Boulevard, between Figueroa St. and Main St.	-	-	-	-
Lomita Boulevard between Main Street and Neptune Avenue	-	-	-	-
Main Street between Sepulveda Blvd and Lomita Blvd	-	-	-	-
Neptune Avenue n/o Lomita Blvd	-	-	-	-
0	-	-	-	-

Appendix F-6

Noise Measurement Results –
Excavation Operations at 24612 Neptune Avenue

Technical Memorandum

Date: December 13, 2012

To: Roy Patterson

From: Ron Reeves

Subject: **Noise Measurement Results –Excavation Operations 24612 Neptune Avenue (November 5, 2012 – November 12, 2012)**

Noise measurements were conducted from November 5-14, 2012 during excavation pilot test operations in the vicinity of 24612 Neptune Avenue to assess the potential noise impacts from mobile and stationary construction equipment on the surrounding community. Noise measurement data were recorded at seven representative locations, which included the front of each residential structure adjacent to the excavation site as shown in **Figure 1**. All measurements were conducted using a Brüel & Kjær Model 2250 Sound Level Meter (SLM). The Model 2250 is a modern fourth generation Type 1 SLM. Accuracy of the SLM was verified before and after monitoring and was within specifications. Instrument calibration is traceable to the National Institute of Standards and Technology.

Figure 1: Noise Measurement Sites

Ambient Noise Levels

The existing environment along Neptune Avenue in the Carousel tract included ambient noise sources such as dogs barking, music, residents backing out of their driveways, etc. and transportation sources such as vehicular traffic, aircraft over flights, and trains passing by along the rail line north of the tract. Short-term (20-30 minute) ambient noise measurements were conducted during four days near the excavation site (24612 Neptune Avenue) prior to the commencement of excavation operations between November 5, 2012 and November 12, 2012, as shown in **Table 1**. The purpose of these measurements was to quantify existing noise levels. The ambient noise levels along Neptune Avenue ranged from 50 to 54 dBA L_{eq}. The maximum noise level ranged from 69 to 80 dBA. Maximum noise levels during the ambient noise measurements were due to vehicular traffic. The absolute maximum noise level, 80 dBA, was due to a school bus traveling south along Neptune Avenue. This value is highlighted in **Table 1** as exceeding the City of Carson Noise Ordinance. Furthermore, a street sweeper was observed (not recorded) to have a noise level of 86 dBA while traveling south along Neptune Avenue.

Table 1: Ambient Noise Measurement Results

Date	Start Time	End Time	Duration	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)
11/5/2012	7:41	8:02	0:21	53	72	62	54	49	48
11/7/2012	7:22	7:58	0:36	54	**80**	62	55	47	42
11/8/2012	7:36	8:01	0:25	54	71	65	58	52	47
11/12/2012	7:17	7:47	0:30	50	69	58	52	49	48

Operational Noise Levels

During excavation, acoustical attenuation blankets 12 feet in height were installed on the north and south sides of the excavation site and around the perimeter of the driveway to reduce community noise exposure from the generator and water buffalo (trailer) located on the driveway, as seen on **Figure 1**. The only construction equipment not shielded by sound attenuation was a single generator that was placed adjacent to the curb on the east side of the street south of the excavation site, dump trucks arriving and departing from excavation site, and concrete trucks delivering slurry. The 12-foot high attenuation panels were installed from November 5-9 and were removed November 12, 2012. Removal of the panels was necessitated due to the need to excavate in the vicinity of the panel support structure. Additional excavation, adjacent to the property boundary, was conducted without noise attenuation.

Tables 2 through 8 below present the excavation noise measurement data and observations made from November 5-14, 2012. Noise measurements were conducted during all excavation and related activities. **Tables 2 through 8** list the L_{eq}, L percentiles, Time Above 75 dBA, and noise sources/comments for each measurement. The noise levels highlighted in bold indicate an exceedance of the L_{max} or L percentile values specified in the City of Carson Noise Ordinance.

The first day of pilot excavation on November 5, 2012 consisted of site setup (i.e. installing attenuation blankets, offloading excavator, generators and water buffalo etc.) and initial grubbing of the site. Noise measurement results for these activities are shown in **Table 2.**

Activities occurring November 6-12, 2012, consisted of soil excavation, slab demolition (including the use of a hydraulic breaker attachment on the excavator to break up the existing slab), dump trucks arriving and departing to transport excavated soil, and concrete trucks delivering slurry. The noise measurement results from these activities are shown in **Tables 3 through 6**.

The loudest noise sources during excavation activities were the air brakes and backup alarms from dump trucks as they arrive and depart from the site, the excavator shaking its bucket as it transferred soil and when it dropped concrete into the dump truck, and when the concrete truck revved its engine to deliver concrete to backfill the lower part of the excavations. From November 12-14, 2012, activities consisted of delivering fill soil to the site and soil compaction. The loudest noise sources during these activities consisted of bucket shaking from the excavator, backup alarms on dump trucks, air brakes and reverberations from the bed of the dump truck as it dumped soil, results can be found in **Tables 6 through 8**.

Table 2: Excavation Noise Measurements and Observations at 24612 Neptune Avenue November 5, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	10:12	10:32	0:20	59	**81**	**70**	**61**	53	48	2	Generator inside enclosure running
5a	13:35	13:37	0:02	62	71	**71**	**66**	**65**	**51**	0	Excavator operating and generator running
1	13:42	14:14	0:32	61	**84**	**68**	**64**	61	**56**	5	Excavator operating and generator running
5a	14:17	14:27	0:10	60	74	**69**	**63**	59	**57**	0	Some Excavation, site setup

Table 3: Excavation Noise Measurements and Observations at 24612 Neptune Avenue November 6, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	13:28	13:59	0:31	62	72	**67**	**65**	62	**62**	0	Excavator, conveyor belt, generators
4	14:07	14:15	0:08	59	67	**65**	**62**	60	**58**	0	Excavator, conveyor belt, generators
3	14:16	14:27	0:11	65	**78**	**71**	**67**	**65**	**63**	2	Excavator, conveyor belt, generators, dump truck
1	14:30	14:34	0:04	64	69	**68**	**66**	**65**	**64**	0	Excavator, conveyor belt, generators
3	14:47	14:54	0:07	64	74	**69**	**66**	64	**63**	0	Excavator, conveyor belt, generators
2	14:55	15:15	0:20	64	74	**68**	**67**	**66**	**63**	0	Excavator, conveyor belt, generators
4	15:19	15:29	0:10	61	74	**69**	**66**	61	**59**	0	Excavator, conveyor belt, generators
3	15:39	15:43	0:04	60	69	**65**	**62**	61	**59**	0	Excavator, conveyor belt, generators
1	15:48	16:09	0:21	60	**77**	**67**	**66**	60	**54**	1	Excavator, conveyor belt, generators

Table 4: Excavation Noise Measurements and Observations at 24612 Neptune Avenue November 7, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	8:05	8:29	0:24	59	72	**65**	**63**	60	**58**	0	Excavator running, site prep.
2	8:32	8:35	0:03	58	60	60	59	59	**58**	0	Generator running, noise barrier flap was opened for ventilation
3	8:37	8:51	0:14	60	65	63	**61**	60	**59**	0	Generators and excavator running, bottom flap of noise barrier open
5a	8:52	9:22	0:30	67	**84**	**77**	**71**	64	**63**	70	Generator and excavator running, dump truck (backup alarm/air brakes)
1	9:31	10:03	0:32	65	71	**68**	**67**	**67**	**65**	0	Generator and excavator running
3	10:06	10:36	0:30	62	**75**	**67**	**66**	62	**61**	1	Dump truck (backup alarm/air brakes), generator running
4	10:38	11:08	0:30	62	**82**	**68**	**63**	62	**61**	3	Dump truck (backup alarm/air brakes), generator running
2	11:12	11:42	0:30	66	**82**	**71**	**68**	**66**	**65**	12	Dump truck (backup alarm/air brakes), generator running, excavator operating (shaking bucket)
1	11:43	12:16	0:33	66	**79**	**71**	**68**	**67**	**66**	12	Generator running, excavator operating (shaking bucket, scratching concrete slab)
1	12:20	12:30	0:10	69	**80**	**74**	**72**	**71**	**68**	4	Generator running, excavator breaking slab with hydraulic hammer (scratching concrete)
5	12:32	12:42	0:10	66	**76**	**68**	**67**	**66**	**66**	1	Generator running, excavator dumping concrete into back of dump truck
1	12:43	13:05	0:22	63	**75**	**70**	**66**	63	**62**	2	Generator running, excavator operating (bucket hit side of truck)
4	13:06	13:21	0:15	64	**80**	**70**	**67**	64	**63**	3	Generator running, excavator operating , dump truck parking (air brakes and backup alarm)
2	13:21	13:31	0:10	67	**80**	**72**	**71**	**68**	**65**	1	Generator running, excavator breaking slab with hydraulic hammer, dump truck parking (air brakes and backup alarm)
3	13:32	13:39	0:07	64	68	**67**	**66**	**65**	**63**	0	Generator running, excavator breaking up slab, dump truck idling
4	13:39	13:49	0:10	64	70	**68**	**67**	**65**	**63**	0	Generator running, excavator breaking up slab, dump truck idling
5a	13:48	13:54	0:06	64	69	**67**	**65**	64	**64**	0	Generator running, excavator breaking up slab, dump truck idling
1	13:58	14:28	0:30	67	**85**	**71**	**69**	**67**	**67**	6	Generator running, excavator operating and dumping soil and concrete into dump truck, scratching concrete, dump truck idling

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
2	14:29	14:41	0:12	65	**79**	**71**	**66**	**65**	**63**	6	Generator running, excavator breaking up slab with hydraulic hammer, dump truck idling
3	14:42	15:01	0:19	66	**79**	**72**	**69**	**67**	**62**	7	Generator running, excavator operating, concrete truck arrives (air brakes, backup alarms)
4	15:01	15:11	0:10	71	**80**	**78**	**75**	**71**	**69**	55	Generator running, excavator idling, concrete truck backing (air brakes, hissing, backup alarm)
1	15:13	15:23	0:10	72	**84**	**77**	**75**	**72**	**70**	76	Generator running, excavator idling, concrete truck backing (air brakes, hissing, backup alarm)
2	15:31	15:48	0:17	77	**88**	**87**	**87**	**77**	**73**	304	Generator running, excavator idling, concrete truck backing (air brakes, hissing, backup alarm), concrete truck revs up engine
3	15:55	16:11	0:16	69	**79**	**76**	**74**	**71**	**65**	58	Generator running, excavator idling, concrete truck backing (air brakes, hissing, backup alarm), concrete truck revs up engine
4	16:11	16:26	0:15	66	**85**	**72**	**68**	**66**	**65**	6	Generator running, excavator idling, concrete truck backing (air brakes, hissing, backup alarm), concrete truck revs up engine

Table 5: Excavation noise measurements and observations at 24612 Neptune Avenue November 8, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	8:09	8:41	0:32	65	**76**	**69**	**66**	**65**	**65**	3	Generator running, excavator operating (shaking bucket), dump truck parking
2	8:42	9:09	0:27	62	70	**66**	**65**	63	**62**	0	Generator running, excavator operating, dump truck parked
3	9:10	9:40	0:30	63	**81**	**71**	**66**	62	**59**	10	Generator running, excavator operating, dump trucks depart and arrive (backup alarm, air brakes)
4	9:41	10:12	0:31	59	74	63	**61**	60	**59**	0	Generator running, excavator operating, dump truck parked
5b	10:13	10:23	0:10	56	67	64	57	56	**55**	0	Generator running, excavator operating, dump truck parked
1	10:24	10:41	0:17	66	**76**	**73**	**68**	**66**	**65**	4	Generator running, excavator operating (scratching concrete slab)
2	10:42	10:48	0:06	65	72	**68**	**67**	**66**	**65**	0	Generator running, excavator breaking up slab (hydraulic hammer)
3	10:48	11:18	0:30	62	71	**67**	**66**	63	**61**	0	Generator running, excavator breaking up slab (hydraulic hammer)
2	11:20	11:50	0:30	63	**81**	**68**	**65**	63	**61**	2	Generator running, excavator operating (shaking bucket), dump truck parking
4	11:51	12:21	0:30	63	**77**	**68**	**63**	62	**61**	9	Generator running, excavator operating (shaking bucket), dump truck noise (backup alarm, air brakes)
5a	12:24	12:39	0:15	67	**81**	**76**	**68**	**66**	**65**	24	Generator running, excavator operating, dump truck noise (backup alarm, air brakes)
4	12:40	12:51	0:11	63	68	**66**	**65**	63	**62**	0	Generator running, excavator breaking up slab (hydraulic hammer)
5a	12:51	13:15	0:24	66	**80**	**73**	**67**	**66**	**64**	17	Generator running, excavator operating, dump truck backing (air brakes, backup alarm)
1	13:15	13:45	0:30	66	**76**	**72**	**68**	**67**	**66**	9	Generator running, excavator operating and breaking up concrete (dumping concrete into dump truck), low flying helicopter, dump truck idling
2	13:48	14:00	0:12	68	**76**	**74**	**72**	**68**	**66**	9	Generator running, excavator breaking up slab on west side of trench (hydraulic hammer)
1	14:01	14:13	0:12	65	70	**68**	**67**	**66**	**65**	0	Generator running, excavator moving broken up concrete on bottom of trench

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
3	14:14	14:26	0:12	67	71	**69**	**68**	**67**	**67**	0	Generator running, Excavator operating
2	14:29	14:59	0:30	65	**84**	**70**	**67**	**65**	**64**	4	Generator running, Excavator operating, dump truck backing (air brakes, backup alarm)
4	15:00	16:21	1:21	71	**85**	**80**	**75**	**69**	**62**	395	Generator running, excavator idling, concrete trucks dump slurry (air brakes, hissing, engine rev up)

Table 6: Excavation noise measurements and observations at 24612 Neptune Avenue November 9, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	7:33	8:03	0:30	65	**77**	**70**	**67**	**66**	**64**	6	Generator running, excavator operating (bucket shaking), dump truck parking (air brakes, backup alarm)
2	8:04	8:34	0:30	65	**81**	**69**	**68**	**65**	**63**	3	Generator running, excavator operating (bucket shaking, dropping concrete), dump truck parking (air brakes, backup alarm)
3	8:35	9:07	0:32	64	**79**	**71**	**66**	63	**61**	12	Generator running, excavator operating (bucket shaking, dropping concrete), dump truck parking (air brakes, backup alarm)
1	9:08	9:39	0:31	69	**76**	**74**	**71**	**69**	**68**	11	Generator running, excavator breaking up slab (hydraulic hammer), excavator operating (bucket shaking, dropping concrete, scratching slab), dump truck parking (air brakes, backup alarm)
6	9:46	9:56	0:10	59	70	**65**	**62**	59	**58**	0	Generator running, excavator operating, back yard filled with a variety of different types of wind charms
7	9:56	10:07	0:11	60	73	**67**	**62**	60	**58**	0	Generator running, excavator operating, back yard filled with a variety of different types of wind charms
4	10:12	10:39	0:27	64	**83**	**71**	**67**	63	**62**	6	Generator running, excavator idling, dump truck parking (air brakes, backup alarm)
5	11:07	11:23	0:16	66	73	**70**	**69**	**67**	**66**	0	Generator running, excavator operating, dump truck idling
5	11:23	11:42	0:19	68	**78**	**70**	**69**	**68**	**68**	1	Generator running, excavator operating (dropped concrete), dump truck idling
1	11:43	11:51	0:08	69	**81**	**76**	**71**	**70**	**69**	10	Generator running, excavator operating (bucket shaking), dump truck idling
5	11:52	12:31	0:39	63	**79**	**68**	**66**	**65**	**59**	9	Generator running, excavator idling, dump truck drives away (hissing, air brakes, backup alarm)
2	12:32	13:07	0:35	64	**77**	**72**	**67**	64	**61**	7	Generator running, excavator operating, loud music from 24618 Neptune
4	13:08	13:38	0:30	70	**81**	**78**	**76**	**71**	**66**	221	Generator running, excavator idling, concrete truck delivering slurry (hissing, air brakes, engine revving up)
3	13:39	13:47	0:08	70	**80**	**77**	**74**	**72**	**68**	36	Generator running, excavator idling, concrete truck delivering slurry (hissing, air brakes, engine revving up)
5a	13:48	14:15	0:27	75	**88**	**84**	**82**	**72**	**69**	264	Generator running, excavator idling, concrete truck delivering slurry (hissing, air brakes, engine revving up)
1	14:16	14:26	0:10	58	**79**	63	59	57	**55**	1	Generator running, excavator idling

Table 7: Excavation noise measurements and observations at 24612 Neptune Avenue November 12, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	7:56	8:28	0:32	64	74	**68**	**66**	**65**	**64**	0	Generator running, excavator operating (bucket scratching concrete slab)
2	8:29	8:56	0:27	64	**78**	**69**	**66**	64	**63**	2	Generator running, excavator operating (shaking bucket)
3	8:57	9:28	0:31	65	73	**69**	**67**	**66**	**64**	0	Generator running, excavator operating, water truck arrives, moved barriers on the south side of site back about a foot
1	9:28	9:58	0:30	71	**78**	**73**	**72**	**72**	**70**	6	Generator running, excavator operating, water truck moves to a different location (air brakes, backup alarm)
4	9:59	10:30	0:31	67	**75**	**71**	**70**	**70**	**65**	2	Generator running, excavator operating, water truck idling, dump truck arrives (air brakes, backup alarm)
5b	10:30	10:40	0:10	62	74	**72**	**67**	61	**57**	0	Generator running, excavator idling, water truck leaving (backup alarm, hydraulic brakes, dump truck arrives (air brakes, backup alarm)
1	10:41	10:57	0:16	68	**76**	**71**	**69**	**68**	**68**	2	Generator running, excavator operating (shaking bucket), dump truck leaves
2	10:57	11:27	0:30	67	**78**	**71**	**69**	**67**	**66**	7	Generator running, excavator operating (shaking bucket), dump truck arrives (air brakes, backup alarm), noise barriers on the south side of enclosure removed
3	11:28	11:59	0:31	60	**77**	**70**	**61**	58	**56**	3	Excavator idling, dump truck arrived (backup alarm, air brakes)
1	12:00	12:30	0:30	74	**88**	**81**	**77**	**75**	**73**	620	Generator running, excavator operating (shaking bucket), dump truck arrives with fill soil (air brakes, backup alarm), noise barriers on the south side of site removed
1	12:30	13:00	0:30	73	**90**	**80**	**77**	**73**	**72**	289	Generator running, excavator operating (shaking bucket), dump truck dumps soil into excavation (loud vibrations), noise barriers on the south side of site removed
1	13:00	13:30	0:30	70	**85**	**78**	**74**	**71**	**63**	81	Generator running, excavator leveling soil, dump truck departs, noise barriers on the south side of site removed
1	13:30	14:00	0:30	64	**84**	**72**	**65**	62	**62**	11	Generator running, excavator leveling soil, noise barriers on the south side of site removed
1	14:00	14:30	0:30	72	**82**	**77**	**76**	**74**	**72**	322	Generator running, excavator leveling soil, noise barriers on the south side of site removed

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	14:30	14:47	0:17	62	74	64	**63**	62	**62**	0	Excavator idling, generator off, fencing off site, noise barriers on the south side of site removed

Table 8: Excavation noise measurements and observations at 24612 Neptune Avenue November 14, 2012

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	9:32	10:02	0:30	74	**87**	**81**	**77**	**75**	**72**	484	Dump truck arrives dumps fill soil and departs (backup alarm, air brakes), excavator levels out soil (backup alarm, shaking bucket, wheel noise)
1	10:02	10:32	0:30	73	**84**	**80**	**78**	**75**	**70**	583	Excavator idling, walker compacting soil, water buffalo running
1	10:32	11:02	0:30	73	**91**	**79**	**76**	**73**	**71**	275	Walker compacting soil, dump truck dumps soil (air brakes, backup alarm, loud vibrations), excavator leveling soil (backup alarm, shaking bucket, wheel noise)
1	11:02	11:32	0:30	70	**82**	**78**	**75**	**71**	**68**	162	Excavator leveling soil (backup alarm, shaking bucket, wheel noise), dump truck arrives and dumps soil (backup alarm, air brakes, water buffalo running
1	11:32	12:02	0:30	73	**86**	**80**	**77**	**74**	**71**	385	Excavator leveling soil (backup alarm, shaking bucket, wheel noise), dump truck arrives and idles (backup alarm, air brakes)
1	12:02	12:32	0:30	75	**85**	**82**	**80**	**76**	**70**	640	Walker compacting soil, dump truck dumps soil (air brakes, backup alarm), excavator leveling soil (backup alarm, shaking bucket, wheel noise)
1	12:32	13:02	0:30	74	**91**	**81**	**77**	**74**	**72**	398	Generator running, walker compacting soil, dump truck dumps soil (air brakes backup alarm, loud vibration), excavator leveling soil (backup alarm, shaking bucket, wheel noise), water buffalo running
1	13:02	13:32	0:30	74	**86**	**82**	**78**	**75**	**72**	495	Generator running, excavator leveling soil (backup alarm, shaking bucket, wheel noise)
1	13:32	14:02	0:30	74	**93**	**80**	**77**	**75**	**73**	488	Generator running, dump truck dumps soil (air brakes, backup alarm, loud vibration), excavator leveling soil (backup alarm, shaking bucket, wheel

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
											noise), water buffalo running
1	14:02	14:32	0:30	73	**85**	**80**	**76**	**74**	**72a**	345	Generator running, excavator leveling soil (backup alarm, shaking bucket, wheel noise)

Note: All noise barriers removed from site during all noise measurements

Equipment calibration records, Field Measurement Data Sheets and documentary photographs are available upon request. If you have any questions or comments, do not hesitate to contact either myself or Stanley Armstrong.

Best regards,

Ron Reeves

Ron Reeves, INCE
URS Corporation
Acoustics and Noise Control

Appendix F-7

Noise Measurement Results –
Excavation Operations at 24533 Ravenna Avenue

Technical Memorandum

Date: January 15, 2013

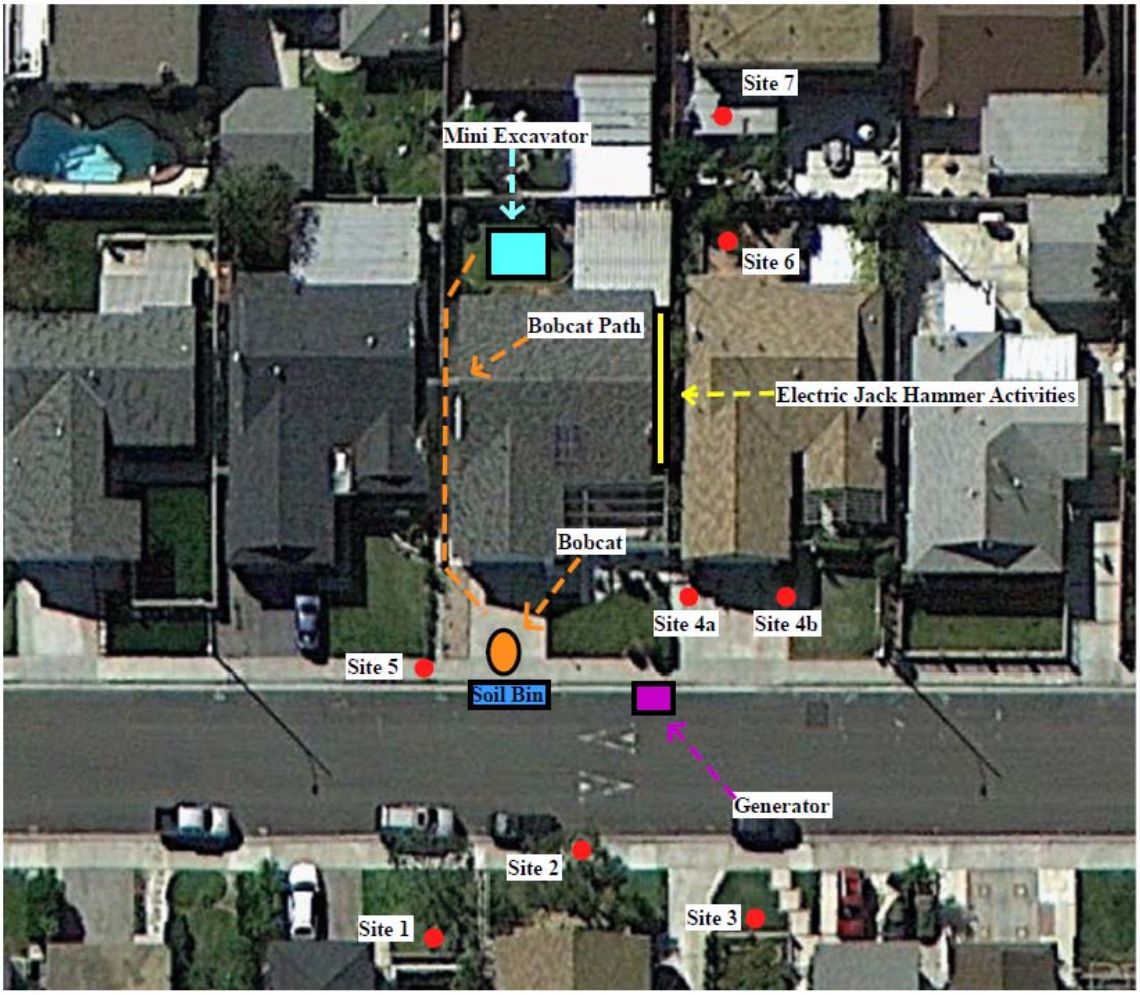
To: Roy Patterson

From: Ron Reeves

Subject: **Noise Measurement Results –Excavation Operations 24533 Ravenna Avenue (December 5, 2012)**

Environmental noise measurements were conducted December 5, 2012 during Excavation Pilot operations in the vicinity of 24553 Ravenna Avenue, Carson, CA to assess the potential noise impacts from mobile and stationary construction equipment on the surrounding community. Noise measurement data were recorded at eight representative locations. These locations included six front yard locations and two rear yard locations of residential properties adjacent to the excavation site as shown on **Figure 1**. All measurements were conducted using a Brüel & Kjær Model 2250 Sound Level Meter (SLM). The Brüel & Kjær Model 2250 is a modern fourth generation Type 1 SLM. Instrument calibration is traceable to the National Institute of Standards and Technology. The SLM was field calibrated before and after monitoring and calibrated within specifications.

Figure 1: Noise Measurement Sites



Ambient Noise Levels

The existing environment along Ravenna Avenue in the community of Carousel include noise sources common to residential community environments such as dogs barking, residents playing music, residents backing out of their drive ways, etc. and transportation sources such as vehicular traffic, aircraft over-flights, and train traffic on the railroad right-of-way north of the Carousel community. Two short-term ambient noise measurements were conducted near the excavation site (24533 Ravenna Avenue) prior to the commencement of excavation operations. These measurements were conducted July 10, 2012 and September 21, 2012. A summary of the measurement data is shown in **Table 1**.

Table 1: Ambient Noise Measurement Results (24533 Ravenna Avenue)

Date	Start Time	End Time	Duration	L_{eq}	L_{max}	$L_{1.7}$	$L_{8.3}$	L_{25}	L_{50}
7/10/2012	7:55	8:10	0:15	48	66	55	51	45	43
9/21/2012	8:02	8:32	0:30	52	68	62	55	47	44

The ambient noise level along Ravenna Avenue during the periods of ambient noise measurements ranged from 48 to 52 dBA L_{eq}. The maximum noise level ranged from 66 to 68 dBA. School busses in the Carousel area have also have been recorded at 80 dBA in past ambient noise measurements along Neptune Avenue. Furthermore, a street sweeper was observed (not recorded) to have a noise level of 86 dBA while traveling south along Neptune Avenue during excavation at 24612 Neptune Avenue.

Operational Noise Levels

Excavation activities at the single-family residence located at 24533 Ravenna Avenue on December 5, 2012 were conducted in the back yard in addition to the northern side of the rear portion of the side yard, as seen on **Figure 1**. A mini-excavator was used to excavate portions of the backyard. A bobcat was used to transport excavated material from the backyard to the front of the driveway and transfer the excavated material into a roll-off soil bin. A delivery truck was used to pick up and drop off the soil bins. Noise generated by the delivery truck consisted of backup alarm noise, hydraulic brake noise, and the truck dropping and lifting the soil bins. A generator was located in front of the residence on Ravenna Avenue. This generator was used to power an electric jack hammer that was used to loosen soil for hand excavation along the northern side of the rear portion of the side yard.

Table 2 presents the noise measurement data and observations made during excavation activities at 24533 Ravenna Avenue. The table lists the L_{eq}[1], L percentiles, Time Above 75 dBA and noise sources/comments for each measurement. The noise levels highlighted in bold indicate an exceedance of the City of Carson Noise Ordinance. The loudest noise sources during excavation activities were the air brakes and back up alarms from dump trucks as they arrived and departed from the site, electric jack hammering, the bobcat traveling to and from the back yard, and metal-on-metal noise as the bobcat dropped material into the soil bin.

Table 2. Excavation Noise Measurement Results (24533 Ravenna Avenue)
December 5, 2012

Excavation Activities

- Generator operating continuously on Ravenna Avenue (powered the electric jack hammer)
- Loosening soil via electric jack hammer on northern side of the rear portion of the side yard
- Truck delivering and picking up soil bins (engine, backup alarm, hydraulics/air brakes, metal rollers-on-metal noise)
- Excavation of rear yard via mini excavator
- Bobcat depositing material into soil bin and replacing soil in backyard
- Site cleanup

Site	Start Time	End Time	Duration (hh:mm)	L_{eq}	L_{max} (75 dBA)	$L_{1.7}$ (65 dBA)	$L_{8.3}$ (60 dBA)	L_{25} (55 dBA)	L_{50} (50 dBA)	Time Above 75 dBA (Sec.)	Noise Sources/Comments
1	8:35	9:06	0:31	62	**79**	**67**	**65**	**62**	**59**	1	Truck that dropped off soil bin leaves; generator running; electric jack hammer operating; bobcat going to and from backyard occasionally to dispose of soil in bin
2	9:10	9:40	0:30	62	72	**67**	**65**	**63**	**61**	0	Excavator, bobcat, electric jack hammer, generator
3	9:53	10:14	0:21	60	71	**69**	**62**	**60**	**59**	0	Jack hammer activity from down the street. Brief sawing of wood/board on driveway. Electric jack hammer, generator, excavator.
7	10:38	11:00	0:32	59	70	**66**	**63**	**60**	**57**	0	Excavator, bobcat, electric jack hammer, generator
4a	12:05	12:40	0:35	67	**84**	**73**	**70**	**68**	**66**	9	Excavator, bobcat, electric jack hammer, generator. Truck arrives shortly after 12:30 to drop off soil bin (beeping, metal-on-metal noise, air brakes).
4b	12:41	12:57	0:16	70	**84**	**78**	**74**	**71**	**67**	43	Excavator, bobcat, electric jack hammer, generator. Truck picks up soil bin (beeping, metal-on-metal noise, air brakes).
5	13:02	13:25	0:23	71	**83**	**78**	**76**	**72**	**66**	163	Mostly bobcat noise going to and from backyard to soil bin at front of driveway. Approximately 15 feet away from bobcat. Some generator and electric jack hammer noise.
6	13:29	14:01	0:32	58	68	62	**60**	**59**	**57**	0	Mostly excavator and bobcat noise. Electric jack hammer was not in operation
2	14:08	14:25	0:17	62	**81**	**67**	**64**	**62**	**60**	4	Excavator, bobcat, electric jack hammer, generator

Excavation Activities • Generator operating continuously on Ravenna Avenue (powered the electric jack hammer) • Loosening soil via electric jack hammer on northern side of the rear portion of the side yard • Truck delivering and picking up soil bins (engine, backup alarm, hydraulics/air brakes, metal rollers-on-metal noise) • Excavation of rear yard via mini excavator • Bobcat depositing material into soil bin and replacing soil in backyard • Site cleanup											
Site	**Start Time**	**End Time**	**Duration (hh:mm)**	**L_{eq}**	**L_{max} (75 dBA)**	**$L_{1.7}$ (65 dBA)**	**$L_{8.3}$ (60 dBA)**	**L_{25} (55 dBA)**	**L_{50} (50 dBA)**	**Time Above 75 dBA (Sec.)**	**Noise Sources/Comments**
5	14:28	14:40	0:12	64	**76**	**67**	**66**	**64**	**63**	1	Mostly bobcat noise
1	14:48	15:15	0:27	58	72	**65**	**62**	**58**	**54**	0	Site cleanup and bobcat replacing soil in backyard; generator running

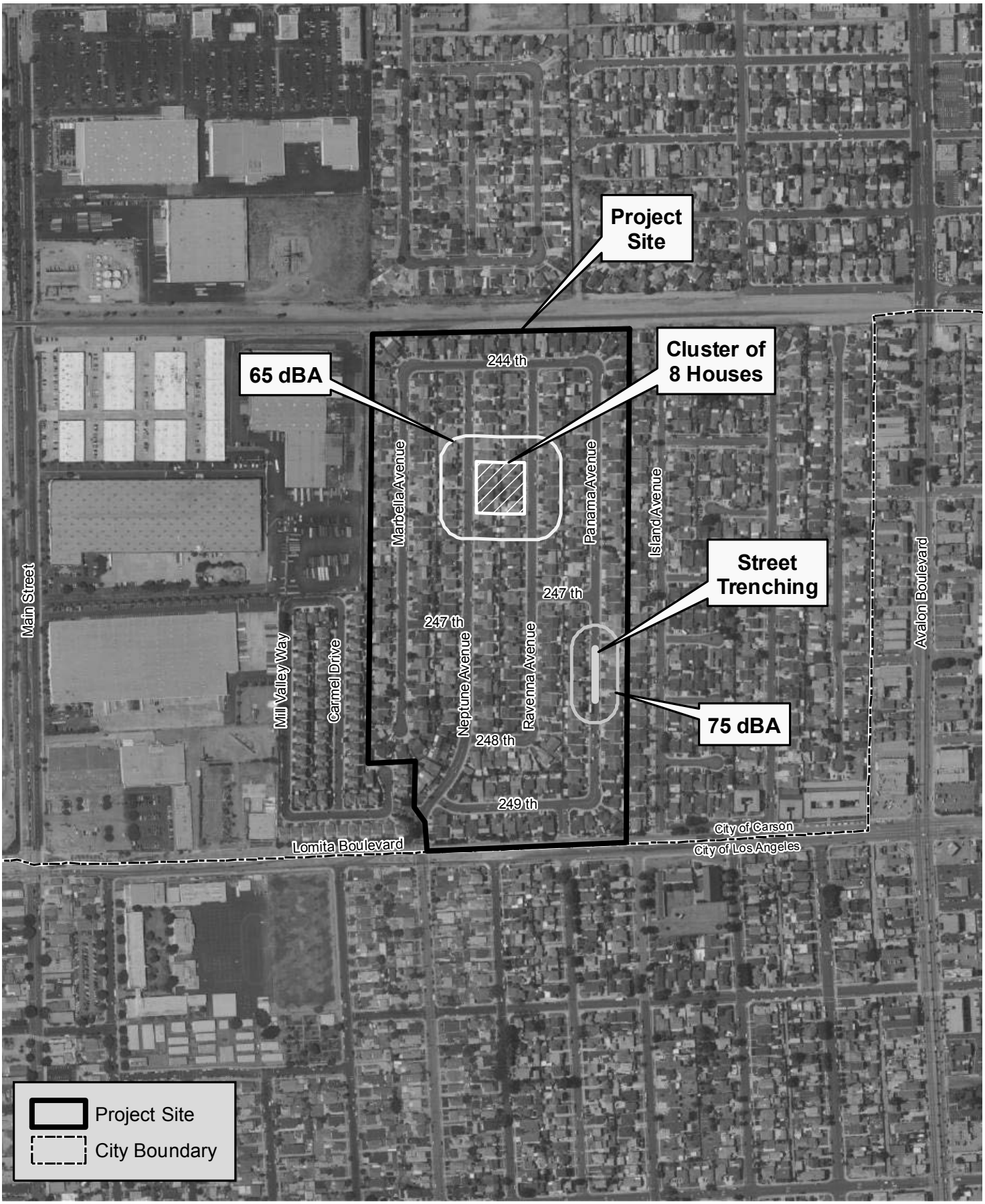
Equipment calibration records, Field Measurement Data Sheets and documentary photographs are available upon request. If you have any questions or comments, do not hesitate to contact either myself or Ryan McMullan.

Best regards,

Ron Reeves

Ron Reeves, INCE
URS Corporation
Acoustics and Noise Control

Appendix F-8
75 dBA and 65 dBA Noise Contours



PCR

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0 500 Feet

65 dBA, Leq and 75 dBA Leq, Noise Contours

Former Kast Property Tank Farm Site Remediation Project

Source: Microsoft, 2010; PCR Services Corporation, 2014.

Appendix G: Traffic Study

Traffic Study for the Kast Property Remediation Action Plan (RAP) EIR

Prepared by
FEHR & PEERS

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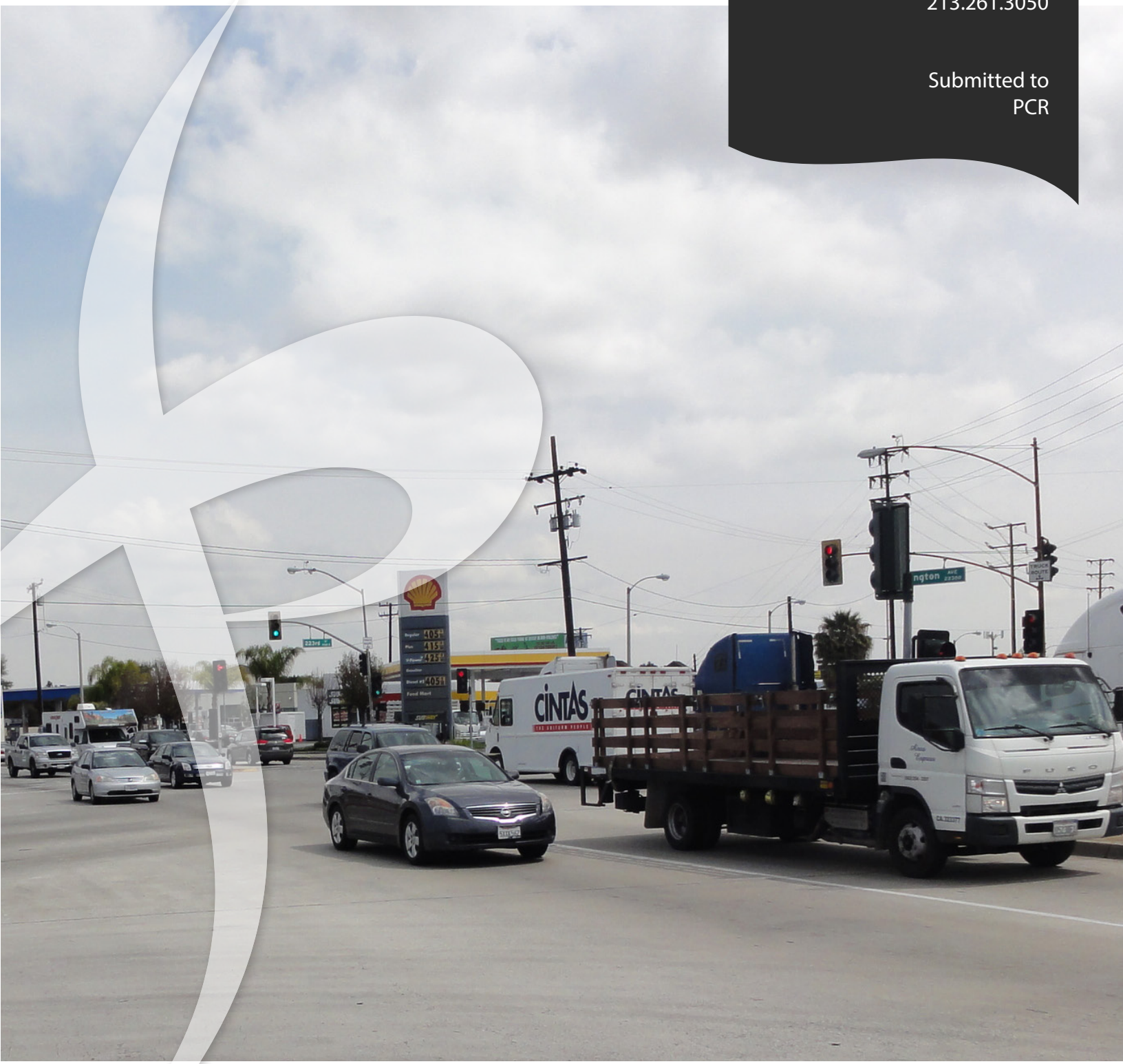
Submitted to
PCR



October 2014

TRAFFIC STUDY FOR THE KAST PROPERTY REMEDIATION ACTION PLAN (RAP) EIR

October 2014

Prepared for:

PCR Services Corporation

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1. INTRODUCTION

Fehr & Peers conducted a traffic impact analysis for the proposed Kast Property Remedial Action Plan (RAP) EIR. This analysis assesses the significance of traffic and circulation impacts that could result from truck and worker trips to and from the project and other activities during remediation.

PROJECT DESCRIPTION

The project site is located in the City of Carson, and is generally bounded by the Monterey Pines community and industrial property of the former Turco Products Facility to the west, Metro-owned railroad tracks to the north, Panama Avenue to the east, and Lomita Boulevard to the south. The project site consists of a 44-acre site that is developed with 285 single-family residences, referred to as the Former Kast Site. Figure 1 shows the regional location and the project site location, respectively.

Beginning in 2008, environmental investigations were conducted in the area that identified that there was contamination by petroleum hydrocarbons within the site. The objectives of the project are to:

- Remediate the site consistent with the Remedial Action Objectives;
- Maintain the residential land use of the site and avoid permanently displacing residents from their homes;
- Minimize short-term disruption to residents;
- Allow residents the long-term ability to safely and efficiently make improvements requiring excavation or penetration into site soils on their properties;
- Limit or minimize impacts associated with the cleanup activities.

The project involves the excavation of soils at impacted properties, soil vapor extraction (SVE)/bioventing to address contamination, vapor mitigation, removal of light non-aqueous phase liquids (LNAPL), and groundwater source reduction. For the remediation, trucks would be entering both to deposit fresh soil and remove contaminated soil, with other trucks arriving and departing for street trenching and well installation. After excavation, street grinding and paving would occur on the properties. Overall, the RAP anticipates the remediation plan to occur over a period of 5.6 years, and that bioventing could continue for a prolonged period after that.

In addition to the proposed project, an expedited variant of the project (Expedited Implementation Option, herein Expedited Option), that would expedite completion of the RAP to 2019, was also analyzed.

STUDY SCOPE

This study evaluates the potential for construction period traffic impacts on the street system surrounding the project site. Due to the nature of the project, no increase in trips is anticipated during the operational phase of the project upon its completion. Potential traffic impacts for the project were evaluated during the peak hours of the typical weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak periods. The following traffic scenarios were analyzed in the study:

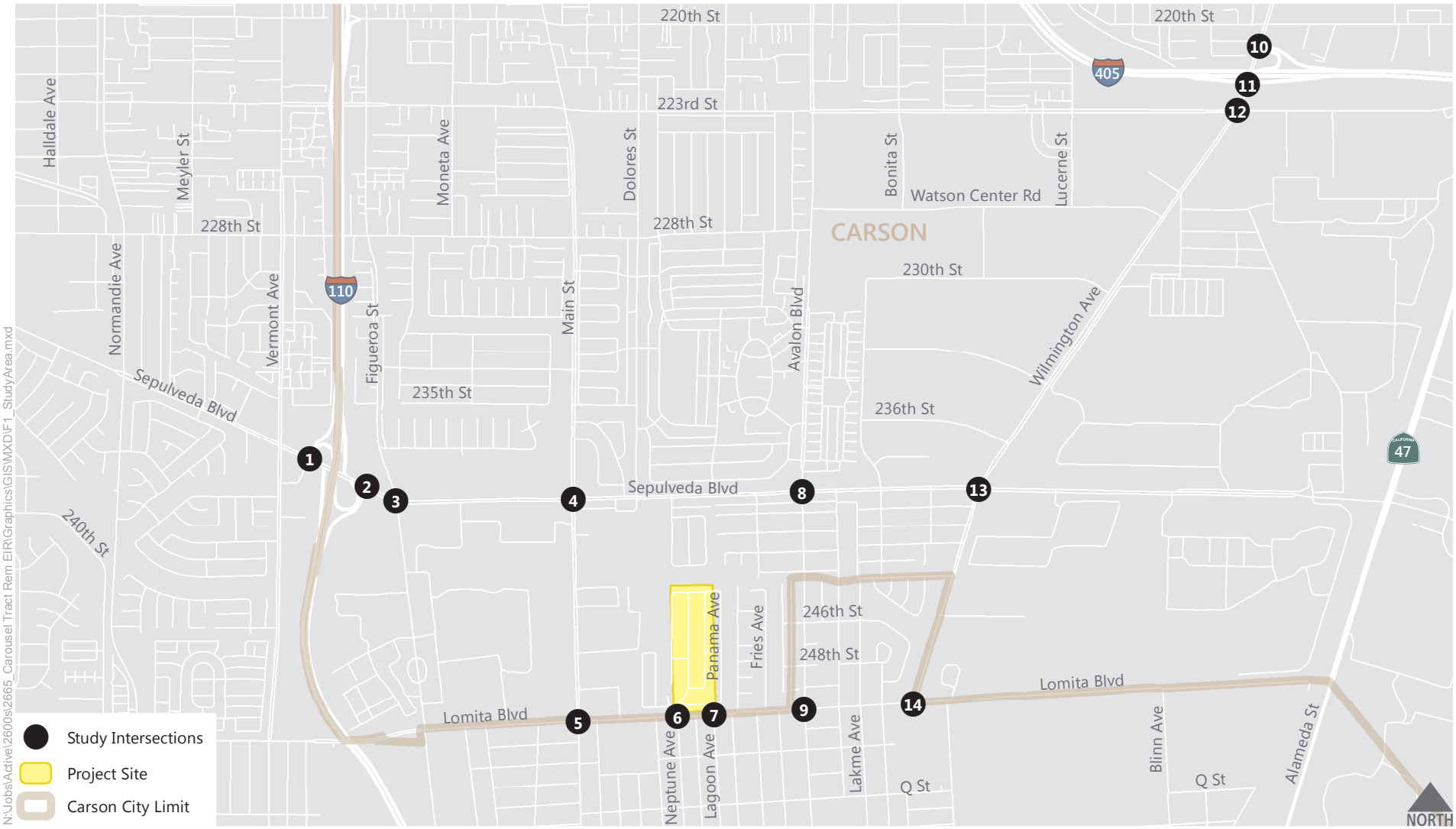


Figure 1

Project Site and Study Intersections

- Existing Conditions (Year 2014) – This analysis of existing weekday AM and PM peak hour traffic conditions provided a basis for the assessment of future traffic conditions. The existing conditions analysis included a description of key area streets and highways, traffic volumes, current intersection operating conditions, and public transit service in the area.

- Existing plus Project (Year 2014) Conditions – This analysis identified the temporary impacts of the proposed project on the existing traffic conditions by adding the RAP-related traffic expected to be generated by the project to existing traffic volumes.

- Existing plus Expedited Option (Year 2014) Conditions – This analysis identified the temporary impacts of the proposed Expedited Option on the existing traffic conditions by adding the RAP-related traffic expected to be generated by the project to the existing traffic volumes.

- Cumulative Base (Year 2021) Conditions – This scenario projected the future traffic growth and intersection operating conditions that could be expected from regional growth and known "related projects" in the vicinity of the project site by 2021. These analyses provide the cumulative baseline conditions against which project impacts were evaluated.

- Cumulative plus Project (Year 2021) Conditions – This analysis identified the temporary incremental impacts of the proposed project traffic on future operating conditions by adding the RAP-related traffic expected to be generated by the project to cumulative base traffic forecasts.

- Expedited Cumulative Base (Year 2019) Conditions – This scenario projected the future traffic growth and intersection operating conditions that could be expected from regional growth and known "related projects" in the vicinity of the project site by year 2019. These analyses provide the cumulative baseline conditions against which the Expedited Option impacts were evaluated.

- Cumulative plus Expedited Option (Year 2019) Conditions – This analysis identified the temporary incremental impacts of the proposed project on future traffic operating conditions by adding the RAP-related traffic expected to be generated by the project to the cumulative base traffic forecasts.

Following consultation with the City of Carson Department of Public Works staff, Fehr & Peers examined 14 intersections in the vicinity of the project site for each of the above traffic scenarios. The study intersections are listed below and illustrated in Figure 1:

1. I-110 SB Off-Ramp & Sepulveda Boulevard
2. I-110 NB Off-Ramp & Sepulveda Boulevard
3. Figueroa Street & Sepulveda Boulevard
4. Main Street & Sepulveda Boulevard
5. Main Street & Lomita Boulevard
6. Neptune Avenue & Lomita Boulevard
7. Lagoon Avenue & Lomita Boulevard (unsignalized)
8. Avalon Boulevard & Sepulveda Boulevard

9. Avalon Boulevard & Lomita Boulevard
10. Wilmington Avenue & I-405 NB Ramps
11. Wilmington Avenue & I-405 SB Ramps
12. Wilmington Avenue & E 223rd Street
13. Wilmington Avenue & Sepulveda Boulevard
14. Wilmington Avenue & Lomita Boulevard (unsignalized)

ORGANIZATION OF REPORT

This report is divided into six chapters, including this introduction. Chapter 2 describes the existing circulation system, traffic volumes, intersection operating conditions of the street system, as well as existing public transit service in the study area. Chapter 3 describes the methodologies used to develop future cumulative traffic forecasts and project traffic volumes. Chapter 4 presents an assessment of potential temporary traffic impacts on intersection operations in the vicinity of the project site. Chapter 5 presents a qualitative analysis of an alternative to the proposed project. Chapter 6 summarizes the conclusions of the study and the recommendations intended to mitigate the adverse impacts expected to occur during the construction process.

2. EXISTING CONDITIONS

A comprehensive data collection effort was undertaken to develop a detailed evaluation of existing transportation conditions in the study area. The assessment of existing conditions in the project study area includes a description of the street and highway system, traffic volumes on these facilities, operating conditions of the selected intersections, and public transit services.

EXISTING STREET SYSTEM

Primary regional access to the project site is provided by the Harbor Freeway (I-110) and the San Diego Freeway (I-405). I-110 runs the north/south direction approximately one-half mile west of the project site; I-405 runs in the northwest/southeast direction north of the project site. The municipal boundary between the cities of Carson and Los Angeles in the project area generally follows Lomita Boulevard. Between Avalon Boulevard and Wilmington Avenue, however, the boundary runs northward along each of those streets to Deloras Drive. Functional classifications noted below are drawn from the Circulation Elements of the General Plans for Carson and Los Angeles. The following is a brief description of the major streets serving the project site:

- Lomita Boulevard – Lomita Boulevard runs east/west south of the project site, providing access to the project site. The Carson Circulation Element classifies it as a Major Highway. The Wilmington Community Plan classifies it as a Secondary Highway. It provides two lanes in each direction and is divided by a two-way left-turn lane. Parking is generally permitted on both sides of the Lomita Boulevard and the posted speed limit is 40 MPH. There is a school zone between Main Street and Neptune Avenue, adjacent to Wilmington Middle School, where the speed limit is 25 MPH when children are present. Lomita Boulevard is a designated truck route.

- Sepulveda Boulevard – Sepulveda Boulevard runs east/west north of the project site, providing access to I-110. The Carson Circulation Element classifies it as a Major Highway. Near the project site, it provides two lanes in each direction and is divided by a raised median. Parking is generally allowed on both sides of Sepulveda Boulevard and the posted speed limit is 40 MPH. Sepulveda Boulevard is a designated truck route.

- 223rd Street – 223rd Street is a Major Highway and runs east/west north of the project site. It has two lanes in each direction and a two-way left-turn lane. Parking is generally allowed on both sides of the street and the posted speed limit is 40 MPH. 223rd Street is a designated truck route.

- Figueroa Street – Figueroa Street runs north/south through the project site west of the project. North of Lomita Boulevard, in Carson, it is classified as a Major Highway. South of Lomita Boulevard, in Los Angeles, it is classified as a Major Highway Class II. It provides two lanes in each direction and is generally divided by a raised median. Parking is allowed and the posted speed limit is 40 MPH. Figueroa Street is a designated truck route.

- Main Street – Main Street runs north/south just west of the project site. North of Lomita Boulevard, in Carson, it is classified as a Major Highway. South of Lomita Boulevard, in Los Angeles, it is named Wilmington Boulevard and is classified as a Secondary Highway. It generally provides two lanes in each direction, divided by raised medians north of the railroad tracks.

Parking is generally permitted on each side of the street. Main Street has a posted speed limit is 40 MPH and is a designated truck route.

- Avalon Boulevard – Avalon Boulevard runs north/south east of the project site. North of Lomita Boulevard, in Carson, it is classified as a Major Highway. South of Lomita Boulevard, in Los Angeles, it is classified as a Major Highway Class II. It provides two lanes in each direction and is divided by a raised median. Parking is permitted on both sides of Avalon Boulevard and the posted speed limit is 40 MPH. Avalon Boulevard is a designated truck route within the City of Carson; trucks are restricted along this roadway within the City of Los Angeles south of Carson.

- Wilmington Avenue – Wilmington Avenue runs north/south east of the project site, providing access to I-405. North of Lomita Boulevard it is classified as a Major Highway. It generally provides two travel lanes in each direction and is divided by a raised median north of the railroad crossing. On-street parking is generally allowed on Wilmington Avenue and the posted speed limit is 40 MPH. Wilmington Avenue is a designated truck route.

- Neptune Avenue – Neptune Avenue is a local street and runs north/south within the Former Kast Site. It provides one travel lane in each direction. On-street parking is allowed on Neptune Avenue. Neptune Avenue is not a permitted truck route, but the City of Carson Municipal Code permits trucks on non-truck route streets when it is part of direct ingress or egress to the final location.

- Lagoon Street – Lagoon Street is a short local street and runs north/south between Lomita Boulevard and 249th Street within the Former Kast Site. It provides one travel lane in each direction. On street parking is allowed on Lagoon Street. Lagoon Street is not a permitted truck route, but the City of Carson Municipal Code permits trucks on non-truck route streets when it is part of direct ingress or egress to the final location.

The City of Carson has identified arterial roadways that are allowed to be used as truck routes in their Municipal Code (CMC 3260.2 and 3260.3). Commercial vehicles exceeding a maximum gross weight of six thousand pounds are only permitted to use truck routes identified in by the City within the municipal code. Lomita Boulevard, Main Street, Sepulveda Boulevard, and Avalon Boulevard within the project study area are all listed in 3260.2 as designated truck routes.

The City of Los Angeles allows major and secondary arterials to be used as truck routes. The City's policy is to allow trucks to also travel in a "reasonable fashion" to and from a work site, including over collector and local streets. The City of Los Angeles Municipal Code (LAMC) prohibits the use of certain segments of specific streets by vehicles over 6,000 gross weight (LAMC Section 80.36.1).

EXISTING TRANSIT SERVICE

Public transit services operating in the project area are operated by the Los Angeles County Metropolitan Transportation Authority (Metro), Los Angeles County Department of Transportation Commuter Express (LADOT), City of Torrance, and City of Carson transit systems. Bus routes and their frequencies during the weekday morning (7:00 to 10:00 AM) and weekday afternoon (3:00 to 6:00 PM) peak periods are detailed below and shown in Figure 2. There is a bus stop on the north side of Lomita Boulevard at its intersection with Neptune Avenue; there are no bus stops at the intersection of Lomita Boulevard & Lagoon Street.

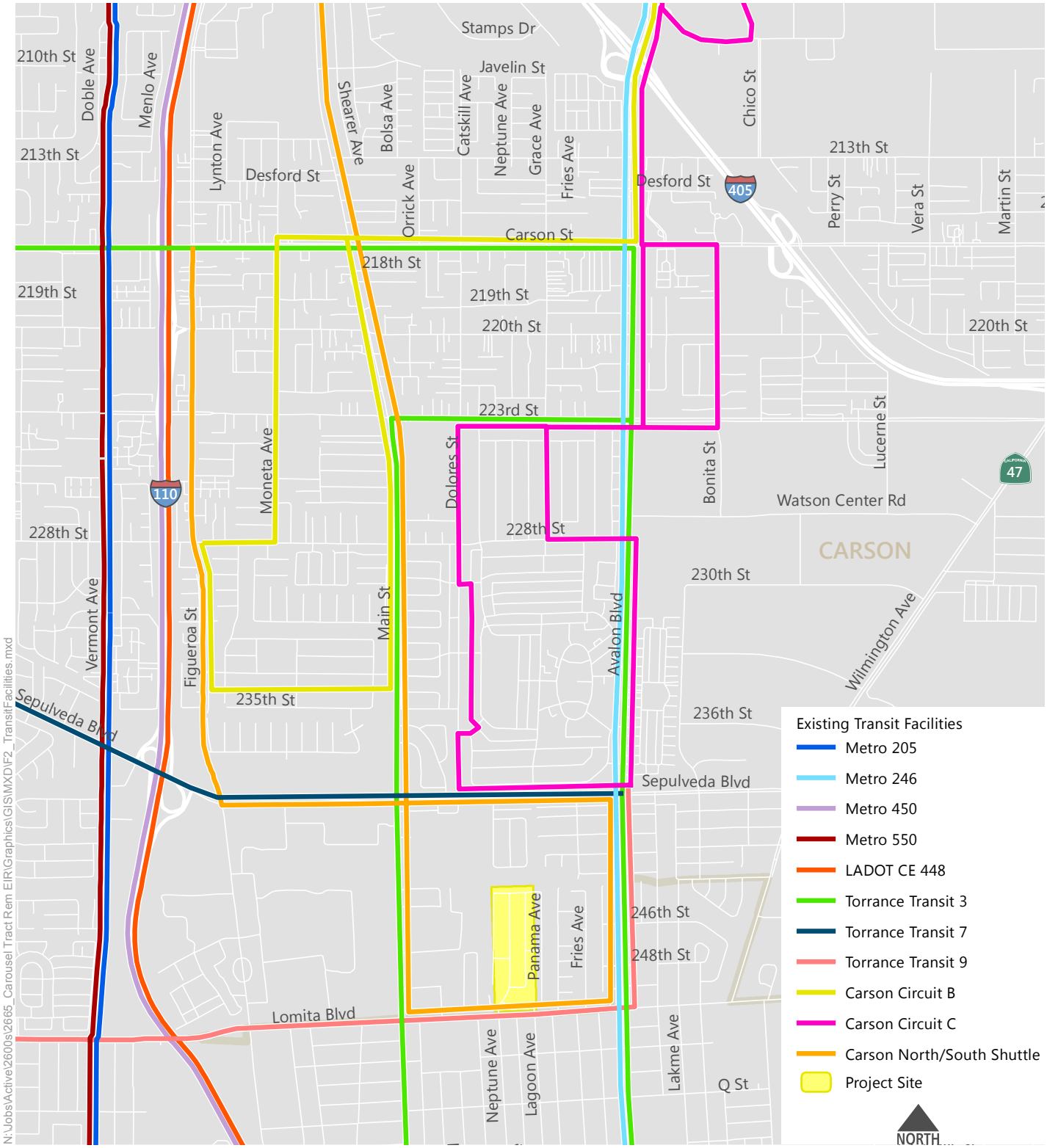


Figure 2

Existing Transit Facilities

- Metro Line 205 – Line 205 travels north/south from San Pedro to Willowbrook with stops in Lomita, Harbor City, Carson, Harbor Gateway, Rancho Dominguez, and Carson. Near the project site, Line 205 travels along Vermont Avenue. Line 205 has 30-minute headways during the weekday peak periods, and 50-minute headways on weekends.

- Metro Line 246 – Line 246 travels north/south from San Pedro to Gardena with stops in Wilmington and Carson. Near the project site, Line 246 travels along Avalon Boulevard. Line 246 has 20-25 minute headways during the weekday peak periods, and 40-minute headways on weekends.

- Metro Line 450 – Line 450 travels north/south from San Pedro to downtown Los Angeles along I-110 through Wilmington, Carson, Harbor Gateway, and Gardena. Near the project site, Line 450 travels along Sepulveda Boulevard. Line 45 has 20- to 30-minute headways during the weekday peak periods, 40-minute headways on Saturdays, and 60-minute headways on Sundays.

- Metro Line 550 – Line 550 travels north/south from San Pedro to downtown Los Angeles with stops in Harbor City, Harbor Gateway, and Wilmington. Near the project site, Line 550 travels along Vermont Avenue. Line 550 has 30- to 40-minute headways during the weekday peak periods, and 50-minute headways on weekends.

- LADOT Commuter Express Line 448 – Line 448 travels north/south from Rancho Palos Verdes to downtown Los Angeles, with stops in Lomita, Harbor City, and Wilmington. Near the project site, Line 448 travels along I-110. Line 448 operates on weekdays only, with 15-minute headways during the peak hours.

- Torrance Transit Line 3/Rapid 3 – Line 3 travels from the South Bay Galleria Transit Center in Torrance to the Metro Blue Line station in Long Beach. Near the project site, Line 3 travels along Avalon Boulevard. Line 3 has 20- to 25-minute headways during the weekday peak periods and Saturdays, and 30-minute headways on Sundays.

- Torrance Transit Line 7 – Line 7 travels between the cities of Redondo Beach and Carson. Near the project site, Line 7 travels along Sepulveda Boulevard. Line 7 has a 1-hour headway daily.

- Torrance Transit Line 9 – Line 9 travels from the Del Amo Mall in Torrance to Carson. Near the project site, Line 9 travels along Lomita Boulevard. Line 9 operates Monday through Saturday with approximately 50-minute headways. The bus stops nearest to the project site are at Lomita Boulevard & Main Street.

- Carson Circuit Route B – Route B is a circuitous route through the City of Carson, traveling along Carson Street, Figueroa Street, 234th Street, and Main Street. In the project study area, this line travels along Main Street. Route B operates at 40-minute headways daily.

- Carson Circuit Route C – Route C is a circuitous route through the City of Carson, traveling along Avalon Boulevard, 223rd Street, Dolores Street, Sepulveda Boulevard and Avalon Boulevard. In the study area, this line travels along Avalon Boulevard. Route C operates at 40-minute headways daily.

- Carson North/South Shuttle – The North/South Shuttle travels north and south through the City of Carson. In the study area, the shuttle travels along Main Street, Sepulveda Boulevard, and Lomita Boulevard. The North/South Shuttle operates twice during the morning peak hour and once during the afternoon peak hour on weekdays only. There is a stop at the intersection of Lomita Boulevard & Neptune Avenue.

EXISTING AND PLANNED BICYCLE FACILITIES

Biking and walking are non-motorized transportation modes that typically serve shorter trips than motorized travel modes. Class I bikeways are separate off-street paths (Bike Path), Class II bikeways are striped lanes within streets (Bike Lanes), and Class III bikeways are signed bicycle routes (Bike Routes). Existing and proposed facilities are shown in Figure 3 and listed below. Currently none of the planned bikeways are funded.

The following roadways have existing Class II bikeways:

- Avalon Boulevard between Lomita Boulevard and West L Street
- Dolores Street between Sepulveda Boulevard and 223rd Street

The following roadways have existing Class III bikeways:

- Figueroa Street between Lomita Boulevard and Anaheim Street
- Dolores Street between 223rd Street and 213th Street

The Carson Bicycle Master Plan proposes the following bicycle facilities along study roadways:

- Class I facility along Metro rail line and LADWP Public Utility Corridor
- Class II facility along 223rd Street between I-110 and Alameda Street
- Class II facility along Sepulveda Boulevard between I-110 and the Los Angeles City Limit
- Class II facility along Lomita Boulevard between I-110 and the Los Angeles City Limit
- Class II facility along Figueroa Street between Alondra Boulevard and Lomita Boulevard
- Class II facility along Main Street between Alondra Boulevard and Lomita Boulevard
- Class II facility along Avalon Boulevard between Alondra Boulevard and BNSF Rail Crossing
- Class II facility along Wilmington Avenue between Del Amo Avenue and 220th Street
- Class II facility along Wilmington Avenue between Sepulveda Boulevard and Lomita Boulevard
- Class III facility along Wilmington Avenue between 220th Street and 223rd Street

EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

The following sections describe the peak hour traffic volumes, the methodology used to analyze the intersection operating conditions, and the resulting levels of service (LOS) for the selected study intersections under existing conditions. Lane configurations at the study intersections are illustrated in Figure 4 and subsequent volume figures.

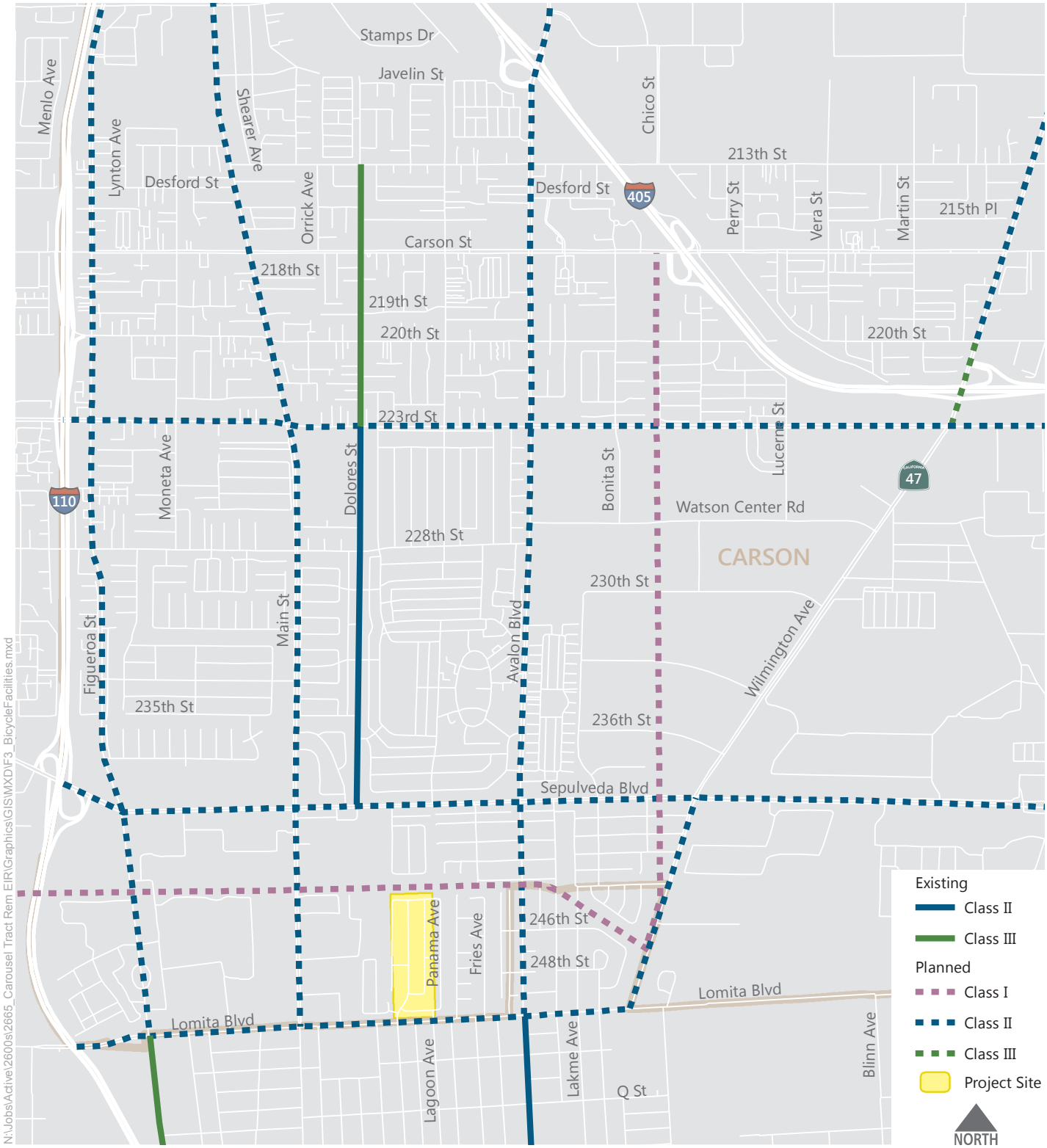
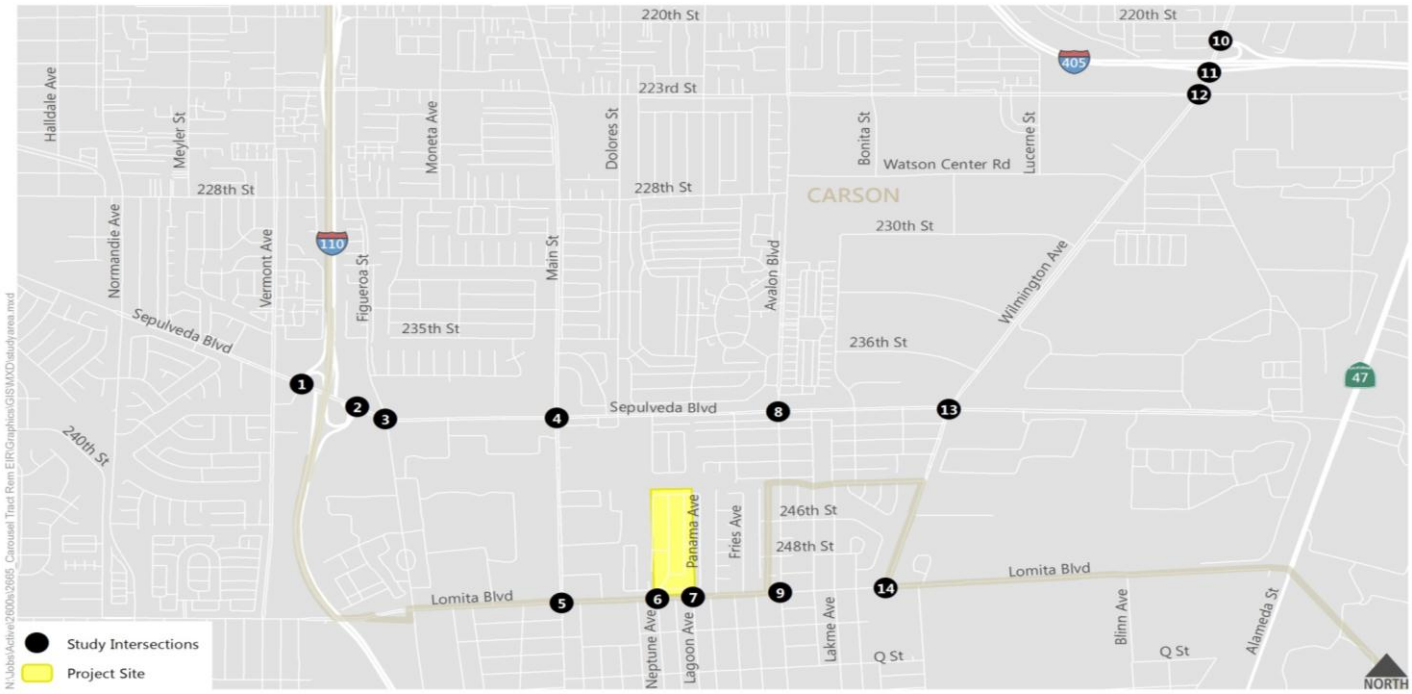


Figure 3

Existing and Planned Bicycle Facilities



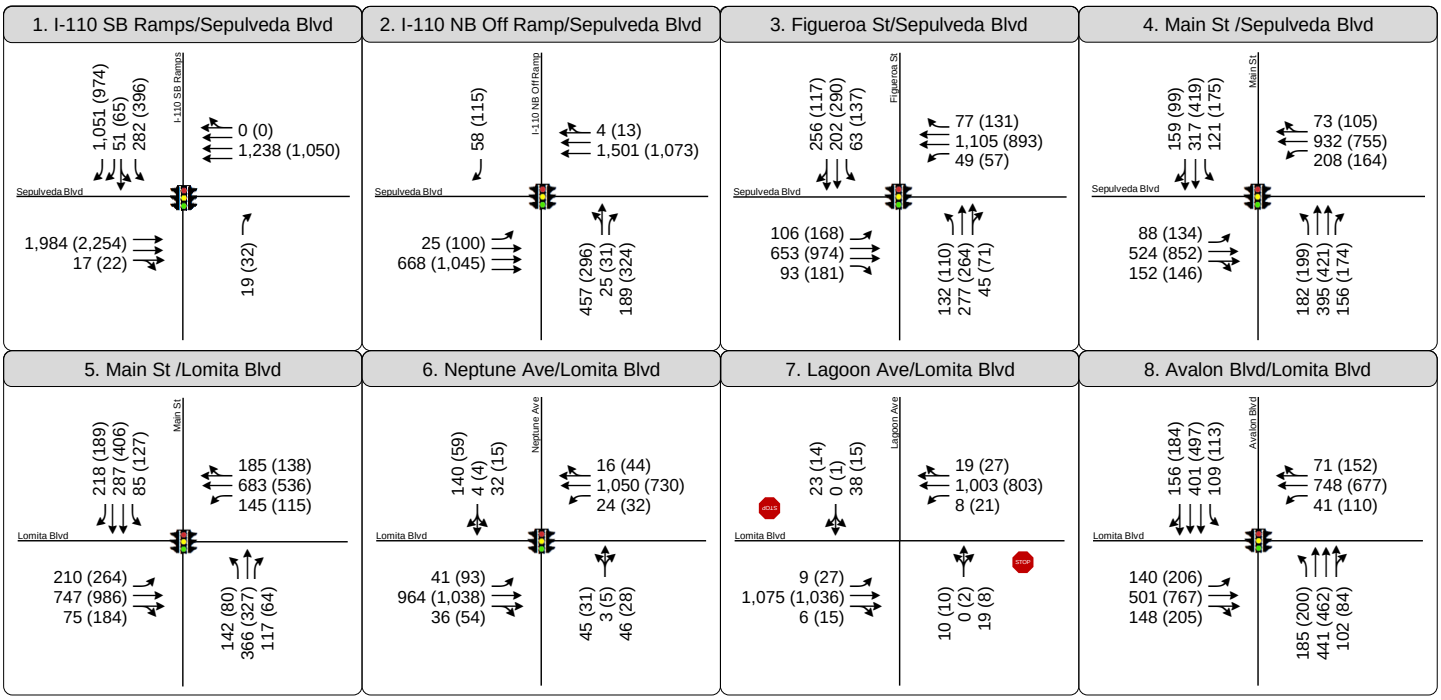


Figure 4

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

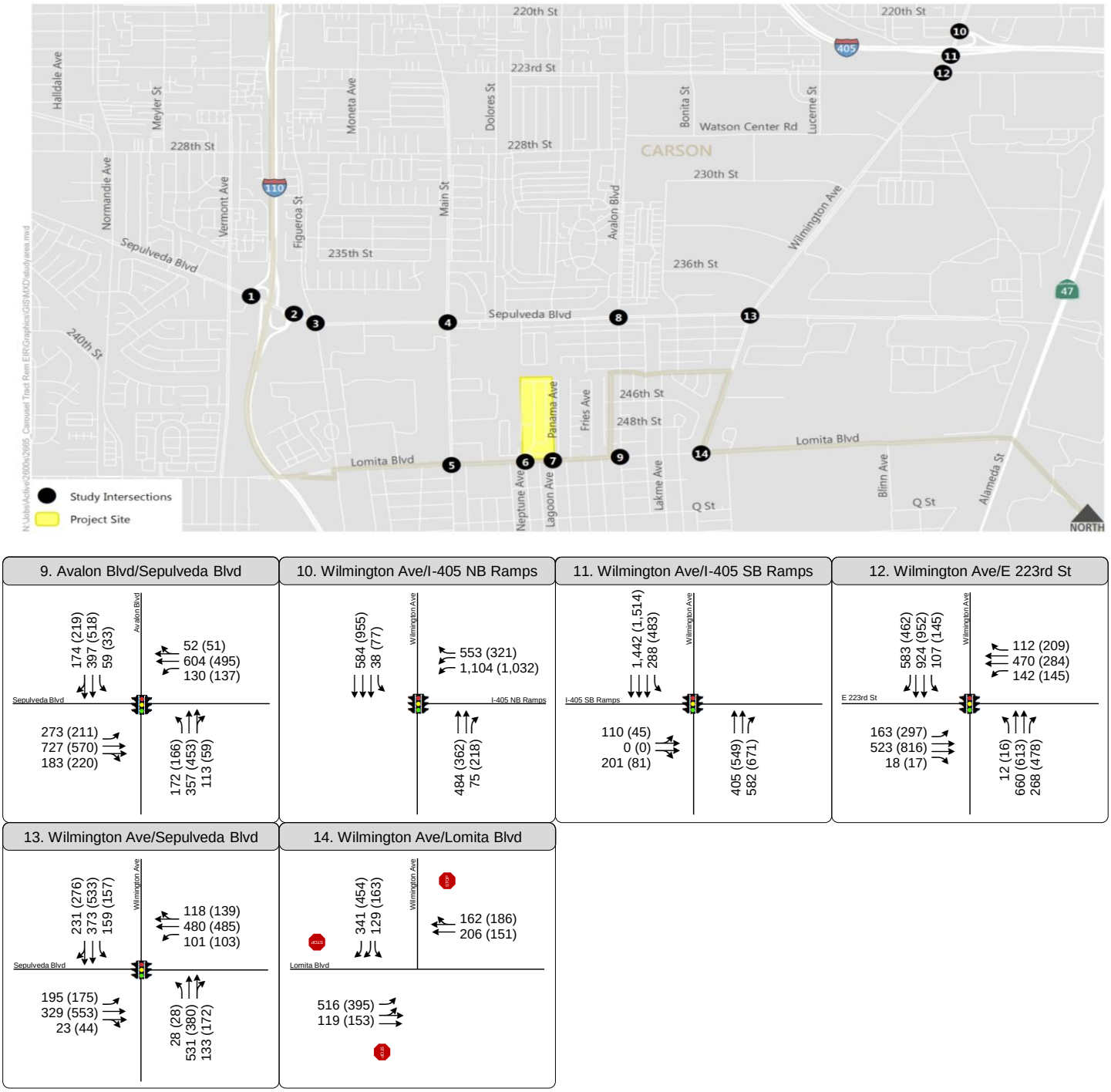


Figure 4

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

Existing Traffic Volumes

Traffic volumes at the 14 study intersections were collected during the morning and afternoon peak periods (from 7:00 to 9:00 AM and 4:00 to 6:00 PM, respectively) in April 2014 and are included in Appendix A. Vehicle classifications were included in the baseline traffic count data. Existing peak hour traffic volumes with passenger-car equivalent (PCE) adjustments are illustrated in Figure 4. Consistent with previous studies of projects in this area, PCE factors of 1.0, 1.5, and 2 were used for passenger vehicles, bobtail trucks and buses, and heavy trucks, respectively, to account for the influence of heavy vehicles in the traffic stream. The *Highway Capacity Manual*, 2000 Edition (HCM 2000) identifies a 2.0 passenger-car unit equivalent for heavy trucks to account for the additional space occupied by these vehicles and the difference in operating capabilities compared with passenger cars.

Level of Service Methodology

To develop an understanding of the existing 2014 traffic conditions at the study intersections, a level of service (LOS) analysis was conducted using the traffic volumes and intersection survey data. LOS is a qualitative measure used to describe the condition of traffic flow, ranging from excellent conditions at LOS A to overloaded conditions at LOS F. Based on the City of Carson's guidelines, the Intersection Capacity Utilization (ICU) methodology was used to determine the intersection volume-to-capacity (V/C) ratio and corresponding LOS for the 12 signalized study intersections. The City of Carson utilizes the 2000 Highway Capacity Manual (HCM 2000) methodology for unsignalized intersections and, for those which are found to operate at LOS E or F, the ICU methodology is also used in order to obtain a V/C ratio for impact assessment purposes.

The ranges of V/C ratios or delay values and corresponding LOS for signalized and unsignalized intersections are included in Tables 1 and 2.

Existing Intersection Levels of Service

A detailed assessment of the existing operating conditions at the 14 intersections, including the V/C ratio and corresponding LOS at each of the study intersections during the morning and afternoon peak hours is summarized in Table 3, and delay for intersections 7 and 14. All 14 analyzed intersections are currently operating at acceptable levels of service (LOS D or better) during both peak hours under ICU methodology. The unsignalized intersections, however, operate at LOS E or F using HCM methodology, meaning that controlled approaches have a higher delay than considered satisfactory. Detailed LOS calculations are provided in Appendix B.

TABLE 1
LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS
ICU METHODOLOGY

Level of Service	Volume/Capacity Ratio	Definition
A	0.000 - 0.600	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	>0.600 - 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat what restricted within groups of vehicles.
C	>0.700 - 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	>0.800 - 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	>0.900 - 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths

Source: *Highway Capacity Manual,* Special Report 209, Transportation Research Board, 1994.

TABLE 2
LEVEL OF SERVICE DEFINITIONS FOR STOP-CONTROLLED INTERSECTIONS

Level of Service	Average Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Source: *Highway Capacity Manual,* Transportation Research Board, 2000.

TABLE 3
EXISTING CONDITIONS INTERSECTION LEVELS OF SERVICE

NO.	INTERSECTION	PEAK HOUR	EXISTING	
			V/C or Delay	LOS
1	I-110 SB Off-Ramp &	AM	0.795	C
	Sepulveda Blvd	PM	0.830	D
2	I-110 NB Off-Ramp &	AM	0.717	C
	Sepulveda Blvd	PM	0.615	B
3	Figueroa St &	AM	0.704	C
	Sepulveda Blvd	PM	0.630	B
4	Main St &	AM	0.682	B
	Sepulveda Blvd	PM	0.751	C
5	Main St &	AM	0.734	C
	Lomita Blvd	PM	0.771	C
6	Neptune Ave &	AM	0.547	A
	Lomita Blvd	PM	0.479	A
7	Lagoon Ave &	AM	0.751	C
		PM	0.662	B
	Lomita Blvd*	AM	80.0s	F
		PM	46.0s	E
8	Avalon Blvd &	AM	0.684	B
	Sepulveda Blvd	PM	0.776	C
9	Avalon Blvd &	AM	0.653	B
	Lomita Blvd	PM	0.641	B
10	Wilmington Ave &	AM	0.656	B
	I-405 NB Ramps	PM	0.652	B
11	Wilmington Ave &	AM	0.720	C
	I-405 SB Ramps	PM	0.822	D
12	Wilmington Ave &	AM	0.623	B
	E 223rd St	PM	0.740	C
13	Wilmington Ave &	AM	0.666	B
	Sepulveda Blvd	PM	0.625	B
14	Wilmington Ave &	AM	0.448	A
		PM	0.422	A
	Lomita Blvd *	AM	50.6s	F
		PM	54.8s	F

Note:

* Unsignalized intersection operating at LOS E or F under HCM conditions; Analyzed under ICU per City of Carson criteria. "s" = seconds of delay/vehicle on the most constrained approach.

s Seconds of delay on the most constrained approach

3. FUTURE TRAFFIC PROJECTIONS

Potential project impacts were assessed against existing conditions as well as cumulative conditions to evaluate the potential impacts of the proposed project on the surrounding street system. Under cumulative conditions it was necessary to develop estimates of future traffic conditions in the study area both with and without the proposed project's traffic. First, estimates of traffic growth were developed for the study area to forecast future conditions without the project. These forecasts included traffic increases as a result of both regional ambient traffic growth and traffic generated by specific developments in the vicinity of the project (related projects). These projected traffic volumes, the cumulative base conditions, represent the future study year conditions without the proposed project. The traffic generated by the proposed project was then estimated and assigned to the surrounding street system. The project traffic was added to the cumulative base to form the cumulative plus project traffic conditions, which were analyzed to determine the incremental traffic impacts attributable to the project itself.

The assumptions and analysis methodology used to develop each of the future traffic scenarios discussed above are described in more detail in the following sections.

PROJECT TRAFFIC PROJECTIONS

The traffic projections for the proposed project were developed using three steps: estimating the trip generation of the project, determining trip distribution, and assigning the project traffic to the roadway system based on assumptions made about excavation methods and routes.

Project and Expedited Option

Two scenarios were developed and analyzed to provide traffic projections during remediation. The Project scenario assumes a 5.1 to 5.6 year remediation period, while the Expedited Option scenario allows for an expedited schedule of 3.0 to 3.5 years with more intense activity during the remediation period. The Project and Expedited Option are described below:

- Proposed Project – An average of 66 one-way truck trips, and maximum of one-way 99 truck trips, would travel to the site daily. Trucks would arrive no earlier than 8:00 AM and leave no later than 4:00 PM.
    - After excavation, approximately 24 one-way truck trips per day would utilize the site for street grinding and paving.
    - Approximately 32 workers would work full days at the project site, arriving as early as 7:00 AM and departing after trucks leave.
        - 16 workers would park on-site using a personal automobile.
        - The remaining 16 workers would park off-site and be shuttled to the site.
    - Up to nine visitors would be on site daily.

- Expedited Option – An average of one-way 118 truck trips, and maximum of 151 one-way truck trips, would travel to the site daily. Trucks would arrive no earlier than 8:00 AM and leave no later than 4:00 PM.

- After excavation, approximately 24 one-way truck trips per day would utilize the site for street grinding and paving.
- Approximately 47 workers would work full days at the project site
  - 24 workers would park on-site using a personal automobile.
  - The remaining 23 workers would park off-site and be shuttled to the site.
- Up to nine visitors would be on site daily.

Project Traffic Generation

Project Scenario

Based on information provided, this analysis assumed that a maximum of approximately 32 workers would be working on-site full-time. Sixteen workers would travel from home to site, and make up to 10 additional round trips daily to various off-site locations. The remaining 16 employees would park at an off-site location and travel to the project site in three shuttle vans, making one round-trip each in the morning and evening peak hours. Workers would arrive as early as 7:00 AM and depart after 4:00 PM. No specific location for off-site worker parking has been identified at this time, but this analysis assumes that it will be located within five miles of the project site.

An average of 66 one-way truck trips would occur at site daily, for a total of 132 trip ends. A maximum of 99 one-way truck trips (198 trip ends) would occur at the site daily. Trucks would arrive no earlier than 8:00 AM and leave no later than 4:00 PM. To provide a realistic yet conservative assumption, the peak activity was analyzed in developing trip generation estimates. Trucks were factored into the analysis as 2.0 passenger car equivalents (PCE) since trucks create a greater impact on traffic operations than automobiles.[1] The estimated daily truck trips were assumed to occur fairly evenly over the workday, with a slight inbound peak during the AM peak hour and a slight outbound peak during the PM peak hour. Due to the nature of activity and hourly limitations, it is assumed that no trucks arriving during the AM peak hour would depart within the same hour. Likewise, no trucks would arrive during the PM peak hour.

An average of nine visitors from the RWQCB or other agencies are assumed to be on-site each day. One of these trips is assumed to occur during each of the peak hours. As shown in Table 4A, it is assumed that the proposed project would generate up to approximately 478 daily PCE trips, with 61 trips during both the AM and PM peak hours. During the AM peak hour the project would generate 58 inbound trips and 3 outbound trips; during the PM peak hour the project would generate 3 inbound trips and 58 outbound trips. This provides a conservatively high estimate for this analysis, as the project truck traffic and employee traffic are not expected to occur during the same hour.

Please note that it is unlikely that employees and trucks would be arriving at the site within the same one-hour during either peak period. However, to maintain a conservative assumption, all employee trips arriving during the AM in addition to the first group of truck trips arriving to the site, were analyzed for the AM peak, with the converse holding true for the PM.

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[1] A PCE factor of 2.0 has been noted as appropriate per the *Highway Capacity Manual,* NCFRP 31 and other local and national sources related to traffic estimation.

TABLE 4A
CAROUSEL TRACT REMEDIATION TRIP GENERATION ESTIMATES

Land Use	Size	Trip Rate							Trip Estimate						
			AM Peak Hour			PM Peak Hour			Weekday	AM Peak Hour Trips			PM Peak Hour		
		Weekday Daily	Rate	% In	% Out	Rate	% In	% Out	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT															
Delivery Trucks [a]	99 trucks	4.00	0.38	100%	0%	0.38	0%	100%	396	38	0	38	0	38	38
Employees - Parking On-Site [b]	16 employees	3.25	1.00	100%	0%	1.00	0%	100%	52	16	0	16	0	16	16
Employees - Parking Off-Site [c]	16 employees	0.75	0.38	50%	50%	0.38	50%	50%	12	3	3	6	3	3	6
Visitors [d]	9 visitors	2.00	0.10	50%	50%	0.10	50%	50%	18	1	0	1	0	1	1
TOTAL									**478**	**58**	**3**	**61**	**3**	**58**	**61**

Notes:

[a] Trip Generation Rates and Estimates reported in Passenger Car Equivalents (PCE); PCE rate of 1 truck = 2 PCEs.

[b] Per Project Description, 16 employees to be parking on-site; trip rate includes trips to various off-site locations not during the peak hour

[c] Per Project Description, 16 employees would arrive using vans. 3 round-trip vans in AM, 3 round-trip vans in PM. Vans would arrive full/depart empty in AM; arrive empty/depart full in PM.

[d] Per Project Description, up to 9 visitors to site daily.

Expedited Option

Based on information provided, the Expedited Option assumed that a maximum of approximately 47 workers would be working on-site full-time. Twenty-four workers would travel from home to the site, and make up to 20 additional round trips daily to various off-site locations. The remaining 23 employees would park at an off-site location and travel to the project site on shuttle vans. The project scenario assumes six round-trips by van in the morning, and six in the evening.

An average of one-way 118 truck trips would occur daily, for a total of 236 trip ends. Trucks would arrive no earlier than 8:00 AM and leave no later than 4:00 PM. A maximum of 151 one-way truck trips (302 trip ends) would occur daily. To provide a realistic yet conservative assumption, the peak activity was analyzed in developing trip generation estimates. As with the analysis of the Proposed Project, in the analysis of Expedited Option trucks were factored into the analysis as 2.0 passenger car equivalents (PCE). The estimated daily truck trips were assumed to occur fairly evenly over the workday, with a slight inbound peak during the AM peak hour and a slight outbound peak during the PM peak hour. Due to the nature of activity and hourly limitations, it is assumed that no trucks arriving during the AM peak hour would depart within the same hour. Likewise, no trucks would arrive during the PM peak hour.

As with the analysis of the Proposed Project, in the analysis of Expedited Option, an average of nine visitors were assumed to come to the site each day, with one occurring in each peak hour.

As shown in Table 4B, it is estimated that the Expedited Option would generate up to approximately 790 daily PCE trips, with 94 trips during both the AM and PM peak hours. During the AM peak hour the project would generate 88 inbound trips and 6 outbound trips; during the PM peak hour the project would generate 6 inbound trips and 88 outbound trips. This provides a conservatively high estimate, as the project's truck traffic and employee traffic will not occur during the same hour.

Please note that it is unlikely that employees and trucks would be arriving at the site within the same one-hour during either peak period. However, to maintain a conservative assumption, all employee trips arriving during the AM in addition to the first group of truck trips arriving to the site, were analyzed for the AM peak, with the converse holding true for the PM.

Project Traffic Distribution and Traffic Assignment

Truck Traffic

Trucks will be coming to the site via I-110 from points north of the project site. To reach the site, trucks will take the I-110 southbound off-ramp at Sepulveda Boulevard and travel east, turn right onto Wilmington Avenue and travel south, turn right onto Lomita Boulevard and travel west, and turn right onto either Neptune Avenue or Lagoon Avenue to enter the project site. Trucks will exit the site by turning right from either Neptune Avenue or Lagoon Avenue onto Lomita Boulevard and traveling west, turning right onto Main Street and traveling north, turn left onto Sepulveda Boulevard and traveling west, and turning right onto the I-110 northbound on-ramp. Figure 5 illustrates the inbound and outbound truck routes planned for use.

Worker Traffic

The distribution pattern of workers parking on-site would depend on the home location of each worker. Based on typical travel patterns in the area, the generalized distribution was used.

- 35% to and from the south via the I-405 freeway
- 25% to and from the north via the I-405 freeway
- 10% to and from the south via the I-110 freeway
- 20% to and from the north via the I-110 freeway
- 10% to and from the east via Sepulveda Boulevard

The off-site location for workers traveling to the site via shuttle van is currently unknown but is assumed to be within five miles. Based on existing land use and the nearby roadway network, it is assumed that the off-site location would be north of the site, with access to the site via I-110. As such, and to maintain a conservative analysis, it has been assumed that workers traveling by shuttle van would use the same routes as the truck trips.

Visitor Traffic

This study includes an estimate of nine visitors per day; six would arrive from points north using the I-110 freeway. The remaining three visitors would likely access the site using surface streets.

The estimated project only traffic volumes for the combined truck, worker, and visitor trips are illustrated in Figure 6A. The estimated expedited option only traffic volumes are illustrated in Figure 6B.

TABLE 4B
CAROUSEL TRACT REMEDIATION TRIP GENERATION ESTIMATES - EXPEDITED PROJECT OPTION

Land Use	Size	Trip Rate							Trip Estimate						
			AM Peak Hour			PM Peak Hour			Weekday	AM Peak Hour Trips			PM Peak Hour		
		Weekday Daily	Rate	% In	% Out	Rate	% In	% Out	Daily	In	Out	Total	In	Out	Total
PROPOSED PROJECT															
Delivery Trucks [a]	151 trucks	4.00	0.38	100%	0%	0.38	0%	100%	604	57	0	57	0	57	57
Employees - Parking On-Site [b]	24 employees	6.00	1.00	100%	0%	1.00	0%	100%	144	24	0	24	0	24	24
Employees - Parking Off-Site [c]	23 employees	1.04	0.52	50%	50%	0.52	50%	50%	24	6	6	12	6	6	12
Visitors [d]	9 visitors	2.00	0.10	50%	50%	0.10	50%	50%	18	1	0	1	0	1	1
TOTAL									**790**	**88**	**6**	**94**	**6**	**88**	**94**

Notes:

[a] Trip Generation Rates and Estimates reported in Passenger Car Equivalents (PCE); PCE rate of 1 truck = 2 PCEs.

[b] Per Project Description, 24 employees to be parking on-site; trip rate includes trips to various off-site locations not during the peak hour

[c] Per Project Description, 23 employees would arrive using vans. 6 round-trip vans in AM, 6 round-trip vans in PM. Vans would arrive full/depart empty in AM; arrive empty/depart full in PM.

[d] Per Project Description, up to 9 visitors to site daily.

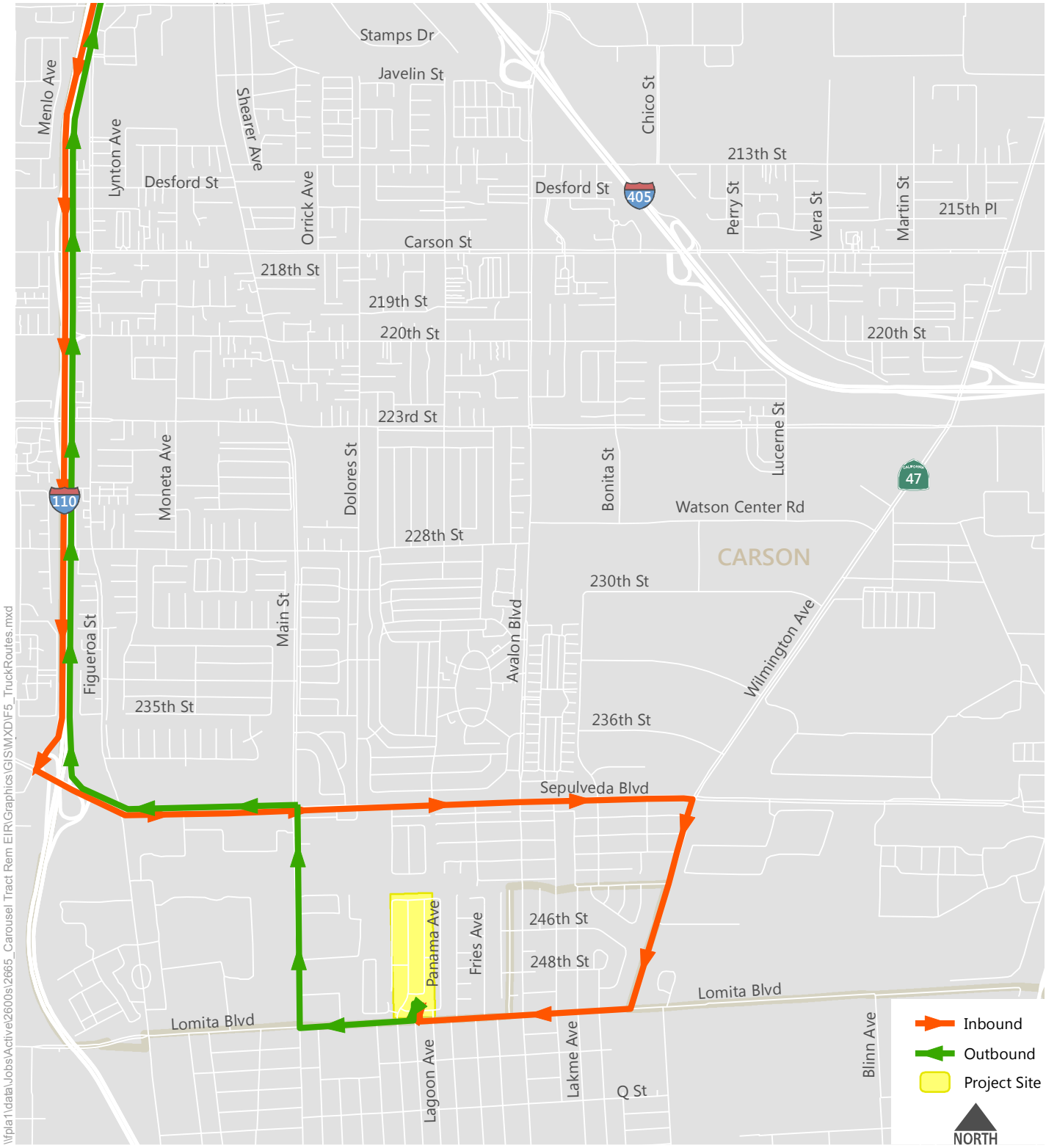
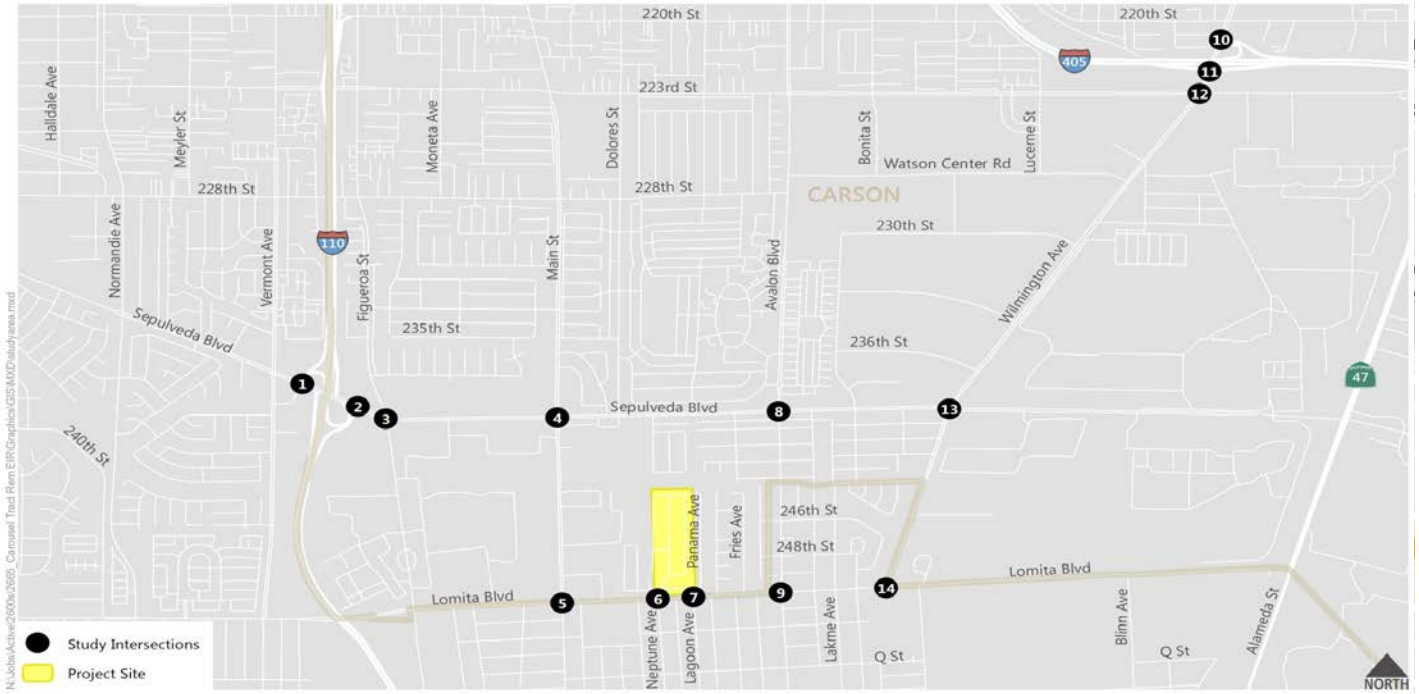


Figure 5

Truck Haul Routes



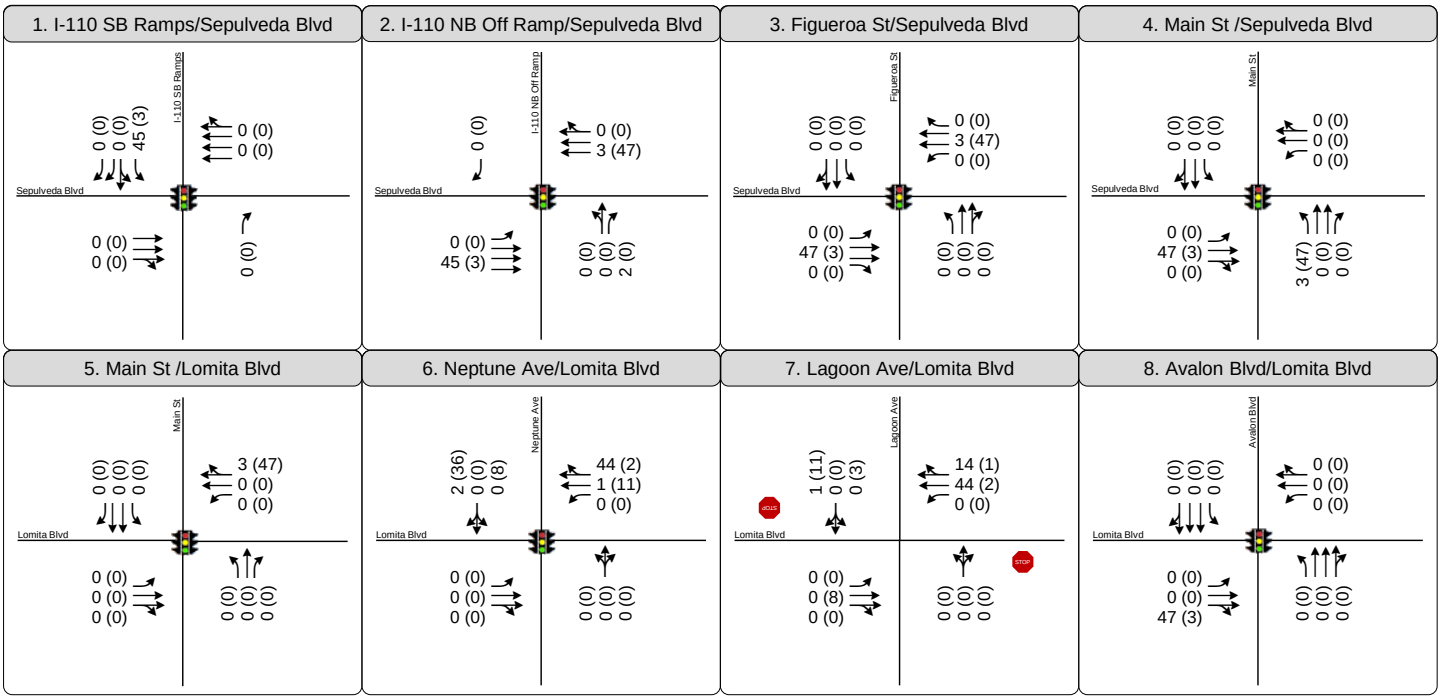
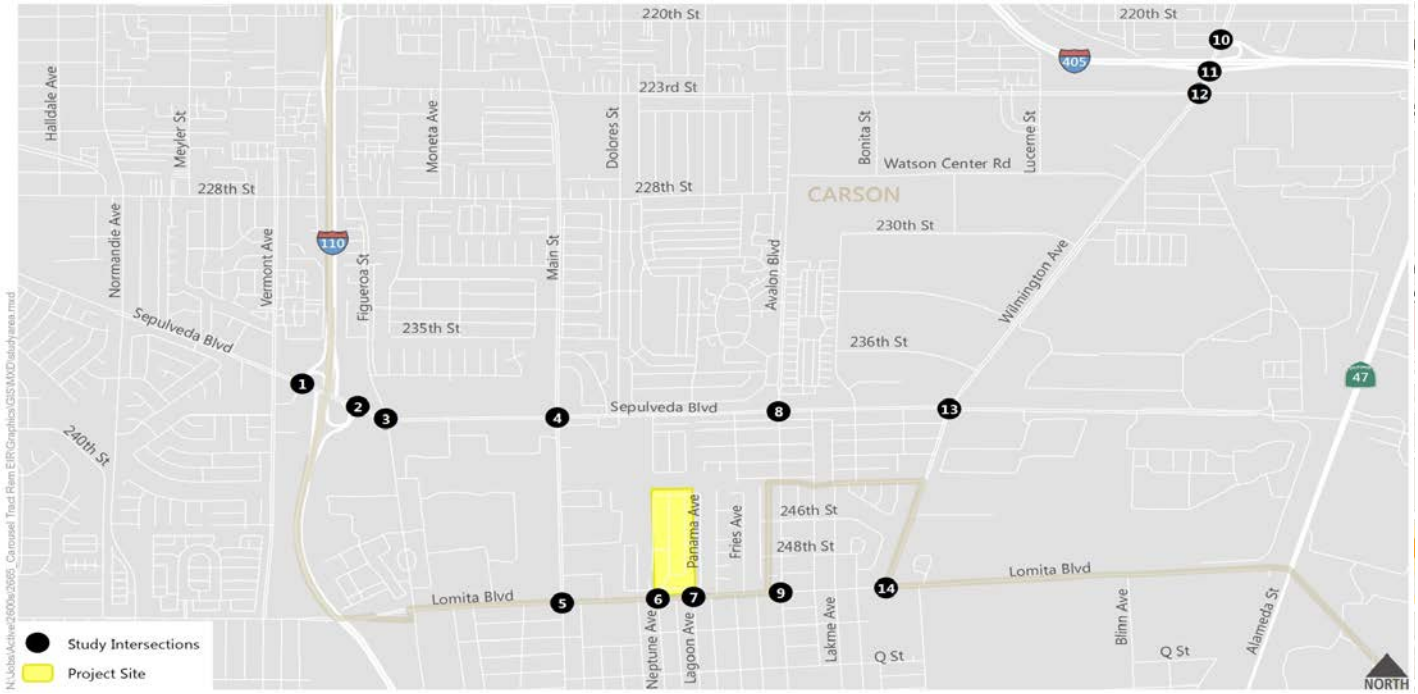


Figure 6A

Peak Hour Traffic Volumes and Lane Configurations - Project Only



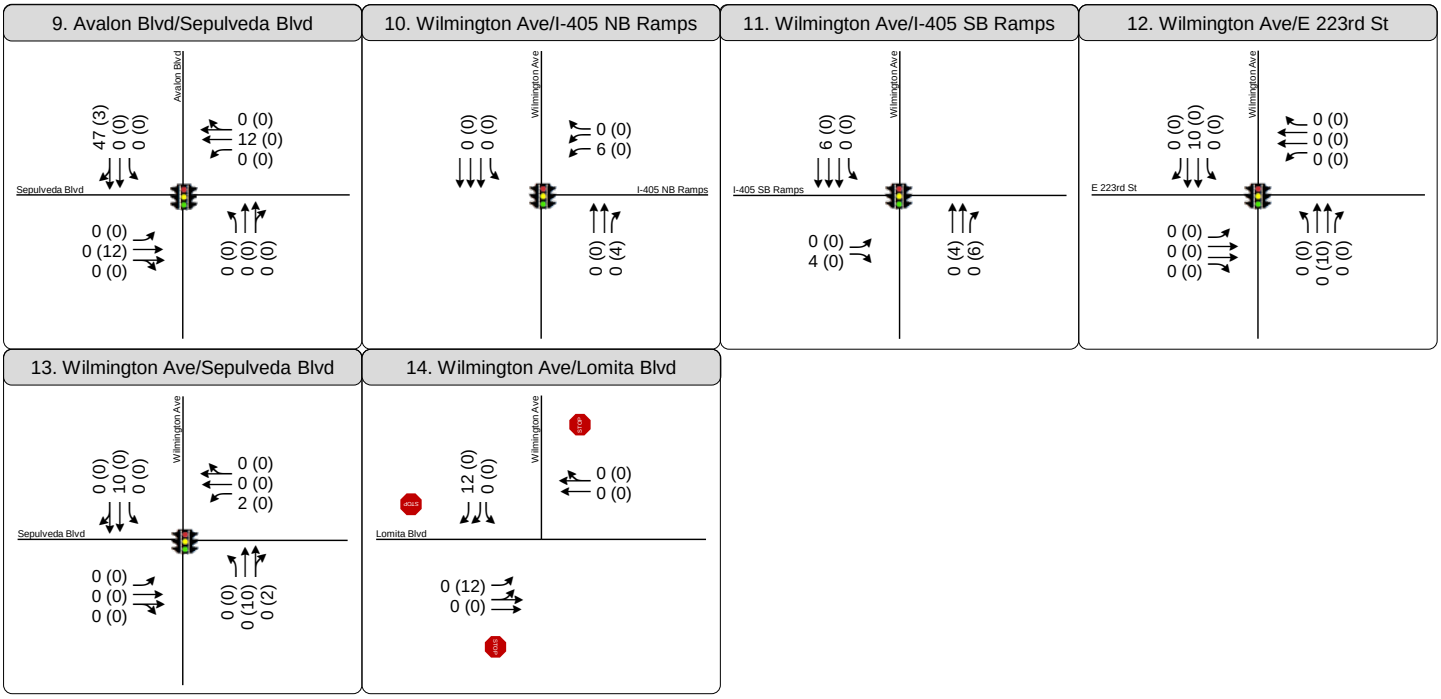
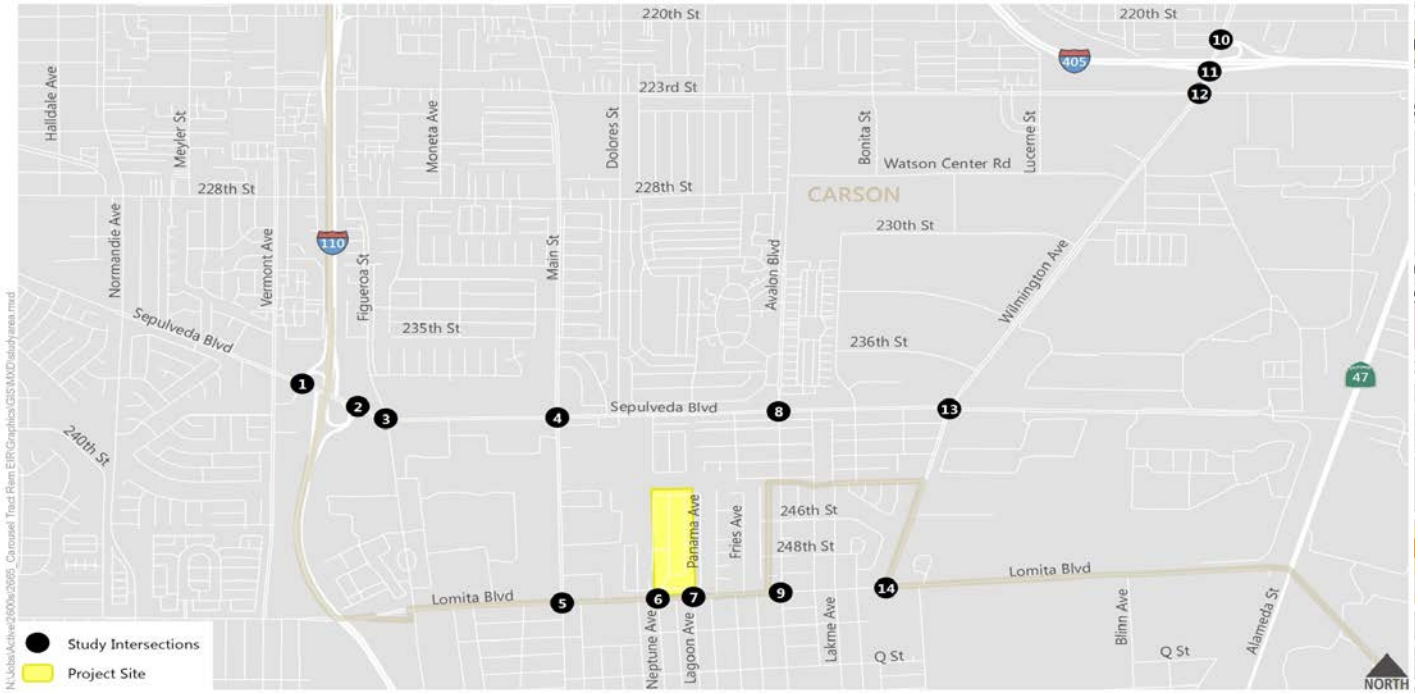


Figure 6A

Peak Hour Traffic Volumes and Lane Configurations - Project Only



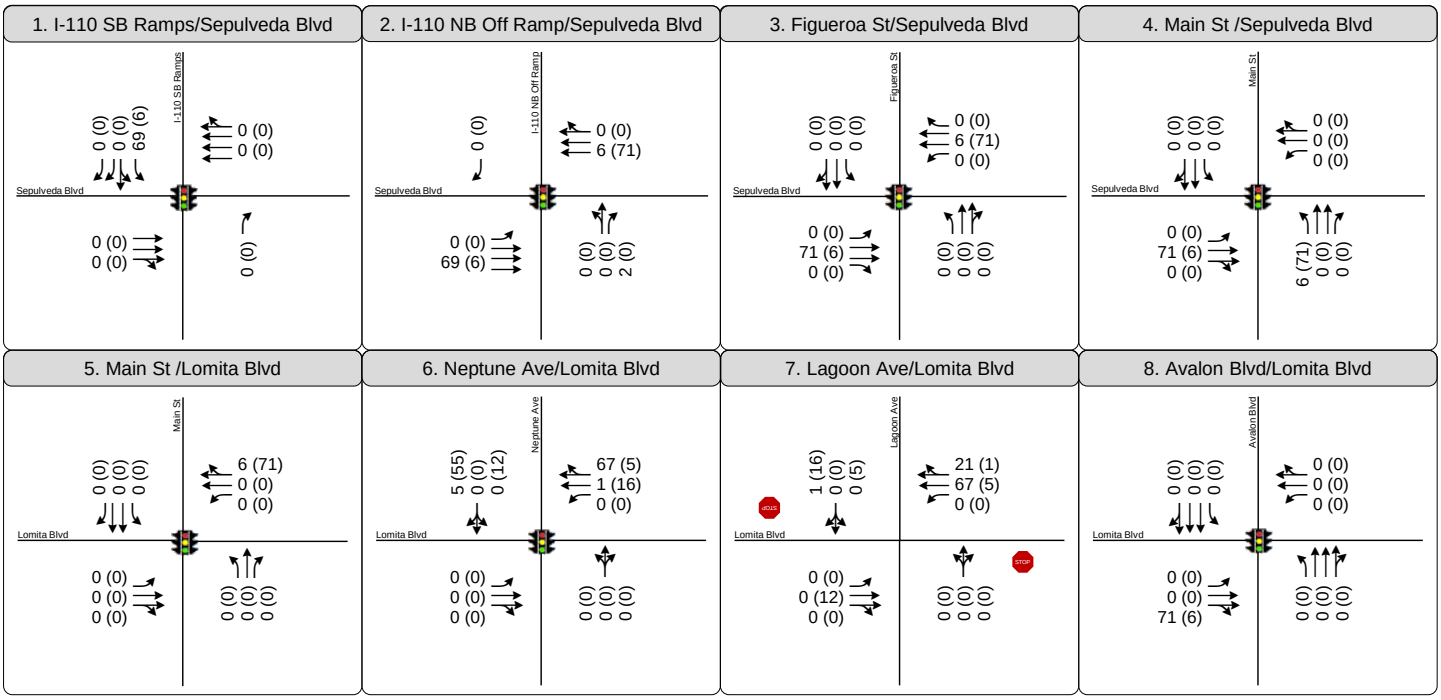
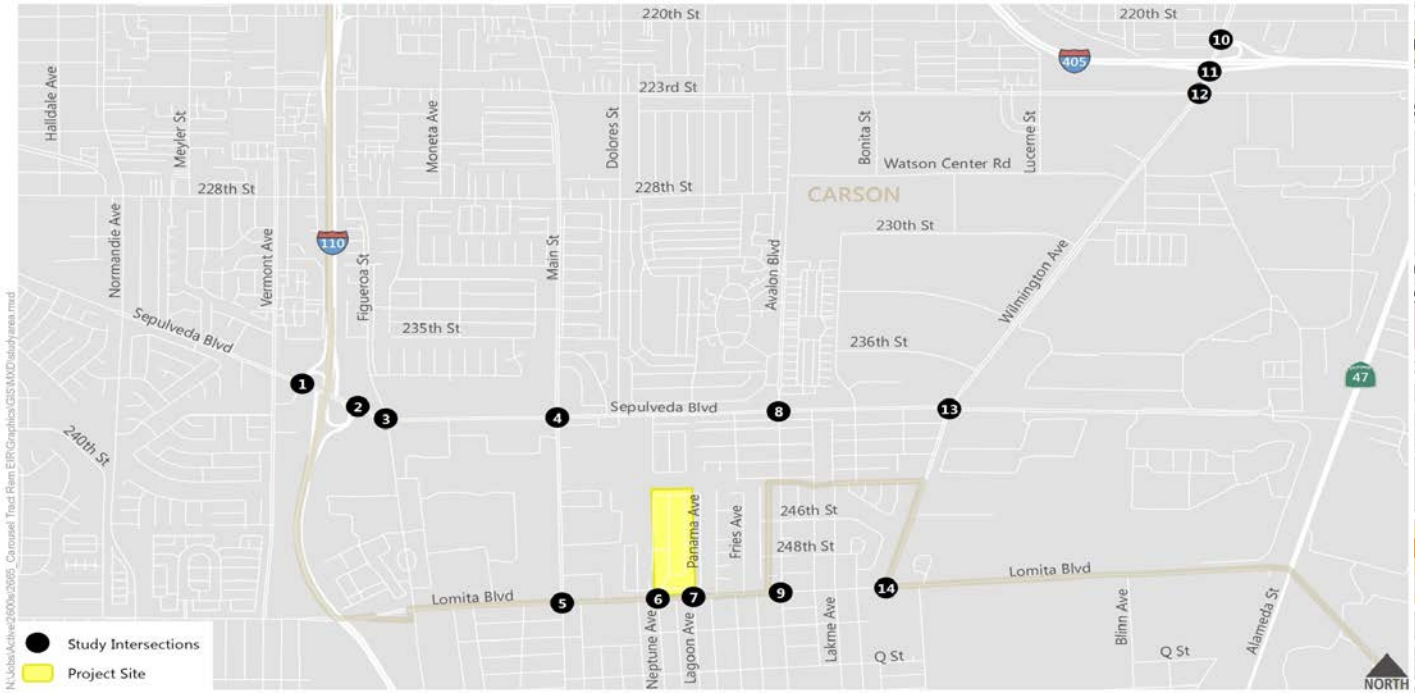


Figure 6B

Peak Hour Traffic Volumes and Lane Configurations - Expedited Option Volumes



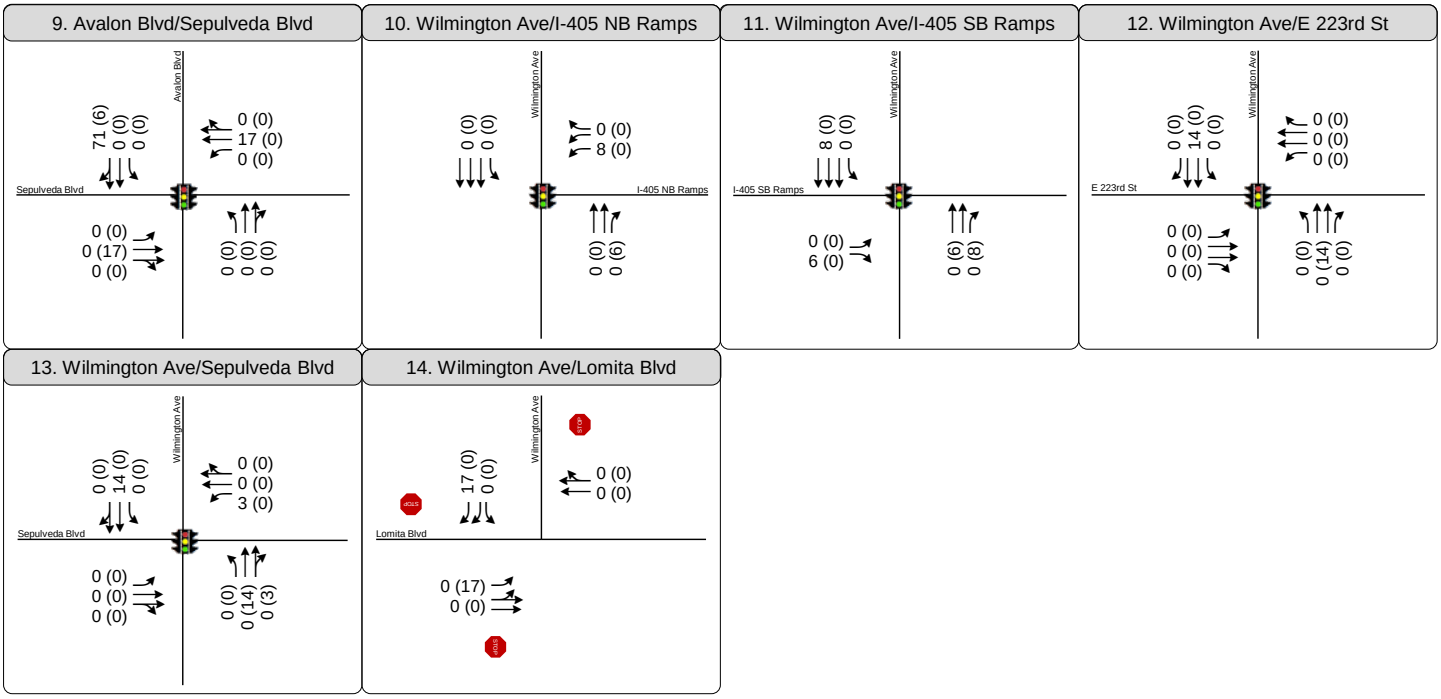


Figure 6B

Peak Hour Traffic Volumes and Lane Configurations - Expedited Option Volumes

The City of Carson's Municipal Code identifies arterial roadways that are allowed to be used as truck routes (CMC 3260.2 and 3260.3). Commercial vehicles exceeding a gross vehicle weight of 6,000 pounds are only permitted to use truck routes identified by the City. Lomita Boulevard, Main Street, Sepulveda Boulevard, and Wilmington Avenue within the project study area are each designated truck routes.

The City of Los Angeles allows major and secondary arterials to be used as truck routes. The City's policy is to allow trucks to also travel in a "reasonable fashion" to and from a work site, including over collector and local streets. The City of Los Angeles Municipal Code (LAMC) prohibits the use of certain segments of specific streets by vehicles over 6,000 gross vehicle weight (LAMC Section 80.36.1). This includes Avalon Boulevard south of the City of Carson city limits.

EXISTING PLUS PROJECT TRAFFIC PROJECTIONS

The proposed project traffic volumes shown in Figure 6A were added to the existing traffic volumes to develop the existing plus project traffic forecasts for the project scenario. The resulting projected existing plus project peak hour traffic volumes for a typical weekday AM and PM peak hour are shown on Figure 7A.

EXISTING PLUS EXPEDITED OPTION TRAFFIC PROJECTIONS

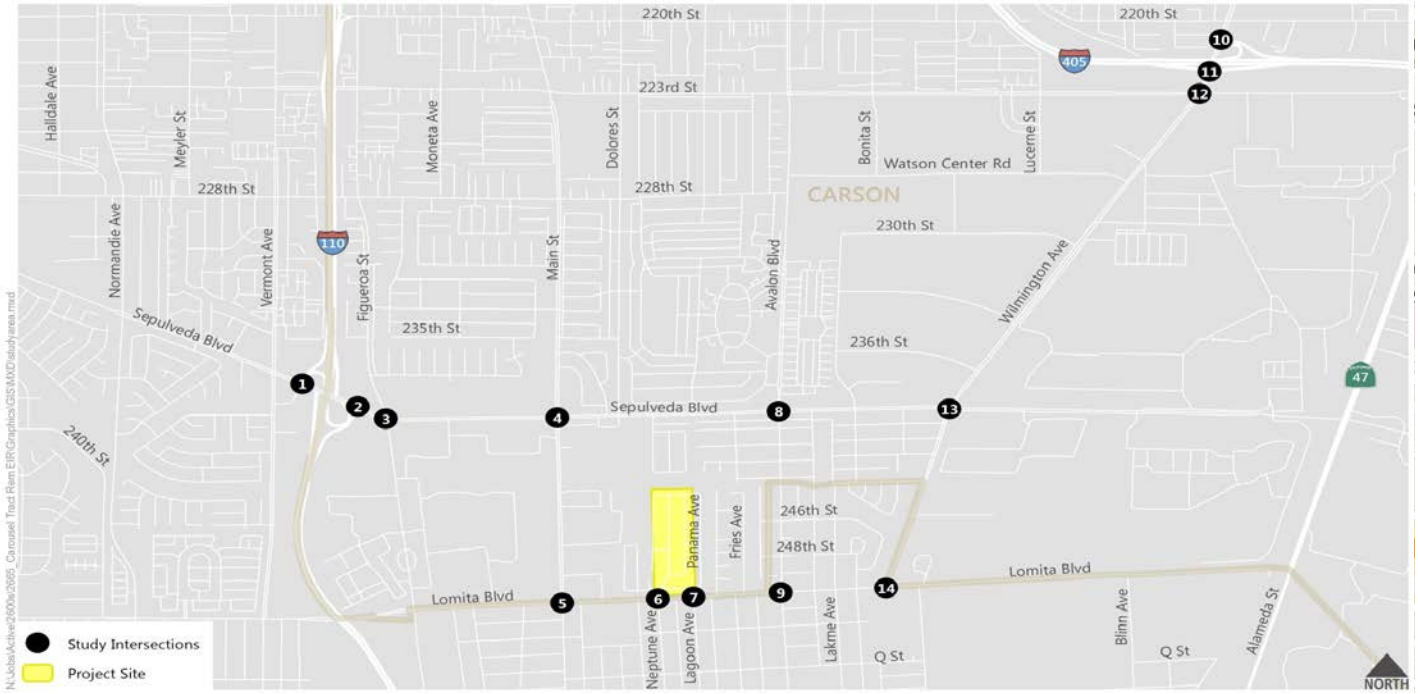
The proposed Expedited Option traffic volumes shown in Figure 6B were added to the existing traffic volumes to develop the Existing plus Expedited Option traffic forecasts. The resulting projected Existing plus Expedited Option peak hour traffic volumes for a typical weekday AM and PM peak hour are shown in Figure 7B.

CUMULATIVE BASE (YEAR 2019 AND 2021) TRAFFIC PROJECTIONS

The cumulative base traffic projections reflect growth in traffic from two primary sources: background or ambient growth in the existing traffic volumes to reflect the effects of overall regional growth both in and outside of the study area, and traffic generated by specific related projects within, or in the vicinity of, the study area.

Areawide Traffic Growth

Traffic volumes in the vicinity of the study area are assumed to increase at a rate of 0.5% per year. This ambient growth rate is consistent with other studies conducted in this area of the City. Future increases in background traffic volumes due to regional growth and development are expected to continue at this rate, at least through the years 2019 and 2021. With the project scheduled to be completed in 2021, the existing 2014 traffic volumes were increased by 3.55% to reflect areawide regional growth from 2014 to 2021, and by 2.53% to reflect areawide regional growth from 2014 to 2019.



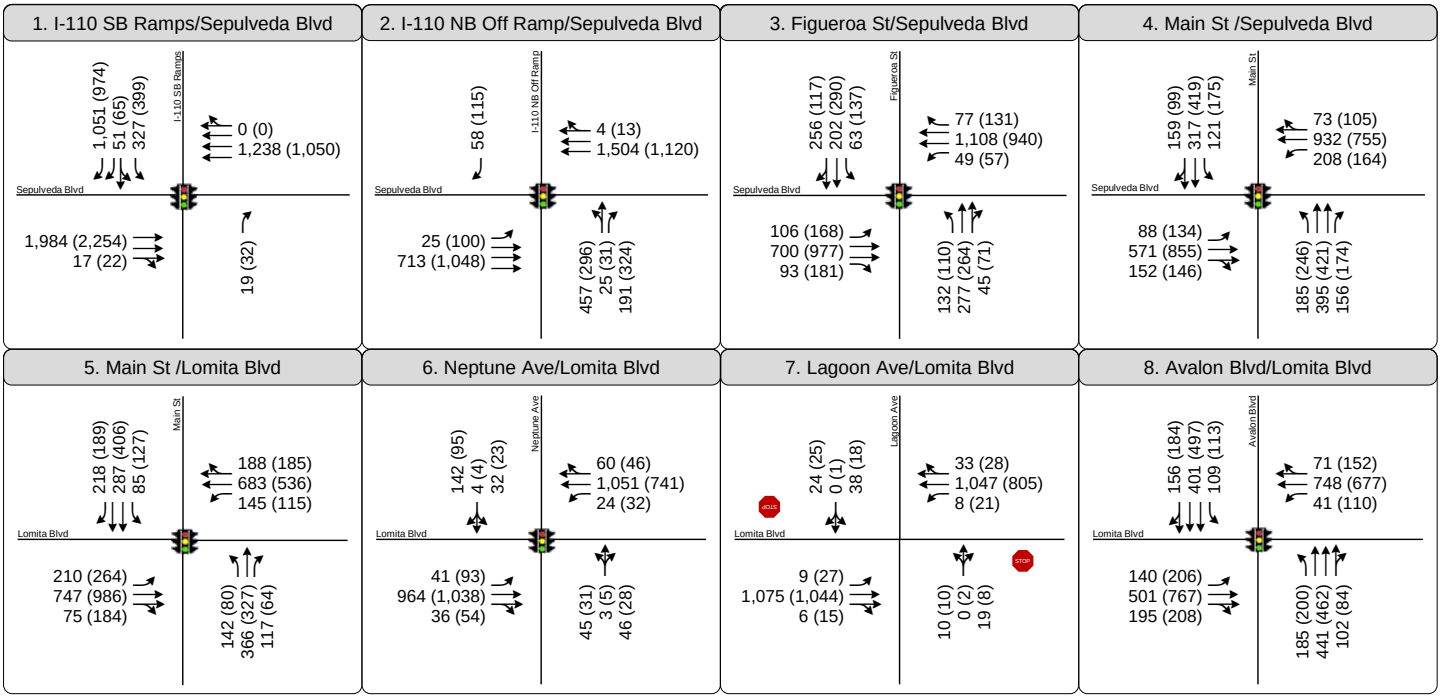
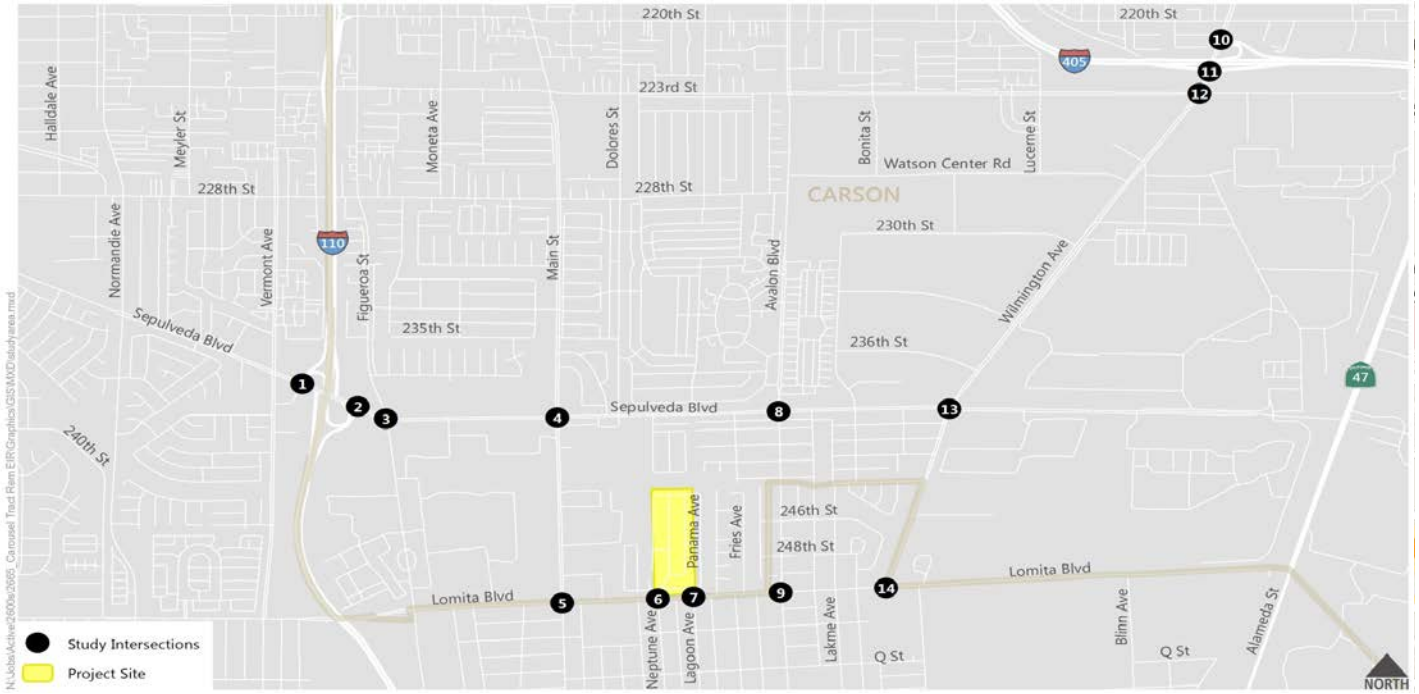


Figure 7A

Peak Hour Traffic Volumes and Lane Configurations - Existing + Project



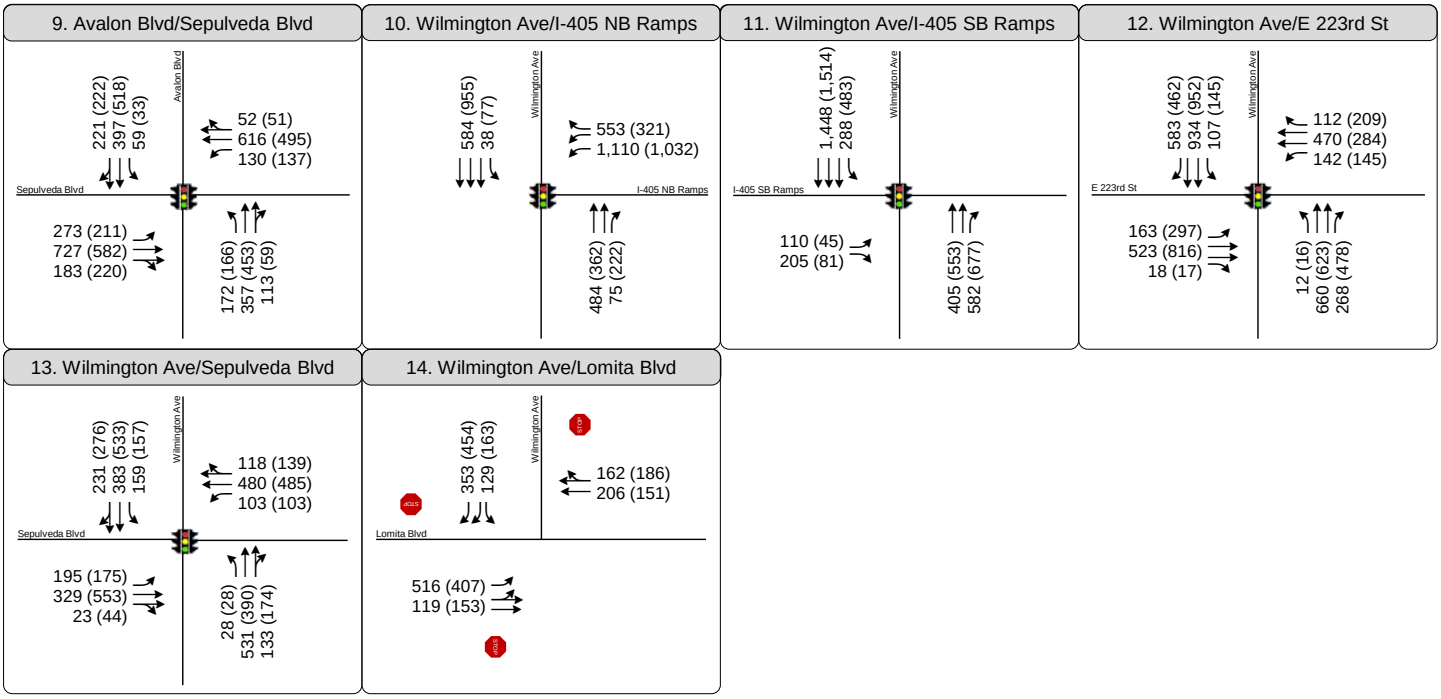
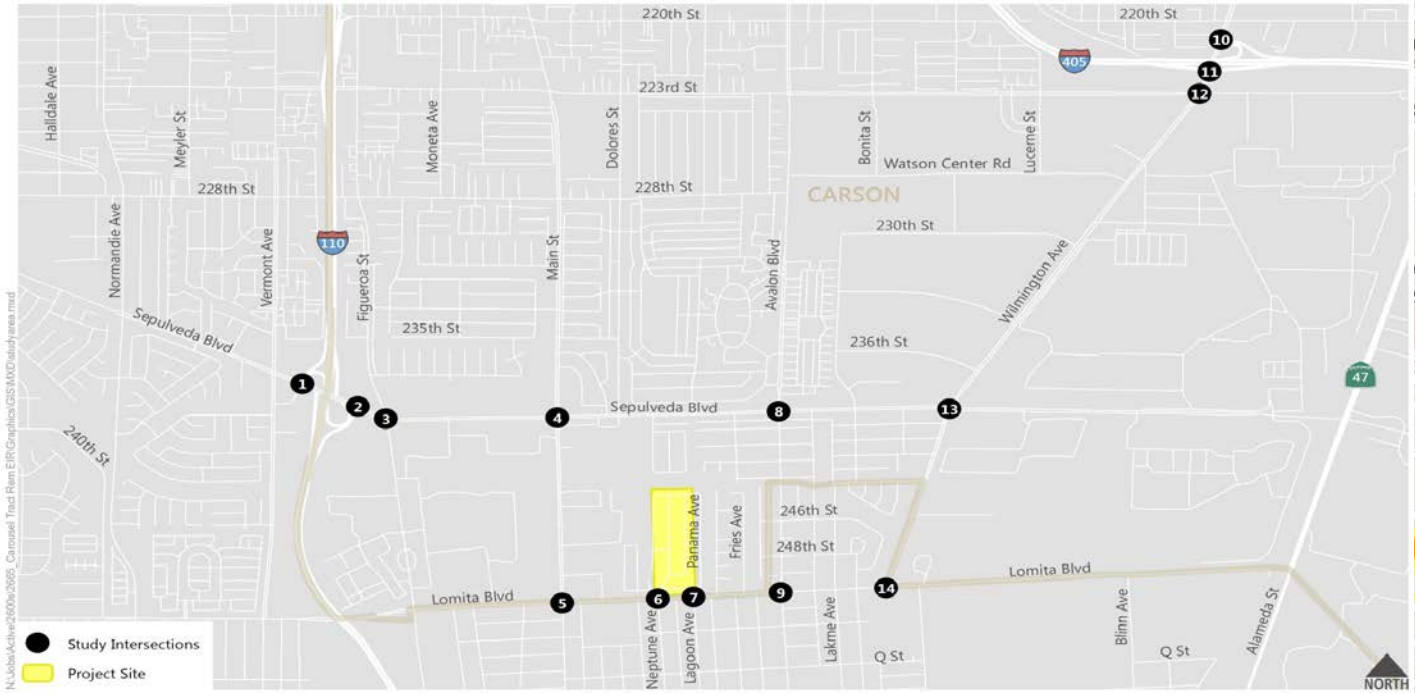


Figure 7A

Peak Hour Traffic Volumes and Lane Configurations - Existing + Project



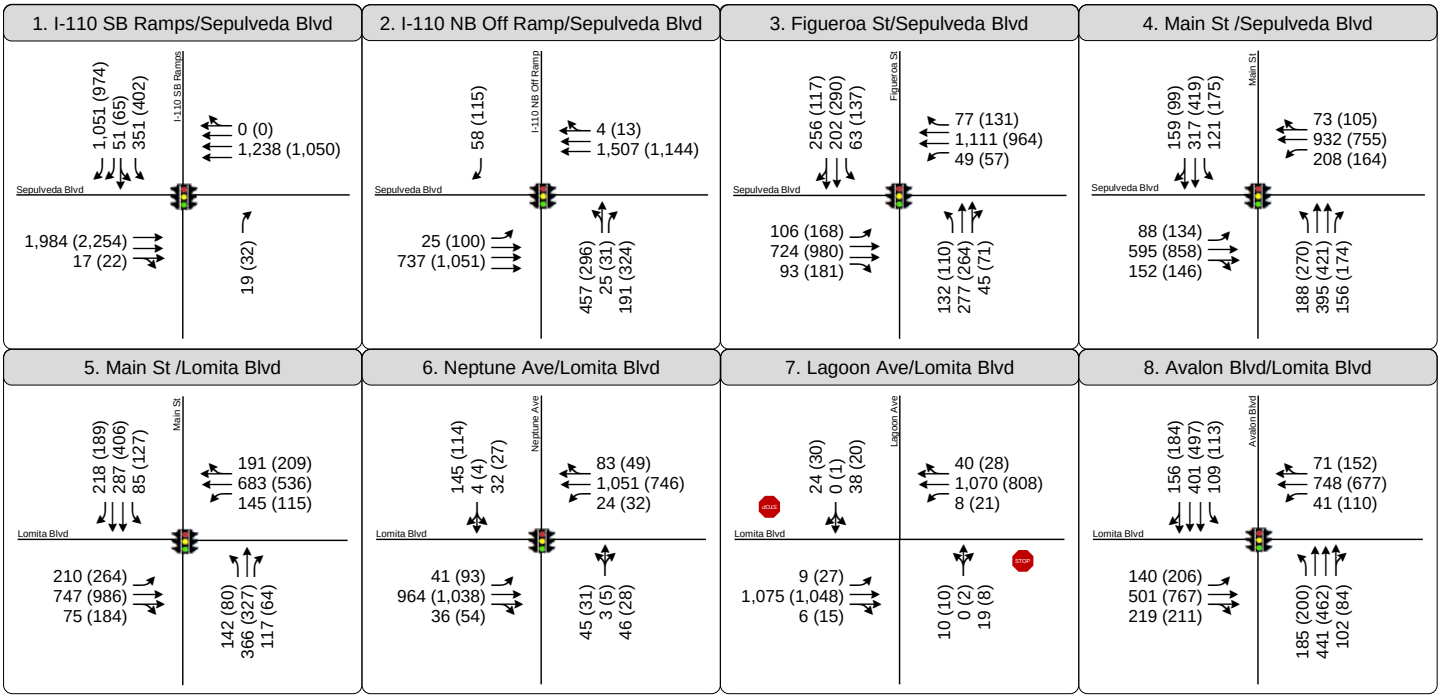
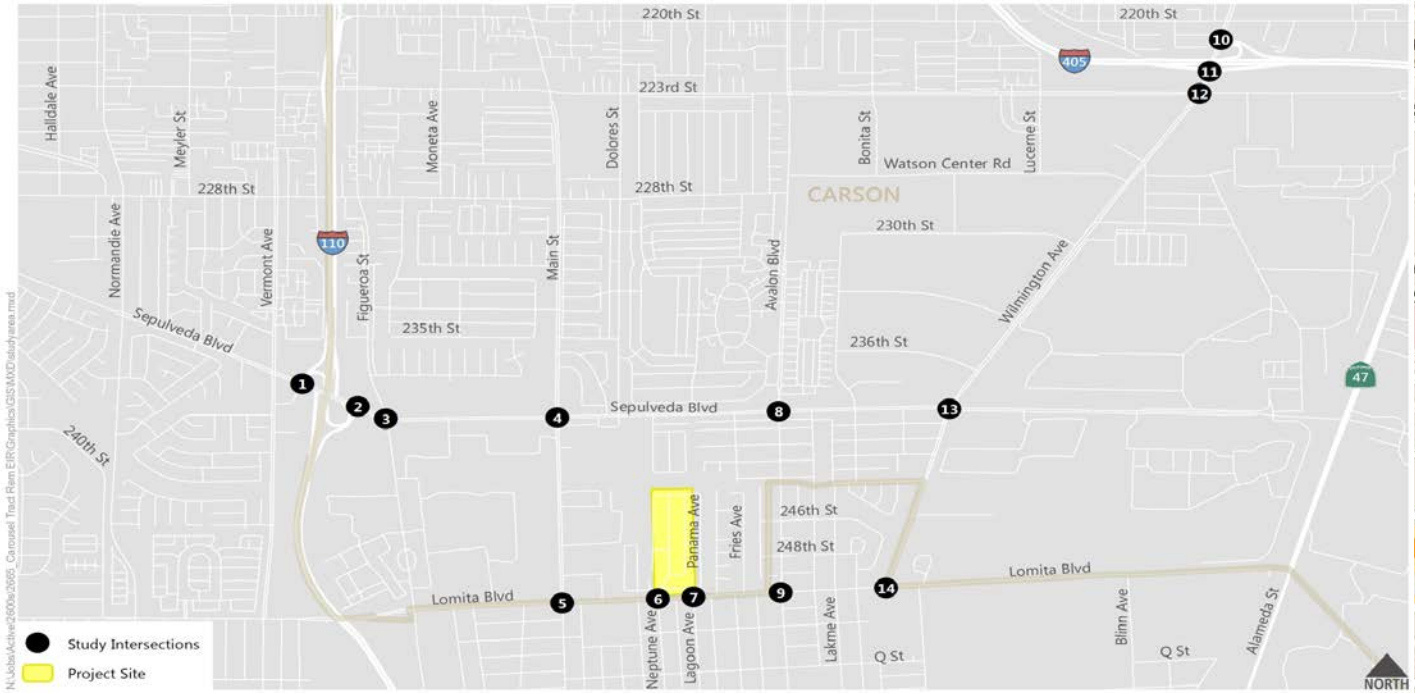


Figure 7B

Peak Hour Traffic Volumes and Lane Configurations - Existing + Expedited Option



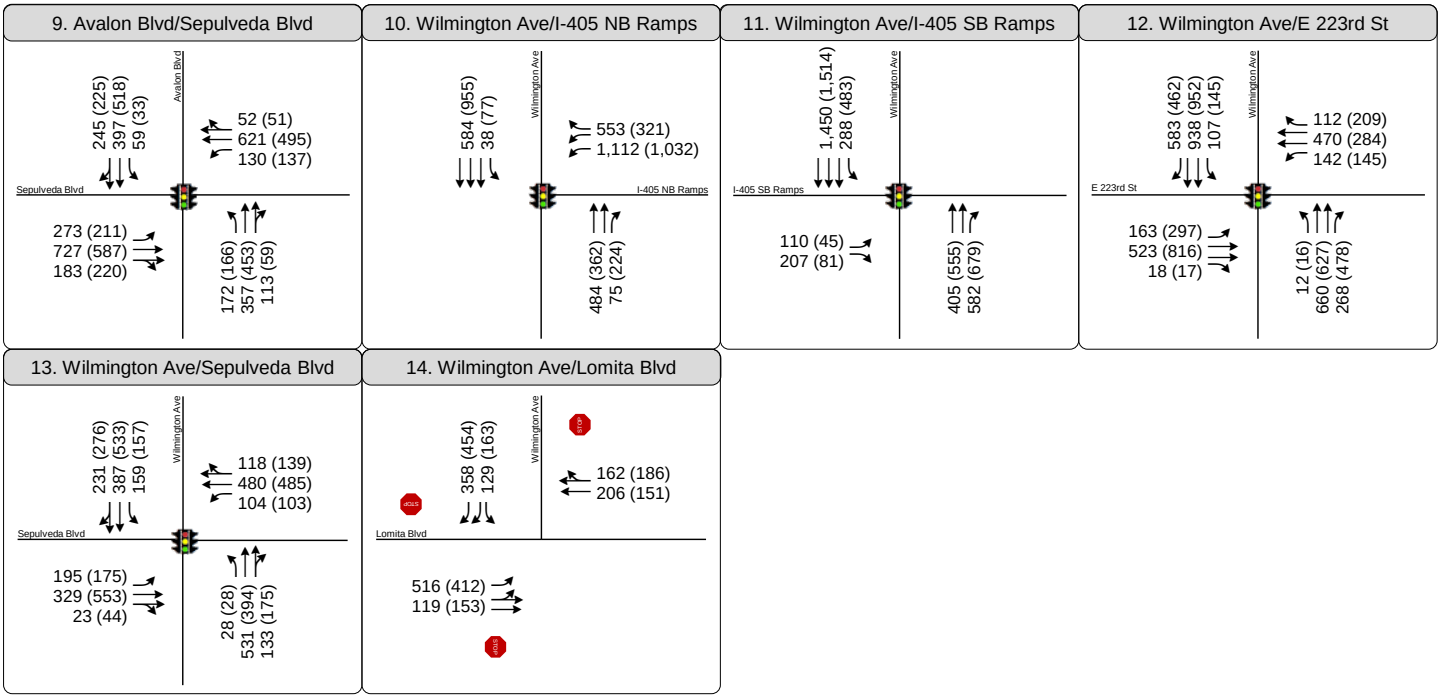


Figure 7B

Peak Hour Traffic Volumes and Lane Configurations - Existing + Expedited Option

Traffic Generation of Related Projects

Traffic expected to be generated by related projects within, or with the potential to affect, the study area was considered in addition to the ambient areawide traffic growth. For this study, related projects within two miles of the project site were identified by the City of Carson and LADOT in Spring 2014. Traffic data from relevant traffic studies and/or environmental impact reports was available for all development projects. The related projects included in this analysis and trip generation estimates for each are shown in Table 5 and their locations are illustrated in Figure 8.

Cumulative Development Project Traffic Distribution

The geographic distribution of traffic generated by developments, such as those included in the list of related projects, depends on several factors. These factors include the type and density of the proposed land use, the geographic distribution of the population from which employees and potential patrons of proposed commercial related projects may be drawn, the geographic distribution of employment and activity centers to which residents of proposed residential related projects may be drawn, the location of each related project in relation to the surrounding street system, and the extent of the roadway network (e.g., its continuity). Relevant traffic studies and/or environmental impact reports for specific projects were used to aid in determining related project trip distribution, and ultimately traffic assignment.

Cumulative Base (2021) Traffic Volumes

The future year 2021 cumulative base traffic volumes were developed using the trip generation estimates and trip distribution patterns described above. The resulting projected cumulative base peak hour traffic volumes for a typical weekday AM and PM peak hour are shown in Figure 9A.

Expedited Cumulative Base (2019) Traffic Volumes

The future year 2019 expedited cumulative base traffic volumes were developed using the trip generation estimates and trip distribution patterns described above. The resulting projected cumulative base peak hour traffic volumes for a typical weekday AM and PM peak hour are shown in Figure 9B.

CUMULATIVE PLUS PROJECT (YEAR 2021) TRAFFIC PROJECTIONS

The temporary increase in traffic (as PCEs) that would occur during the Project was assigned to the street system and added to the cumulative base (year 2021) traffic projections. The resulting projected cumulative plus project peak hour traffic volumes for a typical weekday AM and PM peak hour are shown in Figure 10A.

CUMULATIVE PLUS EXPEDITED OPTION (YEAR 2019) TRAFFIC PROJECTIONS

The temporary increase in traffic (as PCEs) that would occur under the Expedited Option was assigned to the street system and added to the cumulative base (year 2019) traffic projections. The resulting projected Cumulative plus Expedited Option peak hour traffic volumes for a typical weekday AM and PM peak hour are shown in Figure 10B.

TABLE 5
CUMULATIVE PROJECT TRIP GENERATION

Project	Address	Size	Unit	Use	Trip Generation		
					Daily	AM	PM
Kaiser South Bay Hospital Expansion [1]	25825 Vermont Ave, Los Angeles	234.407	ksf	Medical Office	2,971	200	320
		77.5	ksf	Records/office/warehouse			
		286	beds	Hospital			
1311 W Sepulveda Apartments [2]	1311 W Sepulveda Blvd, Los Angeles	352	units	Apartments	1,434	19	55
		17.904	ksf	Retail			
Daycare Facility [3]	25621 S Normandie Ave, Los Angeles	84	child	Daycare	376	67	69
Del Lago Apartments [4]	1450 Pacific Coast Highway, Los Angeles	204	units	Apartments	1,357	104	126
Carson Marketplace/The Boulevards at South Bay [5]	Del Amo Ave west of I-405, Carson	Mixed Use Development			68,951	2,510	5,761
		1,900	ksf	Shopping Center			
		300	room	Hotel			
		1550	DU	Residential			
Carson Shell Revitalization [6]	20945 S Wilmington Ave, Carson	10	employee	Office	6,357	408	580
		90	ksf	Industrial/Commercial			
		83	ksf	Community Retail			
Ponte Vista Residential Project [7]	26900 S Western Ave, Los Angeles	143	DU	Single Family Residential	7,458	571	699
		600	DU	Condominium			
		392	DU	Apartments			
		2.8	AC	Park			

Notes

[1] Traffic Impact Study & Technical Memorandum for the Kaiser Permanente South Bay Medical Center (2006, with amendment 2009), Fehr & Peers/Kaku Associates

[2] Traffic Impact Study for the 1311 W. Sepulveda Boulevard Project (2009), Linscott, Law & Greenspan, Engineers

[3] Memorandum of Understanding (MOU) for the 25621 S Normandie Avenue Child Care Facility (2010), Arch Beach Consulting

[4] Traffic Impact Study for the Proposed Del Lago Apartment Project (2012), Crain & Associates

[5] Traffic Study for the Carson Marketplace (2005), Kaku Associates

[6] Traffic Study for the Carson Shell Revitalization (2012, with amendment 2014), Fehr & Peers

[7] Traffic Impact Study: Ponte Vista at San Pedro (2012), Linscott, Law & Greenspan, Engineers. The City has since approved a reduced project at that site. However, to maintain a conservative analysis, the traffic volumes from the latest published traffic study were used.

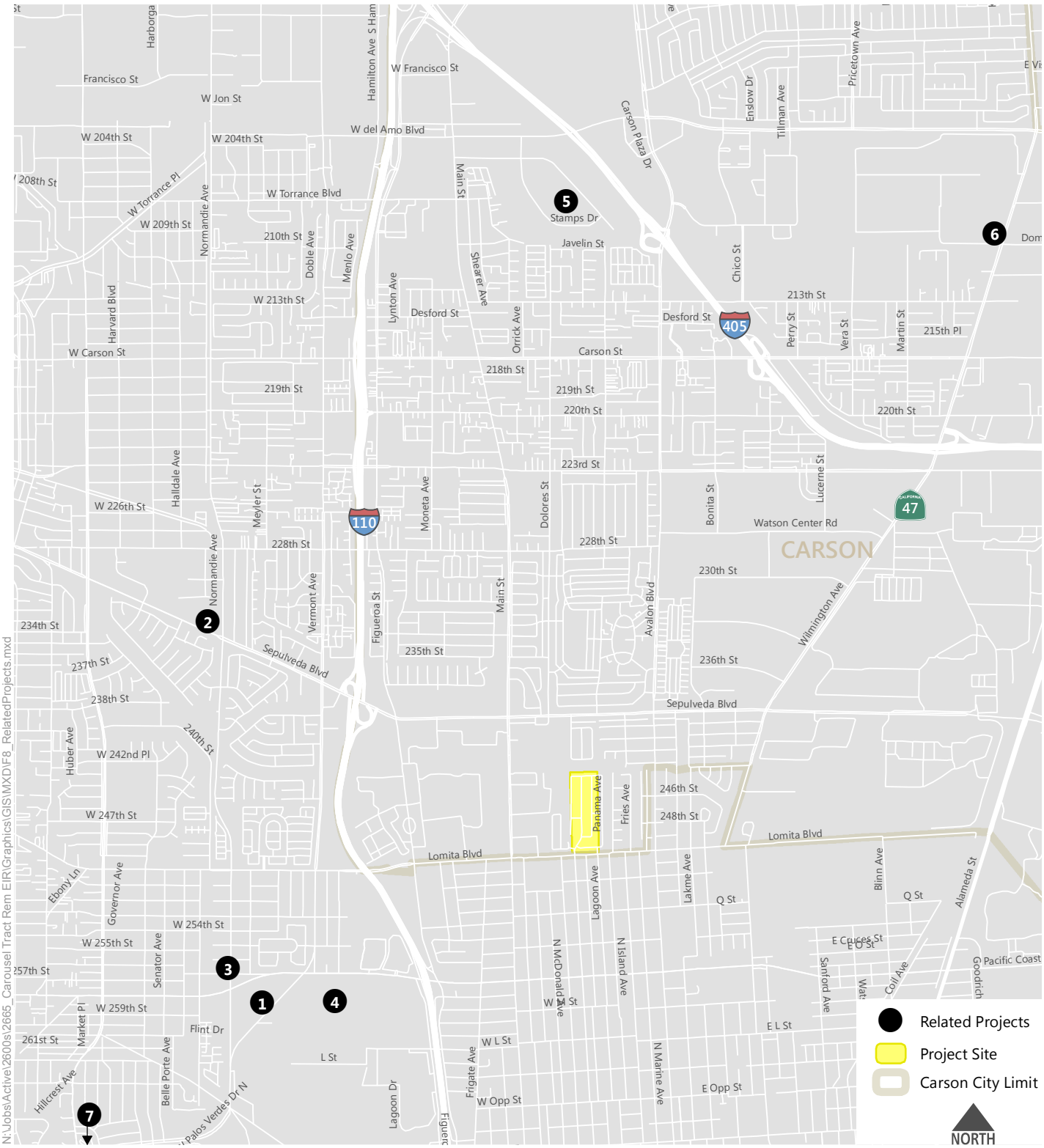
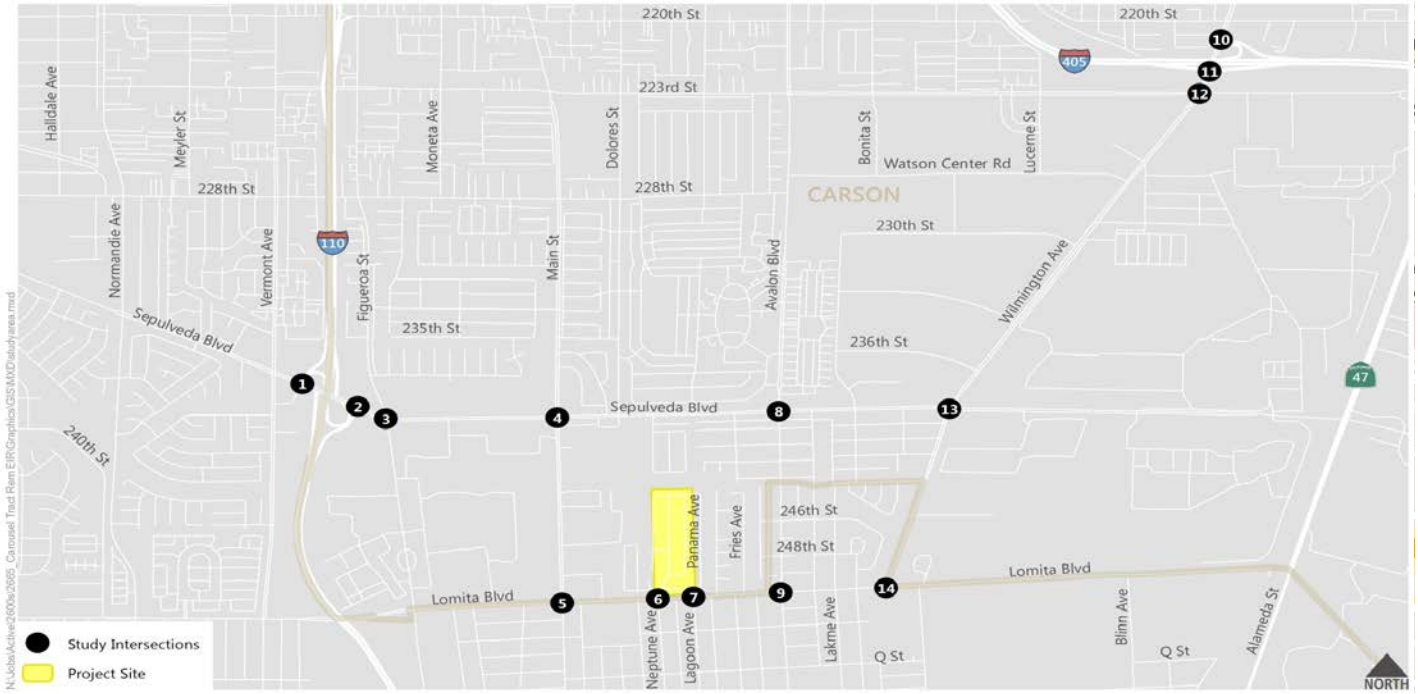


Figure 8

Related Projects



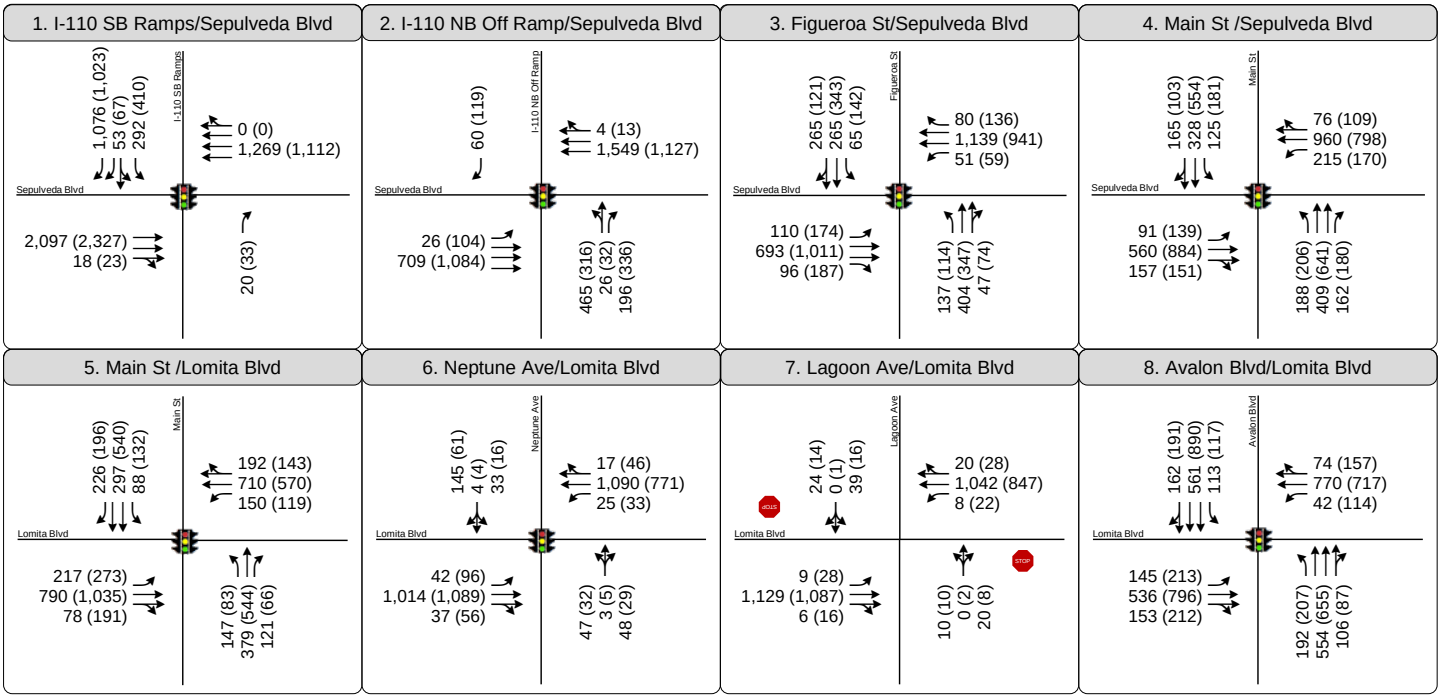
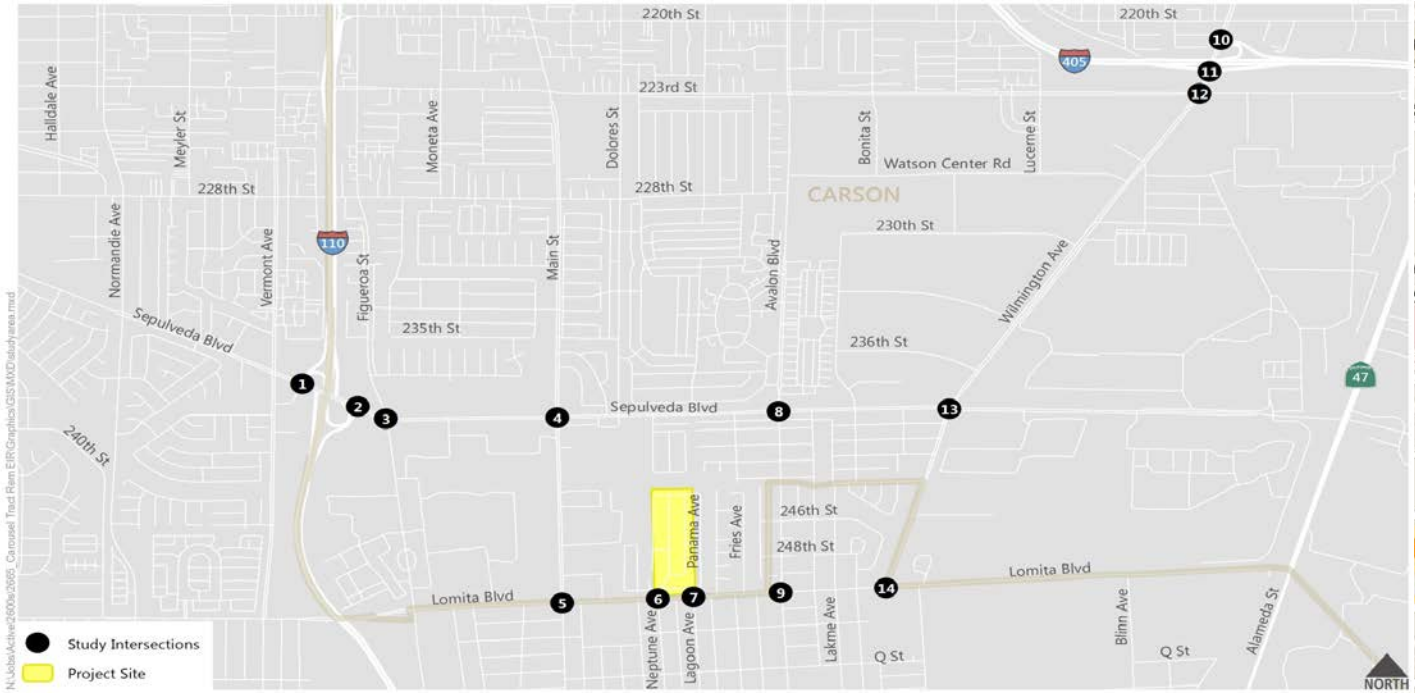


Figure 9

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2021) No Project Conditions



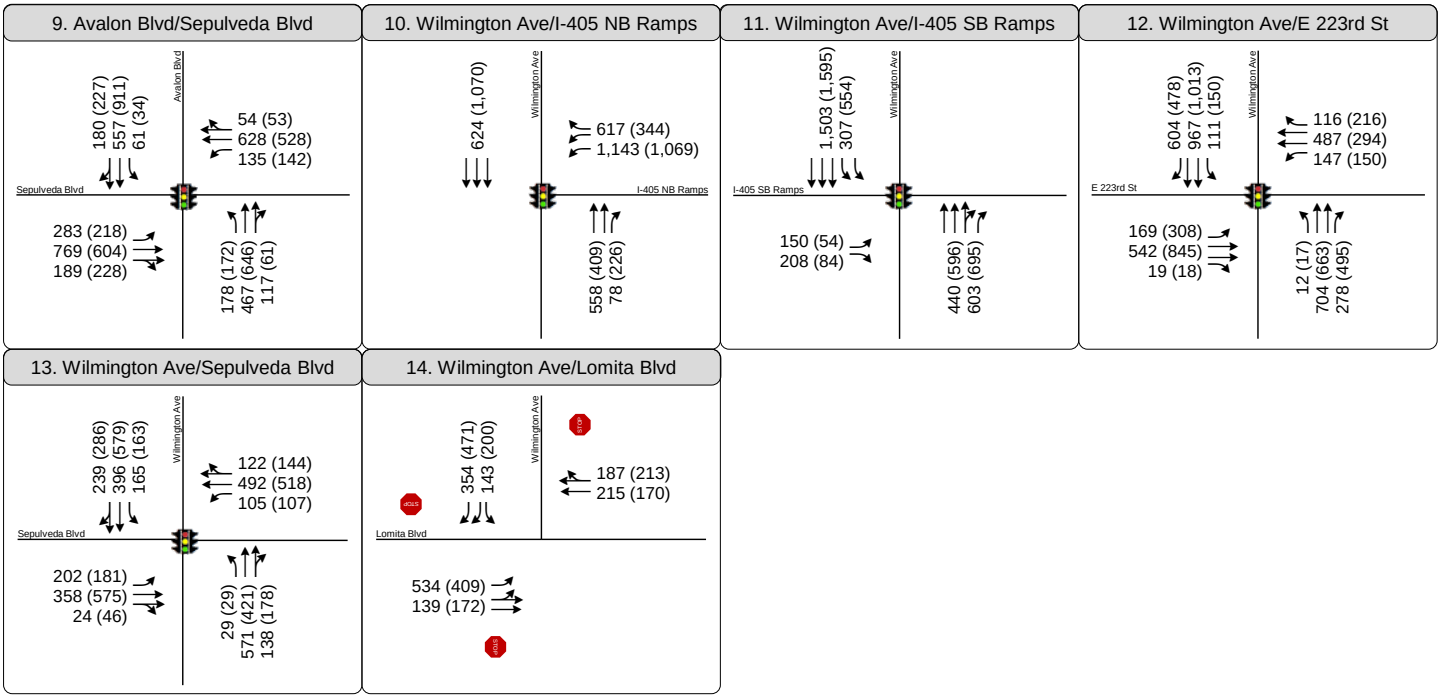
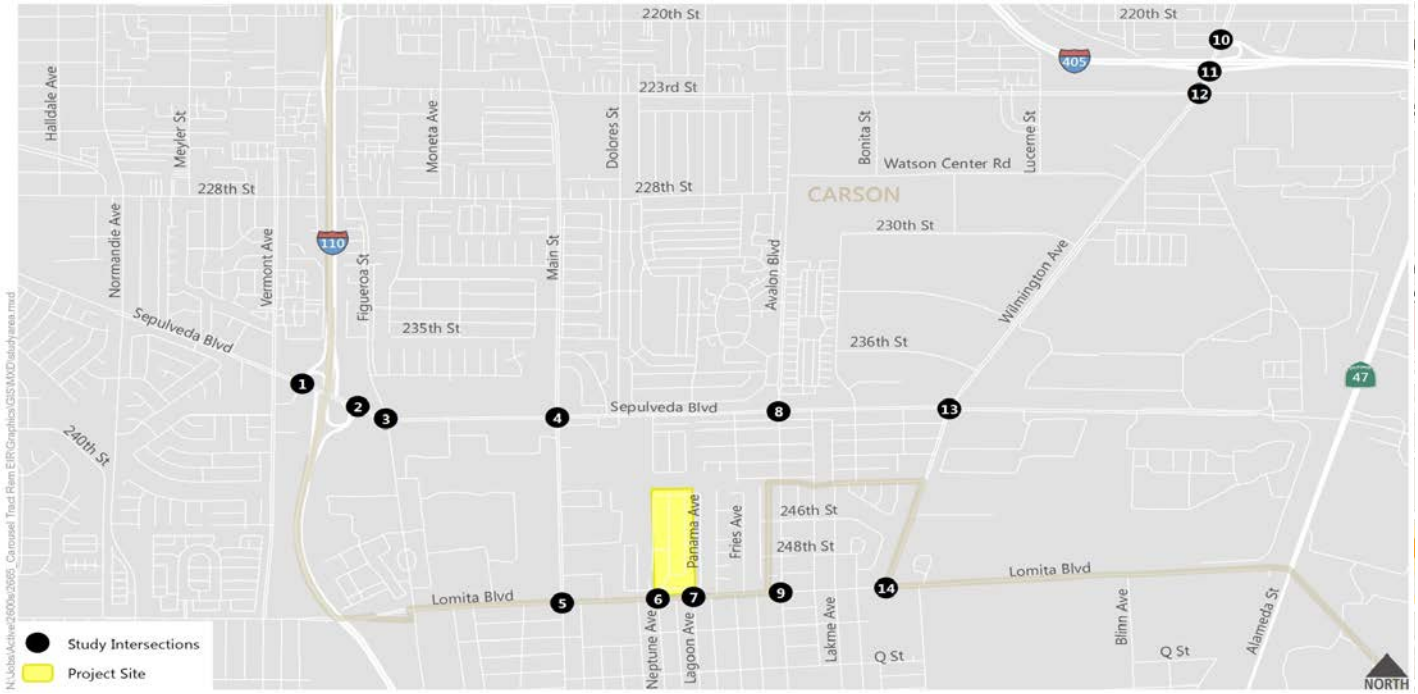


Figure 9

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2021) No Project Conditions



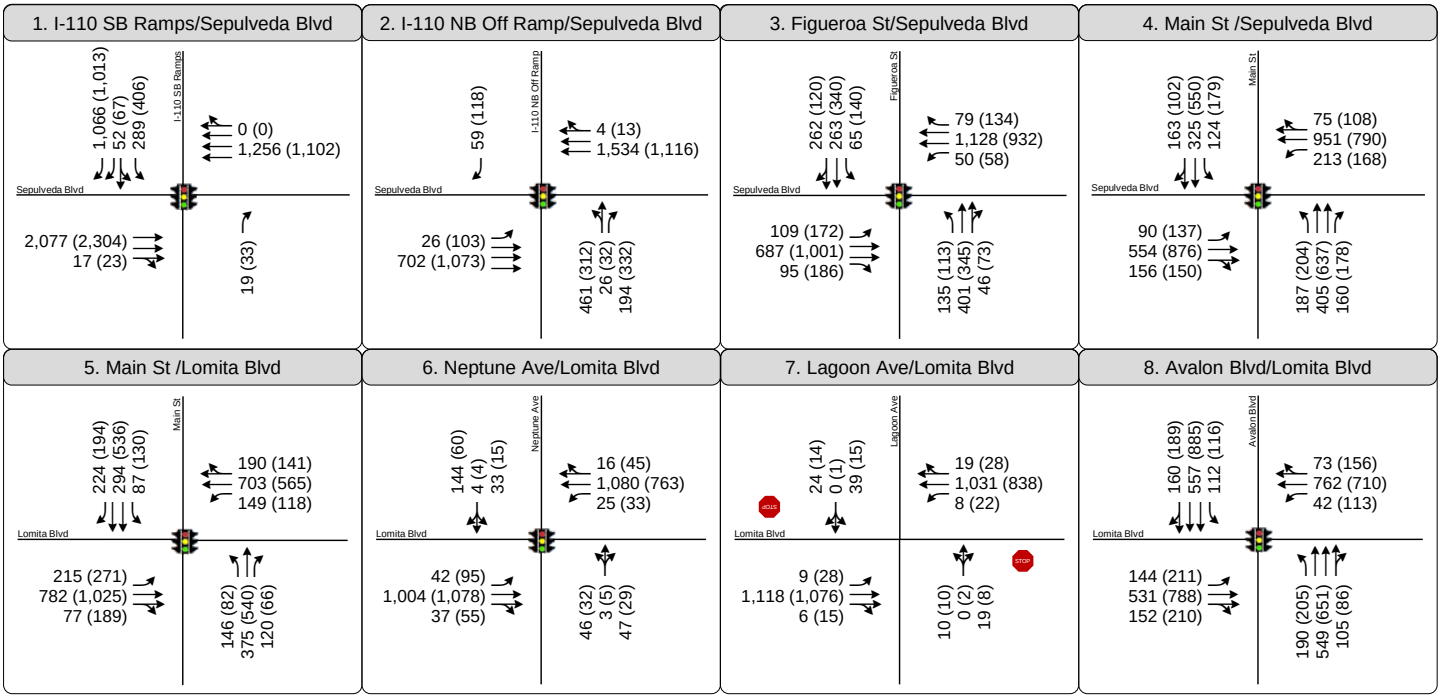
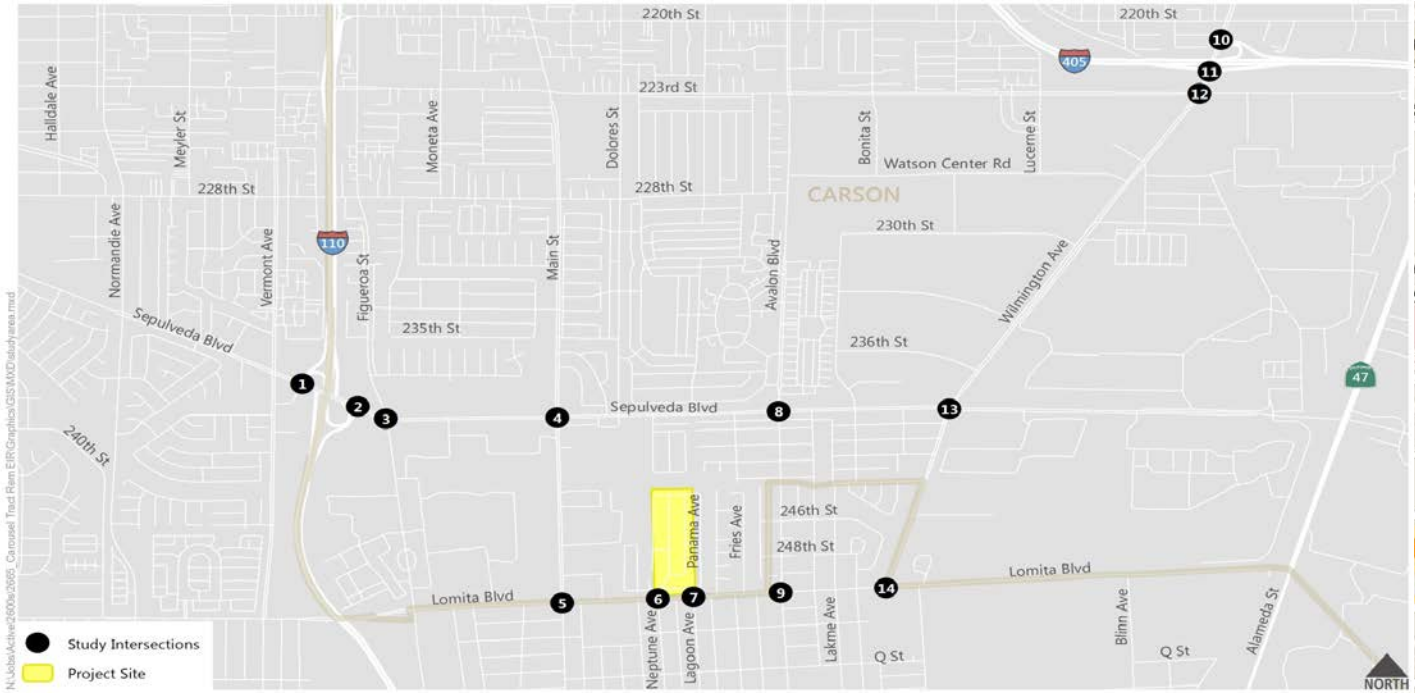


Figure 9B

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2019) No Project Conditions



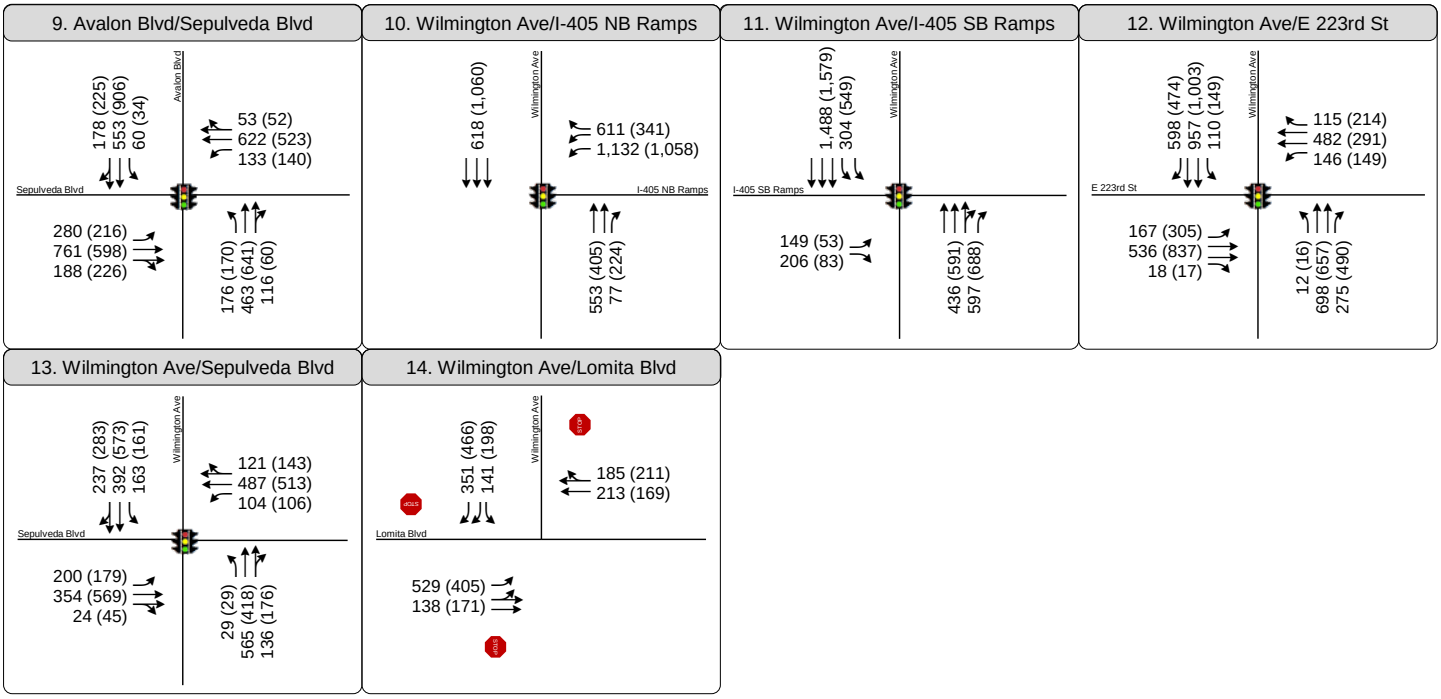
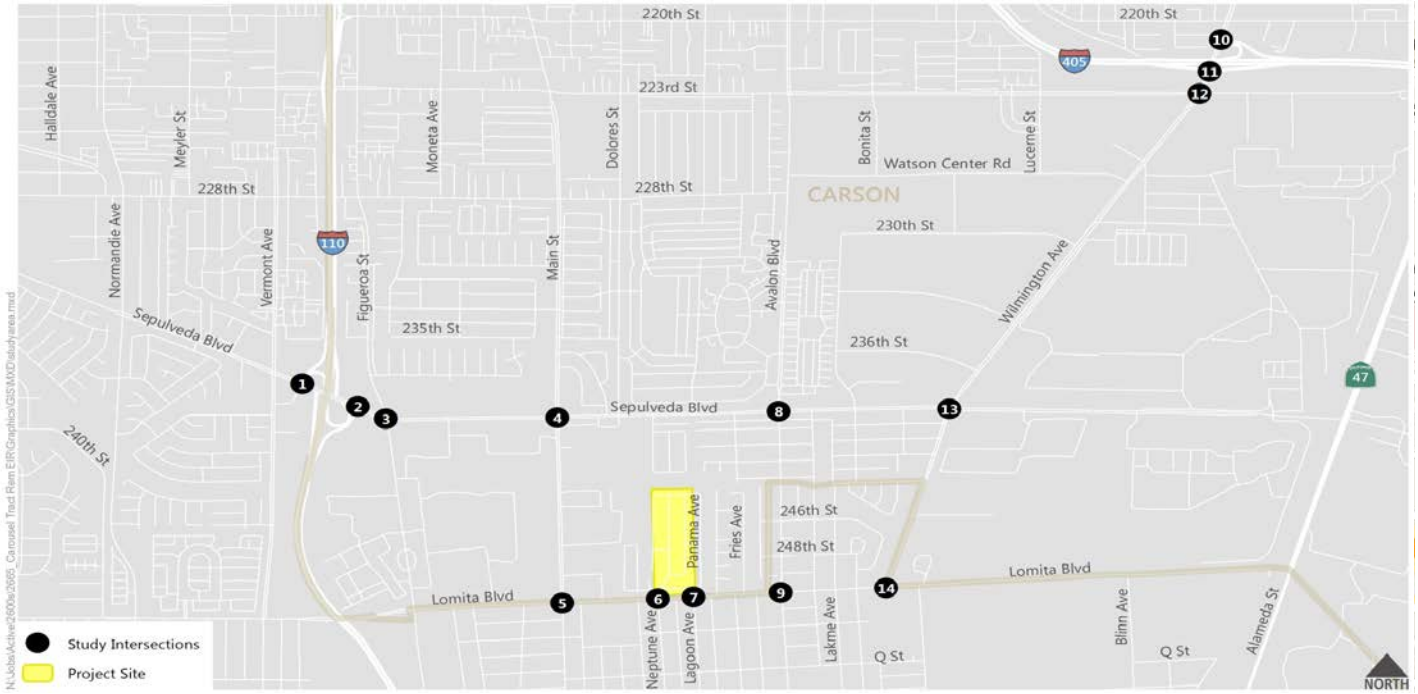


Figure 9B

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2019) No Project Conditions



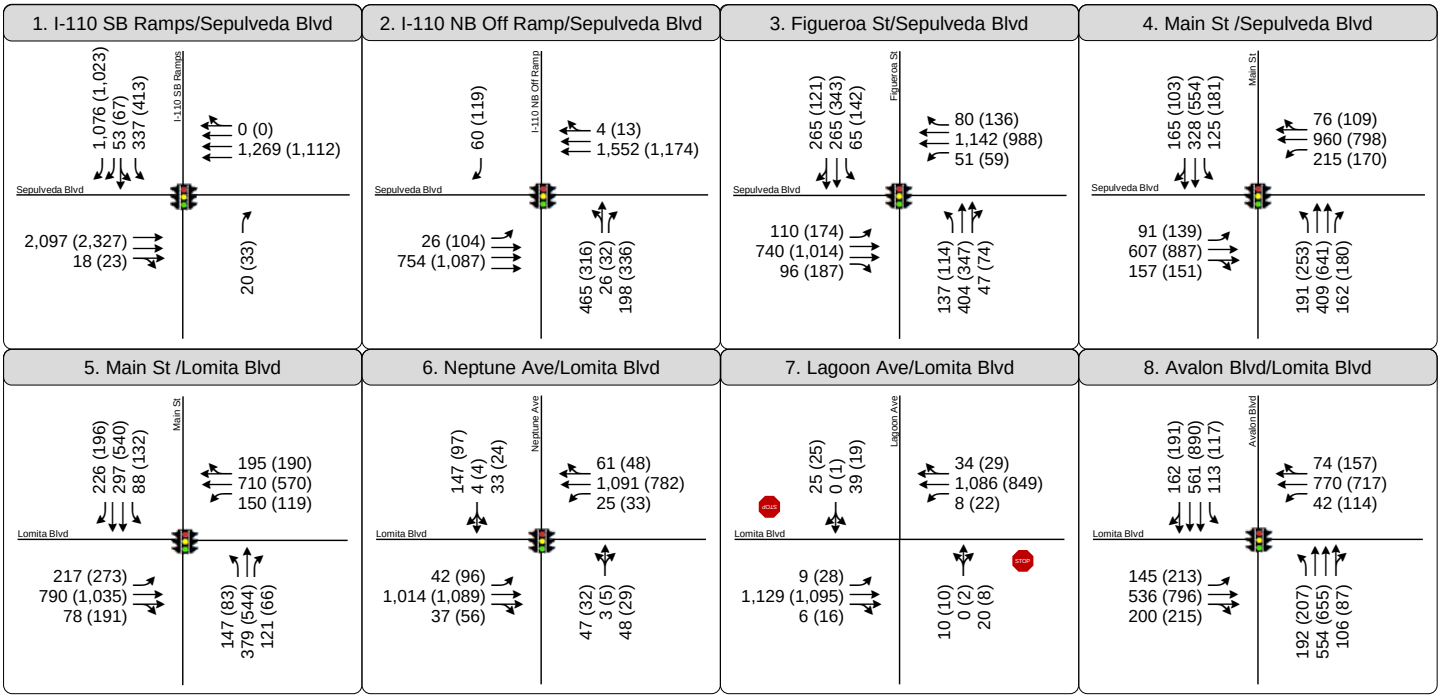
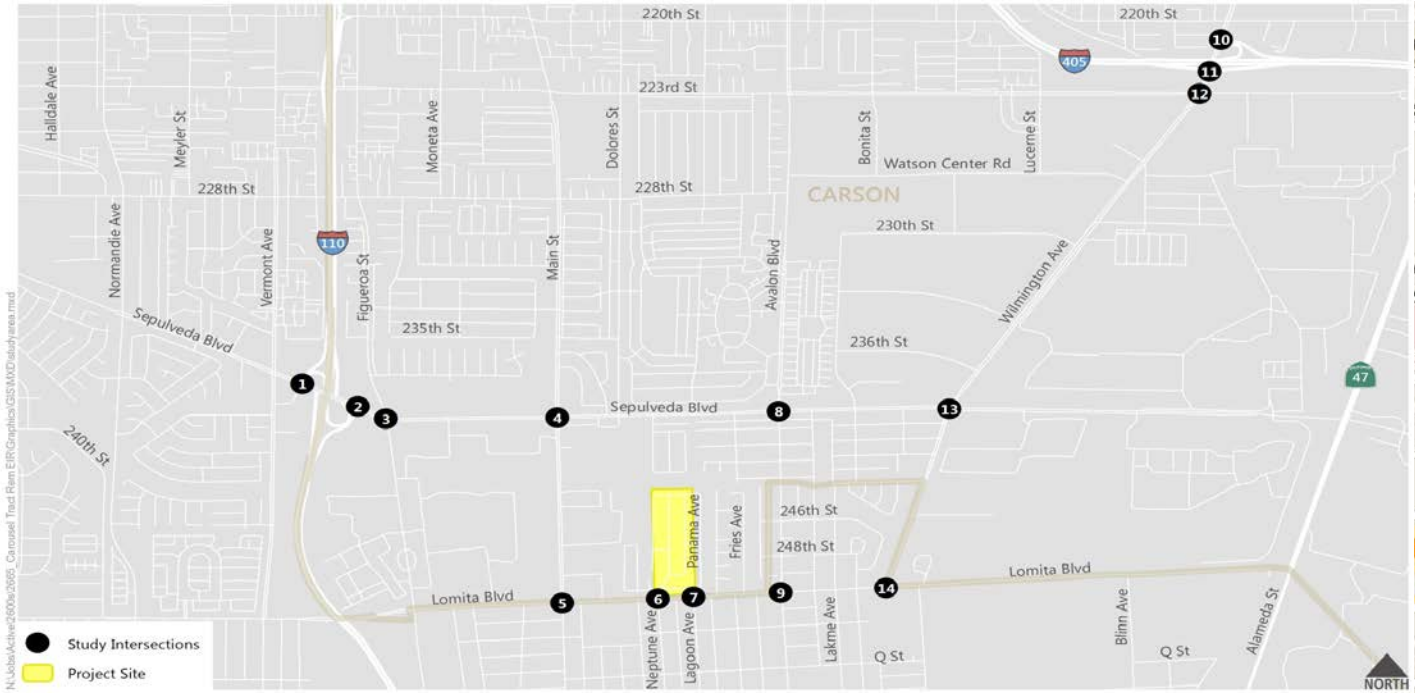


Figure 10A

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2021) + Project Conditions



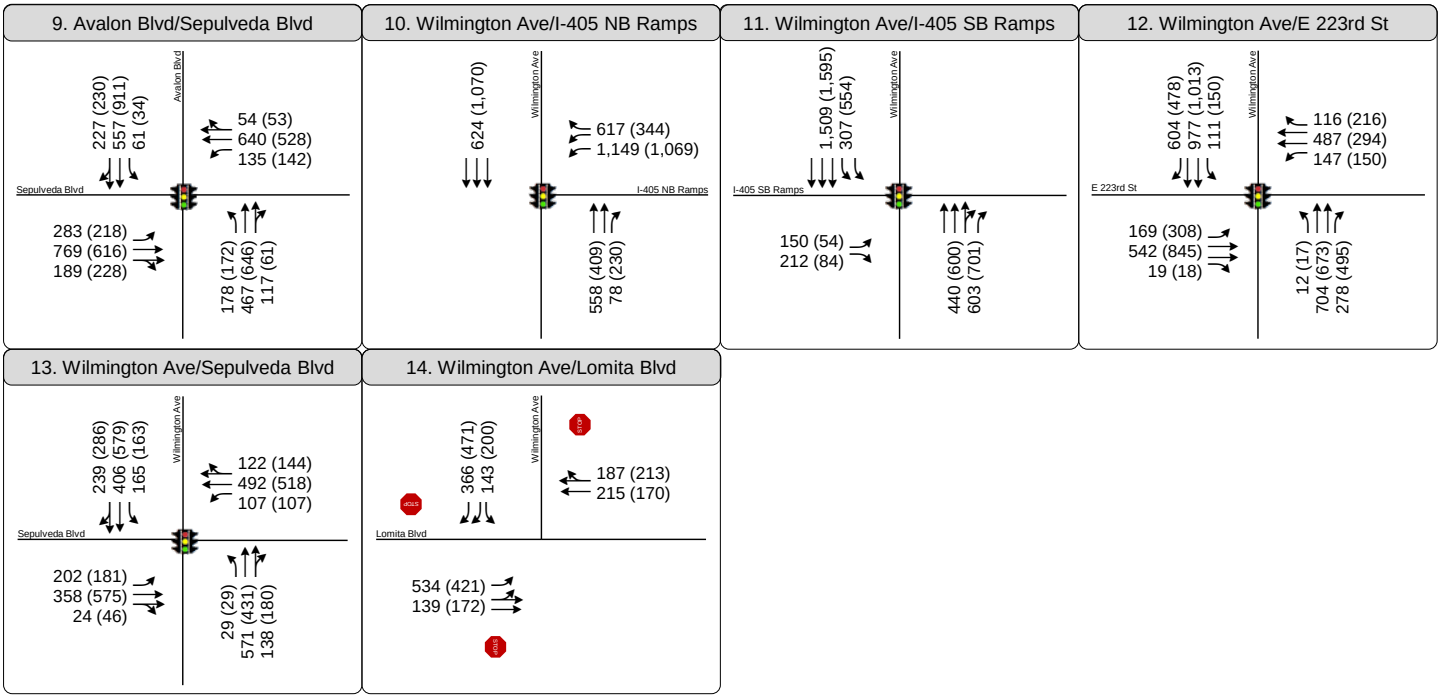
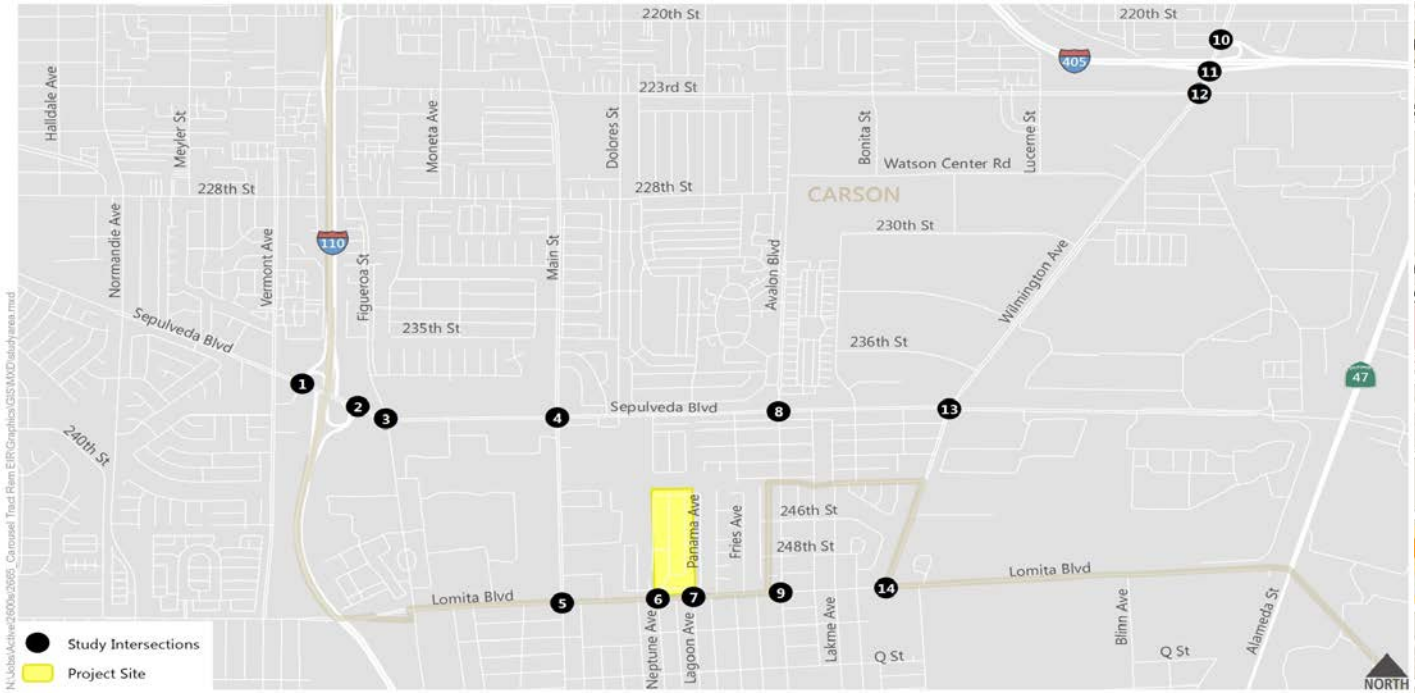


Figure 10A

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2021) + Project Conditions



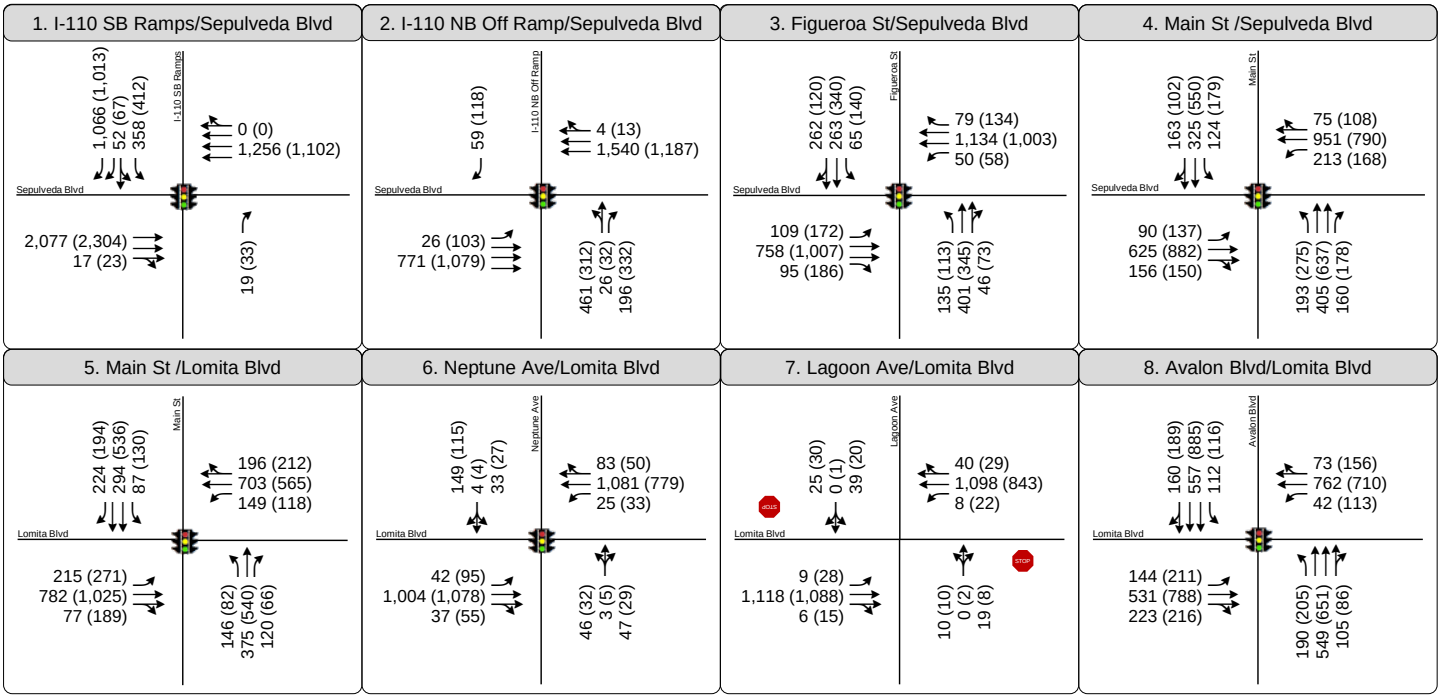
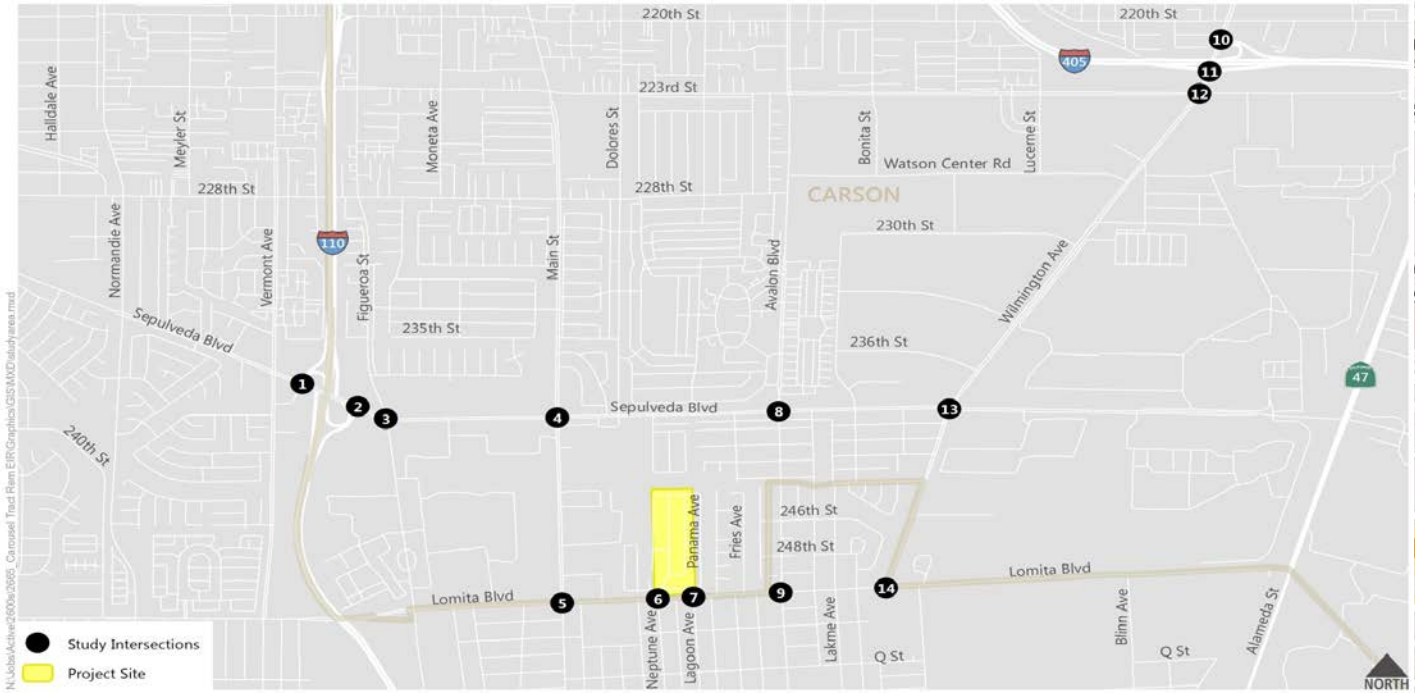


Figure 10B

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2019) + Expedited Option Conditions



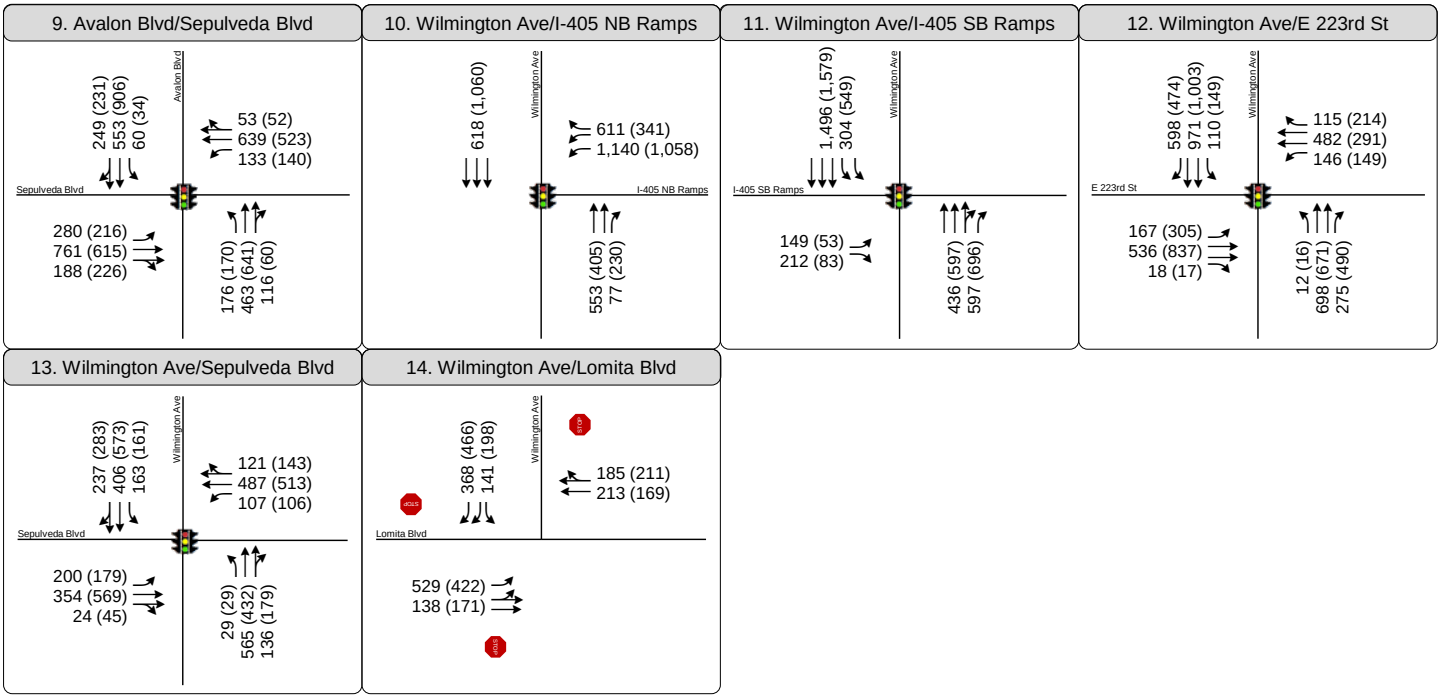


Figure 10B

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Year (2019) + Expedited Option Conditions

4. TRAFFIC IMPACT ANALYSIS

The traffic volume forecasts described in the previous chapter were analyzed to determine the forecast operating conditions at each of the study intersections to identify the potential impacts of external project-related traffic on the surrounding street system. This chapter provides a discussion of the criteria and methodology used and summarizes the results of the analysis.

CRITERIA FOR DETERMINATION OF TEMPORARY ADVERSE TRAFFIC IMPACTS

Although the methodologies and the criteria to calculate volume-to-capacity (V/C) ratios for intersections are typically used by the City of Carson to identify potential traffic impacts during operation, they can also be applied to construction periods.

A temporary adverse impact would occur if the project would increase the V/C ratio of applicable intersections beyond the limits established by the City of Carson, which consider a project-related V/C increase of 0.0.20 or more to be significant at LOS E or F.

Using this threshold, a project would not have a temporary adverse impact at an analyzed intersection if it were operating at LOS A, B, C, or D after the addition of project traffic. If an unsignalized intersection is projected to operate at LOS E or F in HCM, it was also analyzed under the ICU methodology. If the ICU calculations indicate a change in V/C of 0.020 or greater with the addition of project traffic, it is considered to be a temporary significant impact regardless of the ICU LOS. If a signalized intersection were operating at LOS E or F after the addition of project traffic and the incremental change in the V/C ratio were greater than or equal to 0.020, a project would be considered to have a temporary adverse impact.

EXISTING PLUS PROJECT OPERATING CONDITIONS

The existing plus project peak hour traffic volumes was analyzed to identify specific traffic impacts resulting from the addition of project-generated traffic during remediation. The results of the intersection analysis are summarized in Table 6A and compared with the existing intersection operating conditions.

According to the City of Carson's intersection traffic impact significance criteria, the proposed project would not result in any temporary adverse impacts at any of the 14 study intersections.

EXISTING PLUS EXPEDITED OPTION OPERATING CONDITIONS

The Existing plus Expedited Option peak hour traffic volumes was analyzed to identify specific traffic impacts resulting from the addition of project-generated traffic during remediation. The results of the intersection analysis are summarized in Table 6B and compared with the existing intersection operating conditions.

According to the City of Carson's intersection traffic impact significance criteria, the proposed project would not result in any temporary adverse impacts at any of the 14 study intersections.

TABLE 6A
EXISTING PLUS PROJECT
INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	EXISTING		EXISTING + PROJECT		V/C INCREASE	SIGNIFICANT IMPACT?
			V/C or Delay	LOS	V/C or Delay	LOS		
1	I-110 SB Off-Ramp &	AM	0.795	C	0.795	C	0.000	No
	Sepulveda Blvd	PM	0.830	D	0.830	D	0.000	No
2	I-110 NB Off-Ramp &	AM	0.717	C	0.717	C	0.000	No
	Sepulveda Blvd	PM	0.615	B	0.625	C	0.010	No
3	Figueroa St &	AM	0.704	C	0.705	C	0.001	No
	Sepulveda Blvd	PM	0.630	B	0.645	B	0.015	No
4	Main St &	AM	0.682	B	0.684	B	0.002	No
	Sepulveda Blvd	PM	0.751	C	0.782	C	0.031	No
5	Main St &	AM	0.734	C	0.735	C	0.001	No
	Lomita Blvd	PM	0.771	C	0.771	C	0.000	No
6	Neptune Ave &	AM	0.547	A	0.562	A	0.015	No
	Lomita Blvd	PM	0.479	A	0.506	A	0.027	No
7	Lagoon Ave &	AM	0.437	A	0.439	C	0.002	No
	Lomita Blvd*	PM	0.416	A	0.428	B	0.012	No
		AM	80.0s	F	92.8s	F	12.8s	N/A
		PM	46.0s	E	47.5s	E	1.5s	N/A
8	Avalon Blvd &	AM	0.684	B	0.684	B	0.000	No
	Sepulveda Blvd	PM	0.776	C	0.776	C	0.000	No
9	Avalon Blvd &	AM	0.653	B	0.676	B	0.023	No
	Lomita Blvd	PM	0.641	B	0.645	B	0.004	No
10	Wilmington Ave &	AM	0.656	B	0.659	B	0.003	No
	I-405 NB Ramps	PM	0.652	B	0.652	B	0.000	No
11	Wilmington Ave &	AM	0.720	C	0.722	C	0.002	No
	I-405 SB Ramps	PM	0.822	D	0.826	D	0.004	No
12	Wilmington Ave &	AM	0.623	B	0.623	B	0.000	No
	E 223rd St	PM	0.740	C	0.740	C	0.000	No
13	Wilmington Ave &	AM	0.666	B	0.666	B	0.000	No
	Sepulveda Blvd	PM	0.625	B	0.628	B	0.003	No
14	Wilmington Ave &	AM	0.448	A	0.448	A	0.000	No
	Lomita Blvd *	PM	0.422	A	0.427	A	0.005	No
		AM	50.6s	F	58.0s	F	7.4s	N/A
		PM	54.8s	F	57.1s	F	2.3s	N/A

Note:

* Unsignalized intersection operating at LOS E or F under HCM conditions; Analyzed under ICU per City of Carson criteria

s Seconds of delay on the most constrained approach

TABLE 6B
EXISTING PLUS EXPEDITED OPTION
INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	EXISTING		EXISTING + OPTION 1		V/C INCREASE	SIGNIFICANT IMPACT?
			V/C or Delay	LOS	V/C or Delay	LOS		
1	I-110 SB Off-Ramp &	AM	0.795	C	0.795	C	0.000	No
	Sepulveda Blvd	PM	0.830	D	0.830	D	0.000	No
2	I-110 NB Off-Ramp &	AM	0.717	C	0.718	C	0.001	No
	Sepulveda Blvd	PM	0.615	B	0.630	C	0.015	No
3	Figueroa St &	AM	0.704	C	0.706	C	0.002	No
	Sepulveda Blvd	PM	0.630	B	0.652	B	0.022	No
4	Main St &	AM	0.682	B	0.686	B	0.004	No
	Sepulveda Blvd	PM	0.751	C	0.798	C	0.047	No
5	Main St &	AM	0.734	C	0.736	C	0.002	No
	Lomita Blvd	PM	0.771	C	0.771	C	0.000	No
6	Neptune Ave &	AM	0.547	A	0.571	A	0.024	No
	Lomita Blvd	PM	0.479	A	0.521	A	0.042	No
7	Lagoon Ave &	AM	0.437	A	0.448	A	0.011	No
	Lomita Blvd*	PM	0.416	A	0.433	A	0.017	No
		AM	80.0s	F	100.9s	F	20.9s	N/A
		PM	46.0s	E	48.3s	E	2.3s	N/A
8	Avalon Blvd &	AM	0.684	B	0.684	B	0.000	No
	Sepulveda Blvd	PM	0.776	C	0.776	C	0.000	No
9	Avalon Blvd &	AM	0.653	B	0.692	B	0.039	No
	Lomita Blvd	PM	0.641	B	0.647	B	0.006	No
10	Wilmington Ave &	AM	0.656	B	0.659	B	0.003	No
	I-405 NB Ramps	PM	0.652	B	0.652	B	0.000	No
11	Wilmington Ave &	AM	0.720	C	0.723	C	0.003	No
	I-405 SB Ramps	PM	0.822	D	0.827	D	0.005	No
12	Wilmington Ave &	AM	0.623	B	0.623	B	0.000	No
	E 223rd St	PM	0.740	C	0.740	C	0.000	No
13	Wilmington Ave &	AM	0.666	B	0.666	B	0.000	No
	Sepulveda Blvd	PM	0.625	B	0.630	B	0.005	No
14	Wilmington Ave &	AM	0.448	A	0.448	A	0.000	No
	Lomita Blvd *	PM	0.422	A	0.429	A	0.007	No
		AM	50.6s	F	62.5s	F	11.9s	N/A
		PM	54.8s	F	56.1s	F	1.3s	N/A

Note:

* Unsignalized intersection operating at LOS E or F under HCM conditions; Analyzed under ICU per City of Carson criteria

s Seconds of delay on the most constrained approach

CUMULATIVE BASE (YEAR 2021) OPERATING CONDITIONS

The year 2021 cumulative base (without project) peak hour traffic volumes were analyzed using the LOS methodologies described in Chapter 2 to project future LOS at the study intersections during the AM and PM peak hours. The results of this analysis are summarized in Table 7A for the analyzed peak hours. The table provides a summary of the cumulative base scenario. Detailed LOS calculations are provided in Appendix B. As shown in Table 7A, four of the 14 study intersections are projected to operate at LOS E during the peak hour. The poor LOS calculated at study intersections #7 and #14 result from relatively high levels of delay on the most constrained approach, rather than for all vehicles traveling through these stop-controlled intersections.

- 5. Main Street & Lomita Boulevard
- 7. Lagoon Avenue & Lomita Boulevard
- 8. Avalon Boulevard & Lomita Boulevard
- 14. Wilmington Avenue & Lomita Boulevard

CUMULATIVE PLUS PROJECT (YEAR 2021) TRAFFIC OPERATING CONDITIONS

The year 2021 cumulative plus project peak hour traffic volumes were analyzed to project future operating conditions at the study intersections and to identify specific traffic impacts resulting from the addition of project-generated traffic during excavation. Future LOS calculations include the additional project-generated trips that would be necessary during the remediation period. The results of the intersection analysis are summarized in Table 7A and compared against the cumulative base intersection conditions to determine project impacts.

According to the City of Carson's intersection traffic impact significance criteria, the proposed project would not result in any temporary adverse impacts at any of the 14 study intersections.

EXPEDITED CUMULATIVE BASE (YEAR 2019) OPERATING CONDITIONS

The year 2019 expedited cumulative base (without Expedited Option) peak hour traffic volumes were analyzed using the LOS methodologies described in Chapter 2 to project future LOS at the study intersections during the AM and PM peak hours. The results of this analysis are summarized in Table 7B for the analyzed peak hours. The table provides a summary of the cumulative base scenario. Detailed LOS calculations are provided in Appendix C.

As shown in Table 6B, four of the 14 study intersections are projected to operate at LOS E during the AM or PM peak hours, namely. The poor LOS calculated at study intersections #7 and #14 result from relatively high levels of delay on the most constrained approach, rather than for all vehicles traveling through these stop-controlled intersections.

- 5. Main Street & Lomita Boulevard
- 7. Lagoon Avenue & Lomita Boulevard
- 8. Avalon Boulevard & Lomita Boulevard
- 14. Wilmington Avenue & Lomita Boulevard

TABLE 7A
CUMULATIVE YEAR (2021) PLUS PROJECT
INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	FUTURE		FUTURE + PROJECT		V/C INCREASE	SIGNIFICANT IMPACT?
			V/C or Delay	LOS	V/C or Delay	LOS		
1	I-110 SB Off-Ramp &	AM	0.827	D	0.827	D	0.000	No
	Sepulveda Blvd	PM	0.862	D	0.862	D	0.000	No
2	I-110 NB Off-Ramp &	AM	0.735	C	0.735	C	0.000	No
	Sepulveda Blvd	PM	0.645	B	0.654	B	0.009	No
3	Figueroa St &	AM	0.727	C	0.728	C	0.001	No
	Sepulveda Blvd	PM	0.674	B	0.689	B	0.015	No
4	Main St &	AM	0.703	B	0.704	C	0.001	No
	Sepulveda Blvd	PM	0.813	D	0.843	D	0.030	No
5	Main St &	AM	0.760	C	0.761	C	0.001	No
	Lomita Blvd	PM	0.930	E	0.930	E	0.000	No
6	Neptune Ave &	AM	0.565	A	0.580	A	0.015	No
	Lomita Blvd	PM	0.500	A	0.527	A	0.027	No
7		AM	0.455	A	0.456	A	0.001	No
	Lagoon Ave &	PM	0.434	A	0.445	A	0.011	No
	Lomita Blvd*	AM	101.0s	F	118.6s	F	17.6s	N/A
		PM	53.3s	F	55.2s	F	1.9s	N/A
8	Avalon Blvd &	AM	0.751	C	0.751	C	0.000	No
	Sepulveda Blvd	PM	0.923	E	0.923	E	0.000	No
9	Avalon Blvd &	AM	0.705	C	0.718	C	0.013	No
	Lomita Blvd	PM	0.744	C	0.749	C	0.005	No
10	Wilmington Ave &	AM	0.670	B	0.673	B	0.003	No
	I-405 NB Ramps	PM	0.716	C	0.716	C	0.000	No
11	Wilmington Ave &	AM	0.493	A	0.497	A	0.004	No
	I-405 SB Ramps	PM	0.536	B	0.538	B	0.002	No
12	Wilmington Ave &	AM	0.644	B	0.644	B	0.000	No
	E 223rd St	PM	0.765	C	0.765	C	0.000	No
13	Wilmington Ave &	AM	0.693	B	0.693	B	0.000	No
	Sepulveda Blvd	PM	0.659	B	0.663	B	0.004	No
		AM	0.474	A	0.474	A	0.000	No
14	Wilmington Ave &	PM	0.468	A	0.472	A	0.004	No
	Lomita Blvd *	AM	68.4s	F	78.0s	F	9.6s	N/A
		PM	77.6s	F	80.2s	F	2.6s	N/A

Note:

* Unsignalized intersection operating at LOS E or F under HCM conditions; Analyzed under ICU per City of Carson criteria

s Seconds of delay on the most constrained approach

TABLE 7B
CUMULATIVE YEAR (2019) PLUS EXPEDITED OPTION
INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	FUTURE		FUTURE + OPTION 1		V/C INCREASE	SIGNIFICANT IMPACT?
			V/C or Delay	LOS	V/C or Delay	LOS		
1	I-110 SB Off-Ramp &	AM	0.819	D	0.819	D	0.000	No
	Sepulveda Blvd	PM	0.854	D	0.854	D	0.000	No
2	I-110 NB Off-Ramp &	AM	0.727	C	0.729	C	0.002	No
	Sepulveda Blvd	PM	0.638	B	0.653	B	0.015	No
3	Figueroa St &	AM	0.719	C	0.720	C	0.001	No
	Sepulveda Blvd	PM	0.668	B	0.690	B	0.022	No
4	Main St &	AM	0.697	B	0.701	C	0.004	No
	Sepulveda Blvd	PM	0.808	D	0.854	D	0.046	No
5	Main St &	AM	0.751	C	0.753	C	0.002	No
	Lomita Blvd	PM	0.922	E	0.922	E	0.000	No
6	Neptune Ave &	AM	0.561	A	0.585	A	0.024	No
	Lomita Blvd	PM	0.494	A	0.536	A	0.042	No
7		AM	0.451	A	0.458	A	0.007	No
	Lagoon Ave &	PM	0.430	A	0.447	A	0.017	No
	Lomita Blvd*	AM	95.3s	F	121.9s	F	26.6s	N/A
		PM	51.7s	F	54.5s	F	2.8s	N/A
8	Avalon Blvd &	AM	0.744	C	0.744	C	0.000	No
	Sepulveda Blvd	PM	0.917	E	0.917	E	0.000	No
9	Avalon Blvd &	AM	0.698	B	0.718	C	0.020	No
	Lomita Blvd	PM	0.738	C	0.744	C	0.006	No
10	Wilmington Ave &	AM	0.665	B	0.668	B	0.003	No
	I-405 NB Ramps	PM	0.709	C	0.709	C	0.000	No
11	Wilmington Ave &	AM	0.489	A	0.495	A	0.006	No
	I-405 SB Ramps	PM	0.531	B	0.534	A	0.003	No
12	Wilmington Ave &	AM	0.639	B	0.639	B	0.000	No
	E 223rd St	PM	0.758	C	0.758	C	0.000	No
13	Wilmington Ave &	AM	0.686	B	0.686	B	0.000	No
	Sepulveda Blvd	PM	0.654	B	0.659	B	0.005	No
		AM	0.469	A	0.469	A	0.000	No
14	Wilmington Ave &	PM	0.464	A	0.471	A	0.007	No
	Lomita Blvd *	AM	65.5s	F	79.8s	F	13.3s	N/A
		PM	74.5s	F	78.2s	F	3.7s	N/A

Note:

* Unsignalized intersection operating at LOS E or F under HCM conditions; Analyzed under ICU per City of Carson criteria

s Seconds of delay on the most constrained approach

CUMULATIVE PLUS EXPEDITED OPTION (YEAR 2019) TRAFFIC OPERATING CONDITIONS

The year 2019 Cumulative plus Expedited Option peak hour traffic volumes were analyzed to project future operating conditions at the study intersections and to identify specific traffic impacts resulting from the addition of project-generated traffic during excavation. Future LOS calculations include the additional project-generated trips that would be necessary during the excavation period. The results of the intersection analysis are summarized in Table 7B and compared against the cumulative base intersection conditions to determine project impacts.

According to the City of Carson's intersection traffic impact significance criteria, the proposed Expedited Option would not result in any significant impacts at study locations.

CMP ANALYSIS

The *2010 Congestion Management Program (CMP) for Los Angeles County* (Metro, July 2010) provides procedures for conducting transportation impact analyses for the regional transportation system. The CMP requires that when an environmental impact report is prepared for a project, traffic and transit impact analyses be conducted for select regional facilities based on the quantity of project traffic expected to use these facilities.

CMP Traffic Impact Analysis

The CMP guidelines require that the first issue addressed is the determination of the geographic scope of the study area. The criteria for determining the study area for CMP arterial monitoring intersections and for freeway monitoring locations are:

- All CMP arterial monitoring intersections where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours of adjacent street traffic.
- All CMP mainline freeway monitoring locations where the proposed project will add 150 or more trips, in either direction, during either the AM or PM weekday peak hours.

The CMP arterial monitoring intersection nearest to the project site is Figueroa Street & Sepulveda Boulevard. Based on the project trip generation and distribution estimates previously presented and a review of the project traffic volumes, the proposed project would not add more than 50 vehicles per hour (vph) at any CMP monitoring intersections during the peak hours. As a result, no further CMP arterial monitoring analysis is required.

Because total estimated project-related traffic in any direction during either weekday peak hour is projected to be considerably below the minimum criteria of 150 vph, no further CMP freeway analysis is required.

CMP Transit Impact Analysis

The trip generation estimates used in this study include both worker trips and truck trips during the entire project. It was assumed that 32 workers would be needed for the Project, with 16 of them traveling to and from the project site via shuttle van. Applying the CMP guidelines (assuming 3.5% transit use) to the remaining 16 workers' trips, it is estimated that the project could add one new transit person trip in both

the AM and the PM peak hours. Likewise, for the Expedited Option, applying the CMP guidelines to the 24 workers arriving by automobile to the site would yield one new transit person trip in both the AM and PM peak hours. As discussed in Chapter 2, the project site is served by several established public transit routes providing connectivity to public transit services throughout the surrounding area, potentially distributing project transit trips across multiple routes. Given the magnitude of the estimated increase in project-related trips, as well as the temporary nature of any increase, it is concluded that no significant impact on the regional transit system would occur.

PROJECT IMPACTS – TRANSIT

Existing and Future Transit Service

There is existing transit service along the study roadway facilities, as described in Chapter 2. The bus stop closest to the project site is for the Carson North-South Shuttle, which is located on the north side of Lomita Boulevard just west of Neptune Boulevard. This bus stop would not be affected by the project. Furthermore, there are no planned transit lines or bus stops that would be affected by the project. Therefore, the project impact is less than significant and no mitigation is required.

Adopted Transit System Plans, Guidelines, Policies or Standards

The City of Carson General Plan Circulation Element (2004) contains a general plan policy related to transit, promoting the use of public transit (TI-4.1). The project does not conflict with this policy. Therefore the project impact is less than significant and no mitigation is required.

Demand for Public Transit Services above Capacity

In determining the adequacy of public transit capacity, Fehr & Peers considered two factors:

- What is the likely transit demand created by the site?
- What is the residual capacity of services that would likely be used by persons traveling to/from the site?

If the likely transit demand exceeds capacity, then a significant impact occurs. This type of project lends itself to workers arriving and departing by private automobile or by worker shuttle instead of transit. Since neither the Project nor the Expedited Option would generate no more than a nominal number of transit trips, the impact would be less than significant and no mitigation would be required.

PROJECT IMPACTS – BICYCLE

Disruptions to Existing Bicycle Facilities

There are currently no bicycle facilities immediately adjacent to the project site. Although it may be necessary to temporarily close a portion of the local streets within the project site in order to connect the soil vapor extraction system below the street, there will be no long-term road closures that would adversely affect cyclists. It is expected that at least one travel lane will be maintained at all times on the

local streets during construction but detours will be provided if a full closure is found to be necessary. Therefore, the impact is expected to be less than significant.

Project Interferes with Planned Bicycle Facilities

The project is adjacent to Lomita Boulevard. The City of Carson Bicycle Master Plan proposes a Class II facility along Lomita Boulevard; however, this improvement is not currently funded. Additionally, Lomita Boulevard will not be closed during remediation. As a result, the impact is less than significant.

Conflicts with Adopted Bicycle System Plans, Guidelines, Policies, or Standards

The Carson Bicycle Master Plan (2013) provides the following policies related to the bicycle system:

- Ensure that all Carson streets accommodate safe bicycling (1.2)
- Make bicycle parking available, secure, and convenient throughout Carson (1.3)
- Systematically reduce crash risk on City streets through design and enforcement (3.2)
- Develop an institutional culture in City government that treats streets as public spaces (4.3)

The City's General Plan (2004) provides a policy related to the bicycle system related to providing appropriate bicycle access throughout the City by implementing the Bicycle Plan (TI-4.3).

Neither the Project nor the Expedited Option conflicts with any of the aforementioned policies. Therefore the Project and Expedited Option impacts are less than significant.

PROJECT IMPACTS – PEDESTRIAN

Disruptions to Existing Pedestrian Facilities

There are paved sidewalks along all of the roadways within the project site. When each cluster of homes is remediated, the sidewalk adjacent to them may be unavailable at times. As such, pedestrians would not be able to walk along that segment of sidewalk during excavation and reconstruction. However, remediation will be occurring in phases, with work proceeding on clusters of homes concurrently. As such, there will be sidewalk access on one side of the street at all times. Nevertheless, because excavation to a depth of five feet or more will occur immediately adjacent to existing sidewalks, access to those sidewalks may be disrupted during construction. However, this will be addressed as part of the Construction Traffic Management Plan to reduce adverse effects on the pedestrian environment. With the inclusion of the Construction Traffic Management Plan, this impact would be less than significant.

Conflicts with Adopted Pedestrian System Plans, Guidelines, Policies, or Standards

The City of Carson General Plan includes a policy related to pedestrians regarding developing appropriate pedestrian access throughout the City and developing a system of pedestrian walkways, alleviating the conflict between pedestrians, automobiles and bicyclists where feasible (TI-4.2).

The Project and its Expedited Option do not conflict with the aforementioned policy. Therefore the Project and Expedited Option impacts are less than significant.

MITIGATION MEASURES/PROJECT DESIGN FEATURES

As part of the Project or Expedited Option, a Construction Traffic Management Plan would be developed to reduce adverse effects on the transportation network during construction. Construction traffic management plans, including street closure information, haul routes, and staging plans should be prepared and submitted to the City of Carson for review and approval prior to the start of any construction work. These plans would include such elements as the designation of haul routes for construction-related trucks, the sequencing of construction activities, any driveway turning movement restrictions (if any), temporary traffic control devices, travel time restrictions for construction-related traffic, consolidating construction truck deliveries, and designated staging and parking areas for workers and equipment. While not anticipated, if oversized vehicles or loads are to be transported over State highways, a permit would be required from Caltrans.

Where construction activities would occur within a public street right-of-way, the following shall be included in the Construction Traffic Management Plan:

- A site-specific construction work site traffic control plan shall be prepared for each construction phase and submitted to the City of Carson for review and approval prior to the start of any construction work. This plan shall include such elements as the location and hours of any necessary lane closures, local traffic detours (if any), protective devices and traffic controls (such as barricades, cones, flag persons, lights, warning beacons, temporary traffic signals, warning signs), the location and hours of any necessary access limitations for abutting properties, and provisions to maintain emergency access through construction work areas.

- Follow generally accepted construction safety standards to separate pedestrians from construction activity through such measures as protection barriers and signage indicating alternative pedestrian access routes where existing facilities would be affected. This would include the sidewalks around the perimeter of an active excavation site.

- Provide advance notice of planned construction activities to any affected residents and property owners in the vicinity of the construction site.

- Coordinate with emergency service providers (police/sheriffs, fire, ambulance and paramedic services) to provide advance notice of ongoing construction activity and construction hours.

Construction of the proposed project could result in temporary adverse traffic impacts in the immediate vicinity of the project site associated with pedestrian access and truck hazards. These would be moderate and of limited duration. With the implementation of the Construction Traffic Management Plan potential impacts associated with pedestrian access and truck hazards would be less than significant. Therefore, impacts are considered to be adverse but not significant.

5. PROJECT ALTERNATIVE

This section documents the conditions of the project alternatives for the proposed remediation, and provides a qualitative assessment. The following alternatives have been considered:

- No Project Alternative
- Excavation Beneath Landscape and Hardscape to 10 Feet

NO PROJECT ALTERNATIVE

Under the No Project alternative, the project site would not proceed. In this case, the No Project Alternative would mean that the RAP is not implemented at the site. As such, no traffic impacts would occur.

EXCAVATION BENEATH LANDSCAPE AND HARDSCAPE TO 10 FEET

This alternative would include the same remedial technologies as the project, but would excavate soils to a depth of 10 feet bgs (as compared to the 5 feet with targeted excavation to 10 feet bgs under the project). The intensity of worker and truck activity would remain consistent with the proposed project. Under this alternative, the project would be completed by year 2023, instead of year 2021. As such, there would be approximately 1% more ambient traffic growth on the roadway network by the time of completion. As such, this alternative would either result in no impacts, which is consistent with the project, or more impacts than the project.

6. SUMMARY AND CONCLUSIONS

Fehr & Peers conducted a traffic impact analysis for the proposed Kast Property Remediation Action Plan. This analysis assesses potentially adverse traffic impacts caused as a result of truck and worker trips to and from the site during remediation. The key findings and conclusions of the study are summarized below:

- The proposed project consists of soil remediation to the 44-acre Former Kast Site, consisting of 285 single family homes in the City of Carson, and is bounded by the Monterey Pines community and industrial property of the former Turco Products Facility to the west, railroad tracks to the north, Panama Avenue to the east, and Lomita Boulevard to the south. Project construction would occur over a period of up to 5.6 years, beginning in late 2015 and ending in 2021. An Expedited Option would complete remediation by 2019, with construction occurring over a period of up to approximately 3.5 years.

- New baseline traffic data was collected for use in this study in April 2014. Detailed level of service analysis was conducted at 14 intersections in the vicinity of the project site for weekday AM and PM peak hours (between 7:00 and 9:00 AM and 4:00 and 6:00 PM, respectively). All 14 analyzed intersections are currently operating at acceptable levels of service (LOS D or better) using ICU methodology, and the two unsignalized intersections operate at LOS E or F under HCM methodology.

- Future traffic conditions in the study area were forecast for the year 2021 (Project completion year) and 2019 (expedited completion year) based on cumulative development projects information and ambient traffic growth. The cumulative base (2021) analyses (conditions without project construction) show that two of the 14 study intersections are projected to operate at unsatisfactory (LOS E or F) conditions during the PM peak hour. The remaining 12 intersections are projected to operate at LOS D or better conditions. The two unsignalized intersections operate at LOS F under HCM methodology due to poor LOS on the most constrained approach at each intersection.

- Project construction activities would begin in late 2015 and are expected to end in 2021. An Expedited Option would intensify remediation and expedite the completion date to 2019. A PCE factor of 2.0 was applied to the estimated truck trips to generate project trip generation estimates with PCE, and the adjusted number of PCE trips was used in the traffic impact analysis. It is estimated that the proposed project would generate approximately 478 daily trips and 61 PCE trips during both the AM and PM peak hours with 58 inbound and 3 outbound trips during the AM peak hour and 3 inbound and 58 outbound trips during the PM peak hour. It is estimated that the proposed Expedited Option would generate approximately 790 daily trips and 94 PCE trips during both the AM and PM peak hours with 88 inbound and 6 outbound trips during the AM peak hour and 6 inbound and 88 outbound trips during the PM peak hour.

- According to the City of Carson's impact criteria, neither the proposed Project nor the Expedited Option would adversely impact any of the study intersections.

- Neither the Project nor the Expedited Option would result in CMP, transit, bicycle or pedestrian impacts.

- The project does not conflict with any existing non-motorized transportation policies adopted by the City of Carson. However, the sidewalks adjacent to the cluster of affected properties being remediated during a particular time would be unavailable during that portion of excavation. Since the project includes the implementation of a construction management plan, the temporary impact to the pedestrian environment would be adverse but not significant.

- A project design feature/mitigation program was developed to address the identified temporary adverse impacts. By its nature, the proposed project would result in only temporary traffic impacts. Because these impacts would be moderate and of limited duration, they are considered to be less than significant.

REFERENCES

2010 Los Angeles County Congestion Management Program, Los Angeles County Metropolitan Transportation Authority, 2010.

Highway Capacity Manual, Transportation Research Board, 2000.

Trip Generation, 9th Edition, Institute of Transportation Engineers, 2012

Incorporating Truck Analysis into the Highway Capacity Manual, NCFRP Report 31, Richard Dowling, et al. Transportation Research Board 2014

City of Carson Municipal Code, accessed on-line at http://www.codepublishing.com/ca/carson.html

Carson General Plan Update (2004), accessed on-line at http://ci.carson.ca.us/content/department/eco_dev_service/generalplan.asp

Carson Master Plan of Bikeways (2013), accessed on-line at http://ci.carson.ca.us/content/department/eco_dev_service/bikeways.asp

Wilmington Community Plan, Los Angeles Department of City Planning, accessed on-line at http://cityplanning.lacity.org/complan/westla/wlmpage.htm

APPENDIX A:
TRAFFIC COUNT SHEETS

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

Day: Thursday

TOTALS

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM			9	62	9	297	0	485	3	0	208	37	1110
7:15 AM			7	64	10	261	0	465	3	0	279	45	1134
7:30 AM			3	70	17	322	0	510	2	0	288	103	1315
7:45 AM			7	79	10	266	0	505	1	0	311	62	1241
8:00 AM			5	78	11	235	0	475	4	1	326	40	1175
8:15 AM			4	55	13	228	0	494	10	0	312	63	1179
8:30 AM			7	54	15	256	0	454	9	1	250	36	1082
8:45 AM			8	58	7	252	0	442	3	2	211	41	1024
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	50	520	92	2117	0	3830	35	4	2185	427	9260
APPROACH %'s :	0.00%	0.00%	100.00%	19.05%	3.37%	77.57%	0.00%	99.09%	0.91%	0.15%	83.52%	16.32%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	19	282	51	1051	0	1984	17	1	1237	268	4910
PEAK HR FACTOR :		0.679			0.846			0.977			0.963		0.933

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM			12	77	12	196	0	575	2	0	241	40	1155
4:15 PM			17	112	14	251	0	566	10	0	204	39	1213
4:30 PM			13	74	8	234	0	568	5	0	237	54	1193
4:45 PM			8	107	17	251	0	549	4	0	242	46	1224
5:00 PM			12	87	13	244	0	595	6	0	241	49	1247
5:15 PM			5	93	20	251	0	542	3	1	243	27	1185
5:30 PM			5	96	24	235	0	563	9	2	318	28	1280
5:45 PM			10	120	8	244	0	554	4	0	248	37	1225
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	82	766	116	1906	0	4512	43	3	1974	320	9722
APPROACH %'s :	0.00%	0.00%	100.00%	27.47%	4.16%	68.36%	0.00%	99.06%	0.94%	0.13%	85.94%	13.93%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	32	396	65	974	0	2254	22	3	1050	141	4937
PEAK HR FACTOR :		0.667			0.964			0.947			0.858		0.964

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

I-110 SB Ramps and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-001

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach — I-110 SB Ramps

	Lanes 2	0.5	1.5		
AM	1051	51	282	268	AM
NOON	0	0	0	0	NOON
PM	974	65	396	141	PM

Eastbound Approach — Sepulveda Blvd

Lanes	AM	NOON	PM
	2288	0	2024
0	0	0	0
3	1984	0	2254
0	17	0	22

Westbound Approach

AM	NOON	PM	Lanes
268	0	141	1
1237	0	1050	4
1	0	3	0
2285	0	2682	

Northbound Approach

AM	69	0	0	19	AM
NOON	0	0	0	0	NOON
PM	90	0	0	32	PM
		0	1	0	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	1384	268	AM
	0	0	NOON
	1435	141	PM

West Leg AM	NOON	PM		East Leg AM	NOON	PM
2288	0	2024		1506	0	1194
2001	0	2276		2285	0	2682

	South Leg	
AM	69	19
NOON	0	0
PM	90	32

Total Volume Per Leg

	North Leg
	1652 AM
	0 NOON
	1576 PM

West Leg AM	NOON	PM		East Leg AM	NOON	PM
4289	0	4300		3791	0	3876

	South Leg
AM	88
NOON	0
PM	122

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM			9	49	9	289		467	3	0	200	28	41
7:15 AM			7	58	10	245		451	3	0	269	39	44
7:30 AM			3	65	17	307		491	2	0	280	94	74
7:45 AM			7	70	10	247		497	1	0	309	54	79
8:00 AM			5	53	9	218		464	4	1	306	31	51
8:15 AM			4	48	11	208		472	10	0	298	35	52
8:30 AM			7	34	15	244		444	9	1	245	17	53
8:45 AM			8	46	7	231		428	3	0	206	25	44
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	50	423	88	1989	0	3714	35	2	2113	323	8737
APPROACH %'s :	0.00%	0.00%	100.00%	16.92%	3.52%	79.56%	0.00%	99.07%	0.93%	0.08%	86.67%	13.25%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	19	236	47	980	0	1924	17	1	1193	214	4631
PEAK HR FACTOR :		0.679			0.812			0.974			0.941		0.920

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM			12	72	12	194		559	2	0	228	38	61
4:15 PM			17	94	14	240		550	10	0	193	37	65
4:30 PM			11	72	8	225		554	5	0	237	52	57
4:45 PM			8	98	17	240		541	4	0	235	46	64
5:00 PM			12	80	13	233		585	6	0	237	49	84
5:15 PM			5	85	20	244		537	3	1	239	27	68
5:30 PM			5	92	24	233		553	9	2	315	28	80
5:45 PM			10	115	8	239		543	4	0	248	35	71
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	80	708	116	1848	0	4422	43	3	1932	312	9464
APPROACH %'s :	0.00%	0.00%	100.00%	26.50%	4.34%	69.16%	0.00%	99.04%	0.96%	0.13%	85.98%	13.89%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	32	372	65	949	0	2218	22	3	1039	139	4839
PEAK HR FACTOR :		0.667			0.957			0.948			0.856		0.959

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM			0	7	0	4		8	0	0	5	2	41
7:15 AM			0	1	0	8		5	0	0	4	4	44
7:30 AM			0	2	0	7		7	0	0	4	3	74
7:45 AM			0	3	0	10		5	0	0	1	4	79
8:00 AM			0	7	1	7		3	0	0	8	3	51
8:15 AM			0	3	0	12		9	0	0	5	4	52
8:30 AM			0	5	0	5		4	0	0	3	2	53
8:45 AM			0	4	0	10		9	0	0	3	4	44
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	32	1	63	0	50	0	0	33	26	205
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	33.33%	1.04%	65.63%	0.00%	100.00%	0.00%	0.00%	55.93%	44.07%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	15	1	36	0	24	0	0	18	14	108
PEAK HR FACTOR :		0.000			0.867			0.667			0.727		0.919

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM			0	3	0	1		5	0	0	7	0	61
4:15 PM			0	5	0	3		4	0	0	6	1	65
4:30 PM			1	0	0	3		5	0	0	0	0	57
4:45 PM			0	2	0	3		5	0	0	3	0	64
5:00 PM			0	3	0	2		5	0	0	0	0	84
5:15 PM			0	1	0	3		2	0	0	1	0	68
5:30 PM			0	0	0	1		4	0	0	2	0	80
5:45 PM			0	2	0	2		2	0	0	0	1	71
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	1	16	0	18	0	32	0	0	19	2	88
APPROACH %'s :	0.00%	0.00%	100.00%	47.06%	0.00%	52.94%	0.00%	100.00%	0.00%	0.00%	90.48%	9.52%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	6	0	8	0	13	0	0	3	1	31
PEAK HR FACTOR :	0.000			0.700			0.650			0.500			0.959

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM			0	1	0	1		3	0	0	0	3	41
7:15 AM			0	2	0	2		3	0	0	2	0	44
7:30 AM			0	1	0	2		4	0	0	1	2	74
7:45 AM			0	2	0	2		0	0	0	0	1	79
8:00 AM			0	7	0	3		3	0	0	4	2	51
8:15 AM			0	1	1	1		4	0	0	3	11	52
8:30 AM			0	6	0	2		2	0	0	0	8	53
8:45 AM			0	3	0	3		0	0	1	0	5	44
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	23	1	16	0	19	0	1	10	32	102
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	57.50%	2.50%	40.00%	0.00%	100.00%	0.00%	2.33%	23.26%	74.42%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	11	1	8	0	11	0	0	8	16	55
PEAK HR FACTOR :		0.000			0.500			0.688			0.429		0.919

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-001

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM			0	0	0	0		4	0	0	1	1	61
4:15 PM			0	5	0	3		5	0	0	1	0	65
4:30 PM			0	1	0	2		3	0	0	0	1	57
4:45 PM			0	3	0	3		0	0	0	1	0	64
5:00 PM			0	1	0	4		1	0	0	2	0	84
5:15 PM			0	3	0	1		1	0	0	1	0	68
5:30 PM			0	2	0	0		2	0	0	0	0	80
5:45 PM			0	1	0	1		4	0	0	0	0	71
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	16	0	14	0	20	0	0	6	2	58
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	53.33%	0.00%	46.67%	0.00%	100.00%	0.00%	0.00%	75.00%	25.00%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	7	0	6	0	8	0	0	3	0	24
PEAK HR FACTOR :	0.000			0.650			0.500			0.375			0.959

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM	77	1	32	0	0	1	0	141	382	0	286	1	843
7:15 AM	115	3	40	0	0	5	2	151	343	0	328	1	870
7:30 AM	103	8	39	0	0	24	4	174	340	0	432	0	1013
7:45 AM	114	4	50	0	0	11	7	196	338	0	374	1	977
8:00 AM	113	9	61	0	0	16	4	157	314	0	359	3	914
8:15 AM	127	4	39	0	0	7	10	141	357	0	336	0	890
8:30 AM	87	5	46	0	0	13	8	149	319	0	289	0	824
8:45 AM	85	3	43	1	0	14	21	129	320	0	247	0	775
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	821	37	350	1	0	91	56	1238	2713	0	2651	6	7964
APPROACH %'s :	67.96%	3.06%	28.97%	1.09%	0.00%	98.91%	1.40%	30.90%	67.71%	0.00%	99.77%	0.23%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	457	25	189	0	0	58	25	668	1349	0	1501	4	4276
PEAK HR FACTOR :		0.917			0.604			0.944			0.871		0.951

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM	66	5	80	0	0	30	25	282	327	0	271	2	1017
4:15 PM	73	9	81	0	0	23	22	246	331	0	252	4	959
4:30 PM	80	7	95	0	0	21	26	251	327	0	301	2	1023
4:45 PM	77	10	68	0	0	41	27	266	320	0	249	5	976
5:00 PM	90	9	54	0	0	17	23	284	305	0	260	2	945
5:15 PM	104	13	40	0	0	22	27	261	278	0	264	5	897
5:30 PM	91	5	34	0	0	41	30	311	261	0	277	3	957
5:45 PM	68	7	38	0	0	30	25	291	292	0	269	6	951
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	649	65	490	0	0	225	205	2192	2441	0	2143	29	8439
APPROACH %'s :	53.90%	5.40%	40.70%	0.00%	0.00%	100.00%	4.24%	45.31%	50.45%	0.00%	98.66%	1.34%	
PEAK HR START TIME :	400 PM												TOTAL
PEAK HR VOL :	296	31	324	0	0	115	100	1045	1305	0	1073	13	4302
PEAK HR FACTOR :		0.894			0.701			0.966			0.896		0.969

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

I-110 NB Ramps and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-002

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	400 PM

Peak Hour Summary

Southbound Approach (I-110 NB Ramps)

	Lanes 1	0	0		
AM	58	0	0	54	AM
NOON	0	0	0	0	NOON
PM	115	0	0	144	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	2016	0	1484
1	25	0	100
3	668	0	1045
1	1349	0	1305

Westbound Approach

AM	NOON	PM	Lanes
4	0	13	0
1501	0	1073	3
0	0	0	0
857	0	1369	

CONTROL: Signalized

Northbound Approach

AM	1349	457	25	189	AM
NOON	0	0	0	0	NOON
PM	1305	296	31	324	PM
		0.5	0.5	1	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	58	54	AM
	0	0	NOON
	115	144	PM

West Leg AM	NOON	PM	East Leg AM	NOON	PM
2016	0	1484	1505	0	1086
2042	0	2450	857	0	1369

	South Leg	
AM	1349	671
NOON	0	0
PM	1305	651

Total Volume Per Leg

	North Leg
AM	112
NOON	0
PM	259

West Leg AM	NOON	PM	East Leg AM	NOON	PM
4058	0	3934	2362	0	2455

	South Leg
AM	2020
NOON	0
PM	1956

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM	72	1	26	0		1	0	121	371		264	1	117
7:15 AM	109	3	35	0		5	2	141	335		304	1	105
7:30 AM	103	8	37	0		24	4	168	326		395	0	122
7:45 AM	112	4	48	0		11	7	185	332		346	1	131
8:00 AM	104	9	56	0		14	4	131	308		330	3	100
8:15 AM	122	4	39	0		7	10	127	342		287	0	89
8:30 AM	85	5	40	0		13	8	129	309		251	0	87
8:45 AM	80	3	31	1		14	21	112	314		215	0	69
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	787	37	312	1	0	89	56	1114	2637	0	2392	6	7431
APPROACH %'s :	69.28%	3.26%	27.46%	1.11%	0.00%	98.89%	1.47%	29.26%	69.27%	0.00%	99.75%	0.25%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	441	25	180	0	0	56	25	611	1308	0	1358	4	4008
PEAK HR FACTOR :		0.956			0.583			0.927			0.862		0.941

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM	63	5	34	0		30	25	271	316		250	2	82
4:15 PM	71	9	44	0		23	22	228	317		228	4	80
4:30 PM	80	7	50	0		21	26	247	320		277	2	75
4:45 PM	77	10	44	0		41	27	255	316		235	5	84
5:00 PM	90	9	49	0		17	23	274	305		246	2	72
5:15 PM	104	13	38	0		22	27	253	278		247	5	85
5:30 PM	91	5	34	0		41	30	302	254		273	3	84
5:45 PM	68	7	34	0		30	25	285	281		265	6	78
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	644	65	327	0	0	225	205	2115	2387	0	2021	29	8018
APPROACH %'s :	62.16%	6.27%	31.56%	0.00%	0.00%	100.00%	4.36%	44.93%	50.71%	0.00%	98.59%	1.41%	
PEAK HR START TIME :	400 PM												TOTAL
PEAK HR VOL :	291	31	172	0	0	115	100	1001	1269	0	990	13	3982
PEAK HR FACTOR :		0.901			0.701			0.968			0.899		0.967

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM	3	0	1	0		0	0	9	6		4	0	117
7:15 AM	1	0	2	0		0	0	4	0		9	0	105
7:30 AM	0	0	1	0		0	0	4	5		10	0	122
7:45 AM	1	0	1	0		0	0	3	4		9	0	131
8:00 AM	2	0	2	0		1	0	9	0		11	0	100
8:15 AM	2	0	0	0		0	0	5	6		11	0	89
8:30 AM	1	0	1	0		0	0	5	5		9	0	87
8:45 AM	2	0	1	0		0	0	7	4		9	0	69
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	12	0	9	0	0	1	0	46	30	0	72	0	170
APPROACH %'s :	57.14%	0.00%	42.86%	0.00%	0.00%	100.00%	0.00%	60.53%	39.47%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	5	0	4	0	0	1	0	21	15	0	41	0	87
PEAK HR FACTOR :	0.563			0.250			0.818			0.932			0.941

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM	2	0	12	0		0	0	7	3		6	0	82
4:15 PM	0	0	7	0		0	0	5	4		9	0	80
4:30 PM	0	0	7	0		0	0	0	2		5	0	75
4:45 PM	0	0	9	0		0	0	3	1		4	0	84
5:00 PM	0	0	2	0		0	0	5	0		5	0	72
5:15 PM	0	0	0	0		0	0	1	0		6	0	85
5:30 PM	0	0	0	0		0	0	2	2		1	0	84
5:45 PM	0	0	1	0		0	0	1	3		1	0	78
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	2	0	38	0	0	0	0	24	15	0	37	0	116
APPROACH %'s :	5.00%	0.00%	95.00%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	61.54%	38.46%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	400 PM												TOTAL
PEAK HR VOL :	2	0	35	0	0	0	0	15	10	0	24	0	86
PEAK HR FACTOR :		0.661			0.000			0.625			0.667		0.967

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM	0	0	2	0		0	0	3	1		8	0	117
7:15 AM	2	0	1	0		0	0	2	4		5	0	105
7:30 AM	0	0	0	0		0	0	0	3		11	0	122
7:45 AM	0	0	0	0		0	0	3	0		7	0	131
8:00 AM	3	0	1	0		0	0	6	3		6	0	100
8:15 AM	1	0	0	0		0	0	3	3		16	0	89
8:30 AM	0	0	2	0		0	0	6	1		12	0	87
8:45 AM	1	0	5	0		0	0	3	0		9	0	69
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	0	11	0	0	0	0	26	15	0	74	0	133
APPROACH %'s :	38.89%	0.00%	61.11%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	63.41%	36.59%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	4	0	1	0	0	0	0	12	9	0	40	0	66
PEAK HR FACTOR :	0.313			0.000			0.583			0.625			0.941

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-002

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM	0	0	14	0		0	0	0	3		6	0	82
4:15 PM	1	0	13	0		0	0	5	4		5	0	80
4:30 PM	0	0	17	0		0	0	2	2		8	0	75
4:45 PM	0	0	5	0		0	0	3	1		4	0	84
5:00 PM	0	0	1	0		0	0	1	0		3	0	72
5:15 PM	0	0	1	0		0	0	3	0		4	0	85
5:30 PM	0	0	0	0		0	0	3	2		1	0	84
5:45 PM	0	0	1	0		0	0	2	3		1	0	78
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	0	52	0	0	0	0	19	15	0	32	0	119
APPROACH %'s :	1.89%	0.00%	98.11%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	55.88%	44.12%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	400 PM												TOTAL
PEAK HR VOL :	1	0	49	0	0	0	0	10	10	0	23	0	93
PEAK HR FACTOR :	0.735			0.000			0.556			0.719			0.967

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	1	1	2	1	1	2	1					
7:00 AM	33	44	11	3	29	51	15	135	23	9	206	14	496	0	0	0	0
7:15 AM	25	47	7	14	35	68	29	140	20	15	242	17	587	0	0	1	0
7:30 AM	32	90	12	10	64	72	31	154	24	13	320	19	719	0	0	0	0
7:45 AM	44	79	16	16	51	53	24	192	26	12	284	23	697	0	0	0	0
8:00 AM	31	61	10	23	52	63	22	167	23	9	259	18	646	0	0	1	0
8:15 AM	31	36	9	11	36	40	17	140	16	10	281	14	574	0	0	1	0
8:30 AM	31	48	7	8	23	29	18	162	23	15	230	22	537	0	0	2	0
8:45 AM	32	37	14	14	38	36	24	123	23	7	192	12	483	0	0	1	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	259	442	86	99	328	412	180	1213	178	90	2014	139	5440	0	0	6	0
APPROACH %'s :	32.91%	56.16%	10.93%	11.80%	39.09%	49.11%	11.46%	77.21%	11.33%	4.01%	89.79%	6.20%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	132	277	45	63	202	256	106	653	93	49	1105	77	3058				
PEAK HR FACTOR :		0.817			0.892			0.880			0.874		0.909				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	1	1	2	1	1	2	1					
4:00 PM	30	41	29	31	40	38	28	300	37	6	210	24	814	0	0	1	0
4:15 PM	36	71	16	22	65	30	38	236	46	14	204	21	799	0	0	2	0
4:30 PM	33	48	9	22	59	46	30	270	39	5	221	27	809	0	0	1	0
4:45 PM	25	57	13	33	76	34	40	257	33	9	208	16	801	0	0	0	1
5:00 PM	24	57	11	37	68	21	49	250	39	16	215	23	810	0	0	1	0
5:15 PM	40	72	15	31	82	34	35	227	47	15	223	40	861	0	0	0	0
5:30 PM	16	71	22	31	80	31	45	253	55	14	238	32	888	0	0	0	0
5:45 PM	30	64	23	38	60	31	39	244	40	12	217	36	834	0	0	2	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	234	481	138	245	530	265	304	2037	336	91	1736	219	6616	0	0	7	4
APPROACH %'s :	27.43%	56.39%	16.18%	23.56%	50.96%	25.48%	11.36%	76.09%	12.55%	4.45%	84.85%	10.70%					
PEAK HR START TIME :	500 PM												TOTAL				
PEAK HR VOL :	110	264	71	137	290	117	168	974	181	57	893	131	3393				
PEAK HR FACTOR :		0.876			0.925			0.937			0.952		0.955				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Figueroa St and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-003

City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach (Figueroa St)

Lanes	1	2	1		
AM	256	202	63	460	AM
NOON	0	0	0	0	NOON
PM	117	290	137	563	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	1493	0	1120
1	106	0	168
2	653	0	974
1	93	0	181

Westbound Approach

AM	NOON	PM	Lanes
77	0	131	1
1105	0	893	2
49	0	57	1
761	0	1182	

CONTROL: Signalized

Northbound Approach

AM	344	132	277	45	AM
NOON	0	0	0	0	NOON
PM	528	110	264	71	PM
		1	2	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	521	460	AM
	0	0	NOON
	544	563	PM

West Leg	AM	NOON	PM
	1493	0	1120
	852	0	1323

East Leg	AM	NOON	PM
	1231	0	1081
	761	0	1182

	South Leg	
AM	344	454
NOON	0	0
PM	528	445

Total Volume Per Leg

	North Leg
AM	981
NOON	0
PM	1107

West Leg	AM	NOON	PM
	2345	0	2443

East Leg	AM	NOON	PM
	1992	0	2263

	South Leg
AM	798
NOON	0
PM	973

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	1	1	2	1	1	2	1					
7:00 AM	23	42	11	3	27	49	13	111	23	9	193	10	514	0	0	0	0
7:15 AM	25	45	7	11	35	64	29	130	15	13	222	14	610	0	0	1	0
7:30 AM	28	87	12	10	62	63	31	148	24	10	296	19	790	0	0	0	0
7:45 AM	40	77	12	14	51	53	22	182	24	10	258	23	766	0	0	0	0
8:00 AM	24	56	10	23	50	61	22	149	15	9	241	16	676	0	0	1	0
8:15 AM	29	31	9	11	33	40	17	130	14	10	235	14	573	0	0	1	0
8:30 AM	29	43	7	8	20	29	18	139	17	15	196	20	541	0	0	2	0
8:45 AM	28	35	12	12	38	36	22	105	14	7	164	10	483	0	0	1	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	226	416	80	92	316	395	174	1094	146	83	1805	126	4953	0	0	6	0
APPROACH %'s :	31.30%	57.62%	11.08%	11.46%	39.35%	49.19%	12.31%	77.37%	10.33%	4.12%	89.62%	6.26%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	117	265	41	58	198	241	104	609	78	42	1017	72	2842				
PEAK HR FACTOR :		0.820			0.920			0.867			0.870		0.899				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	1	1	2	1	1	2	1					
4:00 PM	26	41	23	29	40	38	25	240	37	6	190	17	712	0	0	1	0
4:15 PM	27	71	14	20	63	30	38	191	44	12	189	18	717	0	0	2	0
4:30 PM	24	46	9	22	59	46	30	221	39	5	206	27	734	0	0	1	0
4:45 PM	21	55	13	33	76	32	40	223	33	9	198	16	749	0	0	0	1
5:00 PM	22	57	11	35	68	21	49	236	37	16	205	23	780	0	0	1	0
5:15 PM	35	72	13	29	82	34	35	219	45	15	212	40	831	0	0	0	0
5:30 PM	16	71	22	29	80	31	45	244	55	14	233	30	870	0	0	0	0
5:45 PM	30	61	23	38	60	31	39	237	40	12	212	36	819	0	0	2	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	201	474	128	235	528	263	301	1811	330	89	1645	207	6212	0	0	7	4
APPROACH %'s :	25.03%	59.03%	15.94%	22.90%	51.46%	25.63%	12.33%	74.16%	13.51%	4.59%	84.75%	10.66%					

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	103	261	69	131	290	117	168	936	177	57	862	129	3300
PEAK HR FACTOR :		0.902			0.928			0.931			0.946		0.948

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	1	1	2	1	
7:00 AM	1	1	0	0	0	1	1	9	0	0	2	1	16
7:15 AM	0	1	0	2	0	1	0	4	2	1	8	2	21
7:30 AM	0	2	0	0	0	6	0	4	0	2	4	0	18
7:45 AM	1	1	1	1	0	0	1	4	0	0	9	0	18
8:00 AM	2	3	0	0	1	0	0	8	0	0	8	1	23
8:15 AM	1	3	0	0	2	0	0	4	1	0	9	0	20
8:30 AM	1	3	0	0	2	0	0	7	0	0	8	1	22
8:45 AM	1	1	1	1	0	0	1	5	2	0	8	1	21
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	15	2	4	5	8	3	45	5	3	56	6	159
APPROACH %'s :	29.17%	62.50%	8.33%	23.53%	29.41%	47.06%	5.66%	84.91%	9.43%	4.62%	86.15%	9.23%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	3	7	1	3	1	7	1	20	2	3	29	3	80
PEAK HR FACTOR :	0.550			0.458			0.719			0.795			0.899

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	1	1	2	1	
4:00 PM	0	0	1	1	0	0	2	17	0	0	8	2	31
4:15 PM	3	0	1	0	1	0	0	11	0	1	6	2	25
4:30 PM	3	1	0	0	0	0	0	6	0	0	2	0	12
4:45 PM	1	1	0	0	0	0	0	13	0	0	4	0	19
5:00 PM	0	0	0	1	0	0	0	5	1	0	4	0	11
5:15 PM	2	0	0	0	0	0	0	1	0	0	3	0	6
5:30 PM	0	0	0	1	0	0	0	2	0	0	3	0	6
5:45 PM	0	2	0	0	0	0	0	2	0	0	2	0	6
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	9	4	2	3	1	0	2	57	1	1	32	4	116
APPROACH %'s :	60.00%	26.67%	13.33%	75.00%	25.00%	0.00%	3.33%	95.00%	1.67%	2.70%	86.49%	10.81%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	2	2	0	2	0	0	0	10	1	0	12	0	29
PEAK HR FACTOR :	0.500			0.500			0.458			0.750			0.948

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	1	1	2	1	
7:00 AM	4	0	0	0	1	0	0	5	0	0	5	1	16
7:15 AM	0	0	0	0	0	1	0	2	1	0	4	0	8
7:30 AM	2	0	0	0	1	0	0	0	0	0	9	0	12
7:45 AM	1	0	1	0	0	0	0	2	1	1	6	0	12
8:00 AM	2	0	0	0	0	1	0	3	4	0	3	0	13
8:15 AM	0	0	0	0	0	0	0	2	0	0	16	0	18
8:30 AM	0	0	0	0	0	0	0	6	3	0	11	0	20
8:45 AM	1	0	0	0	0	0	0	5	3	0	8	0	17
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	10	0	1	0	2	2	0	25	12	1	62	1	116
APPROACH %'s :	90.91%	0.00%	9.09%	0.00%	50.00%	50.00%	0.00%	67.57%	32.43%	1.56%	96.88%	1.56%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	5	0	1	0	1	2	0	7	6	1	22	0	45
PEAK HR FACTOR :	0.750			0.750			0.464			0.639			0.899

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-003

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Figueroa St			Figueroa St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	1	1	2	1	
4:00 PM	2	0	2	0	0	0	0	17	0	0	4	2	27
4:15 PM	2	0	0	1	0	0	0	14	1	0	3	0	21
4:30 PM	2	0	0	0	0	0	0	20	0	0	6	0	28
4:45 PM	1	0	0	0	0	1	0	7	0	0	2	0	11
5:00 PM	1	0	0	0	0	0	0	3	0	0	2	0	6
5:15 PM	1	0	1	1	0	0	0	3	1	0	3	0	10
5:30 PM	0	0	0	0	0	0	0	3	0	0	0	1	4
5:45 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	9	0	3	2	0	1	0	69	2	0	21	3	110
APPROACH %'s :	75.00%	0.00%	25.00%	66.67%	0.00%	33.33%	0.00%	97.18%	2.82%	0.00%	87.50%	12.50%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	2	0	1	1	0	0	0	11	1	0	6	1	23
PEAK HR FACTOR :	0.375			0.250			0.750			0.583			0.948

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	0	1	2	0	1	2	0					
7:00 AM	32	64	24	25	50	18	11	102	17	34	179	14	474	0	0	0	1
7:15 AM	71	64	22	22	63	23	19	114	24	60	200	12	559	0	0	0	1
7:30 AM	48	108	33	31	91	51	20	121	28	56	255	21	707	0	0	0	2
7:45 AM	57	105	40	34	88	45	25	146	47	72	222	21	740	0	0	0	2
8:00 AM	39	93	50	37	76	34	24	127	49	40	225	15	677	0	0	0	2
8:15 AM	38	89	33	19	62	29	19	130	28	40	230	16	606	0	0	0	1
8:30 AM	41	58	19	25	57	25	12	117	30	35	185	10	515	2	1	1	1
8:45 AM	37	74	27	22	60	19	27	92	33	27	158	11	476	0	0	0	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	363	655	248	215	547	244	157	949	256	364	1654	120	5772	2	1	1	11
APPROACH %'s :	28.67%	51.74%	19.59%	21.37%	54.37%	24.25%	11.53%	69.68%	18.80%	17.03%	77.36%	5.61%					

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	182	395	156	121	317	159	88	524	152	208	932	73	3307
PEAK HR FACTOR :		0.907			0.863			0.876			0.913		0.917

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	0	1	2	0	1	2	0					
4:00 PM	52	113	46	41	110	36	57	240	48	45	154	19	796	1	0	1	4
4:15 PM	45	112	35	39	98	26	33	203	39	28	176	33	710	0	0	1	1
4:30 PM	44	90	50	40	93	38	30	204	39	37	158	18	707	0	0	0	3
4:45 PM	44	102	49	36	105	15	40	238	50	35	187	25	780	0	0	0	3
5:00 PM	54	104	52	42	93	27	33	211	44	42	187	27	758	0	0	0	3
5:15 PM	55	105	32	51	111	31	24	197	27	53	183	34	743	1	0	0	2
5:30 PM	46	110	41	46	110	26	37	206	25	34	198	19	742	1	0	0	4
5:45 PM	48	96	36	40	87	20	38	206	41	38	172	29	707	1	0	0	4
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	388	832	341	335	807	219	292	1705	313	312	1415	204	7163	4	0	2	24
APPROACH %'s :	24.86%	53.30%	21.84%	24.61%	59.29%	16.09%	12.64%	73.81%	13.55%	16.16%	73.28%	10.56%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	199	421	174	175	419	99	134	852	146	164	755	105	3643				
PEAK HR FACTOR :		0.945			0.898			0.863			0.948		0.984				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Main St and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-004

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Main St)

Lanes	0	2	1		
AM	159	317	121	556	AM
NOON	0	0	0	0	NOON
PM	99	419	175	660	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	1273	0	1053
1	88	0	134
2	524	0	852
0	152	0	146

Westbound Approach

Lanes	AM	NOON	PM
0	73	0	105
2	932	0	755
1	208	0	164
	801	0	1201

Northbound Approach

				Lanes
AM	677	182	395	156	AM
NOON	0	0	0	0	NOON
PM	729	199	421	174	PM
		1	2	1	

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	597	556	AM
	0	0	NOON
	693	660	PM

West Leg			East Leg		
AM	NOON	PM			
1273	0	1053	1213	0	1024
764	0	1132	801	0	1201
			AM	NOON	PM

	South Leg	
AM	677	733
NOON	0	0
PM	729	794

Total Volume Per Leg

	North Leg
	1153 AM
	0 NOON
	1353 PM

West Leg			East Leg		
AM	NOON	PM			
2037	0	2185	2014	0	2225
			AM	NOON	PM

	South Leg
AM	1410
NOON	0
PM	1523

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	0	1	2	0	1	2	0					
7:00 AM	28	62	20	25	48	18	9	84	17	34	164	12	521	0	0	0	1
7:15 AM	55	59	20	19	61	23	17	103	22	58	190	10	637	0	0	0	1
7:30 AM	40	108	33	31	89	48	20	118	26	56	237	19	825	0	0	0	2
7:45 AM	43	103	33	34	84	45	25	136	45	70	205	21	844	0	0	0	2
8:00 AM	37	91	48	35	74	34	22	117	47	38	207	13	763	0	0	0	2
8:15 AM	32	89	31	19	62	29	17	120	28	40	190	13	670	0	0	0	1
8:30 AM	32	55	17	23	55	25	12	102	26	31	167	10	555	2	1	1	1
8:45 AM	33	71	27	22	60	17	23	78	33	27	132	9	532	0	0	0	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	300	638	229	208	533	239	145	858	244	354	1492	107	5347	2	1	1	11
APPROACH %'s :	25.71%	54.67%	19.62%	21.22%	54.39%	24.39%	11.63%	68.81%	19.57%	18.13%	76.40%	5.48%					
PEAK HR START TIME :	730 AM												TOTAL				
PEAK HR VOL :	152	391	145	119	309	156	84	491	146	204	839	66	3102				
PEAK HR FACTOR :		0.950			0.869			0.875			0.889		0.919				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
4:00 PM	43	111	42	41	107	36	53	186	48	45	139	19	870
4:15 PM	42	110	31	39	95	26	33	163	29	26	155	33	782
4:30 PM	38	90	47	40	93	38	30	164	35	32	154	18	779
4:45 PM	41	100	44	36	103	15	40	205	44	33	178	25	864
5:00 PM	50	104	46	42	93	27	33	203	42	39	179	25	883
5:15 PM	55	103	28	51	111	31	24	188	25	48	172	34	870
5:30 PM	44	108	41	46	108	26	37	196	25	34	193	19	877
5:45 PM	46	96	36	40	87	20	38	198	41	38	168	27	835
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	359	822	315	335	797	219	288	1503	289	295	1338	200	6760
APPROACH %'s :	24.00%	54.95%	21.06%	24.80%	58.99%	16.21%	13.85%	72.26%	13.89%	16.09%	73.00%	10.91%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	190	415	159	175	415	99	134	792	136	154	722	103	3494
PEAK HR FACTOR :		0.955			0.892			0.919			0.964		0.989

UTURNS

	NB	SB	EB	WB
4:00 PM	1	0	1	4
4:15 PM	0	0	1	1
4:30 PM	0	0	0	3
4:45 PM	0	0	0	3
5:00 PM	0	0	0	3
5:15 PM	1	0	0	2
5:30 PM	1	0	0	4
5:45 PM	1	0	0	4
	NB	SB	EB	WB
TOTAL VOLUMES :	4	0	2	24

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	1	2	0	1	2	0	
7:00 AM	0	1	1	0	1	0	1	5	0	0	3	1	13
7:15 AM	5	2	1	2	1	0	1	6	0	1	5	1	25
7:30 AM	0	0	0	0	0	2	0	2	1	0	5	1	11
7:45 AM	4	1	2	0	0	0	0	5	0	1	6	0	19
8:00 AM	0	1	0	1	1	0	1	5	0	1	8	1	19
8:15 AM	0	0	1	0	0	0	0	5	0	0	9	2	17
8:30 AM	2	2	1	0	1	0	0	3	1	1	5	0	16
8:45 AM	0	2	0	0	0	1	1	4	0	0	9	0	17
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	11	9	6	3	4	3	4	35	2	4	50	6	137
APPROACH %'s :	42.31%	34.62%	23.08%	30.00%	40.00%	30.00%	9.76%	85.37%	4.88%	6.67%	83.33%	10.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	4	2	3	1	1	2	1	17	1	2	28	4	66
PEAK HR FACTOR :	0.321			0.500			0.792			0.773			0.919

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	1	2	0	1	2	0	
4:00 PM	2	1	1	0	2	0	0	17	0	0	6	0	29
4:15 PM	2	1	1	0	2	0	0	12	0	0	7	0	25
4:30 PM	1	0	2	0	0	0	0	5	0	2	0	0	10
4:45 PM	2	1	3	0	1	0	0	10	0	0	3	0	20
5:00 PM	1	0	1	0	0	0	0	4	1	2	4	1	14
5:15 PM	0	1	1	0	0	0	0	2	0	2	3	0	9
5:30 PM	0	1	0	0	1	0	0	4	0	0	3	0	9
5:45 PM	1	0	0	0	0	0	0	1	0	0	1	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	9	5	9	0	6	0	0	55	1	6	27	1	119
APPROACH %'s :	39.13%	21.74%	39.13%	0.00%	100.00%	0.00%	0.00%	98.21%	1.79%	17.65%	79.41%	2.94%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	3	3	5	0	2	0	0	20	1	4	13	1	52
PEAK HR FACTOR :	0.458			0.500			0.525			0.643			0.989

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	1	2	0	1	2	0	
7:00 AM	2	0	1	0	0	0	0	5	0	0	5	0	13
7:15 AM	4	1	0	0	0	0	0	1	1	0	1	0	8
7:30 AM	4	0	0	0	1	0	0	0	0	0	5	0	10
7:45 AM	4	0	2	0	2	0	0	1	1	0	4	0	14
8:00 AM	1	0	1	0	0	0	0	1	1	0	3	0	7
8:15 AM	3	0	0	0	0	0	1	1	0	0	13	0	18
8:30 AM	3	0	0	1	0	0	0	5	1	1	5	0	16
8:45 AM	2	0	0	0	0	0	1	4	0	0	6	1	14
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	23	1	4	1	3	0	2	18	4	1	42	1	100
APPROACH %'s :	82.14%	3.57%	14.29%	25.00%	75.00%	0.00%	8.33%	75.00%	16.67%	2.27%	95.45%	2.27%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	12	0	3	0	3	0	1	3	2	0	25	0	49
PEAK HR FACTOR :	0.625			0.375			0.750			0.481			0.919

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-004

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Main St			Main St			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	1	2	0	1	2	0	
4:00 PM	3	0	1	0	0	0	2	14	0	0	3	0	23
4:15 PM	0	0	1	0	0	0	0	11	5	1	5	0	23
4:30 PM	2	0	0	0	0	0	0	16	2	1	2	0	23
4:45 PM	0	0	0	0	0	0	0	9	3	1	2	0	15
5:00 PM	1	0	2	0	0	0	0	1	0	0	1	0	5
5:15 PM	0	0	1	0	0	0	0	3	1	1	3	0	9
5:30 PM	1	0	0	0	0	0	0	2	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	3	0	0	1	1	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	0	5	0	0	0	2	59	11	4	17	1	106
APPROACH %'s :	58.33%	0.00%	41.67%	#DIV/0!	#DIV/0!	#DIV/0!	2.78%	81.94%	15.28%	18.18%	77.27%	4.55%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	2	0	3	0	0	0	0	15	4	2	6	0	32
PEAK HR FACTOR :	0.417			0.000			0.396			0.500			0.989

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	24	54	8	9	45	38	41	105	14	24	155	25	464
7:15 AM	31	61	11	23	40	56	33	136	12	21	192	42	566
7:30 AM	45	101	26	17	80	75	60	191	19	41	217	52	778
7:45 AM	30	91	37	21	77	59	52	218	21	41	163	43	732
8:00 AM	37	99	29	25	78	38	59	163	19	37	146	48	642
8:15 AM	30	75	25	22	52	46	39	175	16	26	157	42	600
8:30 AM	20	58	8	25	49	33	37	102	12	20	118	38	442
8:45 AM	24	53	10	14	50	23	31	100	21	19	119	22	409
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	241	592	154	156	471	368	352	1190	134	229	1267	312	5466
APPROACH %'s :	24.42%	59.98%	15.60%	15.68%	47.34%	36.98%	21.00%	71.00%	8.00%	12.67%	70.08%	17.26%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	142	366	117	85	287	218	210	747	75	145	683	185	3260
PEAK HR FACTOR :		0.908			0.858			0.887			0.817		0.882

UTURNS

	NB	SB	EB	WB
7:00 AM	0	2	0	0
7:15 AM	0	1	0	0
7:30 AM	0	2	0	0
7:45 AM	0	3	0	1
8:00 AM	0	6	0	1
8:15 AM	0	4	0	0
8:30 AM	0	6	0	0
8:45 AM	0	2	0	0
	NB	SB	EB	WB
TOTAL VOLUMES :	0	26	0	2

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
4:00 PM	8	76	11	35	97	45	60	244	34	17	100	32	675
4:15 PM	23	88	16	24	73	49	79	246	38	31	121	28	705
4:30 PM	20	78	11	31	88	32	58	219	39	26	153	26	683
4:45 PM	23	93	14	24	107	40	64	270	51	26	127	33	756
5:00 PM	13	77	11	42	104	46	67	222	49	26	124	32	723
5:15 PM	19	72	15	30	85	59	69	248	45	28	169	37	785
5:30 PM	25	85	24	31	110	44	64	246	39	35	116	36	745
5:45 PM	27	80	15	30	87	47	69	225	47	28	164	28	740
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	158	649	117	247	751	362	530	1920	342	217	1074	252	6619
APPROACH %'s :	17.10%	70.24%	12.66%	18.16%	55.22%	26.62%	18.98%	68.77%	12.25%	14.06%	69.60%	16.33%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	80	327	64	127	406	189	264	986	184	115	536	138	3416
PEAK HR FACTOR :		0.879			0.940			0.931			0.843		0.975

UTURNS	NB	SB	EB	WB
4:00 PM	0	8	0	1
4:15 PM	0	2	0	0
4:30 PM	0	1	0	0
4:45 PM	0	6	0	0
5:00 PM	0	7	0	0
5:15 PM	0	5	0	0
5:30 PM	0	2	0	0
5:45 PM	0	8	0	0
	NB	SB	EB	WB
TOTAL VOLUMES :	0	39	0	1

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Main St and Lomita Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-005

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Main St)

Lanes	1	2	1		
AM	218	287	85	761	AM
NOON	0	0	0	0	NOON
PM	189	406	127	729	PM

Eastbound Approach (Lomita Blvd)

Lanes	AM	NOON	PM
	1043	0	805
1	210	0	264
2	747	0	986
0	75	0	184

Westbound Approach

AM	NOON	PM	Lanes
185	0	138	0
683	0	536	2
145	0	115	1
949	0	1177	

Northbound Approach

AM	507	142	366	117	AM
NOON	0	0	0	0	NOON
PM	705	80	327	64	PM
		1	2	0	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	AM	NOON	PM
North Leg	590	0	722
	761	0	729
West Leg	1043	0	805
	1032	0	1434
East Leg	1013	0	789
	949	0	1177
South Leg	507	0	705
	625	0	471

Total Volume Per Leg

	AM	NOON	PM
North Leg	1351	0	1451
West Leg	2075	0	2239
East Leg	1962	0	1966
South Leg	1132	0	1176

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	1	1	2	0	1	2	0					
7:00 AM	24	52	8	9	43	36	39	103	12	22	148	23	519	0	2	0	0
7:15 AM	31	59	11	23	40	54	31	134	9	18	192	39	641	0	1	0	0
7:30 AM	45	98	26	17	76	73	60	186	19	37	212	48	897	0	2	0	0
7:45 AM	30	86	35	21	70	59	52	218	19	41	161	43	835	0	3	0	1
8:00 AM	37	97	29	22	76	36	59	156	16	35	144	46	753	0	6	0	1
8:15 AM	30	70	23	22	50	46	39	170	16	24	153	38	681	0	4	0	0
8:30 AM	20	55	8	25	47	31	37	102	10	20	112	35	502	0	6	0	0
8:45 AM	22	51	8	14	48	20	29	92	21	19	101	22	447	0	2	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	239	568	148	153	450	355	346	1161	122	216	1223	294	5275	0	26	0	2
APPROACH %'s :	25.03%	59.48%	15.50%	15.97%	46.97%	37.06%	21.24%	71.27%	7.49%	12.46%	70.57%	16.96%					

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	142	351	113	82	272	214	210	730	70	137	670	175	3166
PEAK HR FACTOR :		0.896			0.855			0.874			0.827		0.882

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB	SB	EB	WB
4:00 PM	8	68	11	35	94	45	58	230	34	17	95	32	727	0	8	0	1
4:15 PM	23	83	14	24	73	47	75	238	38	31	121	26	793	0	2	0	0
4:30 PM	20	78	11	31	82	32	58	200	39	26	146	26	749	0	1	0	0
4:45 PM	23	91	14	24	104	40	62	264	51	26	127	30	856	0	6	0	0
5:00 PM	13	75	11	42	102	46	67	222	49	26	121	32	806	0	7	0	0
5:15 PM	19	72	15	30	83	59	67	243	45	28	166	35	862	0	5	0	0
5:30 PM	25	83	24	29	108	44	64	241	39	35	114	36	842	0	2	0	0
5:45 PM	27	78	15	30	85	47	69	223	47	26	164	28	839	0	8	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	158	628	115	245	731	360	520	1861	342	215	1054	245	6474	0	39	0	1
APPROACH %'s :	17.54%	69.70%	12.76%	18.34%	54.72%	26.95%	19.10%	68.34%	12.56%	14.20%	69.62%	16.18%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	80	321	64	125	397	189	260	970	184	115	528	133	3366				
PEAK HR FACTOR :		0.881			0.936			0.938			0.847		0.976				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	0	1	2	0	
7:00 AM	0	1	0	0	1	1	1	1	1	1	3	1	11
7:15 AM	0	1	0	0	0	1	1	1	2	2	0	2	10
7:30 AM	0	2	0	0	1	1	0	2	0	1	3	0	10
7:45 AM	0	3	1	0	2	0	0	0	1	0	1	0	8
8:00 AM	0	1	0	2	1	1	0	3	2	1	0	1	12
8:15 AM	0	3	1	0	1	0	0	2	0	1	1	0	9
8:30 AM	0	2	0	0	1	0	0	0	1	0	1	2	7
8:45 AM	1	1	1	0	1	2	0	5	0	0	5	0	16
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	14	3	2	8	6	2	14	7	6	14	6	83
APPROACH %'s :	5.56%	77.78%	16.67%	12.50%	50.00%	37.50%	8.70%	60.87%	30.43%	23.08%	53.85%	23.08%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	9	2	2	5	2	0	7	3	3	5	1	39
PEAK HR FACTOR :	0.688			0.563			0.500			0.563			0.882

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

City: Carson

Date: 4/3/2014

SingleUnit

PM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	0	1	2	0	
4:00 PM	0	5	0	0	2	0	1	5	0	0	3	0	16
4:15 PM	0	3	1	0	0	1	1	4	0	0	0	1	11
4:30 PM	0	0	0	0	4	0	0	7	0	0	2	0	13
4:45 PM	0	1	0	0	2	0	0	4	0	0	0	2	9
5:00 PM	0	1	0	0	1	0	0	0	0	0	2	0	4
5:15 PM	0	0	0	0	1	0	1	3	0	0	2	1	8
5:30 PM	0	1	0	1	1	0	0	2	0	0	1	0	6
5:45 PM	0	1	0	0	1	0	0	1	0	1	0	0	4
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	12	1	1	12	1	3	26	0	1	10	4	71
APPROACH %'s :	0.00%	92.31%	7.69%	7.14%	85.71%	7.14%	10.34%	89.66%	0.00%	6.67%	66.67%	26.67%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	3	0	1	5	0	1	9	0	0	5	3	27
PEAK HR FACTOR :	0.750			0.750			0.625			0.667			0.976

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	0	1	2	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	0	0	1	0	1	0	2	5
7:45 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
8:15 AM	0	0	0	0	0	0	0	1	0	0	1	2	4
8:30 AM	0	0	0	0	0	1	0	0	0	0	2	0	3
8:45 AM	0	0	0	0	0	0	1	0	0	0	5	0	6
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	3	1	1	3	0	1	10	4	23
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	75.00%	25.00%	25.00%	75.00%	0.00%	6.67%	66.67%	26.67%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	3	0	0	3	0	1	2	4	13
PEAK HR FACTOR :	0.000			0.375			0.750			0.583			0.882

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-005

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	Main St			Main St			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	2	0	1	2	0	
4:00 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	4	0	0	2	0	6
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	2	9	0	0	2	0	13
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	18.18%	81.82%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	1	0	0	0	0	2
PEAK HR FACTOR :	0.000			0.000			0.500			0.000			0.976

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-005
N/S Street: Main St
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

AM	1
NOON	0
PM	2

4	AM
0	NOON
8	PM

AM	NOON	PM
4	0	11

AM	NOON	PM
30	0	15

NORTH LEG

WEST LEG

EAST LEG

0	0	1
AM	NOON	PM

13	0	14
AM	NOON	PM

SOUTH LEG

AM	20
NOON	0
PM	10

3	AM
0	NOON
7	PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count Peak Hour

PROJECT#: 14-5177-005
N/S Street: Main St
E/W Street: Lomita Blvd
DATE: 4/3/2014
CITY: Carson

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

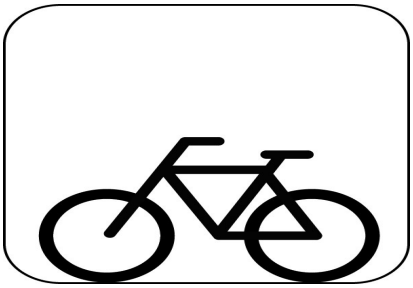
DAY: Thursday

NORTH LEG

AM	3	0	0
NOON	0	0	0
PM	0	5	0

WEST LEG

AM	NOON	PM
0	0	0
5	0	3
0	0	0



EAST LEG

AM	NOON	PM
0	0	0
3	0	0
1	0	1

SOUTH LEG

AM	1	2	1
NOON	0	0	0
PM	0	5	1

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-5177-005
N/S Street: Main St
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	4	1	3	1	0	0
7:15 AM	0	0	3	0	1	5	0	0
7:30 AM	1	3	10	0	4	7	0	4
7:45 AM	0	1	3	0	2	18	0	0
8:00 AM	0	0	4	3	6	0	0	0
8:15 AM	0	0	1	0	1	0	0	0
8:30 AM	0	2	0	2	1	3	0	3
8:45 AM	0	1	1	0	4	0	1	2
TOTALS	**1**	**7**	**26**	**6**	**22**	**34**	**1**	**9**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	2	0	0	1	0	0	0	0	0	0	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	1	0	0	0	1	0	0	0	0
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0
8:15 AM	1	0	0	0	0	0	0	3	0	0	0	0
8:30 AM	0	1	1	0	0	2	0	1	0	1	2	0
8:45 AM	0	1	0	0	0	0	0	0	0	0	1	0
TOTALS	**1**	**6**	**1**	**1**	**1**	**3**	**0**	**6**	**0**	**1**	**3**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	2	1	1	0	5	0	1	2
4:15 PM	0	1	0	1	1	1	0	1
4:30 PM	1	3	4	2	5	4	0	5
4:45 PM	1	2	4	2	5	5	1	2
5:00 PM	0	3	1	0	3	3	0	4
5:15 PM	0	0	1	3	1	3	0	0
5:30 PM	1	0	1	0	4	4	0	0
5:45 PM	0	2	0	1	0	1	0	1
TOTALS	**5**	**12**	**12**	**9**	**24**	**21**	**2**	**15**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	1	5	0	0	0	2	0	0	0	2	1	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	2	1	0	3	0	0	1	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	2	0	0	1	0	1	0	0
5:45 PM	0	1	0	0	0	0	0	1	0	0	0	0
TOTALS	**1**	**10**	**2**	**0**	**5**	**2**	**0**	**3**	**0**	**3**	**1**	**0**

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	5	0	4	5	0	25	5	120	1	2	178	7	347
7:15 AM	13	0	4	3	0	35	9	171	7	5	241	9	484
7:30 AM	11	0	13	11	0	48	8	265	15	9	336	1	706
7:45 AM	13	3	18	10	4	27	5	304	8	5	229	4	614
8:00 AM	8	0	11	8	0	30	19	224	6	5	244	2	549
8:15 AM	9	0	9	3	0	22	10	205	2	10	197	8	466
8:30 AM	7	1	1	1	0	21	6	129	3	1	155	3	320
8:45 AM	6	1	2	3	0	20	8	116	4	2	149	5	309
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	72	5	62	44	4	228	70	1534	46	39	1729	39	3872
APPROACH %'s :	51.80%	3.60%	44.60%	15.94%	1.45%	82.61%	4.24%	92.97%	2.79%	2.16%	95.68%	2.16%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	45	3	46	32	4	140	41	964	36	24	1050	16	2401
PEAK HR FACTOR :		0.691			0.746			0.821			0.788		0.837

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	5	2	5	4	1	13	20	278	16	6	147	8	498
4:15 PM	9	2	6	1	3	18	15	245	13	10	171	9	491
4:30 PM	10	0	3	5	1	19	19	240	9	5	190	8	499
4:45 PM	8	1	10	7	0	12	27	257	9	10	154	11	497
5:00 PM	11	2	4	3	2	18	20	251	11	5	183	9	506
5:15 PM	7	0	10	1	0	11	20	261	18	9	208	9	547
5:30 PM	5	2	4	4	2	18	26	269	16	8	185	15	547
5:45 PM	8	1	8	2	1	17	27	227	10	4	182	9	487
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	63	10	50	27	10	126	174	2028	102	57	1420	78	4145
APPROACH %'s :	51.22%	8.13%	40.65%	16.56%	6.13%	77.30%	7.55%	88.02%	4.43%	3.67%	91.32%	5.02%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	31	5	28	15	4	59	93	1038	54	32	730	44	2133
PEAK HR FACTOR :		0.842			0.813			0.953			0.892		0.963

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Neptune Ave and Lomita Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-006

City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Neptune Ave)

	Lanes 0	1	0		
AM	140	4	32	60	AM
NOON	0	0	0	0	NOON
PM	59	4	15	142	PM

Eastbound Approach (Lomita Blvd)

Lanes	AM	NOON	PM
	1235	0	820
1	41	0	93
2	964	0	1038
0	36	0	54

Westbound Approach

Lanes	AM	NOON	PM
0	16	0	44
2	1050	0	730
1	24	0	32
	1042	0	1081

Northbound Approach

AM	64	45	3	46	AM
NOON	0	0	0	0	NOON
PM	90	31	5	28	PM
		0	1	0	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	176	60	AM
	0	0	NOON
	78	142	PM

West Leg AM	NOON	PM	East Leg AM	NOON	PM
1235	0	820	1090	0	806
1041	0	1185	1042	0	1081

	South Leg	
AM	64	94
NOON	0	0
PM	90	64

Total Volume Per Leg

	North Leg
AM	236
NOON	0
PM	220

West Leg AM	NOON	PM	East Leg AM	NOON	PM
2276	0	2005	2132	0	1887

	South Leg
AM	158
NOON	0
PM	154

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	5	0	4	3	0	25	5	118	1	2	167	7	337
7:15 AM	13	0	4	3	0	35	9	168	7	5	236	9	489
7:30 AM	11	0	13	11	0	48	8	260	15	9	325	1	701
7:45 AM	13	1	16	8	2	27	5	302	8	5	227	4	618
8:00 AM	8	0	11	6	0	30	19	216	4	5	235	0	534
8:15 AM	9	0	9	3	0	22	10	200	2	10	191	8	464
8:30 AM	7	1	1	1	0	21	6	129	3	1	148	3	321
8:45 AM	6	1	2	3	0	20	6	110	4	2	133	5	292
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	72	3	60	38	2	228	68	1503	44	39	1662	37	3756
APPROACH %'s :	53.33%	2.22%	44.44%	14.18%	0.75%	85.07%	4.21%	93.07%	2.72%	2.24%	95.63%	2.13%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	45	1	44	28	2	140	41	946	34	24	1023	14	2342
PEAK HR FACTOR :	0.750			0.720			0.810			0.792			0.835

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	5	2	5	2	1	13	20	264	16	6	142	8	484
4:15 PM	9	2	6	1	3	18	15	235	13	10	169	9	490
4:30 PM	10	0	3	5	1	19	19	224	7	5	180	8	481
4:45 PM	8	1	10	7	0	12	27	252	9	10	154	11	501
5:00 PM	11	2	4	3	2	18	20	251	11	5	180	9	516
5:15 PM	7	0	10	1	0	11	20	258	18	9	205	9	548
5:30 PM	5	2	4	4	2	18	26	262	14	8	183	15	543
5:45 PM	8	1	8	2	1	17	27	225	10	4	180	9	492
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	63	10	50	25	10	126	174	1971	98	57	1393	78	4055
APPROACH %'s :	51.22%	8.13%	40.65%	15.53%	6.21%	78.26%	7.76%	87.87%	4.37%	3.73%	91.16%	5.10%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	31	5	28	15	4	59	93	1023	52	32	722	44	2108
PEAK HR FACTOR :		0.842			0.813			0.967			0.895		0.962

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	0	0	0	1	0	0	0	1	0	0	6	0	8
7:15 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
7:30 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
7:45 AM	0	1	1	1	1	0	0	1	0	0	1	0	6
8:00 AM	0	0	0	1	0	0	0	4	1	0	3	1	10
8:15 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	1	4	0	0	4	0	9
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1	1	3	1	0	1	16	1	0	23	1	48
APPROACH %'s :	0.00%	50.00%	50.00%	75.00%	25.00%	0.00%	5.56%	88.89%	5.56%	0.00%	95.83%	4.17%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	1	1	2	1	0	0	9	1	0	10	1	26
PEAK HR FACTOR :	0.250			0.375			0.500			0.688			0.835

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	0	0	0	1	0	0	0	5	0	0	3	0	9
4:15 PM	0	0	0	0	0	0	0	5	0	0	1	0	6
4:30 PM	0	0	0	0	0	0	0	5	1	0	4	0	10
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
5:15 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
5:30 PM	0	0	0	0	0	0	0	3	1	0	1	0	5
5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	1	0	0	0	24	2	0	14	0	41
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	100.00%	0.00%	0.00%	0.00%	92.31%	7.69%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	8	1	0	5	0	14
PEAK HR FACTOR :	0.000			0.000			0.563			0.625			0.962

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	3	0	0	15	0	18
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	2	0	0	5	0	7
PEAK HR FACTOR :	0.000			0.000			0.500			0.417			0.835

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-006

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	Neptune Ave			Neptune Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	4	0	0	2	0	6
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	9	0	0	2	0	11
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	1	0	0	0	0	1
PEAK HR FACTOR :	0.000			0.000			0.250			0.000			0.962

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-006
N/S Street: Neptune Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

AM	6
NOON	0
PM	4

10	AM
0	NOON
8	PM

AM	NOON	PM
11	0	0

NORTH LEG

AM	NOON	PM
5	0	4

WEST LEG

EAST LEG

1	0	3
AM	NOON	PM

SOUTH LEG

2	0	0
AM	NOON	PM

AM	3
NOON	0
PM	1

8	AM
0	NOON
2	PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-006
N/S Street: Neptune Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014
CITY: Carson

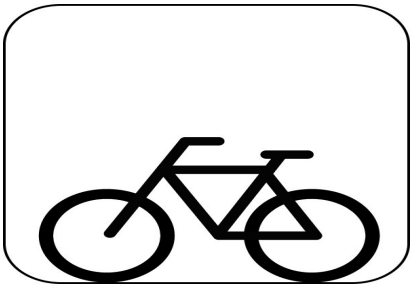
DAY: Thursday

AM	0	0	0
NOON	0	0	0
PM	0	0	0

NORTH LEG

WEST LEG

AM	NOON	PM
0	0	0
5	0	4
1	0	0



EAST LEG

AM	NOON	PM
0	0	0
5	0	6
1	0	0

SOUTH LEG

AM	0	0	0
NOON	0	0	0
PM	2	0	0

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-5177-006
N/S Street: Neptune Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014
CITY: Carson

DAY: Thursday

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	1	0	2	2	0	1	0	0
7:15 AM	2	3	0	2	0	2	0	3
7:30 AM	0	6	0	1	1	0	0	4
7:45 AM	3	1	1	3	1	2	1	4
8:00 AM	1	0	1	2	0	1	0	0
8:15 AM	0	0	2	1	0	0	1	0
8:30 AM	2	0	2	0	0	0	0	0
8:45 AM	1	0	1	0	0	1	0	0
TOTALS	**10**	**10**	**9**	**11**	**2**	**7**	**2**	**11**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	1	0	2	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	3	0	1	2	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0
TOTALS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**1**	**7**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	1	4	0	0	0	4	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	2	1	1	1	0	0	3	0
4:45 PM	1	3	0	1	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0
5:15 PM	3	1	0	0	1	0	0	0
5:30 PM	2	0	0	0	0	2	0	1
5:45 PM	2	0	0	2	0	0	1	0
TOTALS	**11**	**9**	**2**	**4**	**1**	**6**	**4**	**1**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	1	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	3	0
5:15 PM	2	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0
5:45 PM	0	0	0	0	0	0	0	3	0	0	1	0
TOTALS	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**1**	**8**	**0**

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	1	0	2	8	0	7	2	126	0	0	183	2	330
7:15 AM	2	0	5	7	0	6	2	178	0	1	236	2	437
7:30 AM	3	0	6	9	0	11	1	290	3	2	317	1	640
7:45 AM	1	0	4	8	0	7	2	318	2	3	242	7	593
8:00 AM	4	0	7	13	0	1	6	254	0	0	239	5	525
8:15 AM	2	0	2	8	0	4	0	213	1	3	205	6	442
8:30 AM	0	0	2	1	1	6	6	134	0	0	150	3	303
8:45 AM	1	0	6	5	0	6	1	118	2	0	147	2	287
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	14	0	34	59	1	48	20	1631	8	9	1719	28	3571
APPROACH %'s :	29.17%	0.00%	70.83%	54.63%	0.93%	44.44%	1.21%	98.31%	0.48%	0.51%	97.89%	1.59%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	10	0	19	38	0	23	9	1075	6	8	1003	19	2210
PEAK HR FACTOR :		0.659			0.763			0.846			0.805		0.859

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	2	1	3	3	0	2	7	271	3	4	169	5	467
4:15 PM	2	0	1	3	1	5	3	240	5	1	185	8	452
4:30 PM	0	0	2	7	0	5	4	245	3	0	206	4	476
4:45 PM	4	1	3	2	0	1	6	260	4	5	174	6	461
5:00 PM	2	0	1	5	1	3	3	257	4	3	201	8	486
5:15 PM	1	0	3	4	0	8	10	258	4	6	231	10	534
5:30 PM	3	1	1	4	0	2	8	261	3	7	197	3	486
5:45 PM	1	0	0	8	0	7	4	230	1	3	188	8	449
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	15	3	14	36	2	33	45	2022	27	29	1551	52	3829
APPROACH %'s :	46.88%	9.38%	43.75%	50.70%	2.82%	46.48%	2.15%	96.56%	1.29%	1.78%	95.04%	3.19%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	10	2	8	15	1	14	27	1036	15	21	803	27	1979
PEAK HR FACTOR :	0.625			0.625			0.991			0.861			0.925

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Lagoon Ave and Lomita Blvd , Carson

Date:	4/3/2014
Day:	Thursday

Project #:	14-5177 Cars-007
City:	Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Lagoon Ave)

	Left	Thru	Right		
Lanes	0	1	0		
AM	23	0	38	28	AM
NOON	0	0	0	0	NOON
PM	14	1	15	56	PM

Eastbound Approach (Lomita Blvd)

	AM	NOON	PM
	1036	0	827
1	9	0	27
2	1075	0	1036
0	6	0	15
Lanes	AM	NOON	PM

Westbound Approach

	AM	NOON	PM	Lanes
	19	0	27	0
	1003	0	803	2
	8	0	21	1
	1132	0	1059	
	AM	NOON	PM	

CONTROL

2-Way Stop (NB/SB)

Northbound Approach

	Left	Thru	Right	
AM	14	10	0	19	AM
NOON	0	0	0	0	NOON
PM	37	10	2	8	PM
		0	1	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	61	28	AM
	0	0	NOON
	30	56	PM

West Leg	AM	NOON	PM
	1036	0	827
	1090	0	1078

East Leg	AM	NOON	PM
	1030	0	851
	1132	0	1059

South Leg		
AM	14	29
NOON	0	0
PM	37	20

Total Volume Per Leg

North Leg	
89	AM
0	NOON
86	PM

West Leg	AM	NOON	PM
	2126	0	1905

East Leg	AM	NOON	PM
	2162	0	1910

South Leg	
AM	43
NOON	0
PM	57

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	1	0	2	8	0	7	2	123	0	0	172	2	317
7:15 AM	2	0	3	7	0	6	2	175	0	1	231	2	429
7:30 AM	3	0	3	9	0	11	1	285	3	2	306	1	624
7:45 AM	1	0	4	8	0	7	2	313	2	3	240	5	585
8:00 AM	4	0	7	13	0	1	6	244	0	0	230	5	510
8:15 AM	0	0	2	6	0	4	0	208	1	3	199	6	429
8:30 AM	0	0	2	1	1	6	6	134	0	0	143	3	296
8:45 AM	1	0	6	5	0	6	1	113	2	0	131	2	267
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	12	0	29	57	1	48	20	1595	8	9	1652	26	3457
APPROACH %'s :	29.27%	0.00%	70.73%	53.77%	0.94%	45.28%	1.23%	98.27%	0.49%	0.53%	97.93%	1.54%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	8	0	16	36	0	23	9	1050	6	8	975	17	2148
PEAK HR FACTOR :	0.545			0.738			0.840			0.809			0.861

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	2	1	3	3	0	2	7	256	3	4	164	5	450
4:15 PM	2	0	1	3	1	5	3	232	5	1	183	8	444
4:30 PM	0	0	2	7	0	5	4	229	3	0	196	4	450
4:45 PM	4	1	3	2	0	1	6	255	4	5	174	6	461
5:00 PM	2	0	1	5	1	3	3	257	4	3	198	8	485
5:15 PM	1	0	1	4	0	6	10	255	4	6	229	8	524
5:30 PM	3	1	1	4	0	2	8	254	3	5	195	3	479
5:45 PM	1	0	0	8	0	7	4	228	1	3	186	8	446
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	15	3	12	36	2	31	45	1966	27	27	1525	50	3739
APPROACH %'s :	50.00%	10.00%	40.00%	52.17%	2.90%	44.93%	2.21%	96.47%	1.32%	1.69%	95.19%	3.12%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	10	2	6	15	1	12	27	1021	15	19	796	25	1949
PEAK HR FACTOR :		0.563			0.700			0.988			0.864		0.930

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

AM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	0	0	0	0	0	0	0	2	0	0	6	0	8
7:15 AM	0	0	1	0	0	0	0	2	0	0	3	0	6
7:30 AM	0	0	2	0	0	0	0	2	0	0	3	0	7
7:45 AM	0	0	0	0	0	0	0	3	0	0	1	1	5
8:00 AM	0	0	0	0	0	0	0	5	0	0	3	0	8
8:15 AM	1	0	0	1	0	0	0	2	0	0	1	0	5
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	0	3	0	0	4	0	7
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	0	3	1	0	0	0	19	0	0	23	1	48
APPROACH %'s :	25.00%	0.00%	75.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	95.83%	4.17%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1	0	2	1	0	0	0	12	0	0	8	1	25
PEAK HR FACTOR :	0.375			0.250			0.600			0.750			0.861

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	0	0	0	0	0	0	0	6	0	0	3	0	9
4:15 PM	0	0	0	0	0	0	0	4	0	0	1	0	5
4:30 PM	0	0	0	0	0	0	0	5	0	0	4	0	9
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
5:15 PM	0	0	1	0	0	1	0	2	0	0	1	1	6
5:30 PM	0	0	0	0	0	0	0	3	0	1	1	0	5
5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	1	0	24	0	1	13	1	41
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	6.67%	86.67%	6.67%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	1	0	0	1	0	8	0	1	4	1	16
PEAK HR FACTOR :	0.250			0.250			0.667			0.750			0.930

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	3	0	0	15	0	18
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	3	0	0	7	0	10
PEAK HR FACTOR :	0.000			0.000			0.750			0.583			0.861

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-007

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Lagoon Ave			Lagoon Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
4:00 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	4	0	0	2	0	6
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	9	0	0	2	0	11
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	1	0	0	0	0	1
PEAK HR FACTOR :	0.000			0.000			0.250			0.000			0.930

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 2-Way Stop (NB/SB)

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-007
N/S Street: Lagoon Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

AM	7
NOON	0
PM	3

15	AM
0	NOON
6	PM

AM	NOON	PM
0	0	0

NORTH LEG

AM	NOON	PM
0	0	0

WEST LEG

EAST LEG

0	0	0
AM	NOON	PM

SOUTH LEG

0	0	0
AM	NOON	PM

AM	1
NOON	0
PM	2

7	AM
0	NOON
3	PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-007
N/S Street: Lagoon Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014
CITY: Carson

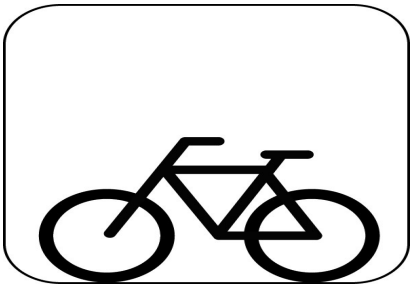
DAY: Thursday

AM	0	0	0
NOON	0	0	0
PM	0	0	0

NORTH LEG

WEST LEG

AM	NOON	PM
0	0	0
5	0	5
0	0	0



EAST LEG

AM	NOON	PM
0	0	2
8	0	4
0	0	0

SOUTH LEG

AM	0	0	0
NOON	0	0	0
PM	2	0	0

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-5177-007
N/S Street: Lagoon Ave
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	1	1	1	1	0	0	0	0
7:15 AM	2	7	0	0	0	0	0	0
7:30 AM	0	5	0	2	0	0	0	0
7:45 AM	2	1	0	4	0	0	0	0
8:00 AM	3	2	1	1	0	0	0	0
8:15 AM	0	0	2	0	0	0	0	0
8:30 AM	2	0	1	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTALS	**10**	**16**	**5**	**8**	**0**	**0**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	3	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	3	0	0	4	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**9**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	1	3	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	0	0
4:30 PM	1	0	1	2	0	0	0	0
4:45 PM	1	3	0	1	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	2	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	2	0	0	1	0	0	0	0
TOTALS	**7**	**6**	**3**	**4**	**0**	**0**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0
5:00 PM	2	0	0	0	0	0	0	1	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	1
5:45 PM	0	0	0	0	0	0	0	3	0	0	1	1
TOTALS	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**6**	**3**

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	32	58	27	19	45	16	20	92	24	11	143	12	409
7:15 AM	31	93	27	22	70	33	32	81	23	11	189	6	494
7:30 AM	41	109	23	17	99	45	28	133	24	12	197	14	592
7:45 AM	45	114	26	35	126	43	35	137	43	9	213	25	692
8:00 AM	54	129	21	29	113	30	41	121	39	11	169	15	589
8:15 AM	45	89	32	28	63	38	36	110	42	9	169	17	544
8:30 AM	35	67	19	12	78	34	28	89	19	12	149	21	461
8:45 AM	23	66	15	18	60	51	32	76	35	12	131	11	441
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	306	725	190	180	654	290	252	839	249	87	1360	121	5253
APPROACH %'s :	25.06%	59.38%	15.56%	16.01%	58.19%	25.80%	18.81%	62.61%	18.58%	5.55%	86.73%	7.72%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	185	441	102	109	401	156	140	501	148	41	748	71	3043
PEAK HR FACTOR :		0.892			0.816			0.917			0.870		0.894

UTURNS

	NB	SB	EB	WB
7:00 AM	0	2	0	1
7:15 AM	0	0	0	0
7:30 AM	0	3	0	0
7:45 AM	0	3	0	0
8:00 AM	0	5	1	1
8:15 AM	1	3	0	0
8:30 AM	0	1	1	4
8:45 AM	0	0	0	0
	NB	SB	EB	WB
TOTAL VOLUMES :	1	17	2	6

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	0	1	2	0	1	2	0					
4:00 PM	41	120	12	28	117	36	53	205	50	31	139	31	702	0	8	2	0
4:15 PM	49	134	21	21	97	33	49	176	56	18	132	35	638	0	5	2	2
4:30 PM	53	108	16	22	121	36	53	179	57	25	145	38	692	0	3	1	2
4:45 PM	54	100	24	23	113	42	59	182	40	19	156	34	692	0	4	1	1
5:00 PM	53	113	23	26	128	53	54	193	54	33	175	32	771	0	6	3	0
5:15 PM	54	120	19	29	146	41	49	203	48	24	173	51	783	0	6	0	0
5:30 PM	39	129	18	35	110	48	44	189	63	34	173	35	749	0	3	2	1
5:45 PM	52	114	24	34	104	43	38	163	61	22	162	28	679	1	6	3	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	395	938	157	218	936	332	399	1490	429	206	1255	284	7039	1	41	14	7
APPROACH %'s :	26.51%	62.95%	10.54%	14.67%	62.99%	22.34%	17.21%	64.28%	18.51%	11.81%	71.92%	16.28%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	200	462	84	113	497	184	206	767	205	110	677	152	3657				
PEAK HR FACTOR :		0.966			0.919			0.978			0.947		0.955				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Avalon Blvd and Sepulveda Ave , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-008

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Avalon Blvd)

Lanes	0	2	1		
AM	156	401	109	652	AM
NOON	0	0	0	0	NOON
PM	184	497	113	820	PM

Eastbound Approach (Sepulveda Ave)

Lanes	AM	NOON	PM
	1089	0	1061
1	140	0	206
2	501	0	767
0	148	0	205

Westbound Approach

Lanes	AM	NOON	PM
0	71	0	152
2	748	0	677
1	41	0	110
	712	0	964

Northbound Approach

				Lanes
AM	590	185	441	102	AM
NOON	0	0	0	0	NOON
PM	812	200	462	84	PM
		1	2	0	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	AM	NOON	PM
North Leg	666	0	794
	652	0	820
West Leg	1089	0	1061
	789	0	1178
East Leg	860	0	939
	712	0	964
South Leg	590	0	812
	728	0	746

Total Volume Per Leg

	AM	NOON	PM
North Leg	1318	0	1614
West Leg	1878	0	2239
East Leg	1572	0	1903
South Leg	1318	0	1558

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

Day: Thursday

Cars

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	2	0	1	2	0	1	2	0					
7:00 AM	29	54	25	15	42	12	18	83	20	9	134	10	451	0	2	0	1
7:15 AM	31	90	27	20	67	30	32	74	20	9	176	6	582	0	0	0	0
7:30 AM	38	101	23	17	94	41	28	128	22	12	184	14	702	0	3	0	0
7:45 AM	45	108	26	33	123	43	33	122	38	9	194	23	797	0	3	0	0
8:00 AM	52	121	21	27	108	24	39	108	39	11	150	13	713	0	5	1	1
8:15 AM	42	87	32	24	63	28	32	103	42	9	138	9	609	1	3	0	0
8:30 AM	35	67	19	12	76	26	26	77	17	12	128	15	510	0	1	1	4
8:45 AM	23	64	13	15	57	40	28	63	32	10	110	11	466	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	295	692	186	163	630	244	236	758	230	81	1214	101	4830	1	17	2	6
APPROACH %'s :	25.15%	58.99%	15.86%	15.72%	60.75%	23.53%	19.28%	61.93%	18.79%	5.80%	86.96%	7.23%					
PEAK HR START TIME :	730 AM												TOTAL				
PEAK HR VOL :	177	417	102	101	388	136	132	461	141	41	666	59	2821				
PEAK HR FACTOR :		0.897			0.785			0.951			0.847		0.885				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	39	115	12	26	114	36	43	163	50	31	124	28	781
4:15 PM	47	132	21	21	95	31	39	141	56	16	112	33	744
4:30 PM	53	101	16	22	118	34	49	138	55	25	136	31	778
4:45 PM	52	100	24	21	111	40	50	158	40	17	144	32	789
5:00 PM	53	110	23	24	125	53	45	184	54	30	167	30	898
5:15 PM	54	118	19	29	143	39	44	189	46	22	157	46	906
5:30 PM	39	126	18	33	107	46	42	175	63	34	168	31	882
5:45 PM	48	112	22	32	101	43	38	154	61	22	156	26	815
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	385	914	155	208	914	322	350	1302	425	197	1164	257	6593
APPROACH %'s :	26.48%	62.86%	10.66%	14.40%	63.30%	22.30%	16.85%	62.69%	20.46%	12.18%	71.94%	15.88%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	194	466	82	118	476	181	169	702	224	108	648	133	3501
PEAK HR FACTOR :		0.971			0.918			0.967			0.954		0.966

UTURNS

	NB	SB	EB	WB
4:00 PM	0	8	2	0
4:15 PM	0	5	2	2
4:30 PM	0	3	1	2
4:45 PM	0	4	1	1
5:00 PM	0	6	3	0
5:15 PM	0	6	0	0
5:30 PM	0	3	2	1
5:45 PM	1	6	3	1
	NB	SB	EB	WB
TOTAL VOLUMES :	1	41	14	7

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	2	1	0	1	2	1	0	2	1	1	3	1	15
7:15 AM	0	2	0	1	2	2	0	2	2	1	6	0	18
7:30 AM	2	5	0	0	3	1	0	3	1	0	3	0	18
7:45 AM	0	4	0	1	2	0	1	7	2	0	10	0	27
8:00 AM	1	5	0	1	3	1	0	6	0	0	7	1	25
8:15 AM	2	1	0	1	0	4	1	3	0	0	7	4	23
8:30 AM	0	0	0	0	1	1	1	4	0	0	6	1	14
8:45 AM	0	1	1	2	2	3	1	3	2	1	10	0	26
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	19	1	7	15	13	4	30	8	3	52	7	166
APPROACH %'s :	25.93%	70.37%	3.70%	20.00%	42.86%	37.14%	9.52%	71.43%	19.05%	4.84%	83.87%	11.29%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	5	15	0	3	8	6	2	19	3	0	27	5	93
PEAK HR FACTOR :	0.714			0.850			0.600			0.727			0.885

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	1	3	0	0	2	0	4	13	0	0	6	2	31
4:15 PM	1	1	0	0	1	1	5	10	0	1	5	0	25
4:30 PM	0	3	0	0	2	1	1	7	1	0	3	2	20
4:45 PM	1	0	0	1	1	1	6	5	0	1	4	1	21
5:00 PM	0	2	0	1	2	0	3	3	0	2	4	1	18
5:15 PM	0	1	0	0	2	0	2	4	1	0	9	3	22
5:30 PM	0	2	0	1	2	1	1	5	0	0	2	0	14
5:45 PM	1	1	1	1	2	0	0	2	0	0	0	0	8
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	13	1	4	14	4	22	49	2	4	33	9	159
APPROACH %'s :	22.22%	72.22%	5.56%	18.18%	63.64%	18.18%	30.14%	67.12%	2.74%	8.70%	71.74%	19.57%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	1	6	1	3	8	1	6	14	1	2	15	4	62
PEAK HR FACTOR :		0.667			0.750			0.750			0.438		0.966

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

City: Carson

MultiUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	0	1	1	1	0	1	1	3	1	0	2	0	11
7:15 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
7:30 AM	0	0	0	0	0	1	0	0	0	0	4	0	5
7:45 AM	0	0	0	0	0	0	0	2	1	0	2	1	6
8:00 AM	0	0	0	0	0	2	1	2	0	0	4	0	9
8:15 AM	0	0	0	1	0	2	1	1	0	0	10	1	16
8:30 AM	0	0	0	0	0	3	0	3	1	0	6	2	15
8:45 AM	0	0	0	0	0	3	1	4	0	0	3	0	11
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1	1	2	0	12	4	17	3	0	33	4	77
APPROACH %'s :	0.00%	50.00%	50.00%	14.29%	0.00%	85.71%	16.67%	70.83%	12.50%	0.00%	89.19%	10.81%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	1	0	5	2	5	1	0	20	2	36
PEAK HR FACTOR :	0.000			0.500			0.667			0.500			0.885

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-008

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Sepulveda Ave			Sepulveda Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	0	0	0	1	0	0	2	11	0	0	3	0	17
4:15 PM	0	0	0	0	0	0	1	10	0	0	6	1	18
4:30 PM	0	1	0	0	0	0	1	15	0	0	2	2	21
4:45 PM	0	0	0	0	0	0	0	8	0	0	3	0	11
5:00 PM	0	0	0	0	0	0	2	2	0	0	1	0	5
5:15 PM	0	0	0	0	0	1	1	4	0	1	1	0	8
5:30 PM	0	0	0	0	0	0	0	3	0	0	1	2	6
5:45 PM	1	0	0	0	0	0	0	3	0	0	3	1	8
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	1	0	1	0	1	7	56	0	1	20	6	94
APPROACH %'s :	50.00%	50.00%	0.00%	50.00%	0.00%	50.00%	11.11%	88.89%	0.00%	3.70%	74.07%	22.22%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	1	0	0	0	0	1	3	12	0	1	6	3	27
PEAK HR FACTOR :	0.250			0.250			0.750			0.625			0.966

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	36	64	19	10	57	38	35	108	19	18	96	7	407
7:15 AM	38	71	17	4	66	45	41	108	39	18	131	9	478
7:30 AM	49	88	25	13	87	49	64	178	56	24	179	9	684
7:45 AM	37	96	33	26	118	43	74	235	63	31	152	14	789
8:00 AM	47	97	32	13	108	51	76	170	29	38	129	18	664
8:15 AM	39	76	23	7	84	31	59	144	35	37	144	11	575
8:30 AM	28	69	14	5	95	33	33	69	38	19	77	5	388
8:45 AM	25	63	18	6	65	29	32	71	33	18	82	5	359
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	299	624	181	84	680	319	414	1083	312	203	990	78	5267
APPROACH %'s :	27.08%	56.52%	16.39%	7.76%	62.79%	29.46%	22.89%	59.87%	17.25%	15.97%	77.89%	6.14%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	172	357	113	59	397	174	273	727	183	130	604	52	3241
PEAK HR FACTOR :		0.912			0.842			0.795			0.927		0.879

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	40	97	13	9	121	45	48	139	48	32	109	11	575
4:15 PM	37	124	7	6	120	39	56	138	46	28	111	10	561
4:30 PM	43	111	9	6	133	51	41	151	44	34	132	16	617
4:45 PM	38	102	12	5	125	52	60	158	54	35	100	12	613
5:00 PM	39	108	23	12	130	47	51	128	65	32	132	15	635
5:15 PM	46	132	15	10	130	69	59	133	57	36	131	8	648
5:30 PM	32	133	18	10	135	51	63	114	51	24	114	8	588
5:45 PM	37	105	19	7	111	50	63	142	47	27	120	9	595
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	312	912	116	65	1005	404	441	1103	412	248	949	89	6056
APPROACH %'s :	23.28%	68.06%	8.66%	4.41%	68.18%	27.41%	22.55%	56.39%	21.06%	19.28%	73.79%	6.92%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	166	453	59	33	518	219	211	570	220	137	495	51	3132
PEAK HR FACTOR :		0.878			0.921			0.920			0.938		0.948

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Avalon Blvd and Lomita Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-009

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Peak Hour Summary

Southbound Approach (Avalon Blvd)

Lanes	0	2	1		
AM	174	397	59	682	AM
NOON	0	0	0	0	NOON
PM	219	518	33	715	PM

Eastbound Approach (Lomita Blvd)

Lanes	AM	NOON	PM
	950	0	880
1	273	0	211
2	727	0	570
0	183	0	220

Westbound Approach

AM	NOON	PM	Lanes
52	0	51	0
604	0	495	2
130	0	137	1
899	0	662	

Northbound Approach

	1	2	0	Lanes
AM	710	172	357	113	AM
NOON	0	0	0	0	NOON
PM	875	166	453	59	PM

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	630	682	AM
	0	0	NOON
	770	715	PM

West Leg	AM	NOON	PM
	950	0	880
	1183	0	1001

East Leg	AM	NOON	PM
	786	0	683
	899	0	662

South Leg		
AM	710	642
NOON	0	0
PM	875	678

Total Volume Per Leg

North Leg	
1312	AM
0	NOON
1485	PM

West Leg	AM	NOON	PM
	2133	0	1881

East Leg	AM	NOON	PM
	1685	0	1345

South Leg	
AM	1352
NOON	0
PM	1553

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	33	59	19	8	52	34	33	106	17	18	91	7	477
7:15 AM	36	68	17	4	61	43	41	108	37	16	128	9	568
7:30 AM	47	83	25	13	79	49	62	178	54	24	171	7	792
7:45 AM	37	96	29	26	113	41	71	232	63	31	152	12	903
8:00 AM	47	94	32	13	105	51	71	165	29	33	125	18	783
8:15 AM	39	74	21	7	82	31	59	139	35	35	138	11	671
8:30 AM	28	69	12	5	93	33	33	69	38	19	70	5	474
8:45 AM	25	60	18	4	60	27	32	68	30	18	69	5	416
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	292	603	173	80	645	309	402	1065	303	194	944	74	5084
APPROACH %'s :	27.34%	56.46%	16.20%	7.74%	62.38%	29.88%	22.71%	60.17%	17.12%	16.01%	77.89%	6.11%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	170	347	107	59	379	172	263	714	181	123	586	48	3149
PEAK HR FACTOR :		0.902			0.847			0.791			0.937		0.872

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	40	94	13	9	119	45	46	127	48	32	104	11	688
4:15 PM	34	121	7	6	118	39	56	128	46	28	111	10	704
4:30 PM	41	104	9	6	131	48	41	137	44	34	126	16	737
4:45 PM	38	102	12	5	123	52	58	155	54	35	100	12	746
5:00 PM	37	106	23	12	127	47	51	128	65	32	132	15	775
5:15 PM	46	132	13	10	125	67	59	130	57	36	131	8	814
5:30 PM	32	130	18	10	133	51	63	110	49	24	114	8	742
5:45 PM	37	101	19	7	111	48	61	142	47	27	120	9	729
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	305	890	114	65	987	397	435	1057	410	248	938	89	5935
APPROACH %'s :	23.30%	67.99%	8.71%	4.49%	68.12%	27.40%	22.87%	55.57%	21.56%	19.45%	73.57%	6.98%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	162	444	57	33	506	214	209	550	220	137	489	51	3072
PEAK HR FACTOR :		0.868			0.932			0.917			0.946		0.943

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	2	2	0	0	3	1	0	1	1	0	3	0	13
7:15 AM	1	2	0	0	3	1	0	0	1	1	2	0	11
7:30 AM	1	3	0	0	5	0	1	0	0	0	1	1	12
7:45 AM	0	0	1	0	2	1	2	2	0	0	0	1	9
8:00 AM	0	2	0	0	2	0	3	2	0	2	1	0	12
8:15 AM	0	1	1	0	1	0	0	2	0	1	1	0	7
8:30 AM	0	0	1	0	1	0	0	0	0	0	2	0	4
8:45 AM	0	2	0	1	3	1	0	2	2	0	2	0	13
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	12	3	1	20	4	6	9	4	4	12	2	81
APPROACH %'s :	21.05%	63.16%	15.79%	4.00%	80.00%	16.00%	31.58%	47.37%	21.05%	22.22%	66.67%	11.11%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1	6	2	0	10	1	6	6	0	3	3	2	40
PEAK HR FACTOR :	0.563			0.550			0.600			0.667			0.872

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	0	2	0	0	1	0	1	5	0	0	3	0	12
4:15 PM	2	2	0	0	1	0	0	4	0	0	0	0	9
4:30 PM	1	3	0	0	1	2	0	4	0	0	1	0	12
4:45 PM	0	0	0	0	1	0	1	2	0	0	0	0	4
5:00 PM	1	1	0	0	2	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	0	2	1	0	2	0	0	0	0	5
5:30 PM	0	2	0	0	1	0	0	1	1	0	0	0	5
5:45 PM	0	1	0	0	0	1	1	0	0	0	0	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	11	0	0	9	4	3	18	1	0	4	0	54
APPROACH %'s :	26.67%	73.33%	0.00%	0.00%	69.23%	30.77%	13.64%	81.82%	4.55%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	2	4	0	0	6	3	1	8	0	0	1	0	25
PEAK HR FACTOR :	0.375			0.750			0.563			0.250			0.943

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	0	1	0	1	0	1	1	0	0	0	0	0	4
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	3	0	4
7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	1	1	0	3
8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1	1	1	1	1	1	2	1	1	13	0	23
APPROACH %'s :	0.00%	50.00%	50.00%	33.33%	33.33%	33.33%	25.00%	50.00%	25.00%	7.14%	92.86%	0.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	1	0	1	0	0	2	1	1	6	0	12
PEAK HR FACTOR :	0.250			0.250			0.750			0.583			0.872

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-009

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	Avalon Blvd			Avalon Blvd			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
4:30 PM	0	1	0	0	0	0	0	4	0	0	2	0	7
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	2	1	0	1	0	0	9	0	0	2	0	15
APPROACH %'s :	0.00%	66.67%	33.33%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	1	1	0	1	0	0	4	0	0	2	0	9
PEAK HR FACTOR :	0.500			0.250			0.250			0.250			0.943

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-009
N/S Street: Avalon Blvd
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

AM	41
NOON	0
PM	7

8	AM
0	NOON
4	PM

AM	NOON	PM
22	0	18

NORTH LEG

AM	NOON	PM
27	0	15

WEST LEG

EAST LEG

15	0	15
AM	NOON	PM

SOUTH LEG

26	0	7
AM	NOON	PM

AM	10
NOON	0
PM	6

8	AM
0	NOON
7	PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 14-5177-009
N/S Street: Avalon Blvd
E/W Street: Lomita Blvd
DATE: 4/3/2014
CITY: Carson

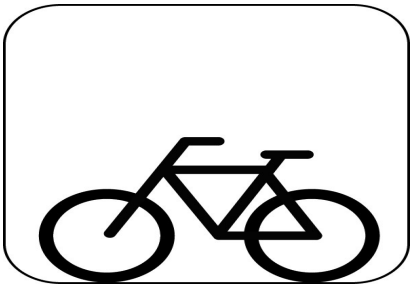
DAY: Thursday

AM	1	1	3
NOON	0	0	0
PM	0	9	0

NORTH LEG

WEST LEG

AM	NOON	PM
0	0	0
2	0	0
2	0	1



EAST LEG

AM	NOON	PM
1	0	0
0	0	0
1	0	3

SOUTH LEG

AM	0	5	0
NOON	0	0	0
PM	1	3	0

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-5177-009
N/S Street: Avalon Blvd
E/W Street: Lomita Blvd
DATE: 4/3/2014 DAY: Thursday
CITY: Carson

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	1	1	0	1	0	4	1	2
7:15 AM	1	0	1	2	2	2	3	7
7:30 AM	3	0	1	2	2	5	1	10
7:45 AM	16	1	3	0	8	8	5	5
8:00 AM	18	2	4	2	12	5	7	3
8:15 AM	4	5	2	4	4	9	2	4
8:30 AM	0	2	0	2	0	2	3	3
8:45 AM	1	2	1	0	0	1	0	3
TOTALS	**44**	**13**	**12**	**13**	**28**	**36**	**22**	**37**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	2	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	1	0	0
7:45 AM	0	0	0	2	0	0	0	1	0	0	0	0
8:00 AM	0	5	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	1	1	0	1	2	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0
8:45 AM	0	0	0	0	2	0	0	0	0	0	0	0
TOTALS	**1**	**8**	**0**	**3**	**3**	**1**	**0**	**2**	**2**	**1**	**1**	**1**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	1	1	2	2	2	7	0	4
4:15 PM	2	1	2	0	2	1	6	5
4:30 PM	3	1	1	3	1	1	7	5
4:45 PM	1	1	1	2	2	6	2	4
5:00 PM	1	1	1	3	3	0	3	1
5:15 PM	1	0	2	1	3	0	2	0
5:30 PM	1	0	0	4	1	2	2	4
5:45 PM	0	2	1	0	0	1	1	1
TOTALS	**10**	**7**	**10**	**15**	**14**	**18**	**23**	**24**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	1	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	1	0	0	0	0	0	1	0
4:30 PM	0	1	0	0	0	0	0	0	0	2	0	0
4:45 PM	0	1	0	0	5	0	0	0	0	0	0	0
5:00 PM	1	1	0	0	3	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	1	0	0	0	1	1	0	0
5:30 PM	0	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	1	0	0	0
TOTALS	**1**	**6**	**0**	**0**	**11**	**0**	**0**	**0**	**2**	**3**	**2**	**0**

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
7:00 AM	0	84	23	9	122	0	0	0	0	291	0	141	586
7:15 AM	0	97	25	11	149	0	0	0	0	293	0	137	615
7:30 AM	0	108	13	6	158	0	0	0	0	288	0	117	582
7:45 AM	0	147	18	7	155	0	0	0	0	277	0	160	617
8:00 AM	0	132	19	14	122	0	0	0	0	246	0	139	540
8:15 AM	0	98	24	11	157	0	0	0	0	254	0	127	573
8:30 AM	0	86	28	13	141	0	0	0	0	204	0	121	507
8:45 AM	0	88	20	16	125	0	0	0	0	268	0	101	530
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	840	170	87	1129	0	0	0	0	2121	0	1043	5390
APPROACH %'s :	0.00%	83.17%	16.83%	7.15%	92.85%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	67.04%	0.00%	32.96%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	484	75	38	584	0	0	0	0	1104	0	553	2838
PEAK HR FACTOR :		0.847			0.948			0.000			0.948		0.929

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
4:00 PM	0	101	56	32	232	0	0	0	0	210	0	77	607
4:15 PM	0	75	52	17	225	0	0	0	0	237	0	71	602
4:30 PM	0	87	67	17	244	0	0	0	0	174	0	98	600
4:45 PM	0	89	68	15	238	0	0	0	0	264	0	79	664
5:00 PM	0	74	48	27	222	0	0	0	0	245	0	69	611
5:15 PM	0	109	47	18	267	0	0	0	0	259	0	95	686
5:30 PM	0	90	55	17	228	0	0	0	0	264	0	78	642
5:45 PM	0	89	58	10	187	0	0	0	0	210	0	103	568
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	714	451	153	1843	0	0	0	0	1863	0	670	5694
APPROACH %'s :	0.00%	61.29%	38.71%	7.67%	92.33%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	73.55%	0.00%	26.45%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	362	218	77	955	0	0	0	0	1032	0	321	2965
PEAK HR FACTOR :		0.924			0.905			0.000			0.956		0.932

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Wilmington Ave and I-405 NB Ramps , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-010

City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Wilmington Ave)

	Lanes 0	3	1		
AM	0	584	38	1037	AM
NOON	0	0	0	0	NOON
PM	0	955	77	683	PM

Eastbound Approach (I-405 NB Ramps)

Lanes	AM	NOON	PM
	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Westbound Approach

AM	NOON	PM	Lanes
553	0	321	1
0	0	0	0
1104	0	1032	2
113	0	295	

CONTROL: Signalized

Northbound Approach

AM	1688	0	484	75	AM
NOON	0	0	0	0	NOON
PM	1987	0	362	218	PM
		0	2	1	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	622	1037	AM
	0	0	NOON
	1032	683	PM

West Leg AM	NOON	PM		East Leg AM	NOON	PM
0	0	0		1657	0	1353
0	0	0		113	0	295

	South Leg	
AM	1688	559
NOON	0	0
PM	1987	580

Total Volume Per Leg

	North Leg
AM	1659
NOON	0
PM	1715

West Leg AM	NOON	PM		East Leg AM	NOON	PM
0	0	0		1770	0	1648

	South Leg
AM	2247
NOON	0
PM	2567

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
7:00 AM		76	11	7	87					251		121	553
7:15 AM		74	11	9	119					265		120	598
7:30 AM		90	7	4	129					247		101	578
7:45 AM		130	13	3	119					255		151	671
8:00 AM		109	10	7	85					191		117	519
8:15 AM		81	14	7	105					195		107	509
8:30 AM		71	15	8	86					168		91	439
8:45 AM		71	13	5	89					196		85	459
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	702	94	50	819	0	0	0	0	1768	0	893	4326
APPROACH %'s :	0.00%	88.19%	11.81%	5.75%	94.25%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	66.44%	0.00%	33.56%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	370	42	23	454	0	0	0	0	1018	0	493	2400
PEAK HR FACTOR :		0.720			0.897			0.000			0.930		0.894

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
4:00 PM		81	38	24	202					163		56	564
4:15 PM		52	38	13	187					195		43	528
4:30 PM		66	60	15	215					142		70	568
4:45 PM		66	53	12	209					220		52	612
5:00 PM		56	40	25	193					210		61	585
5:15 PM		77	33	13	236					240		69	668
5:30 PM		70	50	17	207					222		62	628
5:45 PM		68	42	10	162					174		90	546
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	536	354	129	1611	0	0	0	0	1566	0	503	4699
APPROACH %'s :	0.00%	60.22%	39.78%	7.41%	92.59%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	75.69%	0.00%	24.31%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	269	176	67	845	0	0	0	0	892	0	244	2493
PEAK HR FACTOR :		0.927			0.916			0.000			0.919		0.933

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
7:00 AM		1	4	1	11					12		4	33
7:15 AM		7	5	1	9					4		3	29
7:30 AM		5	1	0	7					6		4	23
7:45 AM		7	3	1	13					8		2	34
8:00 AM		6	2	2	14					10		1	35
8:15 AM		3	0	0	20					10		4	37
8:30 AM		6	2	3	23					9		5	48
8:45 AM		3	2	3	9					13		4	34
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	38	19	11	106	0	0	0	0	72	0	27	273
APPROACH %'s :	0.00%	66.67%	33.33%	9.40%	90.60%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	72.73%	0.00%	27.27%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	20	13	3	40	0	0	0	0	30	0	13	119
PEAK HR FACTOR :		0.688			0.768			0.000			0.672		0.894

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
4:00 PM		8	1	4	5					7		10	35
4:15 PM		3	5	1	9					8		4	30
4:30 PM		6	3	1	7					9		12	38
4:45 PM		7	3	2	7					8		7	34
5:00 PM		4	1	0	7					6		4	22
5:15 PM		5	0	2	7					3		13	30
5:30 PM		5	2	0	7					5		8	27
5:45 PM		3	4	0	7					5		3	22
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	41	19	10	56	0	0	0	0	51	0	61	238
APPROACH %'s :	0.00%	68.33%	31.67%	15.15%	84.85%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	45.54%	0.00%	54.46%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	21	6	4	28	0	0	0	0	22	0	32	113
PEAK HR FACTOR :		0.675			0.889			0.000			0.844		0.933

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
7:00 AM		3	3	0	9					11		7	33
7:15 AM		6	3	0	8					11		6	34
7:30 AM		5	2	1	9					16		5	38
7:45 AM		3	0	1	8					5		3	20
8:00 AM		7	3	2	8					20		10	50
8:15 AM		6	5	2	11					22		7	53
8:30 AM		3	5	0	10					11		11	40
8:45 AM		6	2	3	11					26		5	53
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	39	23	9	74	0	0	0	0	122	0	54	321
APPROACH %'s :	0.00%	62.90%	37.10%	10.84%	89.16%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	69.32%	0.00%	30.68%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	17	8	2	34	0	0	0	0	43	0	21	125
PEAK HR FACTOR :		0.694			0.900			0.000			0.762		0.894

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-010

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 NB Ramps			I-405 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0	0	0	2	0	1	
4:00 PM		4	8	1	11					18		3	45
4:15 PM		9	3	1	12					15		11	51
4:30 PM		6	1	0	9					9		5	30
4:45 PM		6	5	0	9					16		8	44
5:00 PM		6	3	1	9					13		1	33
5:15 PM		12	7	1	10					7		3	40
5:30 PM		6	1	0	5					17		2	31
5:45 PM		8	5	0	7					14		4	38
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	57	33	4	72	0	0	0	0	109	0	37	312
APPROACH %'s :	0.00%	63.33%	36.67%	5.26%	94.74%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	74.66%	0.00%	25.34%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	30	16	2	33	0	0	0	0	53	0	14	148
PEAK HR FACTOR :		0.605			0.795			0.000			0.698		0.933

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
7:00 AM	0	94	143	71	345	0	19	0	53	0	0	0	631
7:15 AM	0	96	157	73	365	0	20	0	39	0	0	0	654
7:30 AM	0	99	143	72	378	0	29	0	32	0	0	0	654
7:45 AM	0	116	139	72	354	0	42	0	77	0	0	0	684
8:00 AM	0	116	111	59	307	0	34	2	52	0	0	0	565
8:15 AM	0	97	141	68	325	0	29	0	70	0	0	0	633
8:30 AM	0	82	127	77	283	0	26	0	67	0	0	0	580
8:45 AM	0	76	122	58	336	0	30	0	44	0	0	0	590
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	776	1083	550	2693	0	229	2	434	0	0	0	5767
APPROACH %'s :	0.00%	41.74%	58.26%	16.96%	83.04%	0.00%	34.44%	0.30%	65.26%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	405	582	288	1442	0	110	0	201	0	0	0	3028
PEAK HR FACTOR :		0.968			0.961			0.653			0.000		0.946

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
4:00 PM	0	130	148	144	306	0	15	0	32	0	0	0	645
4:15 PM	0	116	174	120	335	0	10	0	36	0	0	0	675
4:30 PM	0	149	175	126	288	0	7	0	17	0	0	0	613
4:45 PM	0	150	183	132	363	0	11	0	15	0	0	0	704
5:00 PM	0	113	186	106	372	0	12	0	18	0	0	0	694
5:15 PM	0	143	157	129	399	0	10	0	26	0	0	0	721
5:30 PM	0	143	145	116	380	0	11	1	22	0	0	0	675
5:45 PM	0	133	160	88	310	0	13	0	18	0	0	0	589
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1077	1328	961	2753	0	89	1	184	0	0	0	6393
APPROACH %'s :	0.00%	44.78%	55.22%	25.88%	74.12%	0.00%	32.48%	0.36%	67.15%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	549	671	483	1514	0	44	1	81	0	0	0	3343
PEAK HR FACTOR :		0.916			0.946			0.875			0.000		0.967

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Wilmington Ave and I-405 SB Ramps , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-011

City: Carson

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Wilmington Ave)

Lanes	0	3	1		
AM	0	1442	288	515	AM
NOON	0	0	0	0	NOON
PM	0	1514	483	593	PM

Eastbound Approach (I-405 SB Ramps)

Lanes	AM	NOON	PM
	0	0	0
0.5	110	0	44
1	0	0	1
0.5	201	0	81

Westbound Approach

AM	NOON	PM	Lanes
0	0	0	0
0	0	0	0
0	0	0	0
870	0	1155	

Northbound Approach

AM	1643	0	405	582	AM
NOON	0	0	0	0	NOON
PM	1595	0	549	671	PM
Lanes		0	2	1	Lanes

CONTROL: Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	AM	NOON	PM
North Leg	1730	0	1997
East Leg	515	0	593
South Leg	1643	0	1595
West Leg	987	0	1220

	AM	NOON	PM
North Leg	0	0	0
East Leg	0	0	0
South Leg	870	0	1155
West Leg	311	0	126

Total Volume Per Leg

	AM	NOON	PM
North Leg	2245	0	2590
East Leg	870	0	1155
South Leg	2630	0	2815
West Leg	311	0	126

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0					
7:00 AM		80	98	46	295		15	0	46				580				
7:15 AM		67	115	55	325		11	0	28				601				
7:30 AM		84	106	53	328		20	0	26				617				
7:45 AM		99	113	44	323		36	0	64				679				
8:00 AM		87	71	36	239		32	2	32				499				
8:15 AM		76	90	43	245		21	0	48				523				
8:30 AM		63	82	39	226		20	0	48				478				
8:45 AM		57	66	29	254		23	0	28				457				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	613	741	345	2235	0	178	2	320	0	0	0	4434	0	0	0	0
APPROACH %'s :	0.00%	45.27%	54.73%	13.37%	86.63%	0.00%	35.60%	0.40%	64.00%	#DIV/0!	#DIV/0!	#DIV/0!					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	0	330	432	198	1271	0	82	0	164	0	0	0	2477				
PEAK HR FACTOR :		0.899			0.964			0.615			0.000		0.912				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 2	NR 1	SL 1	ST 3	SR 0	EL 0.5	ET 1	ER 0.5	WL 0	WT 0	WR 0	TOTAL
4:00 PM		101	116	127	241		10	0	21				616
4:15 PM		80	137	107	274		6	0	28				632
4:30 PM		120	146	109	241		5	0	15				636
4:45 PM		119	163	126	299		5	0	11				723
5:00 PM		86	152	101	318		6	0	9				672
5:15 PM		105	133	121	353		8	0	21				741
5:30 PM		123	112	108	321		9	1	14				688
5:45 PM		102	134	81	260		7	0	16				600
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	836	1093	880	2307	0	56	1	135	0	0	0	5308
APPROACH %'s :	0.00%	43.34%	56.66%	27.61%	72.39%	0.00%	29.17%	0.52%	70.31%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	433	560	456	1291	0	28	1	55	0	0	0	2824
PEAK HR FACTOR :		0.880			0.921			0.724			0.000		0.953

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
7:00 AM		4	7	7	16		1	0	3				38
7:15 AM		11	5	4	9		2	0	3				34
7:30 AM		3	6	3	9		2	0	1				24
7:45 AM		7	4	8	14		4	0	3				40
8:00 AM		7	4	6	17		0	0	9				43
8:15 AM		2	10	7	24		1	0	9				53
8:30 AM		6	6	16	18		1	0	11				58
8:45 AM		3	8	3	17		3	0	4				38
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	43	50	54	124	0	14	0	43	0	0	0	328
APPROACH %'s :	0.00%	46.24%	53.76%	30.34%	69.66%	0.00%	24.56%	0.00%	75.44%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	25	22	22	48	0	9	0	10	0	0	0	136
PEAK HR FACTOR :		0.734			0.761			0.679			0.000		0.912

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
4:00 PM		6	1	2	14		2	0	3				28
4:15 PM		9	10	2	11		1	0	4				37
4:30 PM		11	2	3	14		0	0	1				31
4:45 PM		7	5	1	13		1	0	1				28
5:00 PM		6	5	2	13		1	0	3				30
5:15 PM		4	5	1	9		0	0	2				21
5:30 PM		5	2	1	11		0	0	1				20
5:45 PM		7	4	2	8		0	0	0				21
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	55	34	14	93	0	5	0	15	0	0	0	216
APPROACH %'s :	0.00%	61.80%	38.20%	13.08%	86.92%	0.00%	25.00%	0.00%	75.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	22	17	5	46	0	2	0	7	0	0	0	99
PEAK HR FACTOR :		0.813			0.850			0.563			0.000		0.953

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
7:00 AM		4	17	7	13		1	0	1				43
7:15 AM		6	17	6	13		3	0	3				48
7:30 AM		5	14	7	18		3	0	2				49
7:45 AM		3	10	8	5		0	0	4				30
8:00 AM		9	17	7	21		1	0	3				58
8:15 AM		9	18	7	22		3	0	4				63
8:30 AM		5	18	7	15		2	0	1				48
8:45 AM		7	22	12	28		1	0	5				75
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	48	133	61	135	0	14	0	23	0	0	0	414
APPROACH %'s :	0.00%	26.52%	73.48%	31.12%	68.88%	0.00%	37.84%	0.00%	62.16%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	18	58	28	49	0	7	0	10	0	0	0	170
PEAK HR FACTOR :		0.826			0.770			0.708			0.000		0.912

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-011

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			I-405 SB Ramps			I-405 SB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	1	3	0	0.5	1	0.5	0	0	0	
4:00 PM		10	15	7	22		1	0	3				58
4:15 PM		11	11	5	22		1	0	1				51
4:30 PM		6	13	6	13		1	0	0				39
4:45 PM		10	6	2	22		2	0	1				43
5:00 PM		9	13	1	17		2	0	2				44
5:15 PM		16	8	3	16		1	0	1				45
5:30 PM		6	15	3	21		1	0	3				49
5:45 PM		10	10	2	19		3	0	1				45
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	78	91	29	152	0	12	0	12	0	0	0	374
APPROACH %'s :	0.00%	46.15%	53.85%	16.02%	83.98%	0.00%	50.00%	0.00%	50.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	41	42	9	76	0	6	0	7	0	0	0	181
PEAK HR FACTOR :		0.865			0.885			0.813			0.000		0.953

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	1	1	2	1	1	2	1					
7:00 AM	5	151	44	30	238	133	41	112	1	20	50	17	686	1	8	0	2
7:15 AM	0	166	55	22	231	147	38	129	3	30	121	28	804	0	12	0	1
7:30 AM	3	174	84	19	242	157	38	122	4	44	115	21	846	0	6	0	1
7:45 AM	4	170	61	35	243	162	48	137	7	35	127	29	884	0	13	0	0
8:00 AM	5	150	68	31	208	117	39	135	4	33	107	34	776	0	8	0	2
8:15 AM	7	159	81	39	218	133	45	86	5	21	86	20	734	0	8	0	4
8:30 AM	5	141	48	29	215	103	36	100	4	25	74	27	661	2	13	0	2
8:45 AM	3	128	46	36	238	106	37	101	3	21	72	26	686	0	7	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	32	1239	487	241	1833	1058	322	922	31	229	752	202	7348	3	75	0	15
APPROACH %'s :	1.82%	70.48%	27.70%	7.69%	58.52%	33.78%	25.25%	72.31%	2.43%	19.36%	63.57%	17.08%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	12	660	268	107	924	583	163	523	18	142	470	112	3982				
PEAK HR FACTOR :		0.900			0.917			0.917			0.948		0.941				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	1	1	2	1	1	2	1					
4:00 PM	5	168	132	25	196	115	70	166	8	34	47	39	832	0	3	0	0
4:15 PM	0	153	95	37	222	125	77	174	7	25	51	43	856	0	16	0	2
4:30 PM	9	148	107	31	198	89	79	195	6	41	90	90	926	0	11	0	3
4:45 PM	3	143	109	38	234	98	75	183	7	37	63	83	927	0	11	0	1
5:00 PM	5	153	110	38	230	130	79	209	6	37	76	55	970	0	16	0	2
5:15 PM	2	153	127	38	249	128	77	200	0	36	79	37	971	0	13	0	1
5:30 PM	6	164	132	31	239	106	66	224	4	35	66	34	937	0	11	0	3
5:45 PM	5	164	97	37	188	106	77	175	7	24	79	40	830	0	13	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	35	1246	909	275	1756	897	600	1526	45	269	551	421	8530	0	94	0	14
APPROACH %'s :	1.60%	56.89%	41.51%	9.39%	59.97%	30.64%	27.64%	70.29%	2.07%	21.68%	44.40%	33.92%					

PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	16	613	478	145	952	462	297	816	17	145	284	209	4434
PEAK HR FACTOR :		0.916			0.939			0.961			0.872		0.983

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Wilmington Ave and E 223rd St , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-012

City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Wilmington Ave)

	Lanes 1	2	1		
AM	583	924	107	935	AM
NOON	0	0	0	0	NOON
PM	462	952	145	1119	PM

Eastbound Approach (E 223rd St)

Lanes	AM	NOON	PM
	1065	0	762
1	163	0	297
2	523	0	816
1	18	0	17

Westbound Approach

Lanes	AM	NOON	PM
1	112	0	209
2	470	0	284
1	142	0	145
	898	0	1439

Northbound Approach

AM	1084	12	660	268	AM
NOON	0	0	0	0	NOON
PM	1114	16	613	478	PM
		1	2	1	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg	
AM	1614	935
NOON	0	0
PM	1559	1119

West Leg	AM	NOON	PM
	1065	0	762
	704	0	1130

East Leg	AM	NOON	PM
	724	0	638
	898	0	1439

South Leg		
AM	1084	940
NOON	0	0
PM	1114	1107

Total Volume Per Leg

North Leg	
AM	2549
NOON	0
PM	2678

West Leg	AM	NOON	PM
	1769	0	1892

East Leg	AM	NOON	PM
	1622	0	2077

South Leg	
AM	2024
NOON	0
PM	2221

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	1	1	2	1	1	2	1					
7:00 AM	3	110	40	27	192	127	26	101	1	16	48	15	706	1	8	0	2
7:15 AM	0	121	45	19	196	133	29	121	3	30	116	26	839	0	12	0	1
7:30 AM	1	128	73	17	203	144	34	107	4	38	115	21	885	0	6	0	1
7:45 AM	4	134	57	33	206	143	41	129	1	35	123	29	935	0	13	0	0
8:00 AM	5	100	68	23	152	100	22	125	2	31	98	29	755	0	8	0	2
8:15 AM	7	104	69	28	153	112	33	76	3	21	86	14	706	0	8	0	4
8:30 AM	5	89	42	24	150	98	23	93	2	22	74	21	643	2	13	0	2
8:45 AM	3	72	39	25	157	98	20	87	3	19	65	20	608	0	7	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	28	858	433	196	1409	955	228	839	19	212	725	175	6077	3	75	0	15
APPROACH %'s :	2.12%	65.05%	32.83%	7.66%	55.04%	37.30%	20.99%	77.26%	1.75%	19.06%	65.20%	15.74%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	10	483	243	92	757	520	126	482	10	134	452	105	3414				
PEAK HR FACTOR :		0.911			0.896			0.904			0.924		0.913				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	2	1	1	2	1	1	2	1					
4:00 PM	2	112	118	25	139	100	55	156	8	30	47	34	826	0	3	0	0
4:15 PM	0	100	87	33	174	107	63	164	5	25	51	41	850	0	16	0	2
4:30 PM	7	104	91	28	161	80	72	182	4	37	84	90	940	0	11	0	3
4:45 PM	3	108	99	36	176	91	63	167	4	28	58	78	911	0	11	0	1
5:00 PM	3	109	88	36	174	117	60	202	6	37	73	53	958	0	16	0	2
5:15 PM	2	110	99	38	205	124	66	192	0	32	75	34	977	0	13	0	1
5:30 PM	6	123	122	31	178	104	60	218	4	32	66	32	976	0	11	0	3
5:45 PM	5	120	91	32	156	90	66	165	7	20	77	31	860	0	13	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	28	886	795	259	1363	813	505	1446	38	241	531	393	7298	0	94	0	14
APPROACH %'s :	1.64%	51.84%	46.52%	10.64%	55.98%	33.39%	25.39%	72.70%	1.91%	20.69%	45.58%	33.73%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	14	450	408	141	733	436	249	779	14	129	272	197	3822				
PEAK HR FACTOR :		0.869			0.892			0.924			0.912		0.978				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	1	1	2	1	
7:00 AM	0	6	1	2	13	1	3	2	0	1	1	1	31
7:15 AM	0	3	0	2	7	5	2	0	0	0	3	1	23
7:30 AM	1	8	3	1	7	2	1	3	0	1	0	0	27
7:45 AM	0	9	0	0	14	10	2	1	1	0	0	0	37
8:00 AM	0	8	0	4	12	7	2	1	0	1	3	2	40
8:15 AM	0	10	0	3	15	11	1	1	1	0	0	1	43
8:30 AM	0	9	1	3	23	2	2	2	1	2	0	4	49
8:45 AM	0	8	3	2	19	1	2	4	0	1	2	4	46
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	61	8	17	110	39	15	14	3	6	9	13	296
APPROACH %'s :	1.43%	87.14%	11.43%	10.24%	66.27%	23.49%	46.88%	43.75%	9.38%	21.43%	32.14%	46.43%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	1	28	3	7	40	24	7	5	1	2	6	3	127
PEAK HR FACTOR :		0.667			0.740			0.813			0.458		0.913

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	1	1	2	1	
4:00 PM	2	5	4	0	14	2	3	5	0	1	0	2	38
4:15 PM	0	14	4	1	8	5	4	4	1	0	0	1	42
4:30 PM	1	8	4	2	10	3	2	6	1	1	1	0	39
4:45 PM	0	7	5	0	12	3	5	8	2	3	2	2	49
5:00 PM	1	4	5	0	12	7	6	2	0	0	2	1	40
5:15 PM	0	6	4	0	9	1	3	4	0	0	1	2	30
5:30 PM	0	3	1	0	10	0	0	1	0	2	0	0	17
5:45 PM	0	9	1	2	1	5	3	0	0	1	1	3	26
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	56	28	5	76	26	26	30	4	8	7	11	281
APPROACH %'s :	4.55%	63.64%	31.82%	4.67%	71.03%	24.30%	43.33%	50.00%	6.67%	30.77%	26.92%	42.31%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	1	20	15	0	43	11	14	15	2	5	5	5	136
PEAK HR FACTOR :		0.750			0.711			0.517			0.536		0.978

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

MultiUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	1	1	2	1	
7:00 AM	1	16	1	0	13	2	5	4	0	1	0	0	43
7:15 AM	0	20	5	0	12	3	3	4	0	0	0	0	47
7:30 AM	0	17	3	0	14	5	1	5	0	2	0	0	47
7:45 AM	0	11	2	1	8	2	2	3	2	0	2	0	33
8:00 AM	0	19	0	1	19	3	7	4	1	0	2	1	57
8:15 AM	0	20	6	3	21	2	5	4	0	0	0	2	63
8:30 AM	0	19	2	0	15	1	5	2	0	0	0	0	44
8:45 AM	0	22	1	4	26	3	7	4	0	0	2	0	69
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	144	20	9	128	21	35	30	3	3	6	3	403
APPROACH %'s :	0.61%	87.27%	12.12%	5.70%	81.01%	13.29%	51.47%	44.12%	4.41%	25.00%	50.00%	25.00%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	67	10	2	53	13	13	16	3	2	4	1	184
PEAK HR FACTOR :		0.770			0.739			0.667			0.583		0.913

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-012

City: Carson

MultiUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			E 223rd St			E 223rd St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	1	1	2	1	
4:00 PM	0	24	4	0	18	6	5	1	0	1	0	1	60
4:15 PM	0	16	1	1	18	5	4	2	0	0	0	0	47
4:30 PM	0	16	5	0	11	2	2	2	0	1	2	0	41
4:45 PM	0	12	1	1	20	1	2	2	0	2	1	1	43
5:00 PM	0	19	7	1	19	1	5	2	0	0	0	0	54
5:15 PM	0	17	11	0	15	1	3	1	0	2	1	0	51
5:30 PM	0	18	4	0	23	1	3	2	0	0	0	1	52
5:45 PM	0	15	2	1	15	4	3	5	0	1	0	2	48
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	137	35	4	139	21	27	17	0	7	4	5	396
APPROACH %'s :	0.00%	79.65%	20.35%	2.44%	84.76%	12.80%	61.36%	38.64%	0.00%	43.75%	25.00%	31.25%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	66	23	2	77	4	13	7	0	4	2	2	200
PEAK HR FACTOR :		0.795			0.865			0.714			0.500		0.978

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	3	0	1	2	0	1	2	0					
7:00 AM	0	108	27	32	99	52	37	63	8	16	104	18	456	0	0	0	0
7:15 AM	8	114	23	35	100	68	65	59	6	20	110	23	509	0	2	1	0
7:30 AM	7	150	39	41	95	67	44	86	1	32	119	32	556	0	0	1	0
7:45 AM	7	133	44	38	96	45	45	101	4	17	137	38	565	0	0	2	0
8:00 AM	6	134	27	45	82	51	41	83	12	32	114	25	512	1	1	0	0
8:15 AM	6	129	36	55	72	45	51	75	14	24	83	33	488	0	0	0	0
8:30 AM	6	85	23	56	73	38	36	60	8	15	102	25	436	0	0	0	0
8:45 AM	3	86	20	56	73	51	38	50	9	10	69	25	401	0	0	1	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	43	939	239	358	690	417	357	577	62	166	838	219	4905	1	3	5	0
APPROACH %'s :	3.52%	76.90%	19.57%	24.44%	47.10%	28.46%	35.84%	57.93%	6.22%	13.57%	68.52%	17.91%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	28	531	133	159	373	231	195	329	23	101	480	118	2701				
PEAK HR FACTOR :		0.883			0.940			0.912			0.910		0.947				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	3	0	1	2	0	1	2	0					
4:00 PM	7	108	51	49	107	69	37	135	10	31	101	44	634	0	0	0	0
4:15 PM	7	99	37	52	133	62	26	111	13	19	92	69	614	1	0	0	0
4:30 PM	7	80	51	38	134	66	48	104	10	25	101	53	630	1	0	0	0
4:45 PM	6	101	40	37	112	54	36	129	12	26	126	57	629	0	1	0	0
5:00 PM	11	103	50	40	151	63	53	136	9	24	125	25	676	1	0	0	1
5:15 PM	6	88	43	39	147	75	44	162	7	29	127	29	702	0	0	0	1
5:30 PM	5	88	39	41	123	84	42	126	16	24	107	28	630	0	1	0	0
5:45 PM	6	91	29	26	119	72	54	111	6	20	113	26	576	1	0	0	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	55	758	340	322	1026	545	340	1014	83	198	892	331	5904	4	2	0	3
APPROACH %'s :	4.77%	65.74%	29.49%	17.01%	54.20%	28.79%	23.66%	70.56%	5.78%	13.93%	62.77%	23.29%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	28	380	172	157	533	276	175	553	44	103	485	139	3045				
PEAK HR FACTOR :		0.884			0.925			0.906			0.870		0.956				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Wilmington Ave and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-013

City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (Wilmington Ave)

Lanes	0	3	1		
AM	231	373	159	844	AM
NOON	0	0	0	0	NOON
PM	276	533	157	694	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	739	0	789
1	195	0	175
2	329	0	553
0	23	0	44

Westbound Approach

AM	NOON	PM	Lanes
118	0	139	0
480	0	485	2
101	0	103	1
621	0	882	

CONTROL: Signalized

Northbound Approach

AM	497	28	531	133	AM
NOON	0	0	0	0	NOON
PM	680	28	380	172	PM
		1	2	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	763	844	AM
	0	0	NOON
	966	694	PM

West Leg			East Leg		
AM	NOON	PM			
739	0	789	699	0	727
547	0	772	621	0	882
			AM	NOON	PM

	South Leg	
AM	497	692
NOON	0	0
PM	680	580

Total Volume Per Leg

	North Leg
	1607 AM
	0 NOON
	1660 PM

West Leg			East Leg		
AM	NOON	PM			
1286	0	1561	1320	0	1609
			AM	NOON	PM

	South Leg
AM	1189
NOON	0
PM	1260

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	0	1	3	0	1	2	0	1	2	0					
7:00 AM	0	93	18	10	87	47	37	56	6	14	95	13	476	0	0	0	0
7:15 AM	3	100	20	8	98	56	61	57	4	18	105	9	539	0	2	1	0
7:30 AM	5	130	26	12	89	64	40	78	1	30	110	19	604	0	0	1	0
7:45 AM	5	124	42	14	94	43	43	87	2	14	127	25	620	0	0	2	0
8:00 AM	2	111	22	12	72	44	39	66	12	22	110	12	524	1	1	0	0
8:15 AM	1	116	33	15	60	39	49	72	12	15	79	10	501	0	0	0	0
8:30 AM	0	66	15	3	59	29	36	44	8	12	93	9	374	0	0	0	0
8:45 AM	1	61	14	17	62	45	34	43	5	8	61	12	363	0	0	1	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	17	801	190	91	621	367	339	503	50	133	780	109	4001	1	3	5	0
APPROACH %'s :	1.69%	79.46%	18.85%	8.43%	57.55%	34.01%	38.00%	56.39%	5.61%	13.01%	76.32%	10.67%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	15	465	110	46	353	207	183	288	19	84	452	65	2287				
PEAK HR FACTOR :		0.863			0.918			0.928			0.905		0.922				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	3	0	1	2	0	1	2	0	
4:00 PM	1	94	43	19	96	67	31	115	5	22	86	10	589
4:15 PM	5	91	35	21	121	53	26	99	10	13	80	14	568
4:30 PM	7	75	49	27	130	62	40	91	6	22	92	16	617
4:45 PM	6	90	38	22	100	54	34	116	10	18	114	20	622
5:00 PM	6	84	44	24	138	60	49	131	5	19	118	9	687
5:15 PM	4	78	35	18	142	67	35	158	3	25	122	13	700
5:30 PM	5	80	39	24	110	82	40	118	14	24	101	23	660
5:45 PM	6	80	29	19	111	68	52	104	6	20	103	17	615
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	40	672	312	174	948	513	307	932	59	163	816	122	5058
APPROACH %'s :	3.91%	65.63%	30.47%	10.64%	57.98%	31.38%	23.65%	71.80%	4.55%	14.80%	74.11%	11.08%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	21	332	156	88	490	263	158	523	32	86	455	65	2669
PEAK HR FACTOR :		0.950			0.926			0.909			0.947		0.953

UTURNS

	NB	SB	EB	WB
4:00 PM	0	0	0	0
4:15 PM	1	0	0	0
4:30 PM	1	0	0	0
4:45 PM	0	1	0	0
5:00 PM	1	0	0	1
5:15 PM	0	0	0	1
5:30 PM	0	1	0	0
5:45 PM	1	0	0	1
	NB	SB	EB	WB
TOTAL VOLUMES :	4	2	0	3

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	3	0	1	2	0	1	2	0	
7:00 AM	0	2	3	5	5	2	0	3	1	1	3	2	27
7:15 AM	2	0	2	3	0	4	0	0	1	1	2	1	16
7:30 AM	1	4	6	6	0	2	1	4	0	1	2	3	30
7:45 AM	1	2	0	9	1	1	0	5	1	2	1	2	25
8:00 AM	1	7	2	7	1	2	0	6	0	4	1	3	34
8:15 AM	2	3	2	8	4	1	0	2	1	2	1	6	32
8:30 AM	0	3	0	14	4	3	0	5	0	2	3	5	39
8:45 AM	0	3	1	10	3	4	1	2	1	1	4	2	32
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	24	16	62	18	19	2	27	5	14	17	24	235
APPROACH %'s :	14.89%	51.06%	34.04%	62.63%	18.18%	19.19%	5.88%	79.41%	14.71%	25.45%	30.91%	43.64%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	5	13	10	25	2	9	1	15	2	8	6	9	105
PEAK HR FACTOR :	0.636			0.818			0.750			0.719			0.922

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	3	0	1	2	0	1	2	0	
4:00 PM	1	4	1	12	3	1	1	4	2	3	7	8	47
4:15 PM	0	1	1	11	1	2	0	1	2	1	5	14	39
4:30 PM	0	2	0	3	0	1	1	3	0	2	3	10	25
4:45 PM	0	3	1	2	5	0	0	3	0	4	4	10	32
5:00 PM	2	3	1	4	3	2	1	2	0	2	3	8	31
5:15 PM	0	4	5	3	2	5	3	1	0	0	3	4	30
5:30 PM	0	0	0	3	2	1	0	1	1	0	0	3	11
5:45 PM	0	2	0	3	0	1	0	3	0	0	1	2	12
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	3	19	9	41	16	13	6	18	5	12	26	59	227
APPROACH %'s :	9.68%	61.29%	29.03%	58.57%	22.86%	18.57%	20.69%	62.07%	17.24%	12.37%	26.80%	60.82%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	2	10	7	12	12	8	4	7	1	6	10	25	104
PEAK HR FACTOR :		0.528			0.800			0.750			0.569		0.953

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

City: Carson

MultiUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	3	0	1	2	0	1	2	0	
7:00 AM	0	6	2	7	2	1	0	1	0	0	2	1	22
7:15 AM	1	7	0	11	1	3	2	1	0	0	1	6	33
7:30 AM	0	7	2	10	3	0	1	1	0	0	3	4	31
7:45 AM	0	3	1	5	0	0	1	3	0	0	4	5	22
8:00 AM	1	6	1	11	4	2	1	4	0	2	1	4	37
8:15 AM	1	4	0	14	3	2	1	0	0	3	1	7	36
8:30 AM	3	7	4	16	4	2	0	4	0	0	2	4	46
8:45 AM	1	10	2	12	3	0	1	2	1	0	1	5	38
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	50	12	86	20	10	7	16	1	5	15	36	265
APPROACH %'s :	10.14%	72.46%	17.39%	74.14%	17.24%	8.62%	29.17%	66.67%	4.17%	8.93%	26.79%	64.29%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	2	23	4	37	8	5	5	9	0	2	9	19	123
PEAK HR FACTOR :	0.806			0.735			0.700			0.833			0.922

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-013

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	3	0	1	2	0	1	2	0	
4:00 PM	2	4	3	6	3	0	2	7	1	2	2	11	43
4:15 PM	1	3	0	7	5	3	0	5	0	2	2	17	45
4:30 PM	0	1	1	3	2	1	3	4	2	0	2	11	30
4:45 PM	0	3	0	6	2	0	1	4	1	1	3	11	32
5:00 PM	1	7	2	5	4	0	1	1	2	1	1	2	27
5:15 PM	1	2	0	8	1	0	2	1	2	2	0	5	24
5:30 PM	0	4	0	6	5	0	1	3	0	0	3	0	22
5:45 PM	0	4	0	1	4	1	1	1	0	0	4	3	19
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	5	28	6	42	26	5	11	26	8	8	17	60	242
APPROACH %'s :	12.82%	71.79%	15.38%	57.53%	35.62%	6.85%	24.44%	57.78%	17.78%	9.41%	20.00%	70.59%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	2	16	2	25	12	0	5	9	5	4	7	18	105
PEAK HR FACTOR :	0.500			0.841			0.792			0.483			0.953

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0	
7:00 AM	0	0	0	26	0	74	85	27	0	0	17	30	259
7:15 AM	0	0	0	19	0	95	108	31	0	0	38	29	320
7:30 AM	0	0	0	22	0	115	134	28	0	0	56	58	413
7:45 AM	0	0	0	37	0	87	136	26	0	0	46	37	369
8:00 AM	0	0	0	37	0	73	119	33	0	0	65	42	369
8:15 AM	0	0	0	33	0	66	127	32	0	0	39	25	322
8:30 AM	0	0	0	32	0	63	67	25	0	0	23	40	250
8:45 AM	0	0	0	25	0	62	65	21	0	0	26	33	232
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	231	0	635	841	223	0	0	310	294	2534
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	26.67%	0.00%	73.33%	79.04%	20.96%	0.00%	0.00%	51.32%	48.68%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	129	0	341	516	119	0	0	206	162	1473
PEAK HR FACTOR :	0.000			0.858			0.980			0.807			0.892

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0	
4:00 PM	0	0	0	32	0	102	101	30	0	0	28	38	331
4:15 PM	0	0	0	29	0	115	92	46	0	0	24	38	344
4:30 PM	0	0	0	42	0	114	95	44	0	0	42	47	384
4:45 PM	0	0	0	36	0	102	116	38	0	0	32	45	369
5:00 PM	0	0	0	48	0	110	90	29	0	0	49	56	382
5:15 PM	0	0	0	37	0	128	94	42	0	0	28	38	367
5:30 PM	0	0	0	28	0	116	93	38	0	0	35	36	346
5:45 PM	0	0	0	27	0	91	113	36	0	0	26	31	324
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	279	0	878	794	303	0	0	264	329	2847
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	24.11%	0.00%	75.89%	72.38%	27.62%	0.00%	0.00%	44.52%	55.48%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	0	0	163	0	454	395	153	0	0	151	186	1502
PEAK HR FACTOR :	0.000			0.935			0.890			0.802			0.978

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 3-Way Stop (SB/EB/WB)

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Wilmington Ave and Lomita Blvd , Carson

Date:	4/3/2014
Day:	Thursday

Project #:	14-5177 Cars-014
City:	Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Peak Hour Summary

Southbound Approach (Wilmington Ave)

	Lanes 2	0	1		
AM	341	0	129	678	AM
NOON	0	0	0	0	NOON
PM	454	0	163	581	PM

Eastbound Approach (Lomita Blvd)

Lanes	AM	NOON	PM
	547	0	605
1.5	516	0	395
1.5	119	0	153
0	0	0	0

Westbound Approach

Lanes	AM	NOON	PM
0	162	0	186
2	206	0	151
0	0	0	0
	248	0	316

CONTROL

3-Way Stop (SB/EB/WB)

Northbound Approach

AM	0	0	0	0	AM
NOON	0	0	0	0	NOON
PM	0	0	0	0	PM
		0	0	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	470	678	AM
	0	0	NOON
	617	581	PM

West Leg AM	NOON	PM		East Leg AM	NOON	PM
547	0	605		368	0	337
635	0	548		248	0	316

	South Leg	
AM	0	0
NOON	0	0
PM	0	0

Total Volume Per Leg

	North Leg	
	1148	AM
	0	NOON
	1198	PM

West Leg AM	NOON	PM		East Leg AM	NOON	PM
1182	0	1153		616	0	653

	South Leg
AM	0
NOON	0
PM	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0					
7:00 AM				19		69	82	23			17	18	228				
7:15 AM				17		93	108	28			38	14	298				
7:30 AM				17		113	134	28			50	33	375				
7:45 AM				31		87	134	26			44	26	348				
8:00 AM				25		73	117	29			56	19	319				
8:15 AM				14		61	123	32			33	11	274				
8:30 AM				14		60	65	23			19	21	202				
8:45 AM				16		57	62	21			18	10	184				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	153	0	613	825	210	0	0	275	152	2228	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	19.97%	0.00%	80.03%	79.71%	20.29%	0.00%	0.00%	64.40%	35.60%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	0	0	0	90	0	366	493	111	0	0	188	92	1340				
PEAK HR FACTOR :	0.000			0.877			0.932			0.843			0.893				

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0	
4:00 PM				17		97	99	20			28	25	286
4:15 PM				24		115	92	39			24	23	317
4:30 PM				29		114	91	32			36	39	341
4:45 PM				26		102	113	36			32	32	341
5:00 PM				33		110	90	29			49	32	343
5:15 PM				26		128	89	42			28	32	345
5:30 PM				21		116	91	38			35	28	329
5:45 PM				25		91	113	34			26	23	312
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	201	0	873	778	270	0	0	258	234	2614
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	18.72%	0.00%	81.28%	74.24%	25.76%	0.00%	0.00%	52.44%	47.56%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	0	0	114	0	454	383	139	0	0	145	135	1370
PEAK HR FACTOR :	0.000			0.922			0.876			0.864			0.993

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0					
7:00 AM				2		3	2	1			0	0	8				
7:15 AM				0		1	0	2			0	2	5				
7:30 AM				2		0	0	0			1	7	10				
7:45 AM				4		0	0	0			1	3	8				
8:00 AM				4		0	1	1			3	6	15				
8:15 AM				6		2	1	0			1	4	14				
8:30 AM				8		2	1	1			0	3	15				
8:45 AM				2		2	2	0			1	2	9				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	28	0	10	7	5	0	0	7	27	84	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	73.68%	0.00%	26.32%	58.33%	41.67%	0.00%	0.00%	20.59%	79.41%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	0	0	0	10	0	1	1	3	0	0	5	18	38				
PEAK HR FACTOR :	0.000			0.688			0.500			0.639			0.893				

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0	
4:00 PM				6		2	1	4			0	3	16
4:15 PM				2		0	0	2			0	3	7
4:30 PM				2		0	0	5			1	1	9
4:45 PM				5		0	2	1			0	2	10
5:00 PM				3		0	0	0			0	4	7
5:15 PM				3		0	2	0			0	4	9
5:30 PM				2		0	0	0			0	1	3
5:45 PM				1		0	0	1			0	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	24	0	2	5	13	0	0	1	18	63
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	92.31%	0.00%	7.69%	27.78%	72.22%	0.00%	0.00%	5.26%	94.74%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	0	0	13	0	0	4	6	0	0	1	11	35
PEAK HR FACTOR :	0.000			0.650			0.500			0.750			0.993

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0	
7:00 AM				2		0	0	1			0	6	9
7:15 AM				1		0	0	0			0	6	7
7:30 AM				1		1	0	0			2	7	11
7:45 AM				0		0	1	0			0	3	4
8:00 AM				3		0	0	1			2	7	13
8:15 AM				5		1	1	0			2	4	13
8:30 AM				3		0	0	0			2	7	12
8:45 AM				3		1	0	0			3	10	17
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	18	0	3	2	2	0	0	11	50	86
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	85.71%	0.00%	14.29%	50.00%	50.00%	0.00%	0.00%	18.03%	81.97%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	5	0	1	1	1	0	0	4	23	35
PEAK HR FACTOR :	0.000			0.500			0.500			0.750			0.893

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-014

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

PM

NS/EW Streets:	Wilmington Ave			Wilmington Ave			Lomita Blvd			Lomita Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	0	1	0	2	1.5	1.5	0	0	2	0					
4:00 PM				3		1	0	2			0	4	10				
4:15 PM				1		0	0	2			0	5	8				
4:30 PM				5		0	2	2			2	3	14				
4:45 PM				1		0	0	0			0	5	6				
5:00 PM				5		0	0	0			0	9	14				
5:15 PM				3		0	1	0			0	0	4				
5:30 PM				2		0	1	0			0	3	6				
5:45 PM				0		0	0	0			0	4	4				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	20	0	1	4	6	0	0	2	33	66	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	95.24%	0.00%	4.76%	40.00%	60.00%	0.00%	0.00%	5.71%	94.29%					
PEAK HR START TIME :	430 PM												TOTAL				
PEAK HR VOL :	0	0	0	14	0	0	3	2	0	0	2	17	38				
PEAK HR FACTOR :	0.000			0.700			0.313			0.528			0.993				

CONTROL : 3-Way Stop (SB/EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM									42				42
7:15 AM									45				45
7:30 AM									74				74
7:45 AM									80				80
8:00 AM									52				52
8:15 AM									52				52
8:30 AM									53				53
8:45 AM									45				45
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	443	0	0	0	443
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	258	0	0	0	258
PEAK HR FACTOR :	0.000			0.000			0.806			0.000			0.806

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM									61				61
4:15 PM									65				65
4:30 PM									58				58
4:45 PM									64				64
5:00 PM									85				85
5:15 PM									68				68
5:30 PM									80				80
5:45 PM									71				71
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	552	0	0	0	552
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	304	0	0	0	304
PEAK HR FACTOR :	0.000			0.000			0.894			0.000			0.894

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

I-110 SB Ramps and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-101

City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach (I-110 SB Ramps)

	Lanes 2	0.5	1.5		
AM	0	0	0	0	AM
NOON	0	0	0	0	NOON
PM	0	0	0	0	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	0	0	0
0	0	0	0
3	0	0	0
0	258	0	304

Westbound Approach

AM	NOON	PM	Lanes
0	0	0	1
0	0	0	4
0	0	0	0
0	0	0	

Northbound Approach

AM	258	0	0	0	AM
NOON	0	0	0	0	NOON
PM	304	0	0	0	PM
		0	1	0	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	0	0	AM
	0	0	NOON
	0	0	PM

West Leg	AM	NOON	PM
	0	0	0
	258	0	304

East Leg	AM	NOON	PM
	0	0	0
	0	0	0

	South Leg	
AM	258	0
NOON	0	0
PM	304	0

Total Volume Per Leg

	North Leg
AM	0
NOON	0
PM	0

West Leg	AM	NOON	PM
	258	0	304

East Leg	AM	NOON	PM
	0	0	0

	South Leg
AM	258
NOON	0
PM	304

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM									41				41
7:15 AM									44				44
7:30 AM									74				74
7:45 AM									79				79
8:00 AM									51				51
8:15 AM									52				52
8:30 AM									53				53
8:45 AM									44				44
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	438	0	0	0	438
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	256	0	0	0	256
PEAK HR FACTOR :		0.000			0.000			0.810			0.000		0.810

UTURNS			
NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM									61				61
4:15 PM									65				65
4:30 PM									57				57
4:45 PM									64				64
5:00 PM									84				84
5:15 PM									68				68
5:30 PM									80				80
5:45 PM									71				71
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	550	0	0	0	550
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	303	0	0	0	303
PEAK HR FACTOR :		0.000			0.000			0.902			0.000		0.902

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM									1				1
7:15 AM									1				1
7:30 AM									0				0
7:45 AM									1				1
8:00 AM									1				1
8:15 AM									0				0
8:30 AM									0				0
8:45 AM									1				1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	5	0	0	0	5
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	2	0	0	0	2
PEAK HR FACTOR :	0.000			0.000			0.500			0.000			0.810

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

City: Carson

SingleUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM									0				0
4:15 PM									0				0
4:30 PM									1				1
4:45 PM									0				0
5:00 PM									1				1
5:15 PM									0				0
5:30 PM									0				0
5:45 PM									0				0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	2	0	0	0	2
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	1	0	0	0	1
PEAK HR FACTOR :	0.000			0.000			0.250			0.000			0.902

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

Day: Thursday

MultiUnit

City: Carson

Date: 4/3/2014

AM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
7:00 AM									0				0
7:15 AM									0				0
7:30 AM									0				0
7:45 AM									0				0
8:00 AM									0				0
8:15 AM									0				0
8:30 AM									0				0
8:45 AM									0				0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000			0.000			0.000			0.000			0.810

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-101

Day: Thursday

City: Carson

MultiUnit

Date: 4/3/2014

PM

NS/EW Streets:	I-110 SB Ramps			I-110 SB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	2	0	3	0	0	4	1	
4:00 PM									0				0
4:15 PM									0				0
4:30 PM									0				0
4:45 PM									0				0
5:00 PM									0				0
5:15 PM									0				0
5:30 PM									0				0
5:45 PM									0				0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000			0.000			0.000			0.000			0.902

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

City: Carson

Day: Thursday

Date: 4/3/2014

TOTALS

AM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM												123	123
7:15 AM												112	112
7:30 AM												132	132
7:45 AM												143	143
8:00 AM												107	107
8:15 AM												95	95
8:30 AM												95	95
8:45 AM												77	77
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	884	884
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	510	510
PEAK HR FACTOR :		0.000			0.000			0.000			0.892		0.892

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

Day: Thursday

City: Carson

Date: 4/3/2014

TOTALS

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM												88	88
4:15 PM												88	88
4:30 PM												86	86
4:45 PM												85	85
5:00 PM												83	83
5:15 PM												93	93
5:30 PM												86	86
5:45 PM												80	80
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	689	689
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	347	347
PEAK HR FACTOR :		0.000			0.000			0.000			0.933		0.933

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

I-110 NB Ramps and Sepulveda Blvd , Carson

Date: 4/3/2014

Day: Thursday

Project #: 14-5177 Cars-102

City: Carson

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (I-110 NB Ramps)

Lanes	1	0	0		
AM	0	0	0	510	AM
NOON	0	0	0	0	NOON
PM	0	0	0	347	PM

Eastbound Approach (Sepulveda Blvd)

Lanes	AM	NOON	PM
	0	0	0
1	0	0	0
3	0	0	0
1	0	0	0

Westbound Approach

AM	NOON	PM	Lanes
510	0	347	0
0	0	0	3
0	0	0	0
0	0	0	

Northbound Approach

AM	0	0	0	0	AM
NOON	0	0	0	0	NOON
PM	0	0	0	0	PM
		0.5	0.5	1	Lanes

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
	0	510	AM
	0	0	NOON
	0	347	PM

West Leg			East Leg		
AM	NOON	PM			
0	0	0	510	0	347
0	0	0	0	0	0
			AM	NOON	PM

	South Leg	
AM	0	0
NOON	0	0
PM	0	0

Total Volume Per Leg

	North Leg
	510 AM
	0 NOON
	347 PM

West Leg			East Leg		
AM	NOON	PM			
0	0	0	510	0	347
			AM	NOON	PM

	South Leg
AM	0
NOON	0
PM	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

AM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM												117	117
7:15 AM												105	105
7:30 AM												122	122
7:45 AM												131	131
8:00 AM												100	100
8:15 AM												89	89
8:30 AM												87	87
8:45 AM												69	69
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	820	820
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	475	475
PEAK HR FACTOR :		0.000			0.000			0.000			0.906		0.906

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

Day: Thursday

City: Carson

Cars

Date: 4/3/2014

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM												82	82
4:15 PM												80	80
4:30 PM												75	75
4:45 PM												84	84
5:00 PM												72	72
5:15 PM												85	85
5:30 PM												84	84
5:45 PM												78	78
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	640	640
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	325	325
PEAK HR FACTOR :		0.000			0.000			0.000			0.956		0.956

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

City: Carson

SingleUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM												0	0
7:15 AM												3	3
7:30 AM												2	2
7:45 AM												6	6
8:00 AM												4	4
8:15 AM												3	3
8:30 AM												4	4
8:45 AM												4	4
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	26	26
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	11	11
PEAK HR FACTOR :	0.000			0.000			0.000			0.458			0.906

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

Day: Thursday

City: Carson

SingleUnit

Date: 4/3/2014

PM

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM												2	2
4:15 PM												4	4
4:30 PM												4	4
4:45 PM												1	1
5:00 PM												6	6
5:15 PM												5	5
5:30 PM												1	1
5:45 PM												1	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	24	24
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	13	13
PEAK HR FACTOR :		0.000			0.000			0.000			0.542		0.956

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

City: Carson

MultiUnit

AM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
7:00 AM												6	6
7:15 AM												4	4
7:30 AM												8	8
7:45 AM												6	6
8:00 AM												3	3
8:15 AM												3	3
8:30 AM												4	4
8:45 AM												4	4
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	38	38
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	24	24
PEAK HR FACTOR :	0.000			0.000			0.000			0.750			0.906

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-5177 Cars-102

City: Carson

MultiUnit

PM

Day: Thursday

Date: 4/3/2014

NS/EW Streets:	I-110 NB Ramps			I-110 NB Ramps			Sepulveda Blvd			Sepulveda Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	1	1	3	1	0	3	0	
4:00 PM												4	4
4:15 PM												4	4
4:30 PM												7	7
4:45 PM												0	0
5:00 PM												5	5
5:15 PM												3	3
5:30 PM												1	1
5:45 PM												1	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	25	25
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	0.00%	100.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	9	9
PEAK HR FACTOR :	0.000			0.000			0.000			0.450			0.956

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

APPENDIX B:
INTERSECTION LEVEL OF SERVICE WORKSHEETS

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:	WBR		

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,051	3,200	0.328 *	N-S(1):	0.142
	TH	0.31	51	490	0.104	N-S(2):	0.328 *
	LT	1.69	282	2,168	0.130	E-W(1):	0.417 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.193
	TH	4.00	1,238	6,400	0.193		
	LT	0.00	0	0	0.000 *	V/C:	0.745
Northbound	RT	1.00	19	1,600	0.012	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	17	0	0.000	ICU:	0.795
	TH	3.00	1,984	4,800	0.417 *		
	LT	0.00	0	0	0.000	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	974	3,200	0.304 *	N-S(1):	0.199
	TH	0.28	65	451	0.144	N-S(2):	0.304 *
	LT	1.72	396	2,199	0.180	E-W(1):	0.476 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.165
	TH	4.00	1,050	6,400	0.165		
	LT	0.00	3	1,600	0.002 *	V/C:	0.780
Northbound	RT	1.00	32	1,600	0.019	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	22	0	0.000	ICU:	0.830
	TH	3.00	2,254	4,800	0.474 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	58	1,600	0.036 *	N-S(1):	0.337 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.139
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.330 *
	TH	3.00	1,501	4,800	0.314 *		
	LT	0.00	0	0	0.000	V/C:	0.667
Northbound	RT	1.00	189	1,600	0.118	Lost Time:	0.050
	TH	1.00	25	1,600	0.301 *	ITS:	0.000
	LT	0.00	457	1,600	0.286		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.717
	TH	3.00	668	4,800	0.139		
	LT	1.00	25	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	115	1,600	0.072 *	N-S(1):	0.276 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.218
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.289 *
	TH	3.00	1,073	4,800	0.226 *		
	LT	0.00	0	0	0.000	V/C:	0.565
Northbound	RT	1.00	324	1,600	0.203	Lost Time:	0.050
	TH	1.00	31	1,600	0.204 *	ITS:	0.000
	LT	0.00	296	1,600	0.185		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.615
	TH	3.00	1,045	4,800	0.218		
	LT	1.00	100	1,600	0.063 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	256	1,600	0.160 *	N-S(1):	0.140
	TH	2.00	202	1,600	0.126	N-S(2):	0.243 *
	LT	1.00	63	1,600	0.039	E-W(1):	0.235
Westbound	RT	1.00	77	1,600	0.028	E-W(2):	0.411 *
	TH	2.00	1,105	3,200	0.345 *		
	LT	1.00	49	1,600	0.031	V/C:	0.654
Northbound	RT	0.00	45	0	0.000	Lost Time:	0.050
	TH	2.00	277	3,200	0.101	ITS:	0.000
	LT	1.00	132	1,600	0.083 *		
Eastbound	RT	1.00	93	1,600	0.017	ICU:	0.704
	TH	2.00	653	3,200	0.204		
	LT	1.00	106	1,600	0.066 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	117	0	0.000	N-S(1):	0.191
	TH	2.00	290	3,200	0.127 *	N-S(2):	0.196 *
	LT	1.00	137	1,600	0.086	E-W(1):	0.340
Westbound	RT	1.00	131	1,600	0.039	E-W(2):	0.384 *
	TH	2.00	893	3,200	0.279 *		
	LT	1.00	57	1,600	0.036	V/C:	0.580
Northbound	RT	0.00	71	0	0.000	Lost Time:	0.050
	TH	2.00	264	3,200	0.105	ITS:	0.000
	LT	1.00	110	1,600	0.069 *		
Eastbound	RT	1.00	181	1,600	0.079	ICU:	0.630
	TH	2.00	974	3,200	0.304		
	LT	1.00	168	1,600	0.105 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	159	0	0.000	N-S(1):	0.199
	TH	2.00	317	3,200	0.149 *	N-S(2):	0.263 *
	LT	1.00	121	1,600	0.076	E-W(1):	0.341
Westbound	RT	0.00	73	0	0.000	E-W(2):	0.369 *
	TH	2.00	932	3,200	0.314 *		
	LT	1.00	208	1,600	0.130	V/C:	0.632
Northbound	RT	1.00	156	1,600	0.033	Lost Time:	0.050
	TH	2.00	395	3,200	0.123	ITS:	0.000
	LT	1.00	182	1,600	0.114 *		
Eastbound	RT	0.00	152	0	0.000	ICU:	0.682
	TH	2.00	524	3,200	0.211		
	LT	1.00	88	1,600	0.055 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	99	0	0.000	N-S(1):	0.241
	TH	2.00	419	3,200	0.162 *	N-S(2):	0.286 *
	LT	1.00	175	1,600	0.109	E-W(1):	0.415 *
Westbound	RT	0.00	105	0	0.000	E-W(2):	0.353
	TH	2.00	755	3,200	0.269		
	LT	1.00	164	1,600	0.103 *	V/C:	0.701
Northbound	RT	1.00	174	1,600	0.058	Lost Time:	0.050
	TH	2.00	421	3,200	0.132	ITS:	0.000
	LT	1.00	199	1,600	0.124 *		
Eastbound	RT	0.00	146	0	0.000	ICU:	0.751
	TH	2.00	852	3,200	0.312 *		
	LT	1.00	134	1,600	0.084	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	218	1,600	0.005	N-S(1):	0.282 *
	TH	2.00	287	3,200	0.090	N-S(2):	0.179
	LT	1.00	85	1,600	0.053 *	E-W(1):	0.348
Westbound	RT	0.00	185	0	0.000	E-W(2):	0.402 *
	TH	2.00	683	3,200	0.271 *		
	LT	1.00	145	1,600	0.091	V/C:	0.684
Northbound	RT	1.00	117	1,600	0.028	Lost Time:	0.050
	TH	1.00	366	1,600	0.229 *	ITS:	0.000
	LT	1.00	142	1,600	0.089		
Eastbound	RT	0.00	75	0	0.000	ICU:	0.734
	TH	2.00	747	3,200	0.257		
	LT	1.00	210	1,600	0.131 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	189	1,600	0.000	N-S(1):	0.283 *
	TH	2.00	406	3,200	0.127	N-S(2):	0.177
	LT	1.00	127	1,600	0.079 *	E-W(1):	0.438 *
Westbound	RT	0.00	138	0	0.000	E-W(2):	0.376
	TH	2.00	536	3,200	0.211		
	LT	1.00	115	1,600	0.072 *	V/C:	0.721
Northbound	RT	1.00	64	1,600	0.004	Lost Time:	0.050
	TH	1.00	327	1,600	0.204 *	ITS:	0.000
	LT	1.00	80	1,600	0.050		
Eastbound	RT	0.00	184	0	0.000	ICU:	0.771
	TH	2.00	986	3,200	0.366 *		
	LT	1.00	264	1,600	0.165	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	140	0	0.000	N-S(1):	0.079
	TH	1.00	4	1,600	0.110 *	N-S(2):	0.138 *
	LT	0.00	32	1,600	0.020	E-W(1):	0.328
Westbound	RT	0.00	16	0	0.000	E-W(2):	0.359 *
	TH	2.00	1,050	3,200	0.333 *		
	LT	1.00	24	1,600	0.015	V/C:	0.497
Northbound	RT	0.00	46	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.059	ITS:	0.000
	LT	0.00	45	1,600	0.028 *		
Eastbound	RT	0.00	36	0	0.000	ICU:	0.547
	TH	2.00	964	3,200	0.313		
	LT	1.00	41	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	59	0	0.000	N-S(1):	0.049
	TH	1.00	4	1,600	0.049 *	N-S(2):	0.068 *
	LT	0.00	15	1,600	0.009	E-W(1):	0.361 *
Westbound	RT	0.00	44	0	0.000	E-W(2):	0.300
	TH	2.00	730	3,200	0.242		
	LT	1.00	32	1,600	0.020 *	V/C:	0.429
Northbound	RT	0.00	28	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.040	ITS:	0.000
	LT	0.00	31	1,600	0.019 *		
Eastbound	RT	0.00	54	0	0.000	ICU:	0.479
	TH	2.00	1,038	3,200	0.341 *		
	LT	1.00	93	1,600	0.058	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	23	0	0.000	N-S(1):	0.042
	TH	1.00	0	1,600	0.038 *	N-S(2):	0.044 *
	LT	0.00	38	1,600	0.024	E-W(1):	0.657 *
Westbound	RT	0.00	19	0	0.000	E-W(2):	0.000
	TH	2.00	1,003	3,200	0.319 *		
	LT	1.00	8	1,600	0.005	V/C:	0.701
Northbound	RT	0.00	19	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.018	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.751
	TH	2.00	1,075	3,200	0.338 *		
	LT	1.00	9	1,600	0.006	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	14	0	0.000	N-S(1):	0.022
	TH	1.00	1	1,600	0.019 *	N-S(2):	0.025 *
	LT	0.00	15	1,600	0.009	E-W(1):	0.587 *
Westbound	RT	0.00	27	0	0.000	E-W(2):	0.000
	TH	2.00	803	3,200	0.259 *		
	LT	1.00	21	1,600	0.013	V/C:	0.612
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	15	0	0.000	ICU:	0.662
	TH	2.00	1,036	3,200	0.328 *		
	LT	1.00	27	1,600	0.017	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	156	0	0.000	N-S(1):	0.238
	TH	2.00	401	3,200	0.174 *	N-S(2):	0.290 *
	LT	1.00	109	1,600	0.068	E-W(1):	0.229
Westbound	RT	0.00	71	0	0.000	E-W(2):	0.344 *
	TH	2.00	748	3,200	0.256 *		
	LT	1.00	41	1,600	0.026	V/C:	0.634
Northbound	RT	0.00	102	0	0.000	Lost Time:	0.050
	TH	2.00	441	3,200	0.170	ITS:	0.000
	LT	1.00	185	1,600	0.116 *		
Eastbound	RT	0.00	148	0	0.000	ICU:	0.684
	TH	2.00	501	3,200	0.203		
	LT	1.00	140	1,600	0.088 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	184	0	0.000	N-S(1):	0.242
	TH	2.00	497	3,200	0.213 *	N-S(2):	0.338 *
	LT	1.00	113	1,600	0.071	E-W(1):	0.373
Westbound	RT	0.00	152	0	0.000	E-W(2):	0.388 *
	TH	2.00	677	3,200	0.259 *		
	LT	1.00	110	1,600	0.069	V/C:	0.726
Northbound	RT	0.00	84	0	0.000	Lost Time:	0.050
	TH	2.00	462	3,200	0.171	ITS:	0.000
	LT	1.00	200	1,600	0.125 *		
Eastbound	RT	0.00	205	0	0.000	ICU:	0.776
	TH	2.00	767	3,200	0.304		
	LT	1.00	206	1,600	0.129 *	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	174	0	0.000	N-S(1):	0.135
	TH	3.00	397	4,800	0.119 *	N-S(2):	0.227 *
	LT	1.00	59	1,600	0.037	E-W(1):	0.365
Westbound	RT	0.00	52	0	0.000	E-W(2):	0.376 *
	TH	2.00	604	3,200	0.205 *		
	LT	1.00	130	1,600	0.081	V/C:	0.603
Northbound	RT	0.00	113	0	0.000	Lost Time:	0.050
	TH	3.00	357	4,800	0.098	ITS:	0.000
	LT	1.00	172	1,600	0.108 *		
Eastbound	RT	0.00	183	0	0.000	ICU:	0.653
	TH	2.00	727	3,200	0.284		
	LT	1.00	273	1,600	0.171 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	219	0	0.000	N-S(1):	0.128
	TH	3.00	518	4,800	0.154 *	N-S(2):	0.258 *
	LT	1.00	33	1,600	0.021	E-W(1):	0.333 *
Westbound	RT	0.00	51	0	0.000	E-W(2):	0.303
	TH	2.00	495	3,200	0.171		
	LT	1.00	137	1,600	0.086 *	V/C:	0.591
Northbound	RT	0.00	59	0	0.000	Lost Time:	0.050
	TH	3.00	453	4,800	0.107	ITS:	0.000
	LT	1.00	166	1,600	0.104 *		
Eastbound	RT	0.00	220	0	0.000	ICU:	0.641
	TH	2.00	570	3,200	0.247 *		
	LT	1.00	211	1,600	0.132	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.175 *
	TH	3.00	584	4,800	0.122	N-S(2):	0.122
	LT	1.00	38	1,600	0.024 *	E-W(1):	0.431 *
Westbound	RT	1.00	553	1,600	0.334	E-W(2):	0.334
	TH	0.00	0	0	0.000		
	LT	2.00	1,104	2,560	0.431 *	V/C:	0.606
Northbound	RT	1.00	75	1,600	0.000	Lost Time:	0.050
	TH	2.00	484	3,200	0.151 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.656
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.161
	TH	3.00	955	4,800	0.199 *	N-S(2):	0.199 *
	LT	1.00	77	1,600	0.048	E-W(1):	0.403 *
Westbound	RT	1.00	321	1,600	0.177	E-W(2):	0.177
	TH	0.00	0	0	0.000		
	LT	2.00	1,032	2,560	0.403 *	V/C:	0.602
Northbound	RT	1.00	218	1,600	0.000	Lost Time:	0.050
	TH	2.00	362	3,200	0.113	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.652
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.544 *
	TH	3.00	1,442	4,800	0.300	N-S(2):	0.300
	LT	1.00	288	1,600	0.180 *	E-W(1):	0.126 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.069
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.670
Northbound	RT	1.00	582	1,600	0.364 *	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	201	1,600	0.126 *	ICU:	0.720
	TH	2.00	0	1,600	0.069		
	LT	0.00	110	1,600	0.069	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.721 *
	TH	3.00	1,514	4,800	0.315	N-S(2):	0.315
	LT	1.00	483	1,600	0.302 *	E-W(1):	0.051 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.028
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.772
Northbound	RT	1.00	671	1,600	0.419 *	Lost Time:	0.050
	TH	2.00	549	3,200	0.172	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	81	1,600	0.051 *	ICU:	0.822
	TH	2.00	0	1,600	0.028		
	LT	0.00	45	1,600	0.028	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	583	1,600	0.313 *	N-S(1):	0.273
	TH	2.00	924	3,200	0.289	N-S(2):	0.321 *
	LT	1.00	107	1,600	0.067	E-W(1):	0.252 *
Westbound	RT	1.00	112	1,600	0.037	E-W(2):	0.249
	TH	2.00	470	3,200	0.147		
	LT	1.00	142	1,600	0.089 *	V/C:	0.573
Northbound	RT	1.00	268	1,600	0.123	Lost Time:	0.050
	TH	2.00	660	3,200	0.206	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	18	1,600	0.008	ICU:	0.623
	TH	2.00	523	3,200	0.163 *		
	LT	1.00	163	1,600	0.102	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	462	1,600	0.196	N-S(1):	0.344 *
	TH	2.00	952	3,200	0.298	N-S(2):	0.308
	LT	1.00	145	1,600	0.091 *	E-W(1):	0.346 *
Westbound	RT	1.00	209	1,600	0.085	E-W(2):	0.275
	TH	2.00	284	3,200	0.089		
	LT	1.00	145	1,600	0.091 *	V/C:	0.690
Northbound	RT	1.00	478	1,600	0.253 *	Lost Time:	0.050
	TH	2.00	613	3,200	0.192	ITS:	0.000
	LT	1.00	16	1,600	0.010		
Eastbound	RT	1.00	17	1,600	0.006	ICU:	0.740
	TH	2.00	816	3,200	0.255 *		
	LT	1.00	297	1,600	0.186	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	231	0	0.000	N-S(1):	0.307 *
	TH	2.00	373	3,200	0.189	N-S(2):	0.207
	LT	1.00	159	1,600	0.099 *	E-W(1):	0.173
Westbound	RT	0.00	118	0	0.000	E-W(2):	0.309 *
	TH	2.00	480	3,200	0.187 *		
	LT	1.00	101	1,600	0.063	V/C:	0.616
Northbound	RT	0.00	133	0	0.000	Lost Time:	0.050
	TH	2.00	531	3,200	0.208 *	ITS:	0.000
	LT	1.00	28	1,600	0.018		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.666
	TH	2.00	329	3,200	0.110		
	LT	1.00	195	1,600	0.122 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	276	0	0.000	N-S(1):	0.271 *
	TH	2.00	533	3,200	0.253 *	N-S(2):	0.271 *
	LT	1.00	157	1,600	0.098 *	E-W(1):	0.251
Westbound	RT	0.00	139	0	0.000	E-W(2):	0.304 *
	TH	2.00	485	3,200	0.195 *		
	LT	1.00	103	1,600	0.064	V/C:	0.575
Northbound	RT	0.00	172	0	0.000	Lost Time:	0.050
	TH	2.00	380	3,200	0.173 *	ITS:	0.000
	LT	1.00	28	1,600	0.018 *		
Eastbound	RT	0.00	44	0	0.000	ICU:	0.625
	TH	2.00	553	3,200	0.187		
	LT	1.00	175	1,600	0.109 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	341	3,200	0.006	N-S(1):	0.081 *
	TH	0.00	0	0	0.000	N-S(2):	0.006
	LT	1.00	129	1,600	0.081 *	E-W(1):	0.074
Westbound	RT	0.00	162	0	0.000	E-W(2):	0.317 *
	TH	2.00	206	3,200	0.115 *		
	LT	0.00	0	0	0.000	V/C:	0.398
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.448
	TH	1.00	119	1,600	0.074		
	LT	2.00	516	2,560	0.202 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	454	3,200	0.065	N-S(1):	0.102 *
	TH	0.00	0	0	0.000	N-S(2):	0.065
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.096
Westbound	RT	0.00	186	1,600	0.116 *	E-W(2):	0.270 *
	TH	2.00	151	1,600	0.094		
	LT	0.00	0	0	0.000	V/C:	0.372
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.422
	TH	1.00	153	1,600	0.096		
	LT	2.00	395	2,560	0.154 *	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,051	3,200	0.328 *	N-S(1):	0.160
	TH	0.27	51	432	0.118	N-S(2):	0.328 *
	LT	1.73	327	2,215	0.148	E-W(1):	0.417 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.193
	TH	4.00	1,238	6,400	0.193		
	LT	0.00	0	0	0.000 *	V/C:	0.745
Northbound	RT	1.00	19	1,600	0.012	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	17	0	0.000	ICU:	0.795
	TH	3.00	1,984	4,800	0.417 *		
	LT	0.00	0	0	0.000	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	974	3,200	0.304 *	N-S(1):	0.200
	TH	0.28	65	448	0.145	N-S(2):	0.304 *
	LT	1.72	399	2,201	0.181	E-W(1):	0.476 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.165
	TH	4.00	1,050	6,400	0.165		
	LT	0.00	3	1,600	0.002 *	V/C:	0.780
Northbound	RT	1.00	32	1,600	0.019	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	22	0	0.000	ICU:	0.830
	TH	3.00	2,254	4,800	0.474 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	58	1,600	0.036 *	N-S(1):	0.337 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.149
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.330 *
	TH	3.00	1,504	4,800	0.314 *		
	LT	0.00	0	0	0.000	V/C:	0.667
Northbound	RT	1.00	191	1,600	0.119	Lost Time:	0.050
	TH	1.00	25	1,600	0.301 *	ITS:	0.000
	LT	0.00	457	1,600	0.286		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.717
	TH	3.00	713	4,800	0.149		
	LT	1.00	25	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	115	1,600	0.072 *	N-S(1):	0.276 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.218
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.299 *
	TH	3.00	1,120	4,800	0.236 *		
	LT	0.00	0	0	0.000	V/C:	0.575
Northbound	RT	1.00	324	1,600	0.203	Lost Time:	0.050
	TH	1.00	31	1,600	0.204 *	ITS:	0.000
	LT	0.00	296	1,600	0.185		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.625
	TH	3.00	1,048	4,800	0.218		
	LT	1.00	100	1,600	0.063 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	256	1,600	0.160 *	N-S(1):	0.140
	TH	2.00	202	1,600	0.126	N-S(2):	0.243 *
	LT	1.00	63	1,600	0.039	E-W(1):	0.250
Westbound	RT	1.00	77	1,600	0.028	E-W(2):	0.412 *
	TH	2.00	1,108	3,200	0.346 *		
	LT	1.00	49	1,600	0.031	V/C:	0.655
Northbound	RT	0.00	45	0	0.000	Lost Time:	0.050
	TH	2.00	277	3,200	0.101	ITS:	0.000
	LT	1.00	132	1,600	0.083 *		
Eastbound	RT	1.00	93	1,600	0.017	ICU:	0.705
	TH	2.00	700	3,200	0.219		
	LT	1.00	106	1,600	0.066 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	117	0	0.000	N-S(1):	0.191
	TH	2.00	290	3,200	0.127 *	N-S(2):	0.196 *
	LT	1.00	137	1,600	0.086	E-W(1):	0.341
Westbound	RT	1.00	131	1,600	0.039	E-W(2):	0.399 *
	TH	2.00	940	3,200	0.294 *		
	LT	1.00	57	1,600	0.036	V/C:	0.595
Northbound	RT	0.00	71	0	0.000	Lost Time:	0.050
	TH	2.00	264	3,200	0.105	ITS:	0.000
	LT	1.00	110	1,600	0.069 *		
Eastbound	RT	1.00	181	1,600	0.079	ICU:	0.645
	TH	2.00	977	3,200	0.305		
	LT	1.00	168	1,600	0.105 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	159	0	0.000	N-S(1):	0.199
	TH	2.00	317	3,200	0.149 *	N-S(2):	0.265 *
	LT	1.00	121	1,600	0.076	E-W(1):	0.356
Westbound	RT	0.00	73	0	0.000	E-W(2):	0.369 *
	TH	2.00	932	3,200	0.314 *		
	LT	1.00	208	1,600	0.130	V/C:	0.634
Northbound	RT	1.00	156	1,600	0.033	Lost Time:	0.050
	TH	2.00	395	3,200	0.123	ITS:	0.000
	LT	1.00	185	1,600	0.116 *		
Eastbound	RT	0.00	152	0	0.000	ICU:	0.684
	TH	2.00	571	3,200	0.226		
	LT	1.00	88	1,600	0.055 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	99	0	0.000	N-S(1):	0.241
	TH	2.00	419	3,200	0.162 *	N-S(2):	0.316 *
	LT	1.00	175	1,600	0.109	E-W(1):	0.416 *
Westbound	RT	0.00	105	0	0.000	E-W(2):	0.353
	TH	2.00	755	3,200	0.269		
	LT	1.00	164	1,600	0.103 *	V/C:	0.732
Northbound	RT	1.00	174	1,600	0.058	Lost Time:	0.050
	TH	2.00	421	3,200	0.132	ITS:	0.000
	LT	1.00	246	1,600	0.154 *		
Eastbound	RT	0.00	146	0	0.000	ICU:	0.782
	TH	2.00	855	3,200	0.313 *		
	LT	1.00	134	1,600	0.084	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	218	1,600	0.005	N-S(1):	0.282 *
	TH	2.00	287	3,200	0.090	N-S(2):	0.179
	LT	1.00	85	1,600	0.053 *	E-W(1):	0.348
Westbound	RT	0.00	188	0	0.000	E-W(2):	0.403 *
	TH	2.00	683	3,200	0.272 *		
	LT	1.00	145	1,600	0.091	V/C:	0.685
Northbound	RT	1.00	117	1,600	0.028	Lost Time:	0.050
	TH	1.00	366	1,600	0.229 *	ITS:	0.000
	LT	1.00	142	1,600	0.089		
Eastbound	RT	0.00	75	0	0.000	ICU:	0.735
	TH	2.00	747	3,200	0.257		
	LT	1.00	210	1,600	0.131 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	189	1,600	0.000	N-S(1):	0.283 *
	TH	2.00	406	3,200	0.127	N-S(2):	0.177
	LT	1.00	127	1,600	0.079 *	E-W(1):	0.438 *
Westbound	RT	0.00	185	0	0.000	E-W(2):	0.390
	TH	2.00	536	3,200	0.225		
	LT	1.00	115	1,600	0.072 *	V/C:	0.721
Northbound	RT	1.00	64	1,600	0.004	Lost Time:	0.050
	TH	1.00	327	1,600	0.204 *	ITS:	0.000
	LT	1.00	80	1,600	0.050		
Eastbound	RT	0.00	184	0	0.000	ICU:	0.771
	TH	2.00	986	3,200	0.366 *		
	LT	1.00	264	1,600	0.165	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	142	0	0.000	N-S(1):	0.079
	TH	1.00	4	1,600	0.111 *	N-S(2):	0.139 *
	LT	0.00	32	1,600	0.020	E-W(1):	0.328
Westbound	RT	0.00	60	0	0.000	E-W(2):	0.373 *
	TH	2.00	1,051	3,200	0.347 *		
	LT	1.00	24	1,600	0.015	V/C:	0.512
Northbound	RT	0.00	46	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.059	ITS:	0.000
	LT	0.00	45	1,600	0.028 *		
Eastbound	RT	0.00	36	0	0.000	ICU:	0.562
	TH	2.00	964	3,200	0.313		
	LT	1.00	41	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	95	0	0.000	N-S(1):	0.054
	TH	1.00	4	1,600	0.076 *	N-S(2):	0.095 *
	LT	0.00	23	1,600	0.014	E-W(1):	0.361 *
Westbound	RT	0.00	46	0	0.000	E-W(2):	0.304
	TH	2.00	741	3,200	0.246		
	LT	1.00	32	1,600	0.020 *	V/C:	0.456
Northbound	RT	0.00	28	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.040	ITS:	0.000
	LT	0.00	31	1,600	0.019 *		
Eastbound	RT	0.00	54	0	0.000	ICU:	0.506
	TH	2.00	1,038	3,200	0.341 *		
	LT	1.00	93	1,600	0.058	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	24	0	0.000	N-S(1):	0.042
	TH	1.00	0	1,600	0.039 *	N-S(2):	0.045 *
	LT	0.00	38	1,600	0.024	E-W(1):	0.343
Westbound	RT	0.00	33	0	0.000	E-W(2):	0.344 *
	TH	2.00	1,047	3,200	0.338 *		
	LT	1.00	8	1,600	0.005	V/C:	0.389
Northbound	RT	0.00	19	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.018	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.439
	TH	2.00	1,075	3,200	0.338		
	LT	1.00	9	1,600	0.006 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	25	0	0.000	N-S(1):	0.024
	TH	1.00	1	1,600	0.028 *	N-S(2):	0.034 *
	LT	0.00	18	1,600	0.011	E-W(1):	0.344 *
Westbound	RT	0.00	28	0	0.000	E-W(2):	0.277
	TH	2.00	805	3,200	0.260		
	LT	1.00	21	1,600	0.013 *	V/C:	0.378
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	15	0	0.000	ICU:	0.428
	TH	2.00	1,044	3,200	0.331 *		
	LT	1.00	27	1,600	0.017	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	156	0	0.000	N-S(1):	0.238
	TH	2.00	401	3,200	0.174 *	N-S(2):	0.290 *
	LT	1.00	109	1,600	0.068	E-W(1):	0.244
Westbound	RT	0.00	71	0	0.000	E-W(2):	0.344 *
	TH	2.00	748	3,200	0.256 *		
	LT	1.00	41	1,600	0.026	V/C:	0.634
Northbound	RT	0.00	102	0	0.000	Lost Time:	0.050
	TH	2.00	441	3,200	0.170	ITS:	0.000
	LT	1.00	185	1,600	0.116 *		
Eastbound	RT	0.00	195	0	0.000	ICU:	0.684
	TH	2.00	501	3,200	0.218		
	LT	1.00	140	1,600	0.088 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	184	0	0.000	N-S(1):	0.242
	TH	2.00	497	3,200	0.213 *	N-S(2):	0.338 *
	LT	1.00	113	1,600	0.071	E-W(1):	0.374
Westbound	RT	0.00	152	0	0.000	E-W(2):	0.388 *
	TH	2.00	677	3,200	0.259 *		
	LT	1.00	110	1,600	0.069	V/C:	0.726
Northbound	RT	0.00	84	0	0.000	Lost Time:	0.050
	TH	2.00	462	3,200	0.171	ITS:	0.000
	LT	1.00	200	1,600	0.125 *		
Eastbound	RT	0.00	208	0	0.000	ICU:	0.776
	TH	2.00	767	3,200	0.305		
	LT	1.00	206	1,600	0.129 *	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	221	1,600	0.138 *	N-S(1):	0.135
	TH	3.00	397	3,200	0.124	N-S(2):	0.246 *
	LT	1.00	59	1,600	0.037	E-W(1):	0.365
Westbound	RT	0.00	52	0	0.000	E-W(2):	0.380 *
	TH	2.00	616	3,200	0.209 *		
	LT	1.00	130	1,600	0.081	V/C:	0.626
Northbound	RT	0.00	113	0	0.000	Lost Time:	0.050
	TH	3.00	357	4,800	0.098	ITS:	0.000
	LT	1.00	172	1,600	0.108 *		
Eastbound	RT	0.00	183	0	0.000	ICU:	0.676
	TH	2.00	727	3,200	0.284		
	LT	1.00	273	1,600	0.171 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	222	0	0.000	N-S(1):	0.128
	TH	3.00	518	4,800	0.154 *	N-S(2):	0.258 *
	LT	1.00	33	1,600	0.021	E-W(1):	0.337 *
Westbound	RT	0.00	51	0	0.000	E-W(2):	0.303
	TH	2.00	495	3,200	0.171		
	LT	1.00	137	1,600	0.086 *	V/C:	0.595
Northbound	RT	0.00	59	0	0.000	Lost Time:	0.050
	TH	3.00	453	4,800	0.107	ITS:	0.000
	LT	1.00	166	1,600	0.104 *		
Eastbound	RT	0.00	220	0	0.000	ICU:	0.645
	TH	2.00	582	3,200	0.251 *		
	LT	1.00	211	1,600	0.132	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.175 *
	TH	3.00	584	4,800	0.122	N-S(2):	0.122
	LT	1.00	38	1,600	0.024 *	E-W(1):	0.434 *
Westbound	RT	1.00	553	1,600	0.334	E-W(2):	0.334
	TH	0.00	0	0	0.000		
	LT	2.00	1,110	2,560	0.434 *	V/C:	0.609
Northbound	RT	1.00	75	1,600	0.000	Lost Time:	0.050
	TH	2.00	484	3,200	0.151 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.659
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.161
	TH	3.00	955	4,800	0.199 *	N-S(2):	0.199 *
	LT	1.00	77	1,600	0.048	E-W(1):	0.403 *
Westbound	RT	1.00	321	1,600	0.177	E-W(2):	0.177
	TH	0.00	0	0	0.000		
	LT	2.00	1,032	2,560	0.403 *	V/C:	0.602
Northbound	RT	1.00	222	1,600	0.000	Lost Time:	0.050
	TH	2.00	362	3,200	0.113	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.652
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	Y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.544 *
	TH	3.00	1,448	4,800	0.302	N-S(2):	0.302
	LT	1.00	288	1,600	0.180 *	E-W(1):	0.128 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.672
Northbound	RT	1.00	582	1,600	0.364 *	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	205	1,600	0.128 *	ICU:	0.722
	TH	2.00	0	1,600	0.069		
	LT	0.00	110	1,600	0.069	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.725 *
	TH	3.00	1,514	4,800	0.315	N-S(2):	0.315
	LT	1.00	483	1,600	0.302 *	E-W(1):	0.051 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.776
Northbound	RT	1.00	677	1,600	0.423 *	Lost Time:	0.050
	TH	2.00	553	3,200	0.173	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	81	1,600	0.051 *	ICU:	0.826
	TH	2.00	0	1,600	0.028		
	LT	0.00	45	1,600	0.028	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	583	1,600	0.313 *	N-S(1):	0.273
	TH	2.00	934	3,200	0.292	N-S(2):	0.321 *
	LT	1.00	107	1,600	0.067	E-W(1):	0.252 *
Westbound	RT	1.00	112	1,600	0.037	E-W(2):	0.249
	TH	2.00	470	3,200	0.147		
	LT	1.00	142	1,600	0.089 *	V/C:	0.573
Northbound	RT	1.00	268	1,600	0.123	Lost Time:	0.050
	TH	2.00	660	3,200	0.206	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	18	1,600	0.008	ICU:	0.623
	TH	2.00	523	3,200	0.163 *		
	LT	1.00	163	1,600	0.102	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	462	1,600	0.196	N-S(1):	0.344 *
	TH	2.00	952	3,200	0.298	N-S(2):	0.308
	LT	1.00	145	1,600	0.091 *	E-W(1):	0.346 *
Westbound	RT	1.00	209	1,600	0.085	E-W(2):	0.275
	TH	2.00	284	3,200	0.089		
	LT	1.00	145	1,600	0.091 *	V/C:	0.690
Northbound	RT	1.00	478	1,600	0.253 *	Lost Time:	0.050
	TH	2.00	623	3,200	0.195	ITS:	0.000
	LT	1.00	16	1,600	0.010		
Eastbound	RT	1.00	17	1,600	0.006	ICU:	0.740
	TH	2.00	816	3,200	0.255 *		
	LT	1.00	297	1,600	0.186	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	231	0	0.000	N-S(1):	0.307 *
	TH	2.00	383	3,200	0.192	N-S(2):	0.210
	LT	1.00	159	1,600	0.099 *	E-W(1):	0.174
Westbound	RT	0.00	118	0	0.000	E-W(2):	0.309 *
	TH	2.00	480	3,200	0.187 *		
	LT	1.00	103	1,600	0.064	V/C:	0.616
Northbound	RT	0.00	133	0	0.000	Lost Time:	0.050
	TH	2.00	531	3,200	0.208 *	ITS:	0.000
	LT	1.00	28	1,600	0.018		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.666
	TH	2.00	329	3,200	0.110		
	LT	1.00	195	1,600	0.122 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	276	0	0.000	N-S(1):	0.274 *
	TH	2.00	533	3,200	0.253	N-S(2):	0.271
	LT	1.00	157	1,600	0.098 *	E-W(1):	0.251
Westbound	RT	0.00	139	0	0.000	E-W(2):	0.304 *
	TH	2.00	485	3,200	0.195 *		
	LT	1.00	103	1,600	0.064	V/C:	0.578
Northbound	RT	0.00	174	0	0.000	Lost Time:	0.050
	TH	2.00	390	3,200	0.176 *	ITS:	0.000
	LT	1.00	28	1,600	0.018		
Eastbound	RT	0.00	44	0	0.000	ICU:	0.628
	TH	2.00	553	3,200	0.187		
	LT	1.00	175	1,600	0.109 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: EXISTING PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	353	3,200	0.010	N-S(1):	0.081 *
	TH	0.00	0	0	0.000	N-S(2):	0.010
	LT	1.00	129	1,600	0.081 *	E-W(1):	0.074
Westbound	RT	0.00	162	0	0.000	E-W(2):	0.317 *
	TH	2.00	206	3,200	0.115 *		
	LT	0.00	0	0	0.000	V/C:	0.398
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.448
	TH	1.00	119	1,600	0.074		
	LT	2.00	516	2,560	0.202 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	454	3,200	0.062	N-S(1):	0.102 *
	TH	0.00	0	0	0.000	N-S(2):	0.062
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.096
Westbound	RT	0.00	186	1,600	0.116 *	E-W(2):	0.275 *
	TH	2.00	151	1,600	0.094		
	LT	0.00	0	0	0.000	V/C:	0.377
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.427
	TH	1.00	153	1,600	0.096		
	LT	2.00	407	2,560	0.159 *	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,076	3,200	0.336 *	N-S(1):	0.148
	TH	0.31	53	492	0.108	N-S(2):	0.336 *
	LT	1.69	292	2,167	0.135	E-W(1):	0.441 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.198
	TH	4.00	1,269	6,400	0.198		
	LT	0.00	0	0	0.000 *	V/C:	0.777
Northbound	RT	1.00	20	1,600	0.013	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	18	0	0.000	ICU:	0.827
	TH	3.00	2,097	4,800	0.441 *		
	LT	0.00	0	0	0.000	LOS:	D

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,023	3,200	0.320 *	N-S(1):	0.206
	TH	0.28	67	449	0.149	N-S(2):	0.320 *
	LT	1.72	410	2,200	0.186	E-W(1):	0.492 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.174
	TH	4.00	1,112	6,400	0.174		
	LT	0.00	3	1,600	0.002 *	V/C:	0.812
Northbound	RT	1.00	33	1,600	0.020	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.862
	TH	3.00	2,327	4,800	0.490 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	60	1,600	0.038 *	N-S(1):	0.345 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.148
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.340 *
	TH	3.00	1,549	4,800	0.324 *		
	LT	0.00	0	0	0.000	V/C:	0.685
Northbound	RT	1.00	196	1,600	0.123	Lost Time:	0.050
	TH	1.00	26	1,600	0.307 *	ITS:	0.000
	LT	0.00	465	1,600	0.291		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.735
	TH	3.00	709	4,800	0.148		
	LT	1.00	26	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	119	1,600	0.074 *	N-S(1):	0.292 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.226
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.303 *
	TH	3.00	1,127	4,800	0.238 *		
	LT	0.00	0	0	0.000	V/C:	0.595
Northbound	RT	1.00	336	1,600	0.210	Lost Time:	0.050
	TH	1.00	32	1,600	0.218 *	ITS:	0.000
	LT	0.00	316	1,600	0.198		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.645
	TH	3.00	1,084	4,800	0.226		
	LT	1.00	104	1,600	0.065 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	265	0	0.000	N-S(1):	0.182
	TH	2.00	265	3,200	0.166 *	N-S(2):	0.252 *
	LT	1.00	65	1,600	0.041	E-W(1):	0.249
Westbound	RT	1.00	80	1,600	0.030	E-W(2):	0.425 *
	TH	2.00	1,139	3,200	0.356 *		
	LT	1.00	51	1,600	0.032	V/C:	0.677
Northbound	RT	0.00	47	0	0.000	Lost Time:	0.050
	TH	2.00	404	3,200	0.141	ITS:	0.000
	LT	1.00	137	1,600	0.086 *		
Eastbound	RT	1.00	96	1,600	0.017	ICU:	0.727
	TH	2.00	693	3,200	0.217		
	LT	1.00	110	1,600	0.069 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	121	0	0.000	N-S(1):	0.221 *
	TH	2.00	343	3,200	0.145	N-S(2):	0.216
	LT	1.00	142	1,600	0.089 *	E-W(1):	0.353
Westbound	RT	1.00	136	1,600	0.041	E-W(2):	0.403 *
	TH	2.00	941	3,200	0.294 *		
	LT	1.00	59	1,600	0.037	V/C:	0.624
Northbound	RT	0.00	74	0	0.000	Lost Time:	0.050
	TH	2.00	347	3,200	0.132 *	ITS:	0.000
	LT	1.00	114	1,600	0.071		
Eastbound	RT	1.00	187	1,600	0.081	ICU:	0.674
	TH	2.00	1,011	3,200	0.316		
	LT	1.00	174	1,600	0.109 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	165	0	0.000	N-S(1):	0.206
	TH	2.00	328	3,200	0.154 *	N-S(2):	0.272 *
	LT	1.00	125	1,600	0.078	E-W(1):	0.358
Westbound	RT	0.00	76	0	0.000	E-W(2):	0.381 *
	TH	2.00	960	3,200	0.324 *		
	LT	1.00	215	1,600	0.134	V/C:	0.653
Northbound	RT	1.00	162	1,600	0.034	Lost Time:	0.050
	TH	2.00	409	3,200	0.128	ITS:	0.000
	LT	1.00	188	1,600	0.118 *		
Eastbound	RT	0.00	157	0	0.000	ICU:	0.703
	TH	2.00	560	3,200	0.224		
	LT	1.00	91	1,600	0.057 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	103	0	0.000	N-S(1):	0.313
	TH	2.00	554	3,200	0.205 *	N-S(2):	0.334 *
	LT	1.00	181	1,600	0.113	E-W(1):	0.429 *
Westbound	RT	0.00	109	0	0.000	E-W(2):	0.370
	TH	2.00	798	3,200	0.283		
	LT	1.00	170	1,600	0.106 *	V/C:	0.763
Northbound	RT	1.00	180	1,600	0.059	Lost Time:	0.050
	TH	2.00	641	3,200	0.200	ITS:	0.000
	LT	1.00	206	1,600	0.129 *		
Eastbound	RT	0.00	151	0	0.000	ICU:	0.813
	TH	2.00	884	3,200	0.323 *		
	LT	1.00	139	1,600	0.087	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	226	1,600	0.006	N-S(1):	0.292 *
	TH	2.00	297	3,200	0.093	N-S(2):	0.185
	LT	1.00	88	1,600	0.055 *	E-W(1):	0.365
Westbound	RT	0.00	192	0	0.000	E-W(2):	0.418 *
	TH	2.00	710	3,200	0.282 *		
	LT	1.00	150	1,600	0.094	V/C:	0.710
Northbound	RT	1.00	121	1,600	0.029	Lost Time:	0.050
	TH	1.00	379	1,600	0.237 *	ITS:	0.000
	LT	1.00	147	1,600	0.092		
Eastbound	RT	0.00	78	0	0.000	ICU:	0.760
	TH	2.00	790	3,200	0.271		
	LT	1.00	217	1,600	0.136 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	196	1,600	0.000	N-S(1):	0.423 *
	TH	2.00	540	3,200	0.169	N-S(2):	0.221
	LT	1.00	132	1,600	0.083 *	E-W(1):	0.457 *
Westbound	RT	0.00	143	0	0.000	E-W(2):	0.394
	TH	2.00	570	3,200	0.223		
	LT	1.00	119	1,600	0.074 *	V/C:	0.880
Northbound	RT	1.00	66	1,600	0.004	Lost Time:	0.050
	TH	1.00	544	1,600	0.340 *	ITS:	0.000
	LT	1.00	83	1,600	0.052		
Eastbound	RT	0.00	191	0	0.000	ICU:	0.930
	TH	2.00	1,035	3,200	0.383 *		
	LT	1.00	273	1,600	0.171	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	145	0	0.000	N-S(1):	0.082
	TH	1.00	4	1,600	0.114 *	N-S(2):	0.143 *
	LT	0.00	33	1,600	0.021	E-W(1):	0.344
Westbound	RT	0.00	17	0	0.000	E-W(2):	0.372 *
	TH	2.00	1,090	3,200	0.346 *		
	LT	1.00	25	1,600	0.016	V/C:	0.515
Northbound	RT	0.00	48	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.061	ITS:	0.000
	LT	0.00	47	1,600	0.029 *		
Eastbound	RT	0.00	37	0	0.000	ICU:	0.565
	TH	2.00	1,014	3,200	0.328		
	LT	1.00	42	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	61	0	0.000	N-S(1):	0.051
	TH	1.00	4	1,600	0.051 *	N-S(2):	0.071 *
	LT	0.00	16	1,600	0.010	E-W(1):	0.379 *
Westbound	RT	0.00	46	0	0.000	E-W(2):	0.315
	TH	2.00	771	3,200	0.255		
	LT	1.00	33	1,600	0.021 *	V/C:	0.450
Northbound	RT	0.00	29	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.041	ITS:	0.000
	LT	0.00	32	1,600	0.020 *		
Eastbound	RT	0.00	56	0	0.000	ICU:	0.500
	TH	2.00	1,089	3,200	0.358 *		
	LT	1.00	96	1,600	0.060	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	24	0	0.000	N-S(1):	0.043
	TH	1.00	0	1,600	0.039 *	N-S(2):	0.045 *
	LT	0.00	39	1,600	0.024	E-W(1):	0.687 *
Westbound	RT	0.00	20	0	0.000	E-W(2):	0.000
	TH	2.00	1,042	3,200	0.332 *		
	LT	1.00	8	1,600	0.005	V/C:	0.732
Northbound	RT	0.00	20	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.019	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.782
	TH	2.00	1,129	3,200	0.355 *		
	LT	1.00	9	1,600	0.006	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	14	0	0.000	N-S(1):	0.023
	TH	1.00	1	1,600	0.019 *	N-S(2):	0.025 *
	LT	0.00	16	1,600	0.010	E-W(1):	0.618 *
Westbound	RT	0.00	28	0	0.000	E-W(2):	0.000
	TH	2.00	847	3,200	0.273 *		
	LT	1.00	22	1,600	0.014	V/C:	0.643
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	16	0	0.000	ICU:	0.693
	TH	2.00	1,087	3,200	0.345 *		
	LT	1.00	28	1,600	0.018	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	162	0	0.000	N-S(1):	0.277
	TH	2.00	561	3,200	0.226 *	N-S(2):	0.346 *
	LT	1.00	113	1,600	0.071	E-W(1):	0.241
Westbound	RT	0.00	74	0	0.000	E-W(2):	0.355 *
	TH	2.00	770	3,200	0.264 *		
	LT	1.00	42	1,600	0.026	V/C:	0.701
Northbound	RT	0.00	106	0	0.000	Lost Time:	0.050
	TH	2.00	554	3,200	0.206	ITS:	0.000
	LT	1.00	192	1,600	0.120 *		
Eastbound	RT	0.00	153	0	0.000	ICU:	0.751
	TH	2.00	536	3,200	0.215		
	LT	1.00	145	1,600	0.091 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	191	0	0.000	N-S(1):	0.305
	TH	2.00	890	3,200	0.338 *	N-S(2):	0.467 *
	LT	1.00	117	1,600	0.073	E-W(1):	0.386
Westbound	RT	0.00	157	0	0.000	E-W(2):	0.406 *
	TH	2.00	717	3,200	0.273 *		
	LT	1.00	114	1,600	0.071	V/C:	0.873
Northbound	RT	0.00	87	0	0.000	Lost Time:	0.050
	TH	2.00	655	3,200	0.232	ITS:	0.000
	LT	1.00	207	1,600	0.129 *		
Eastbound	RT	0.00	212	0	0.000	ICU:	0.923
	TH	2.00	796	3,200	0.315		
	LT	1.00	213	1,600	0.133 *	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	180	0	0.000	N-S(1):	0.160
	TH	3.00	557	4,800	0.154 *	N-S(2):	0.265 *
	LT	1.00	61	1,600	0.038	E-W(1):	0.383
Westbound	RT	0.00	54	0	0.000	E-W(2):	0.390 *
	TH	2.00	628	3,200	0.213 *		
	LT	1.00	135	1,600	0.084	V/C:	0.655
Northbound	RT	0.00	117	0	0.000	Lost Time:	0.050
	TH	3.00	467	4,800	0.122	ITS:	0.000
	LT	1.00	178	1,600	0.111 *		
Eastbound	RT	0.00	189	0	0.000	ICU:	0.705
	TH	2.00	769	3,200	0.299		
	LT	1.00	283	1,600	0.177 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	227	0	0.000	N-S(1):	0.168
	TH	3.00	911	4,800	0.237 *	N-S(2):	0.345 *
	LT	1.00	34	1,600	0.021	E-W(1):	0.349 *
Westbound	RT	0.00	53	0	0.000	E-W(2):	0.318
	TH	2.00	528	3,200	0.182		
	LT	1.00	142	1,600	0.089 *	V/C:	0.694
Northbound	RT	0.00	61	0	0.000	Lost Time:	0.050
	TH	3.00	646	4,800	0.147	ITS:	0.000
	LT	1.00	172	1,600	0.108 *		
Eastbound	RT	0.00	228	0	0.000	ICU:	0.744
	TH	2.00	604	3,200	0.260 *		
	LT	1.00	218	1,600	0.136	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.174 *
	TH	3.00	669	4,800	0.139	N-S(2):	0.139
	LT	0.00	0	0	0.000 *	E-W(1):	0.446 *
Westbound	RT	1.00	617	1,600	0.386	E-W(2):	0.386
	TH	0.00	0	0	0.000		
	LT	2.00	1,143	2,560	0.446 *	V/C:	0.620
Northbound	RT	1.00	78	1,600	0.000	Lost Time:	0.050
	TH	2.00	558	3,200	0.174 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.670
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.128
	TH	3.00	1,191	4,800	0.248 *	N-S(2):	0.248 *
	LT	0.00	0	0	0.000	E-W(1):	0.418 *
Westbound	RT	1.00	344	1,600	0.215	E-W(2):	0.215
	TH	0.00	0	0	0.000		
	LT	2.00	1,069	2,560	0.418 *	V/C:	0.666
Northbound	RT	1.00	226	1,600	0.000	Lost Time:	0.050
	TH	2.00	409	3,200	0.128	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.716
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.308
	TH	3.00	1,503	4,800	0.313 *	N-S(2):	0.313 *
	LT	2.00	307	2,560	0.120	E-W(1):	0.130 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.094
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.443
Northbound	RT	2.00	603	3,200	0.188	Lost Time:	0.050
	TH	2.00	440	3,200	0.138	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	1.00	208	1,600	0.130 *	ICU:	0.493
	TH	1.00	0	1,600	0.094		
	LT	0.00	150	1,600	0.094	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.433 *
	TH	3.00	1,595	4,800	0.332	N-S(2):	0.332
	LT	2.00	554	2,560	0.216 *	E-W(1):	0.053 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.034
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.486
Northbound	RT	2.00	695	3,200	0.217 *	Lost Time:	0.050
	TH	2.00	596	3,200	0.186	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	1.00	84	1,600	0.053 *	ICU:	0.536
	TH	1.00	0	1,600	0.034		
	LT	0.00	54	1,600	0.034	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	604	1,600	0.325 *	N-S(1):	0.289
	TH	2.00	967	3,200	0.302	N-S(2):	0.333 *
	LT	1.00	111	1,600	0.069	E-W(1):	0.261 *
Westbound	RT	1.00	116	1,600	0.038	E-W(2):	0.258
	TH	2.00	487	3,200	0.152		
	LT	1.00	147	1,600	0.092 *	V/C:	0.594
Northbound	RT	1.00	278	1,600	0.128	Lost Time:	0.050
	TH	2.00	704	3,200	0.220	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	19	1,600	0.008	ICU:	0.644
	TH	2.00	542	3,200	0.169 *		
	LT	1.00	169	1,600	0.106	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	478	1,600	0.203	N-S(1):	0.357 *
	TH	2.00	1,013	3,200	0.317	N-S(2):	0.328
	LT	1.00	150	1,600	0.094 *	E-W(1):	0.358 *
Westbound	RT	1.00	216	1,600	0.088	E-W(2):	0.285
	TH	2.00	294	3,200	0.092		
	LT	1.00	150	1,600	0.094 *	V/C:	0.715
Northbound	RT	1.00	495	1,600	0.263 *	Lost Time:	0.050
	TH	2.00	663	3,200	0.207	ITS:	0.000
	LT	1.00	17	1,600	0.011		
Eastbound	RT	1.00	18	1,600	0.006	ICU:	0.765
	TH	2.00	845	3,200	0.264 *		
	LT	1.00	308	1,600	0.193	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	239	0	0.000	N-S(1):	0.325 *
	TH	2.00	396	3,200	0.198	N-S(2):	0.216
	LT	1.00	165	1,600	0.103 *	E-W(1):	0.185
Westbound	RT	0.00	122	0	0.000	E-W(2):	0.318 *
	TH	2.00	492	3,200	0.192 *		
	LT	1.00	105	1,600	0.066	V/C:	0.643
Northbound	RT	0.00	138	0	0.000	Lost Time:	0.050
	TH	2.00	571	3,200	0.222 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	24	0	0.000	ICU:	0.693
	TH	2.00	358	3,200	0.119		
	LT	1.00	202	1,600	0.126 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	286	0	0.000	N-S(1):	0.289 *
	TH	2.00	579	3,200	0.270	N-S(2):	0.288
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.261
Westbound	RT	0.00	144	0	0.000	E-W(2):	0.320 *
	TH	2.00	518	3,200	0.207 *		
	LT	1.00	107	1,600	0.067	V/C:	0.609
Northbound	RT	0.00	178	0	0.000	Lost Time:	0.050
	TH	2.00	421	3,200	0.187 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	46	0	0.000	ICU:	0.659
	TH	2.00	575	3,200	0.194		
	LT	1.00	181	1,600	0.113 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: EXISTING CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	354	3,200	0.006	N-S(1):	0.089 *
	TH	0.00	0	0	0.000	N-S(2):	0.006
	LT	1.00	143	1,600	0.089 *	E-W(1):	0.087
Westbound	RT	0.00	187	0	0.000	E-W(2):	0.335 *
	TH	2.00	215	3,200	0.126 *		
	LT	0.00	0	0	0.000	V/C:	0.424
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.474
	TH	1.00	139	1,600	0.087		
	LT	2.00	534	2,560	0.209 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	471	3,200	0.067	N-S(1):	0.125 *
	TH	0.00	0	0	0.000	N-S(2):	0.067
	LT	1.00	200	1,600	0.125 *	E-W(1):	0.108
Westbound	RT	0.00	213	1,600	0.133 *	E-W(2):	0.293 *
	TH	2.00	170	1,600	0.106		
	LT	0.00	0	0	0.000	V/C:	0.418
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.468
	TH	1.00	172	1,600	0.108		
	LT	2.00	409	2,560	0.160 *	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,076	3,200	0.336 *	N-S(1):	0.165
	TH	0.27	53	435	0.122	N-S(2):	0.336 *
	LT	1.73	337	2,212	0.152	E-W(1):	0.441 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.198
	TH	4.00	1,269	6,400	0.198		
	LT	0.00	0	0	0.000 *	V/C:	0.777
Northbound	RT	1.00	20	1,600	0.013	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	18	0	0.000	ICU:	0.827
	TH	3.00	2,097	4,800	0.441 *		
	LT	0.00	0	0	0.000	LOS:	D

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,023	3,200	0.320 *	N-S(1):	0.208
	TH	0.28	67	447	0.150	N-S(2):	0.320 *
	LT	1.72	413	2,203	0.188	E-W(1):	0.492 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.174
	TH	4.00	1,112	6,400	0.174		
	LT	0.00	3	1,600	0.002 *	V/C:	0.812
Northbound	RT	1.00	33	1,600	0.020	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.862
	TH	3.00	2,327	4,800	0.490 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	60	1,600	0.038 *	N-S(1):	0.345 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.157
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.340 *
	TH	3.00	1,552	4,800	0.324 *		
	LT	0.00	0	0	0.000	V/C:	0.685
Northbound	RT	1.00	198	1,600	0.124	Lost Time:	0.050
	TH	1.00	26	1,600	0.307 *	ITS:	0.000
	LT	0.00	465	1,600	0.291		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.735
	TH	3.00	754	4,800	0.157		
	LT	1.00	26	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	119	1,600	0.074 *	N-S(1):	0.292 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.226
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.312 *
	TH	3.00	1,174	4,800	0.247 *		
	LT	0.00	0	0	0.000	V/C:	0.604
Northbound	RT	1.00	336	1,600	0.210	Lost Time:	0.050
	TH	1.00	32	1,600	0.218 *	ITS:	0.000
	LT	0.00	316	1,600	0.198		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.654
	TH	3.00	1,087	4,800	0.226		
	LT	1.00	104	1,600	0.065 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	265	0	0.000	N-S(1):	0.182
	TH	2.00	265	3,200	0.166 *	N-S(2):	0.252 *
	LT	1.00	65	1,600	0.041	E-W(1):	0.263
Westbound	RT	1.00	80	1,600	0.030	E-W(2):	0.426 *
	TH	2.00	1,142	3,200	0.357 *		
	LT	1.00	51	1,600	0.032	V/C:	0.678
Northbound	RT	0.00	47	0	0.000	Lost Time:	0.050
	TH	2.00	404	3,200	0.141	ITS:	0.000
	LT	1.00	137	1,600	0.086 *		
Eastbound	RT	1.00	96	1,600	0.017	ICU:	0.728
	TH	2.00	740	3,200	0.231		
	LT	1.00	110	1,600	0.069 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	121	0	0.000	N-S(1):	0.221 *
	TH	2.00	343	3,200	0.145	N-S(2):	0.216
	LT	1.00	142	1,600	0.089 *	E-W(1):	0.354
Westbound	RT	1.00	136	1,600	0.041	E-W(2):	0.418 *
	TH	2.00	988	3,200	0.309 *		
	LT	1.00	59	1,600	0.037	V/C:	0.639
Northbound	RT	0.00	74	0	0.000	Lost Time:	0.050
	TH	2.00	347	3,200	0.132 *	ITS:	0.000
	LT	1.00	114	1,600	0.071		
Eastbound	RT	1.00	187	1,600	0.081	ICU:	0.689
	TH	2.00	1,014	3,200	0.317		
	LT	1.00	174	1,600	0.109 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	165	0	0.000	N-S(1):	0.206
	TH	2.00	328	3,200	0.154 *	N-S(2):	0.273 *
	LT	1.00	125	1,600	0.078	E-W(1):	0.373
Westbound	RT	0.00	76	0	0.000	E-W(2):	0.381 *
	TH	2.00	960	3,200	0.324 *		
	LT	1.00	215	1,600	0.134	V/C:	0.654
Northbound	RT	1.00	162	1,600	0.034	Lost Time:	0.050
	TH	2.00	409	3,200	0.128	ITS:	0.000
	LT	1.00	191	1,600	0.119 *		
Eastbound	RT	0.00	157	0	0.000	ICU:	0.704
	TH	2.00	607	3,200	0.239		
	LT	1.00	91	1,600	0.057 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	103	0	0.000	N-S(1):	0.313
	TH	2.00	554	3,200	0.205 *	N-S(2):	0.363 *
	LT	1.00	181	1,600	0.113	E-W(1):	0.430 *
Westbound	RT	0.00	109	0	0.000	E-W(2):	0.370
	TH	2.00	798	3,200	0.283		
	LT	1.00	170	1,600	0.106 *	V/C:	0.793
Northbound	RT	1.00	180	1,600	0.059	Lost Time:	0.050
	TH	2.00	641	3,200	0.200	ITS:	0.000
	LT	1.00	253	1,600	0.158 *		
Eastbound	RT	0.00	151	0	0.000	ICU:	0.843
	TH	2.00	887	3,200	0.324 *		
	LT	1.00	139	1,600	0.087	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	226	1,600	0.006	N-S(1):	0.292 *
	TH	2.00	297	3,200	0.093	N-S(2):	0.185
	LT	1.00	88	1,600	0.055 *	E-W(1):	0.365
Westbound	RT	0.00	195	0	0.000	E-W(2):	0.419 *
	TH	2.00	710	3,200	0.283 *		
	LT	1.00	150	1,600	0.094	V/C:	0.711
Northbound	RT	1.00	121	1,600	0.029	Lost Time:	0.050
	TH	1.00	379	1,600	0.237 *	ITS:	0.000
	LT	1.00	147	1,600	0.092		
Eastbound	RT	0.00	78	0	0.000	ICU:	0.761
	TH	2.00	790	3,200	0.271		
	LT	1.00	217	1,600	0.136 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	196	1,600	0.000	N-S(1):	0.423 *
	TH	2.00	540	3,200	0.169	N-S(2):	0.221
	LT	1.00	132	1,600	0.083 *	E-W(1):	0.457 *
Westbound	RT	0.00	190	0	0.000	E-W(2):	0.409
	TH	2.00	570	3,200	0.238		
	LT	1.00	119	1,600	0.074 *	V/C:	0.880
Northbound	RT	1.00	66	1,600	0.004	Lost Time:	0.050
	TH	1.00	544	1,600	0.340 *	ITS:	0.000
	LT	1.00	83	1,600	0.052		
Eastbound	RT	0.00	191	0	0.000	ICU:	0.930
	TH	2.00	1,035	3,200	0.383 *		
	LT	1.00	273	1,600	0.171	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	147	0	0.000	N-S(1):	0.082
	TH	1.00	4	1,600	0.115 *	N-S(2):	0.144 *
	LT	0.00	33	1,600	0.021	E-W(1):	0.344
Westbound	RT	0.00	61	0	0.000	E-W(2):	0.386 *
	TH	2.00	1,091	3,200	0.360 *		
	LT	1.00	25	1,600	0.016	V/C:	0.530
Northbound	RT	0.00	48	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.061	ITS:	0.000
	LT	0.00	47	1,600	0.029 *		
Eastbound	RT	0.00	37	0	0.000	ICU:	0.580
	TH	2.00	1,014	3,200	0.328		
	LT	1.00	42	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	97	0	0.000	N-S(1):	0.056
	TH	1.00	4	1,600	0.078 *	N-S(2):	0.098 *
	LT	0.00	24	1,600	0.015	E-W(1):	0.379 *
Westbound	RT	0.00	48	0	0.000	E-W(2):	0.319
	TH	2.00	782	3,200	0.259		
	LT	1.00	33	1,600	0.021 *	V/C:	0.477
Northbound	RT	0.00	29	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.041	ITS:	0.000
	LT	0.00	32	1,600	0.020 *		
Eastbound	RT	0.00	56	0	0.000	ICU:	0.527
	TH	2.00	1,089	3,200	0.358 *		
	LT	1.00	96	1,600	0.060	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	25	0	0.000	N-S(1):	0.043
	TH	1.00	0	1,600	0.040 *	N-S(2):	0.046 *
	LT	0.00	39	1,600	0.024	E-W(1):	0.360 *
Westbound	RT	0.00	34	0	0.000	E-W(2):	0.356
	TH	2.00	1,086	3,200	0.350		
	LT	1.00	8	1,600	0.005 *	V/C:	0.406
Northbound	RT	0.00	20	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.019	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.456
	TH	2.00	1,129	3,200	0.355 *		
	LT	1.00	9	1,600	0.006	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	25	0	0.000	N-S(1):	0.025
	TH	1.00	1	1,600	0.028 *	N-S(2):	0.034 *
	LT	0.00	19	1,600	0.012	E-W(1):	0.361 *
Westbound	RT	0.00	29	0	0.000	E-W(2):	0.292
	TH	2.00	849	3,200	0.274		
	LT	1.00	22	1,600	0.014 *	V/C:	0.395
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	16	0	0.000	ICU:	0.445
	TH	2.00	1,095	3,200	0.347 *		
	LT	1.00	28	1,600	0.018	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	162	0	0.000	N-S(1):	0.277
	TH	2.00	561	3,200	0.226 *	N-S(2):	0.346 *
	LT	1.00	113	1,600	0.071	E-W(1):	0.256
Westbound	RT	0.00	74	0	0.000	E-W(2):	0.355 *
	TH	2.00	770	3,200	0.264 *		
	LT	1.00	42	1,600	0.026	V/C:	0.701
Northbound	RT	0.00	106	0	0.000	Lost Time:	0.050
	TH	2.00	554	3,200	0.206	ITS:	0.000
	LT	1.00	192	1,600	0.120 *		
Eastbound	RT	0.00	200	0	0.000	ICU:	0.751
	TH	2.00	536	3,200	0.230		
	LT	1.00	145	1,600	0.091 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	191	0	0.000	N-S(1):	0.305
	TH	2.00	890	3,200	0.338 *	N-S(2):	0.467 *
	LT	1.00	117	1,600	0.073	E-W(1):	0.387
Westbound	RT	0.00	157	0	0.000	E-W(2):	0.406 *
	TH	2.00	717	3,200	0.273 *		
	LT	1.00	114	1,600	0.071	V/C:	0.873
Northbound	RT	0.00	87	0	0.000	Lost Time:	0.050
	TH	2.00	655	3,200	0.232	ITS:	0.000
	LT	1.00	207	1,600	0.129 *		
Eastbound	RT	0.00	215	0	0.000	ICU:	0.923
	TH	2.00	796	3,200	0.316		
	LT	1.00	213	1,600	0.133 *	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	227	0	0.000	N-S(1):	0.160
	TH	3.00	557	4,800	0.163 *	N-S(2):	0.274 *
	LT	1.00	61	1,600	0.038	E-W(1):	0.383
Westbound	RT	0.00	54	0	0.000	E-W(2):	0.394 *
	TH	2.00	640	3,200	0.217 *		
	LT	1.00	135	1,600	0.084	V/C:	0.668
Northbound	RT	0.00	117	0	0.000	Lost Time:	0.050
	TH	3.00	467	4,800	0.122	ITS:	0.000
	LT	1.00	178	1,600	0.111 *		
Eastbound	RT	0.00	189	0	0.000	ICU:	0.718
	TH	2.00	769	3,200	0.299		
	LT	1.00	283	1,600	0.177 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	230	0	0.000	N-S(1):	0.168
	TH	3.00	911	4,800	0.238 *	N-S(2):	0.346 *
	LT	1.00	34	1,600	0.021	E-W(1):	0.353 *
Westbound	RT	0.00	53	0	0.000	E-W(2):	0.318
	TH	2.00	528	3,200	0.182		
	LT	1.00	142	1,600	0.089 *	V/C:	0.699
Northbound	RT	0.00	61	0	0.000	Lost Time:	0.050
	TH	3.00	646	4,800	0.147	ITS:	0.000
	LT	1.00	172	1,600	0.108 *		
Eastbound	RT	0.00	228	0	0.000	ICU:	0.749
	TH	2.00	616	3,200	0.264 *		
	LT	1.00	218	1,600	0.136	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.174 *
	TH	3.00	669	4,800	0.139	N-S(2):	0.139
	LT	0.00	0	0	0.000 *	E-W(1):	0.449 *
Westbound	RT	1.00	617	1,600	0.386	E-W(2):	0.386
	TH	0.00	0	0	0.000		
	LT	2.00	1,149	2,560	0.449 *	V/C:	0.623
Northbound	RT	1.00	78	1,600	0.000	Lost Time:	0.050
	TH	2.00	558	3,200	0.174 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.673
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.128
	TH	3.00	1,191	4,800	0.248 *	N-S(2):	0.248 *
	LT	0.00	0	0	0.000	E-W(1):	0.418 *
Westbound	RT	1.00	344	1,600	0.215	E-W(2):	0.215
	TH	0.00	0	0	0.000		
	LT	2.00	1,069	2,560	0.418 *	V/C:	0.666
Northbound	RT	1.00	230	1,600	0.000	Lost Time:	0.050
	TH	2.00	409	3,200	0.128	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.716
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	Y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.308
	TH	3.00	1,509	4,800	0.314 *	N-S(2):	0.314 *
	LT	2.00	307	2,560	0.120	E-W(1):	0.133 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.447
Northbound	RT	2.00	603	3,200	0.188	Lost Time:	0.050
	TH	2.00	440	3,200	0.138	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	1.00	212	1,600	0.133 *	ICU:	0.497
	TH	0.00	0	0	0.000		
	LT	1.00	150	1,600	0.094	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.435 *
	TH	3.00	1,595	4,800	0.332	N-S(2):	0.332
	LT	2.00	554	2,560	0.216 *	E-W(1):	0.053 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.488
Northbound	RT	2.00	701	3,200	0.219 *	Lost Time:	0.050
	TH	2.00	600	3,200	0.188	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	1.00	84	1,600	0.053 *	ICU:	0.538
	TH	0.00	0	0	0.000		
	LT	1.00	54	1,600	0.034	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	604	1,600	0.325 *	N-S(1):	0.289
	TH	2.00	977	3,200	0.305	N-S(2):	0.333 *
	LT	1.00	111	1,600	0.069	E-W(1):	0.261 *
Westbound	RT	1.00	116	1,600	0.038	E-W(2):	0.258
	TH	2.00	487	3,200	0.152		
	LT	1.00	147	1,600	0.092 *	V/C:	0.594
Northbound	RT	1.00	278	1,600	0.128	Lost Time:	0.050
	TH	2.00	704	3,200	0.220	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	19	1,600	0.008	ICU:	0.644
	TH	2.00	542	3,200	0.169 *		
	LT	1.00	169	1,600	0.106	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	478	1,600	0.203	N-S(1):	0.357 *
	TH	2.00	1,013	3,200	0.317	N-S(2):	0.328
	LT	1.00	150	1,600	0.094 *	E-W(1):	0.358 *
Westbound	RT	1.00	216	1,600	0.088	E-W(2):	0.285
	TH	2.00	294	3,200	0.092		
	LT	1.00	150	1,600	0.094 *	V/C:	0.715
Northbound	RT	1.00	495	1,600	0.263 *	Lost Time:	0.050
	TH	2.00	673	3,200	0.210	ITS:	0.000
	LT	1.00	17	1,600	0.011		
Eastbound	RT	1.00	18	1,600	0.006	ICU:	0.765
	TH	2.00	845	3,200	0.264 *		
	LT	1.00	308	1,600	0.193	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	239	0	0.000	N-S(1):	0.325 *
	TH	2.00	406	3,200	0.202	N-S(2):	0.220
	LT	1.00	165	1,600	0.103 *	E-W(1):	0.186
Westbound	RT	0.00	122	0	0.000	E-W(2):	0.318 *
	TH	2.00	492	3,200	0.192 *		
	LT	1.00	107	1,600	0.067	V/C:	0.643
Northbound	RT	0.00	138	0	0.000	Lost Time:	0.050
	TH	2.00	571	3,200	0.222 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	24	0	0.000	ICU:	0.693
	TH	2.00	358	3,200	0.119		
	LT	1.00	202	1,600	0.126 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	286	0	0.000	N-S(1):	0.293 *
	TH	2.00	579	3,200	0.270	N-S(2):	0.288
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.261
Westbound	RT	0.00	144	0	0.000	E-W(2):	0.320 *
	TH	2.00	518	3,200	0.207 *		
	LT	1.00	107	1,600	0.067	V/C:	0.613
Northbound	RT	0.00	180	0	0.000	Lost Time:	0.050
	TH	2.00	431	3,200	0.191 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	46	0	0.000	ICU:	0.663
	TH	2.00	575	3,200	0.194		
	LT	1.00	181	1,600	0.113 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: CUMULATIVE PLUS PROJECT CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	366	3,200	0.010	N-S(1):	0.089 *
	TH	0.00	0	0	0.000	N-S(2):	0.010
	LT	1.00	143	1,600	0.089 *	E-W(1):	0.087
Westbound	RT	0.00	187	0	0.000	E-W(2):	0.335 *
	TH	2.00	215	3,200	0.126 *		
	LT	0.00	0	0	0.000	V/C:	0.424
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.474
	TH	1.00	139	1,600	0.087		
	LT	2.00	534	2,560	0.209 *	LOS:	A

Date/Time: PM PEAK HOUR

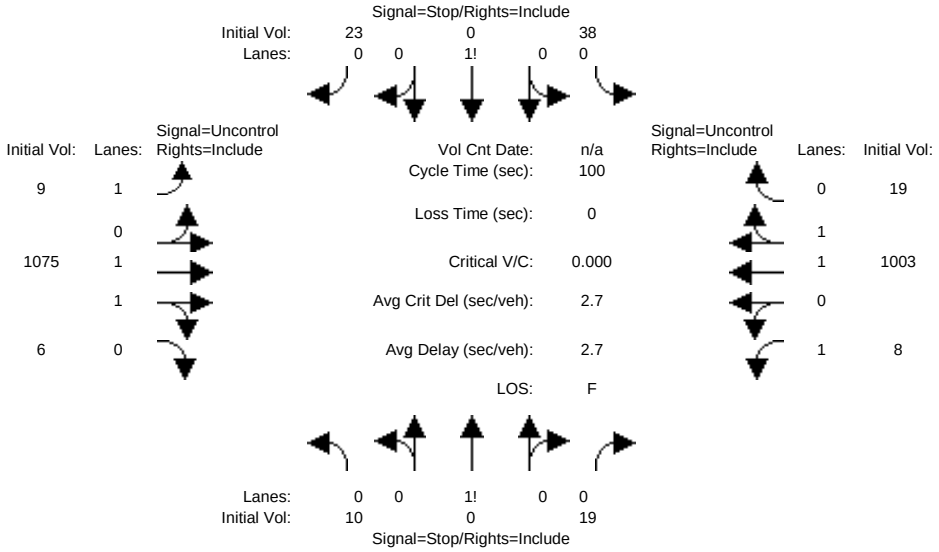
APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	471	3,200	0.065	N-S(1):	0.125 *
	TH	0.00	0	0	0.000	N-S(2):	0.065
	LT	1.00	200	1,600	0.125 *	E-W(1):	0.108
Westbound	RT	0.00	213	1,600	0.133 *	E-W(2):	0.297 *
	TH	2.00	170	1,600	0.106		
	LT	0.00	0	0	0.000	V/C:	0.422
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.472
	TH	1.00	172	1,600	0.108		
	LT	2.00	421	2,560	0.164 *	LOS:	A

* - Denotes critical movement

Carousel Tract Remediation
Existing Conditions

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EX

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    19    38    0    23     9 1075     6     8 1003    19
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    19    38    0    23     9 1075     6     8 1003    19
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    19    38    0    23     9 1075     6     8 1003    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    19    38    0    23     9 1075     6     8 1003    19
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    19    38    0    23     9 1075     6     8 1003    19
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1614 xxxx   541  1584 xxxx   511  1022 xxxx xxxxx  1081 xxxx xxxxx
Potent Cap.:   71 xxxx   491    74 xxxx   513   687 xxxx xxxxx   653 xxxx xxxxx
Move Cap.:     66 xxxx   491    70 xxxx   513   687 xxxx xxxxx   653 xxxx xxxxx
Volume/Cap:  0.15 xxxx  0.04  0.54 xxxx  0.04  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.3 xxxx xxxxx  10.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  153 xxxxx  xxxx  104 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  2.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 34.0 xxxxx xxxxx 80.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    D     *     *    F     *     *    *     *     *    *     *
ApproachDel:      34.0             80.0           xxxxxx           xxxxxx
ApproachLOS:        D                F               *                *
```

Peak Hour Delay Signal Warrant Report

****

Intersection #1 Lagoon & Lomita Am

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    23     9 1075     6     8 1003    19
ApproachDel:      34.0             80.0           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=29]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2210]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=61]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2210]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    23     9 1075     6     8 1003    19
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2120
Minor Approach Volume:           61
Minor Approach Volume Threshold: 26 [less than minimum of 100]
```


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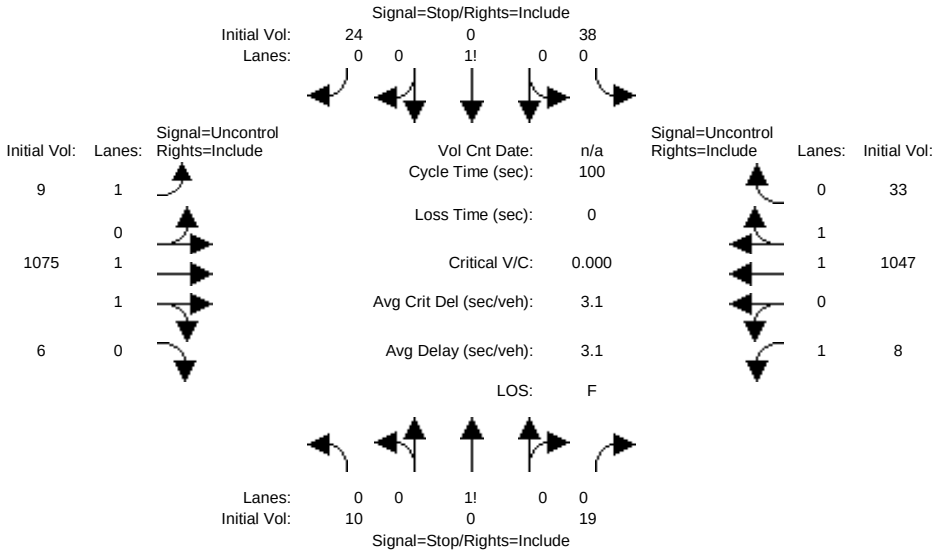
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EP

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    19    38    0    24     9 1075     6     8 1047    33
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    19    38    0    24     9 1075     6     8 1047    33
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    19    38    0    24     9 1075     6     8 1047    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    19    38    0    24     9 1075     6     8 1047    33
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1047    33
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1636 xxxx   541  1635 xxxx   540  1080 xxxx xxxxx  1081 xxxx xxxxx
Potent Cap.:   68 xxxx   491    68 xxxx   491   653 xxxx xxxxx   653 xxxx xxxxx
Move Cap.:     63 xxxx   491    64 xxxx   491   653 xxxx xxxxx   653 xxxx xxxxx
Volume/Cap:  0.16 xxxx  0.04  0.59 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.6 xxxx xxxxx  10.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  148 xxxxx  xxxx   97 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  3.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 35.2 xxxxx xxxxx 92.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      35.2             92.8           xxxxxx           xxxxxx
ApproachLOS:        E                F                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1047    33
ApproachDel:      35.2             92.8           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=29]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2269]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=62]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2269]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1047    33
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2178
Minor Approach Volume:           62
Minor Approach Volume Threshold: 17 [less than minimum of 100]
```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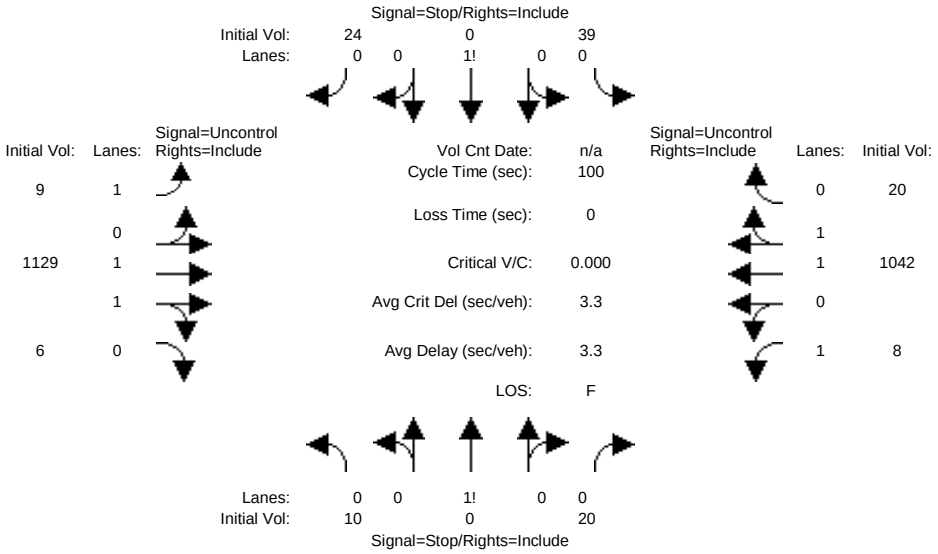
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CB

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    20    39    0    24     9 1129     6     8 1042    20
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    20    39    0    24     9 1129     6     8 1042    20
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    20    39    0    24     9 1129     6     8 1042    20
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    20    39    0    24     9 1129     6     8 1042    20
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    20    39    0    24     9 1129     6     8 1042    20
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1687 xxxx   568  1651 xxxx   531  1062 xxxx xxxxx  1135 xxxx xxxxx
Potent Cap.:   62 xxxx   471    66 xxxx   498   664 xxxx xxxxx   623 xxxx xxxxx
Move Cap.:     58 xxxx   471    62 xxxx   498   664 xxxx xxxxx   623 xxxx xxxxx
Volume/Cap:  0.17 xxxx  0.04  0.63 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.5 xxxx xxxxx  10.9 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  140 xxxxx  xxxx   93 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.8 xxxxx xxxxx  3.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 37.6 xxxxx xxxxx  101 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      37.6            101.0           xxxxxx           xxxxxx
ApproachLOS:        E               F                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    20    39    0    24     9 1129     6     8 1042    20
ApproachDel:      37.6            101.0           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=30]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2307]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.8]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=63]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2307]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    20    39    0    24     9 1129     6     8 1042    20
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2214
Minor Approach Volume:           63
Minor Approach Volume Threshold: 11 [less than minimum of 100]
```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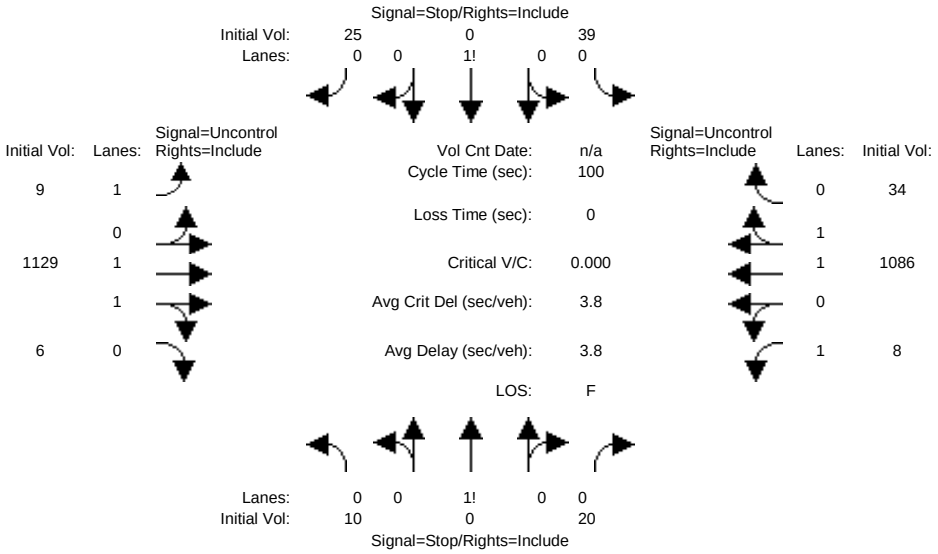
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CP

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    20    39    0    25     9 1129     6     8 1086    34
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    20    39    0    25     9 1129     6     8 1086    34
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    20    39    0    25     9 1129     6     8 1086    34
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    20    39    0    25     9 1129     6     8 1086    34
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    20    39    0    25     9 1129     6     8 1086    34
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1709 xxxx   568  1702 xxxx   560  1120 xxxx xxxxx  1135 xxxx xxxxx
Potent Cap.:   60 xxxx   471    61 xxxx   477   631 xxxx xxxxx   623 xxxx xxxxx
Move Cap.:     56 xxxx   471    57 xxxx   477   631 xxxx xxxxx   623 xxxx xxxxx
Volume/Cap:  0.18 xxxx  0.04  0.68 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.8 xxxx xxxxx  10.9 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  135 xxxxx  xxxx   87 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.8 xxxxx xxxxx  3.7 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 39.1 xxxxx xxxxx  119 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      39.1            118.6           xxxxxx           xxxxxx
ApproachLOS:        E               F                *                *
```

Peak Hour Delay Signal Warrant Report

```
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    20    39    0    25     9 1129     6     8 1086    34
ApproachDel:      39.1            118.6           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=30]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2366]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=2.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=64]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2366]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    20    39    0    25     9 1129     6     8 1086    34
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2272
Minor Approach Volume:           64
Minor Approach Volume Threshold: 2 [less than minimum of 100]
```


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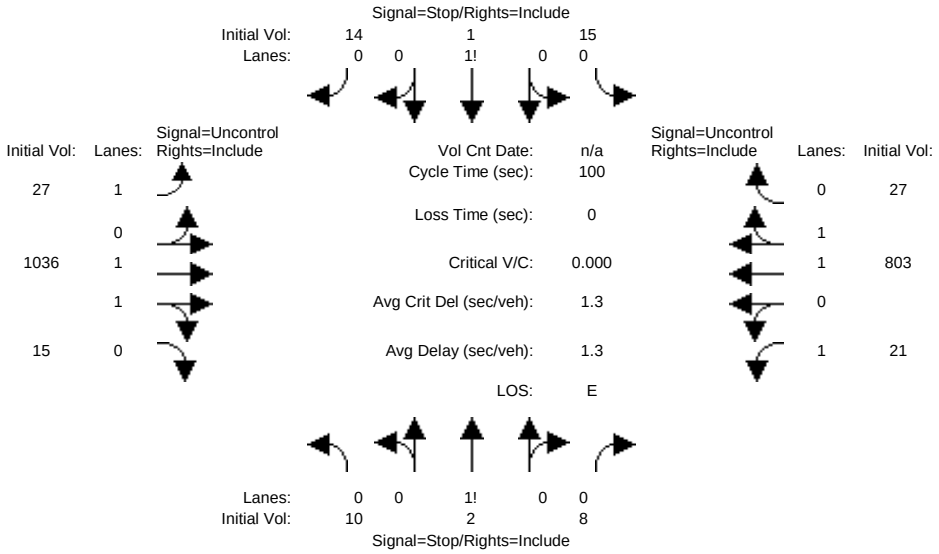
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EX

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    15    1    14    27 1036    15    21  803    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    15    1    14    27 1036    15    21  803    27
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    15    1    14    27 1036    15    21  803    27
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    15    1    14    27 1036    15    21  803    27
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    15    1    14    27 1036    15    21  803    27
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1542 1970   526  1432 1964   415   830 xxxx xxxxx  1051 xxxx xxxxx
Potent Cap.:   80   63   502    97   64   592   811 xxxx xxxxx   670 xxxx xxxxx
Move Cap.:     73   59   502    88   60   592   811 xxxx xxxxx   670 xxxx xxxxx
Volume/Cap:  0.14 0.03  0.02  0.17 0.02  0.02  0.03 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx  10.5 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  108 xxxxx  xxxx  142 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.6 xxxxx xxxxx  0.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 46.0 xxxxx xxxxx 36.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    E     *     *    *     *     *    *     *
ApproachDel:      46.0             36.9           xxxxxx           xxxxxx
ApproachLOS:        E                E                *                *
```

Peak Hour Delay Signal Warrant Report

```
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    15    1    14    27 1036    15    21  803    27
ApproachDel:      46.0             36.9           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1979]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=30]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1979]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    15    1    14    27 1036    15    21  803    27
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1929
Minor Approach Volume:           30
Minor Approach Volume Threshold: 58 [less than minimum of 100]
```


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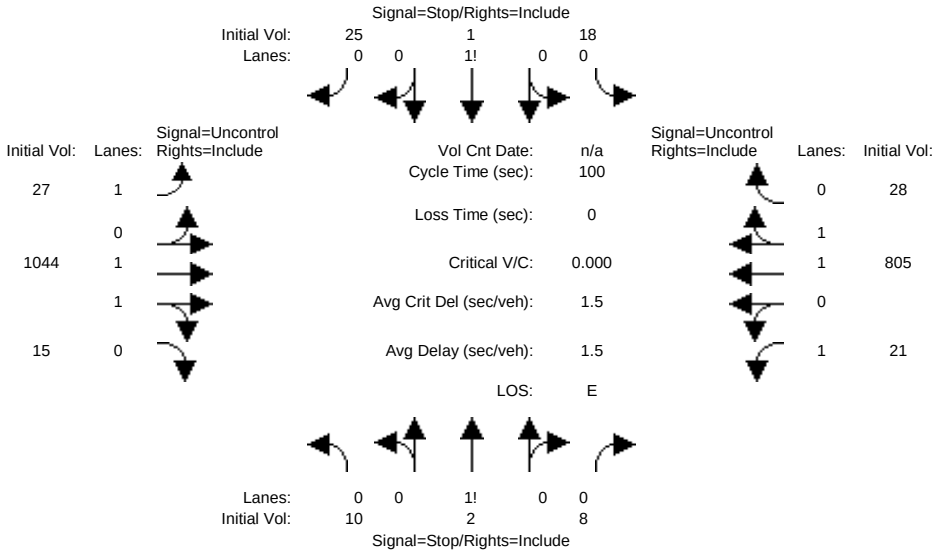
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EP

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    18    1    25    27 1044    15    21  805    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    18    1    25    27 1044    15    21  805    28
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    18    1    25    27 1044    15    21  805    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    18    1    25    27 1044    15    21  805    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    18    1    25    27 1044    15    21  805    28
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1551 1981   530  1438 1974   417   833 xxxx xxxxx  1059 xxxx xxxxx
Potent Cap.:   79   62   499    95   63   591   809 xxxx xxxxx   665 xxxx xxxxx
Move Cap.:     71   58   499    87   59   591   809 xxxx xxxxx   665 xxxx xxxxx
Volume/Cap:  0.14 0.03  0.02  0.21 0.02  0.04  0.03 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx  10.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  104 xxxxx  xxxx  165 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  1.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 47.5 xxxxx xxxxx 34.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    D     *     *    *     *     *    *     *
ApproachDel:      47.5             34.5           xxxxxx           xxxxxx
ApproachLOS:        E                D                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    18    1    25    27 1044    15    21  805    28
ApproachDel:      47.5             34.5           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2004]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2004]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    18    1    25    27 1044    15    21  805    28
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1940
Minor Approach Volume:           44
Minor Approach Volume Threshold: 57 [less than minimum of 100]
```


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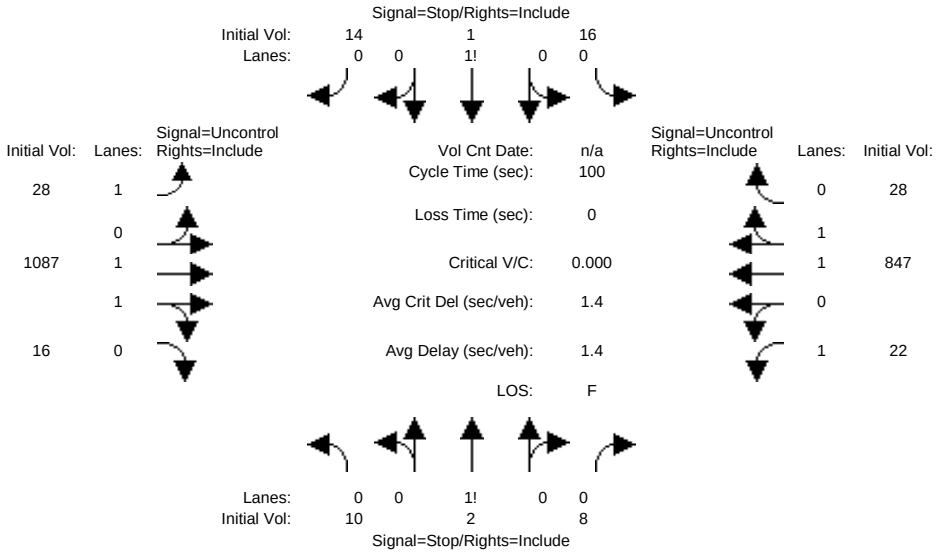
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CB

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    16    1    14    28 1087    16    22  847    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    16    1    14    28 1087    16    22  847    28
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    16    1    14    28 1087    16    22  847    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    16    1    14    28 1087    16    22  847    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    16    1    14    28 1087    16    22  847    28
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1619 2070   552  1506 2064   438   875 xxxx xxxxx  1103 xxxx xxxxx
Potent Cap.:   70   55   483    85   55   573   780 xxxx xxxxx   640 xxxx xxxxx
Move Cap.:     64   51   483    77   51   573   780 xxxx xxxxx   640 xxxx xxxxx
Volume/Cap:  0.16 0.04  0.02  0.21 0.02  0.02  0.04 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.8 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx   94 xxxxx  xxxx  123 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  0.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 53.3 xxxxx xxxxx 43.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    F     *     *    E     *     *    *     *     *    *     *
ApproachDel:      53.3             43.8           xxxxxx           xxxxxx
ApproachLOS:        F                E                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    16    1    14    28 1087    16    22  847    28
ApproachDel:      53.3             43.8           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2079]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2079]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    16    1    14    28 1087    16    22  847    28
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2028
Minor Approach Volume:           31
Minor Approach Volume Threshold: 41 [less than minimum of 100]
```


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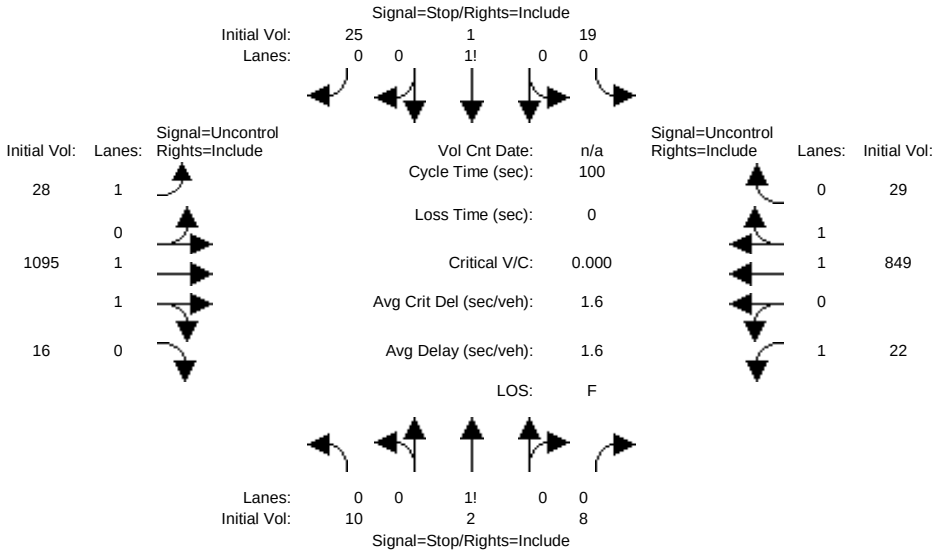
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CP

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    19    1    25    28 1095    16    22  849    29
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    19    1    25    28 1095    16    22  849    29
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    19    1    25    28 1095    16    22  849    29
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    19    1    25    28 1095    16    22  849    29
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    19    1    25    28 1095    16    22  849    29
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1628 2081   556  1512 2075   439   878 xxxx xxxxx  1111 xxxx xxxxx
Potent Cap.:   69   54   480    84   54   571   778 xxxx xxxxx   636 xxxx xxxxx
Move Cap.:     62   50   480    76   51   571   778 xxxx xxxxx   636 xxxx xxxxx
Volume/Cap:  0.16 0.04  0.02  0.25 0.02  0.04  0.04 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.8 xxxx xxxxx  10.9 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx   91 xxxxx  xxxx  144 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.8 xxxxx xxxxx  1.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 55.2 xxxxx xxxxx 41.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    F     *     *    E     *     *    *     *     *    *     *
ApproachDel:      55.2             41.1           xxxxxx           xxxxxx
ApproachLOS:        F                E                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    19    1    25    28 1095    16    22  849    29
ApproachDel:      55.2             41.1           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2104]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2104]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    19    1    25    28 1095    16    22  849    29
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2039
Minor Approach Volume:           45
Minor Approach Volume Threshold: 39 [less than minimum of 100]
```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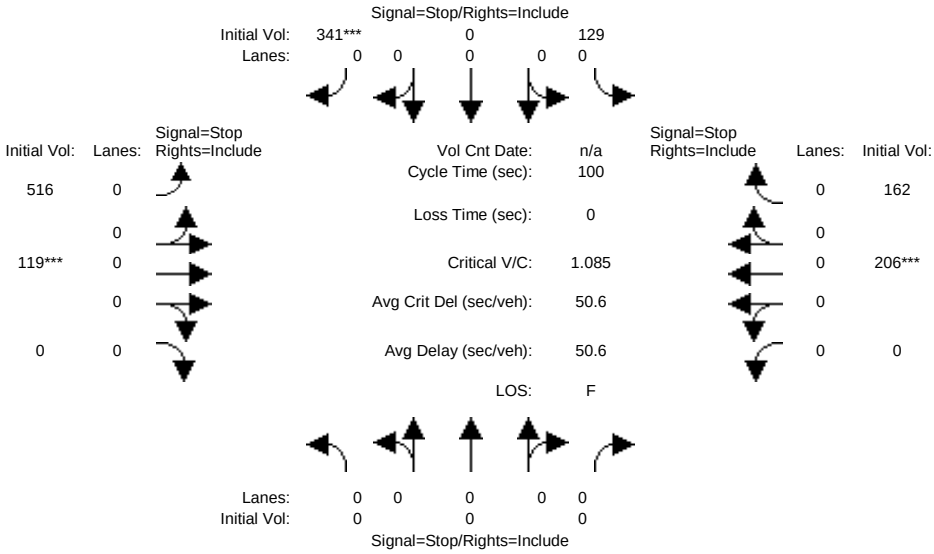
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
EX

Intersection #3: Wilmington/Lomita AM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	129	0	341	516	119	0	0	206	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	129	0	341	516	119	0	0	206	162
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	129	0	341	516	119	0	0	206	162
User Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	0	0	129	0	341	516	119	0	0	206	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	129	0	341	516	119	0	0	206	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	129	0	341	516	119	0	0	206	162
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.27	0.00	0.73	0.81	0.19	0.00	0.00	0.56	0.44
Final Sat.:	0	0	0	164	0	433	475	110	0	0	324	255
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.79	xxxx	0.79	1.09	1.09	xxxx	xxxx	0.64	0.64
Crit Moves:						****		****			****	
Delay/Veh:	0.0	0.0	0.0	27.1	0.0	27.1	86.4	86.4	0.0	0.0	18.7	18.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	27.1	0.0	27.1	86.4	86.4	0.0	0.0	18.7	18.7
LOS by Move:	*	*	*	D	*	D	F	F	*	*	C	C
ApproachDel:	xxxxxx			27.1			86.4			18.7		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			27.1			86.4			18.7		
LOS by Appr:	*			D			F			C		

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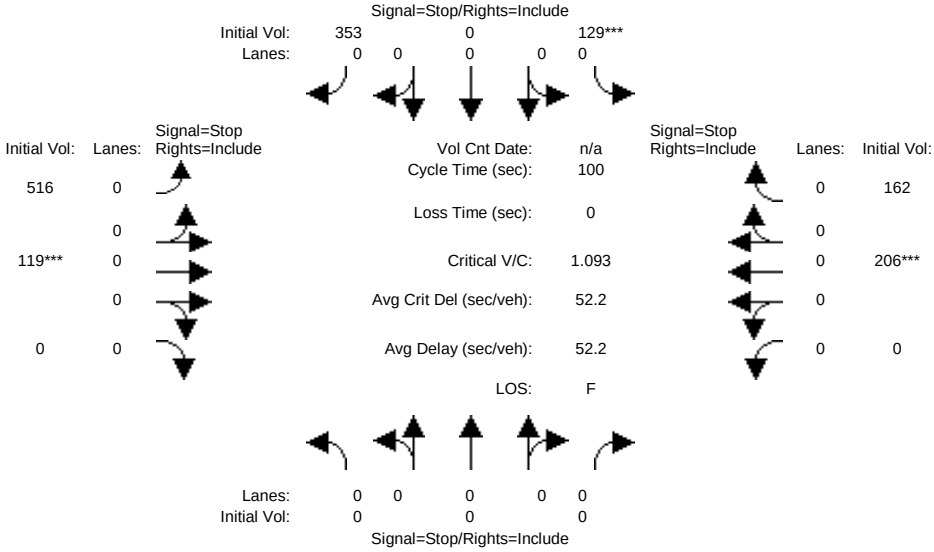
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
EP

Intersection #3: Wilmington/Lomita AM

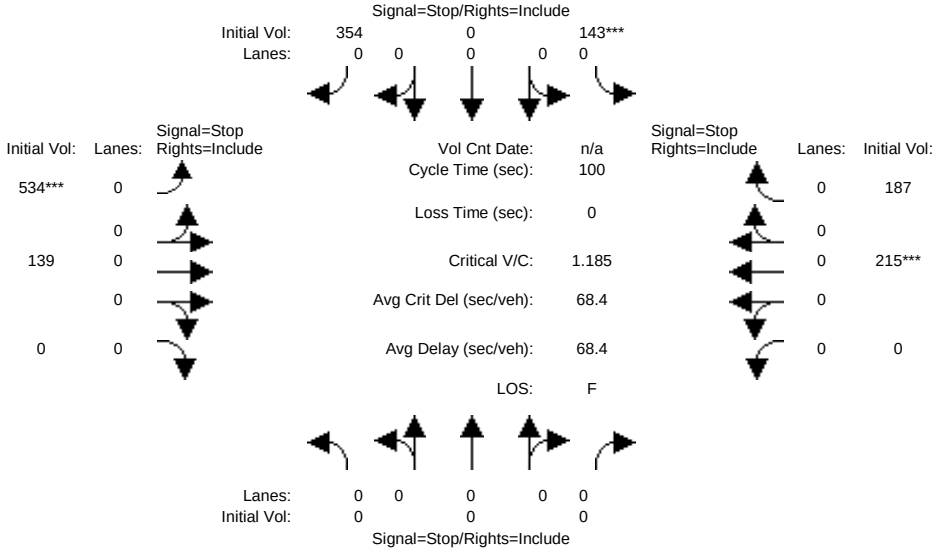


Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	129	0	353	516	119	0	0	206	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	129	0	353	516	119	0	0	206	162
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	129	0	353	516	119	0	0	206	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	129	0	353	516	119	0	0	206	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	129	0	353	516	119	0	0	206	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	129	0	353	516	119	0	0	206	162
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.27	0.00	0.73	0.81	0.19	0.00	0.00	0.56	0.44
Final Sat.:	0	0	0	160	0	437	472	109	0	0	322	253
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.81	xxxx	0.81	1.09	1.09	xxxx	xxxx	0.64	0.64
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	28.8	0.0	28.8	89.3	89.3	0.0	0.0	19.0	19.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	28.8	0.0	28.8	89.3	89.3	0.0	0.0	19.0	19.0
LOS by Move:	*	*	*	D	*	D	F	F	*	*	C	C
ApproachDel:	xxxxxx			28.8			89.3			19.0		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			28.8			89.3			19.0		
LOS by Appr:	*			D			F			C		

Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CB

Intersection #3: Wilmington/Lomita AM

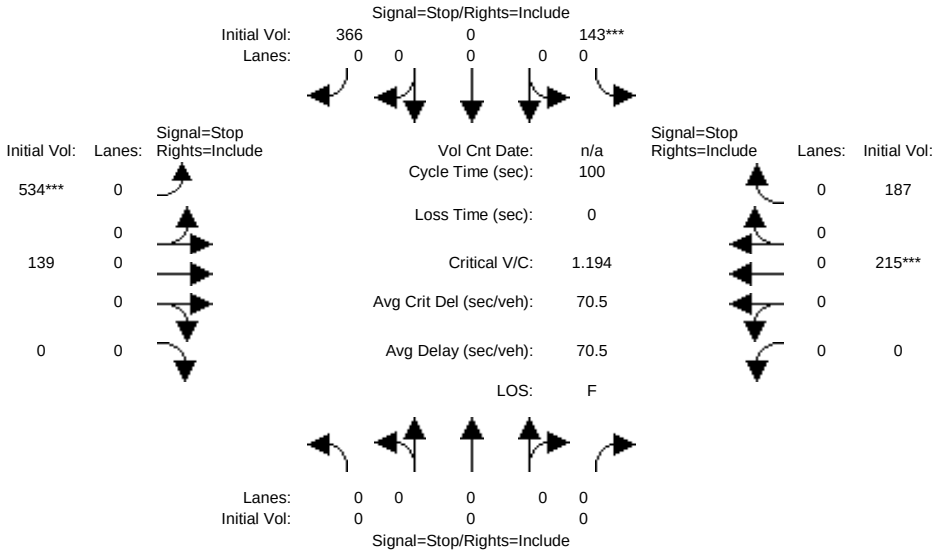


Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	143	0	354	534	139	0	0	215	187
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	143	0	354	534	139	0	0	215	187
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	143	0	354	534	139	0	0	215	187
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	143	0	354	534	139	0	0	215	187
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	143	0	354	534	139	0	0	215	187
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	143	0	354	534	139	0	0	215	187
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.29	0.00	0.71	0.79	0.21	0.00	0.00	0.53	0.47
Final Sat.:	0	0	0	169	0	419	451	117	0	0	305	265
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.84	xxxx	0.84	1.18	1.18	xxxx	xxxx	0.70	0.70
Crit Moves:				****			****				****	
Delay/Veh:	0.0	0.0	0.0	32.8	0.0	32.8	122.4	122	0.0	0.0	22.2	22.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.8	0.0	32.8	122.4	122	0.0	0.0	22.2	22.2
LOS by Move:	*	*	*	D	*	D	F	F	*	*	C	C
ApproachDel:	xxxxxx			32.8			122.4			22.2		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			32.8			122.4			22.2		
LOS by Appr:	*			D			F			C		

Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CP

Intersection #3: Wilmington/Lomita AM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	143	0	366	534	139	0	0	215	187
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	143	0	366	534	139	0	0	215	187
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	143	0	366	534	139	0	0	215	187
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	143	0	366	534	139	0	0	215	187
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	143	0	366	534	139	0	0	215	187
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	143	0	366	534	139	0	0	215	187
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.28	0.00	0.72	0.79	0.21	0.00	0.00	0.53	0.47
Final Sat.:	0	0	0	166	0	424	447	116	0	0	303	263
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.86	xxxx	0.86	1.19	1.19	xxxx	xxxx	0.71	0.71
Crit Moves:				****			****				****	
Delay/Veh:	0.0	0.0	0.0	35.2	0.0	35.2	125.9	126	0.0	0.0	22.5	22.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	35.2	0.0	35.2	125.9	126	0.0	0.0	22.5	22.5
LOS by Move:	*	*	*	E	*	E	F	F	*	*	C	C
ApproachDel:	xxxxxx			35.2			125.9			22.5		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			35.2			125.9			22.5		
LOS by Appr:	*			E			F			C		

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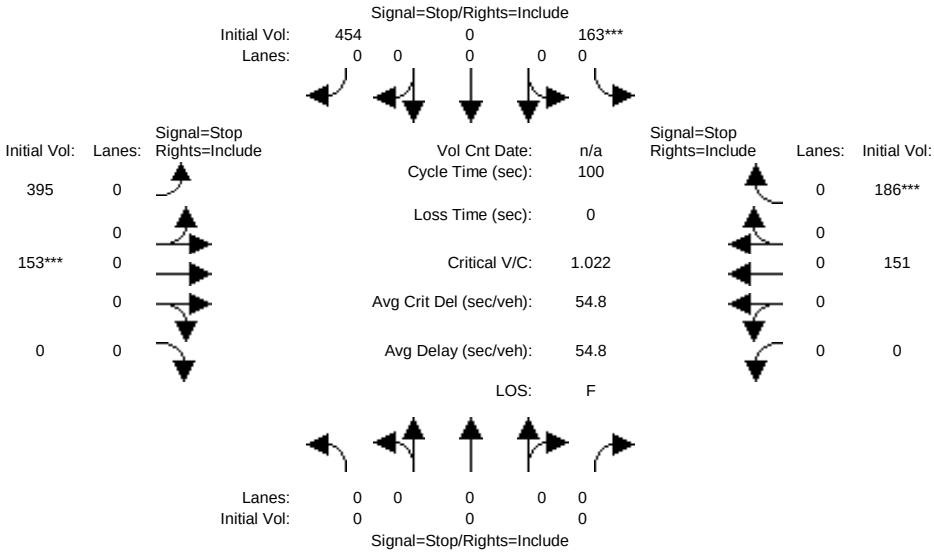
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
EX

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	163	0	454	395	153	0	0	151	186
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	163	0	454	395	153	0	0	151	186
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	163	0	454	395	153	0	0	151	186
User Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	0	0	0	163	0	454	395	153	0	0	151	186
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	163	0	454	395	153	0	0	151	186
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	163	0	454	395	153	0	0	151	186
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.26	0.00	0.74	0.72	0.28	0.00	0.00	0.45	0.55
Final Sat.:	0	0	0	160	0	444	395	153	0	0	248	305
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.02	xxxx	1.02	1.00	1.00	xxxx	xxxx	0.61	0.61
Crit Moves:				****				****				****
Delay/Veh:	0.0	0.0	0.0	66.4	0.0	66.4	63.7	63.7	0.0	0.0	19.2	19.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	66.4	0.0	66.4	63.7	63.7	0.0	0.0	19.2	19.2
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx			66.4			63.7			19.2		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			66.4			63.7			19.2		
LOS by Appr:	*			F			F			C		

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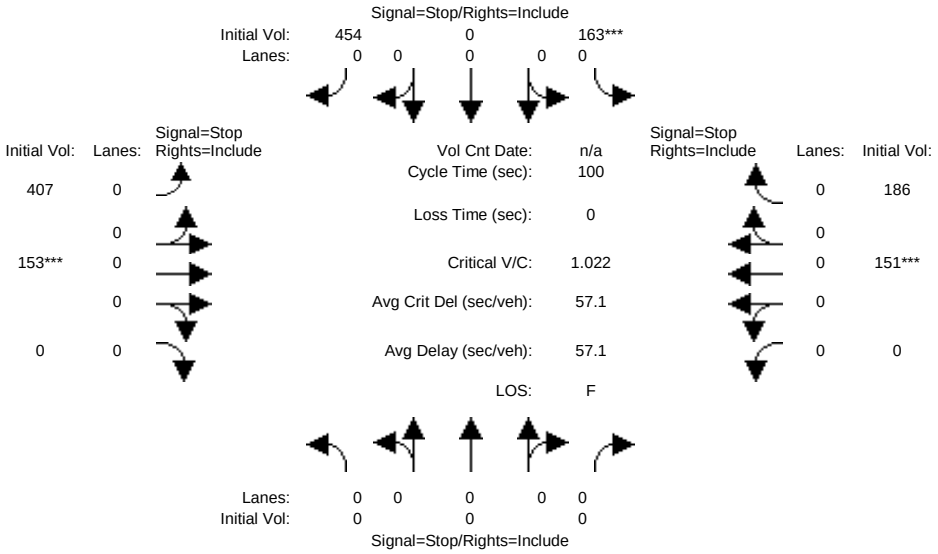
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
EP

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	163	0	454	407	153	0	0	151	186
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	163	0	454	407	153	0	0	151	186
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	163	0	454	407	153	0	0	151	186
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	163	0	454	407	153	0	0	151	186
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	163	0	454	407	153	0	0	151	186
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	163	0	454	407	153	0	0	151	186
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.26	0.00	0.74	0.73	0.27	0.00	0.00	0.45	0.55
Final Sat.:	0	0	0	159	0	444	398	150	0	0	247	305
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.02	xxxx	1.02	1.02	1.02	xxxx	xxxx	0.61	0.61
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	66.5	0.0	66.5	69.5	69.5	0.0	0.0	19.2	19.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	66.5	0.0	66.5	69.5	69.5	0.0	0.0	19.2	19.2
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx				66.5			69.5			19.2	
Delay Adj:	xxxxx				1.00			1.00			1.00	
ApprAdjDel:	xxxxxx				66.5			69.5			19.2	
LOS by Appr:	*				F			F			C	

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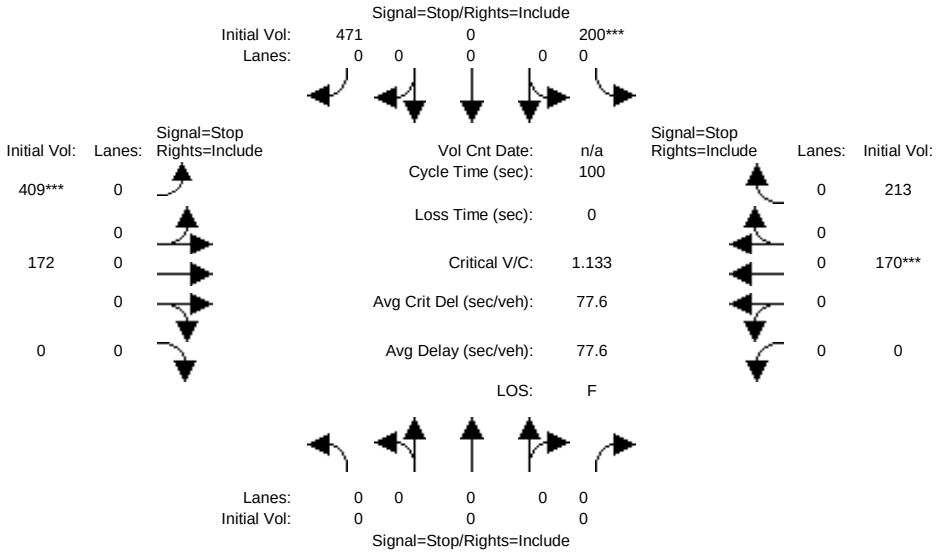
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CB

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	200	0	471	409	172	0	0	170	213
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	200	0	471	409	172	0	0	170	213
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	200	0	471	409	172	0	0	170	213
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	200	0	471	409	172	0	0	170	213
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	200	0	471	409	172	0	0	170	213
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	200	0	471	409	172	0	0	170	213
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.30	0.00	0.70	0.70	0.30	0.00	0.00	0.44	0.56
Final Sat.:	0	0	0	177	0	416	381	160	0	0	245	307
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.13	xxxx	1.13	1.07	1.07	xxxx	xxxx	0.69	0.69
Crit Moves:				****			****				****	
Delay/Veh:	0.0	0.0	0.0	102.1	0.0	102.1	85.3	85.3	0.0	0.0	22.9	22.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	102.1	0.0	102.1	85.3	85.3	0.0	0.0	22.9	22.9
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx			102.1			85.3			22.9		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			102.1			85.3			22.9		
LOS by Appr:	*			F			F			C		

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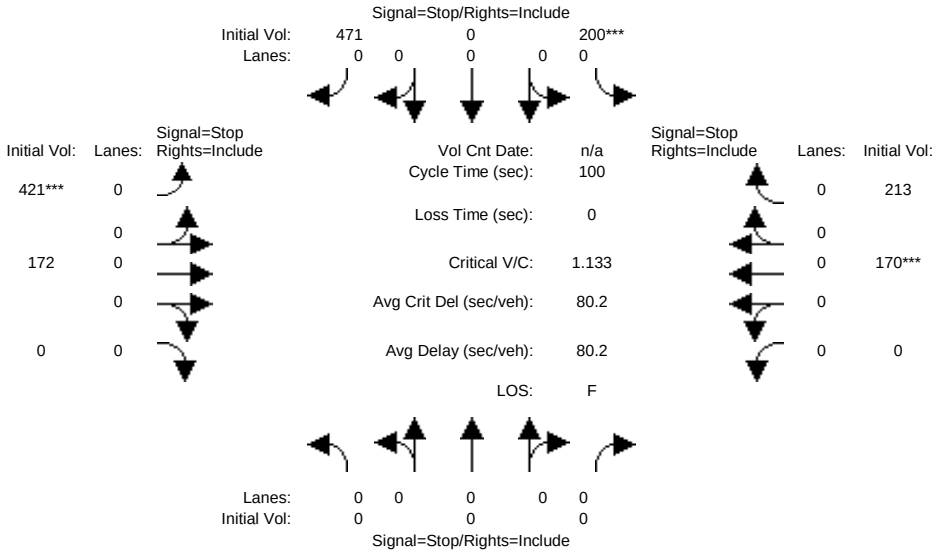
Carousel Tract Remediation
Project

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CP

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	200	0	471	421	172	0	0	170	213
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	200	0	471	421	172	0	0	170	213
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	200	0	471	421	172	0	0	170	213
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	200	0	471	421	172	0	0	170	213
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	200	0	471	421	172	0	0	170	213
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	200	0	471	421	172	0	0	170	213
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.30	0.00	0.70	0.71	0.29	0.00	0.00	0.44	0.56
Final Sat.:	0	0	0	177	0	416	384	157	0	0	245	307
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.13	xxxx	1.13	1.10	1.10	xxxx	xxxx	0.69	0.69
Crit Moves:				****			****				****	
Delay/Veh:	0.0	0.0	0.0	102.1	0.0	102.1	92.5	92.5	0.0	0.0	22.9	22.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	102.1	0.0	102.1	92.5	92.5	0.0	0.0	22.9	22.9
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx			102.1			92.5			22.9		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			102.1			92.5			22.9		
LOS by Appr:	*			F			F			C		

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Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,051	3,200	0.328 *	N-S(1):	0.169
	TH	0.25	51	406	0.126	N-S(2):	0.328 *
	LT	1.75	351	2,235	0.157	E-W(1):	0.417 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.193
	TH	4.00	1,238	6,400	0.193		
	LT	0.00	0	0	0.000 *	V/C:	0.745
Northbound	RT	1.00	19	1,600	0.012	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	17	0	0.000	ICU:	0.795
	TH	3.00	1,984	4,800	0.417 *		
	LT	0.00	0	0	0.000	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	974	3,200	0.304 *	N-S(1):	0.201
	TH	0.28	65	445	0.146	N-S(2):	0.304 *
	LT	1.72	402	2,204	0.182	E-W(1):	0.476 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.165
	TH	4.00	1,050	6,400	0.165		
	LT	0.00	3	1,600	0.002 *	V/C:	0.780
Northbound	RT	1.00	32	1,600	0.019	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	22	0	0.000	ICU:	0.830
	TH	3.00	2,254	4,800	0.474 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	58	1,600	0.036 *	N-S(1):	0.337 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.154
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.331 *
	TH	3.00	1,507	4,800	0.315 *		
	LT	0.00	0	0	0.000	V/C:	0.668
Northbound	RT	1.00	191	1,600	0.119	Lost Time:	0.050
	TH	1.00	25	1,600	0.301 *	ITS:	0.000
	LT	0.00	457	1,600	0.286		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.718
	TH	3.00	737	4,800	0.154		
	LT	1.00	25	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	115	1,600	0.072 *	N-S(1):	0.276 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.219
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.304 *
	TH	3.00	1,144	4,800	0.241 *		
	LT	0.00	0	0	0.000	V/C:	0.580
Northbound	RT	1.00	324	1,600	0.203	Lost Time:	0.050
	TH	1.00	31	1,600	0.204 *	ITS:	0.000
	LT	0.00	296	1,600	0.185		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.630
	TH	3.00	1,051	4,800	0.219		
	LT	1.00	100	1,600	0.063 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	256	1,600	0.160 *	N-S(1):	0.140
	TH	2.00	202	1,600	0.126	N-S(2):	0.243 *
	LT	1.00	63	1,600	0.039	E-W(1):	0.257
Westbound	RT	1.00	77	1,600	0.028	E-W(2):	0.413 *
	TH	2.00	1,111	3,200	0.347 *		
	LT	1.00	49	1,600	0.031	V/C:	0.656
Northbound	RT	0.00	45	0	0.000	Lost Time:	0.050
	TH	2.00	277	3,200	0.101	ITS:	0.000
	LT	1.00	132	1,600	0.083 *		
Eastbound	RT	1.00	93	1,600	0.017	ICU:	0.706
	TH	2.00	724	3,200	0.226		
	LT	1.00	106	1,600	0.066 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	117	0	0.000	N-S(1):	0.191
	TH	2.00	290	3,200	0.127 *	N-S(2):	0.196 *
	LT	1.00	137	1,600	0.086	E-W(1):	0.342
Westbound	RT	1.00	131	1,600	0.039	E-W(2):	0.406 *
	TH	2.00	964	3,200	0.301 *		
	LT	1.00	57	1,600	0.036	V/C:	0.602
Northbound	RT	0.00	71	0	0.000	Lost Time:	0.050
	TH	2.00	264	3,200	0.105	ITS:	0.000
	LT	1.00	110	1,600	0.069 *		
Eastbound	RT	1.00	181	1,600	0.079	ICU:	0.652
	TH	2.00	980	3,200	0.306		
	LT	1.00	168	1,600	0.105 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	159	0	0.000	N-S(1):	0.199
	TH	2.00	317	3,200	0.149 *	N-S(2):	0.267 *
	LT	1.00	121	1,600	0.076	E-W(1):	0.363
Westbound	RT	0.00	73	0	0.000	E-W(2):	0.369 *
	TH	2.00	932	3,200	0.314 *		
	LT	1.00	208	1,600	0.130	V/C:	0.636
Northbound	RT	1.00	156	1,600	0.033	Lost Time:	0.050
	TH	2.00	395	3,200	0.123	ITS:	0.000
	LT	1.00	188	1,600	0.118 *		
Eastbound	RT	0.00	152	0	0.000	ICU:	0.686
	TH	2.00	595	3,200	0.233		
	LT	1.00	88	1,600	0.055 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	99	0	0.000	N-S(1):	0.241
	TH	2.00	419	3,200	0.162 *	N-S(2):	0.331 *
	LT	1.00	175	1,600	0.109	E-W(1):	0.417 *
Westbound	RT	0.00	105	0	0.000	E-W(2):	0.353
	TH	2.00	755	3,200	0.269		
	LT	1.00	164	1,600	0.103 *	V/C:	0.748
Northbound	RT	1.00	174	1,600	0.058	Lost Time:	0.050
	TH	2.00	421	3,200	0.132	ITS:	0.000
	LT	1.00	270	1,600	0.169 *		
Eastbound	RT	0.00	146	0	0.000	ICU:	0.798
	TH	2.00	858	3,200	0.314 *		
	LT	1.00	134	1,600	0.084	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	218	1,600	0.005	N-S(1):	0.282 *
	TH	2.00	287	3,200	0.090	N-S(2):	0.179
	LT	1.00	85	1,600	0.053 *	E-W(1):	0.348
Westbound	RT	0.00	191	0	0.000	E-W(2):	0.404 *
	TH	2.00	683	3,200	0.273 *		
	LT	1.00	145	1,600	0.091	V/C:	0.686
Northbound	RT	1.00	117	1,600	0.028	Lost Time:	0.050
	TH	1.00	366	1,600	0.229 *	ITS:	0.000
	LT	1.00	142	1,600	0.089		
Eastbound	RT	0.00	75	0	0.000	ICU:	0.736
	TH	2.00	747	3,200	0.257		
	LT	1.00	210	1,600	0.131 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	189	1,600	0.000	N-S(1):	0.283 *
	TH	2.00	406	3,200	0.127	N-S(2):	0.177
	LT	1.00	127	1,600	0.079 *	E-W(1):	0.438 *
Westbound	RT	0.00	209	0	0.000	E-W(2):	0.398
	TH	2.00	536	3,200	0.233		
	LT	1.00	115	1,600	0.072 *	V/C:	0.721
Northbound	RT	1.00	64	1,600	0.004	Lost Time:	0.050
	TH	1.00	327	1,600	0.204 *	ITS:	0.000
	LT	1.00	80	1,600	0.050		
Eastbound	RT	0.00	184	0	0.000	ICU:	0.771
	TH	2.00	986	3,200	0.366 *		
	LT	1.00	264	1,600	0.165	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	145	0	0.000	N-S(1):	0.079
	TH	1.00	4	1,600	0.113 *	N-S(2):	0.141 *
	LT	0.00	32	1,600	0.020	E-W(1):	0.328
Westbound	RT	0.00	83	0	0.000	E-W(2):	0.380 *
	TH	2.00	1,051	3,200	0.354 *		
	LT	1.00	24	1,600	0.015	V/C:	0.521
Northbound	RT	0.00	46	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.059	ITS:	0.000
	LT	0.00	45	1,600	0.028 *		
Eastbound	RT	0.00	36	0	0.000	ICU:	0.571
	TH	2.00	964	3,200	0.313		
	LT	1.00	41	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	114	0	0.000	N-S(1):	0.057
	TH	1.00	4	1,600	0.091 *	N-S(2):	0.110 *
	LT	0.00	27	1,600	0.017	E-W(1):	0.361 *
Westbound	RT	0.00	49	0	0.000	E-W(2):	0.306
	TH	2.00	746	3,200	0.248		
	LT	1.00	32	1,600	0.020 *	V/C:	0.471
Northbound	RT	0.00	28	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.040	ITS:	0.000
	LT	0.00	31	1,600	0.019 *		
Eastbound	RT	0.00	54	0	0.000	ICU:	0.521
	TH	2.00	1,038	3,200	0.341 *		
	LT	1.00	93	1,600	0.058	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	24	0	0.000	N-S(1):	0.042
	TH	1.00	0	1,600	0.039 *	N-S(2):	0.045 *
	LT	0.00	38	1,600	0.024	E-W(1):	0.343
Westbound	RT	0.00	40	0	0.000	E-W(2):	0.353 *
	TH	2.00	1,070	3,200	0.347 *		
	LT	1.00	8	1,600	0.005	V/C:	0.398
Northbound	RT	0.00	19	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.018	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.448
	TH	2.00	1,075	3,200	0.338		
	LT	1.00	9	1,600	0.006 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	30	0	0.000	N-S(1):	0.026
	TH	1.00	1	1,600	0.032 *	N-S(2):	0.038 *
	LT	0.00	20	1,600	0.013	E-W(1):	0.345 *
Westbound	RT	0.00	28	0	0.000	E-W(2):	0.278
	TH	2.00	808	3,200	0.261		
	LT	1.00	21	1,600	0.013 *	V/C:	0.383
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	15	0	0.000	ICU:	0.433
	TH	2.00	1,048	3,200	0.332 *		
	LT	1.00	27	1,600	0.017	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	156	0	0.000	N-S(1):	0.238
	TH	2.00	401	3,200	0.174 *	N-S(2):	0.290 *
	LT	1.00	109	1,600	0.068	E-W(1):	0.251
Westbound	RT	0.00	71	0	0.000	E-W(2):	0.344 *
	TH	2.00	748	3,200	0.256 *		
	LT	1.00	41	1,600	0.026	V/C:	0.634
Northbound	RT	0.00	102	0	0.000	Lost Time:	0.050
	TH	2.00	441	3,200	0.170	ITS:	0.000
	LT	1.00	185	1,600	0.116 *		
Eastbound	RT	0.00	219	0	0.000	ICU:	0.684
	TH	2.00	501	3,200	0.225		
	LT	1.00	140	1,600	0.088 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	184	0	0.000	N-S(1):	0.242
	TH	2.00	497	3,200	0.213 *	N-S(2):	0.338 *
	LT	1.00	113	1,600	0.071	E-W(1):	0.375
Westbound	RT	0.00	152	0	0.000	E-W(2):	0.388 *
	TH	2.00	677	3,200	0.259 *		
	LT	1.00	110	1,600	0.069	V/C:	0.726
Northbound	RT	0.00	84	0	0.000	Lost Time:	0.050
	TH	2.00	462	3,200	0.171	ITS:	0.000
	LT	1.00	200	1,600	0.125 *		
Eastbound	RT	0.00	211	0	0.000	ICU:	0.776
	TH	2.00	767	3,200	0.306		
	LT	1.00	206	1,600	0.129 *	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	245	1,600	0.153 *	N-S(1):	0.135
	TH	3.00	397	3,200	0.124	N-S(2):	0.261 *
	LT	1.00	59	1,600	0.037	E-W(1):	0.365
Westbound	RT	0.00	52	0	0.000	E-W(2):	0.381 *
	TH	2.00	621	3,200	0.210 *		
	LT	1.00	130	1,600	0.081	V/C:	0.642
Northbound	RT	0.00	113	0	0.000	Lost Time:	0.050
	TH	3.00	357	4,800	0.098	ITS:	0.000
	LT	1.00	172	1,600	0.108 *		
Eastbound	RT	0.00	183	0	0.000	ICU:	0.692
	TH	2.00	727	3,200	0.284		
	LT	1.00	273	1,600	0.171 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	225	0	0.000	N-S(1):	0.128
	TH	3.00	518	4,800	0.155 *	N-S(2):	0.259 *
	LT	1.00	33	1,600	0.021	E-W(1):	0.338 *
Westbound	RT	0.00	51	0	0.000	E-W(2):	0.303
	TH	2.00	495	3,200	0.171		
	LT	1.00	137	1,600	0.086 *	V/C:	0.597
Northbound	RT	0.00	59	0	0.000	Lost Time:	0.050
	TH	3.00	453	4,800	0.107	ITS:	0.000
	LT	1.00	166	1,600	0.104 *		
Eastbound	RT	0.00	220	0	0.000	ICU:	0.647
	TH	2.00	587	3,200	0.252 *		
	LT	1.00	211	1,600	0.132	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.175 *
	TH	3.00	584	4,800	0.122	N-S(2):	0.122
	LT	1.00	38	1,600	0.024 *	E-W(1):	0.434 *
Westbound	RT	1.00	553	1,600	0.334	E-W(2):	0.334
	TH	0.00	0	0	0.000		
	LT	2.00	1,112	2,560	0.434 *	V/C:	0.609
Northbound	RT	1.00	75	1,600	0.000	Lost Time:	0.050
	TH	2.00	484	3,200	0.151 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.659
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.161
	TH	3.00	955	4,800	0.199 *	N-S(2):	0.199 *
	LT	1.00	77	1,600	0.048	E-W(1):	0.403 *
Westbound	RT	1.00	321	1,600	0.177	E-W(2):	0.177
	TH	0.00	0	0	0.000		
	LT	2.00	1,032	2,560	0.403 *	V/C:	0.602
Northbound	RT	1.00	224	1,600	0.000	Lost Time:	0.050
	TH	2.00	362	3,200	0.113	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.652
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	Y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.544 *
	TH	3.00	1,450	4,800	0.302	N-S(2):	0.302
	LT	1.00	288	1,600	0.180 *	E-W(1):	0.129 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.673
Northbound	RT	1.00	582	1,600	0.364 *	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	207	1,600	0.129 *	ICU:	0.723
	TH	2.00	0	1,600	0.069		
	LT	0.00	110	1,600	0.069	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.726 *
	TH	3.00	1,514	4,800	0.315	N-S(2):	0.315
	LT	1.00	483	1,600	0.302 *	E-W(1):	0.051 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.777
Northbound	RT	1.00	679	1,600	0.424 *	Lost Time:	0.050
	TH	2.00	555	3,200	0.173	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	81	1,600	0.051 *	ICU:	0.827
	TH	2.00	0	1,600	0.028		
	LT	0.00	45	1,600	0.028	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	583	1,600	0.313 *	N-S(1):	0.273
	TH	2.00	938	3,200	0.293	N-S(2):	0.321 *
	LT	1.00	107	1,600	0.067	E-W(1):	0.252 *
Westbound	RT	1.00	112	1,600	0.037	E-W(2):	0.249
	TH	2.00	470	3,200	0.147		
	LT	1.00	142	1,600	0.089 *	V/C:	0.573
Northbound	RT	1.00	268	1,600	0.123	Lost Time:	0.050
	TH	2.00	660	3,200	0.206	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	18	1,600	0.008	ICU:	0.623
	TH	2.00	523	3,200	0.163 *		
	LT	1.00	163	1,600	0.102	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	462	1,600	0.196	N-S(1):	0.344 *
	TH	2.00	952	3,200	0.298	N-S(2):	0.308
	LT	1.00	145	1,600	0.091 *	E-W(1):	0.346 *
Westbound	RT	1.00	209	1,600	0.085	E-W(2):	0.275
	TH	2.00	284	3,200	0.089		
	LT	1.00	145	1,600	0.091 *	V/C:	0.690
Northbound	RT	1.00	478	1,600	0.253 *	Lost Time:	0.050
	TH	2.00	627	3,200	0.196	ITS:	0.000
	LT	1.00	16	1,600	0.010		
Eastbound	RT	1.00	17	1,600	0.006	ICU:	0.740
	TH	2.00	816	3,200	0.255 *		
	LT	1.00	297	1,600	0.186	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	231	0	0.000	N-S(1):	0.307 *
	TH	2.00	387	3,200	0.193	N-S(2):	0.211
	LT	1.00	159	1,600	0.099 *	E-W(1):	0.175
Westbound	RT	0.00	118	0	0.000	E-W(2):	0.309 *
	TH	2.00	480	3,200	0.187 *		
	LT	1.00	104	1,600	0.065	V/C:	0.616
Northbound	RT	0.00	133	0	0.000	Lost Time:	0.050
	TH	2.00	531	3,200	0.208 *	ITS:	0.000
	LT	1.00	28	1,600	0.018		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.666
	TH	2.00	329	3,200	0.110		
	LT	1.00	195	1,600	0.122 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	276	0	0.000	N-S(1):	0.276 *
	TH	2.00	533	3,200	0.253	N-S(2):	0.271
	LT	1.00	157	1,600	0.098 *	E-W(1):	0.251
Westbound	RT	0.00	139	0	0.000	E-W(2):	0.304 *
	TH	2.00	485	3,200	0.195 *		
	LT	1.00	103	1,600	0.064	V/C:	0.580
Northbound	RT	0.00	175	0	0.000	Lost Time:	0.050
	TH	2.00	394	3,200	0.178 *	ITS:	0.000
	LT	1.00	28	1,600	0.018		
Eastbound	RT	0.00	44	0	0.000	ICU:	0.630
	TH	2.00	553	3,200	0.187		
	LT	1.00	175	1,600	0.109 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: EXISTING PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	358	3,200	0.011	N-S(1):	0.081 *
	TH	0.00	0	0	0.000	N-S(2):	0.011
	LT	1.00	129	1,600	0.081 *	E-W(1):	0.074
Westbound	RT	0.00	162	0	0.000	E-W(2):	0.317 *
	TH	2.00	206	3,200	0.115 *		
	LT	0.00	0	0	0.000	V/C:	0.398
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.448
	TH	1.00	119	1,600	0.074		
	LT	2.00	516	2,560	0.202 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	454	3,200	0.061	N-S(1):	0.102 *
	TH	0.00	0	0	0.000	N-S(2):	0.061
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.096
Westbound	RT	0.00	186	1,600	0.116 *	E-W(2):	0.277 *
	TH	2.00	151	1,600	0.094		
	LT	0.00	0	0	0.000	V/C:	0.379
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.429
	TH	1.00	153	1,600	0.096		
	LT	2.00	412	2,560	0.161 *	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,066	3,200	0.333 *	N-S(1):	0.145
	TH	0.30	52	488	0.107	N-S(2):	0.333 *
	LT	1.70	289	2,170	0.133	E-W(1):	0.436 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.196
	TH	4.00	1,256	6,400	0.196		
	LT	0.00	0	0	0.000 *	V/C:	0.769
Northbound	RT	1.00	19	1,600	0.012	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	17	0	0.000	ICU:	0.819
	TH	3.00	2,077	4,800	0.436 *		
	LT	0.00	0	0	0.000	LOS:	D

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,013	3,200	0.317 *	N-S(1):	0.205
	TH	0.28	67	453	0.148	N-S(2):	0.317 *
	LT	1.72	406	2,197	0.185	E-W(1):	0.487 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.173
	TH	4.00	1,102	6,400	0.173		
	LT	0.00	3	1,600	0.002 *	V/C:	0.804
Northbound	RT	1.00	33	1,600	0.020	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.854
	TH	3.00	2,304	4,800	0.485 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	59	1,600	0.037 *	N-S(1):	0.341 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.146
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.336 *
	TH	3.00	1,534	4,800	0.320 *		
	LT	0.00	0	0	0.000	V/C:	0.677
Northbound	RT	1.00	194	1,600	0.121	Lost Time:	0.050
	TH	1.00	26	1,600	0.304 *	ITS:	0.000
	LT	0.00	461	1,600	0.288		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.727
	TH	3.00	702	4,800	0.146		
	LT	1.00	26	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	118	1,600	0.074 *	N-S(1):	0.289 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.224
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.299 *
	TH	3.00	1,116	4,800	0.235 *		
	LT	0.00	0	0	0.000	V/C:	0.588
Northbound	RT	1.00	332	1,600	0.208	Lost Time:	0.050
	TH	1.00	32	1,600	0.215 *	ITS:	0.000
	LT	0.00	312	1,600	0.195		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.638
	TH	3.00	1,073	4,800	0.224		
	LT	1.00	103	1,600	0.064 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	262	0	0.000	N-S(1):	0.181
	TH	2.00	263	3,200	0.164 *	N-S(2):	0.248 *
	LT	1.00	65	1,600	0.041	E-W(1):	0.246
Westbound	RT	1.00	79	1,600	0.029	E-W(2):	0.421 *
	TH	2.00	1,128	3,200	0.353 *		
	LT	1.00	50	1,600	0.031	V/C:	0.669
Northbound	RT	0.00	46	0	0.000	Lost Time:	0.050
	TH	2.00	401	3,200	0.140	ITS:	0.000
	LT	1.00	135	1,600	0.084 *		
Eastbound	RT	1.00	95	1,600	0.017	ICU:	0.719
	TH	2.00	687	3,200	0.215		
	LT	1.00	109	1,600	0.068 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	120	0	0.000	N-S(1):	0.219 *
	TH	2.00	340	3,200	0.144	N-S(2):	0.215
	LT	1.00	140	1,600	0.088 *	E-W(1):	0.349
Westbound	RT	1.00	134	1,600	0.040	E-W(2):	0.399 *
	TH	2.00	932	3,200	0.291 *		
	LT	1.00	58	1,600	0.036	V/C:	0.618
Northbound	RT	0.00	73	0	0.000	Lost Time:	0.050
	TH	2.00	345	3,200	0.131 *	ITS:	0.000
	LT	1.00	113	1,600	0.071		
Eastbound	RT	1.00	186	1,600	0.081	ICU:	0.668
	TH	2.00	1,001	3,200	0.313		
	LT	1.00	172	1,600	0.108 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	163	0	0.000	N-S(1):	0.205
	TH	2.00	325	3,200	0.153 *	N-S(2):	0.270 *
	LT	1.00	124	1,600	0.078	E-W(1):	0.355
Westbound	RT	0.00	75	0	0.000	E-W(2):	0.377 *
	TH	2.00	951	3,200	0.321 *		
	LT	1.00	213	1,600	0.133	V/C:	0.647
Northbound	RT	1.00	160	1,600	0.033	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	1.00	187	1,600	0.117 *		
Eastbound	RT	0.00	156	0	0.000	ICU:	0.697
	TH	2.00	554	3,200	0.222		
	LT	1.00	90	1,600	0.056 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	102	0	0.000	N-S(1):	0.311
	TH	2.00	550	3,200	0.204 *	N-S(2):	0.332 *
	LT	1.00	179	1,600	0.112	E-W(1):	0.426 *
Westbound	RT	0.00	108	0	0.000	E-W(2):	0.367
	TH	2.00	790	3,200	0.281		
	LT	1.00	168	1,600	0.105 *	V/C:	0.758
Northbound	RT	1.00	178	1,600	0.059	Lost Time:	0.050
	TH	2.00	637	3,200	0.199	ITS:	0.000
	LT	1.00	204	1,600	0.128 *		
Eastbound	RT	0.00	150	0	0.000	ICU:	0.808
	TH	2.00	876	3,200	0.321 *		
	LT	1.00	137	1,600	0.086	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	224	1,600	0.006	N-S(1):	0.288 *
	TH	2.00	294	3,200	0.092	N-S(2):	0.183
	LT	1.00	87	1,600	0.054 *	E-W(1):	0.361
Westbound	RT	0.00	190	0	0.000	E-W(2):	0.413 *
	TH	2.00	703	3,200	0.279 *		
	LT	1.00	149	1,600	0.093	V/C:	0.701
Northbound	RT	1.00	120	1,600	0.028	Lost Time:	0.050
	TH	1.00	375	1,600	0.234 *	ITS:	0.000
	LT	1.00	146	1,600	0.091		
Eastbound	RT	0.00	77	0	0.000	ICU:	0.751
	TH	2.00	782	3,200	0.268		
	LT	1.00	215	1,600	0.134 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	194	1,600	0.000	N-S(1):	0.419 *
	TH	2.00	536	3,200	0.168	N-S(2):	0.219
	LT	1.00	130	1,600	0.081 *	E-W(1):	0.453 *
Westbound	RT	0.00	141	0	0.000	E-W(2):	0.390
	TH	2.00	565	3,200	0.221		
	LT	1.00	118	1,600	0.074 *	V/C:	0.872
Northbound	RT	1.00	66	1,600	0.004	Lost Time:	0.050
	TH	1.00	540	1,600	0.338 *	ITS:	0.000
	LT	1.00	82	1,600	0.051		
Eastbound	RT	0.00	189	0	0.000	ICU:	0.922
	TH	2.00	1,025	3,200	0.379 *		
	LT	1.00	271	1,600	0.169	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	144	0	0.000	N-S(1):	0.081
	TH	1.00	4	1,600	0.113 *	N-S(2):	0.142 *
	LT	0.00	33	1,600	0.021	E-W(1):	0.341
Westbound	RT	0.00	16	0	0.000	E-W(2):	0.369 *
	TH	2.00	1,080	3,200	0.343 *		
	LT	1.00	25	1,600	0.016	V/C:	0.511
Northbound	RT	0.00	47	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.060	ITS:	0.000
	LT	0.00	46	1,600	0.029 *		
Eastbound	RT	0.00	37	0	0.000	ICU:	0.561
	TH	2.00	1,004	3,200	0.325		
	LT	1.00	42	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	60	0	0.000	N-S(1):	0.050
	TH	1.00	4	1,600	0.049 *	N-S(2):	0.069 *
	LT	0.00	15	1,600	0.009	E-W(1):	0.375 *
Westbound	RT	0.00	45	0	0.000	E-W(2):	0.312
	TH	2.00	763	3,200	0.253		
	LT	1.00	33	1,600	0.021 *	V/C:	0.444
Northbound	RT	0.00	29	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.041	ITS:	0.000
	LT	0.00	32	1,600	0.020 *		
Eastbound	RT	0.00	55	0	0.000	ICU:	0.494
	TH	2.00	1,078	3,200	0.354 *		
	LT	1.00	95	1,600	0.059	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	24	0	0.000	N-S(1):	0.042
	TH	1.00	0	1,600	0.039 *	N-S(2):	0.045 *
	LT	0.00	39	1,600	0.024	E-W(1):	0.356 *
Westbound	RT	0.00	19	0	0.000	E-W(2):	0.334
	TH	2.00	1,031	3,200	0.328		
	LT	1.00	8	1,600	0.005 *	V/C:	0.401
Northbound	RT	0.00	19	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.018	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.451
	TH	2.00	1,118	3,200	0.351 *		
	LT	1.00	9	1,600	0.006	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	14	0	0.000	N-S(1):	0.022
	TH	1.00	1	1,600	0.019 *	N-S(2):	0.025 *
	LT	0.00	15	1,600	0.009	E-W(1):	0.355 *
Westbound	RT	0.00	28	0	0.000	E-W(2):	0.289
	TH	2.00	838	3,200	0.271		
	LT	1.00	22	1,600	0.014 *	V/C:	0.380
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	15	0	0.000	ICU:	0.430
	TH	2.00	1,076	3,200	0.341 *		
	LT	1.00	28	1,600	0.018	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	160	0	0.000	N-S(1):	0.274
	TH	2.00	557	3,200	0.224 *	N-S(2):	0.343 *
	LT	1.00	112	1,600	0.070	E-W(1):	0.239
Westbound	RT	0.00	73	0	0.000	E-W(2):	0.351 *
	TH	2.00	762	3,200	0.261 *		
	LT	1.00	42	1,600	0.026	V/C:	0.694
Northbound	RT	0.00	105	0	0.000	Lost Time:	0.050
	TH	2.00	549	3,200	0.204	ITS:	0.000
	LT	1.00	190	1,600	0.119 *		
Eastbound	RT	0.00	152	0	0.000	ICU:	0.744
	TH	2.00	531	3,200	0.213		
	LT	1.00	144	1,600	0.090 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	189	0	0.000	N-S(1):	0.303
	TH	2.00	885	3,200	0.336 *	N-S(2):	0.464 *
	LT	1.00	116	1,600	0.073	E-W(1):	0.383
Westbound	RT	0.00	156	0	0.000	E-W(2):	0.403 *
	TH	2.00	710	3,200	0.271 *		
	LT	1.00	113	1,600	0.071	V/C:	0.867
Northbound	RT	0.00	86	0	0.000	Lost Time:	0.050
	TH	2.00	651	3,200	0.230	ITS:	0.000
	LT	1.00	205	1,600	0.128 *		
Eastbound	RT	0.00	210	0	0.000	ICU:	0.917
	TH	2.00	788	3,200	0.312		
	LT	1.00	211	1,600	0.132 *	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	178	0	0.000	N-S(1):	0.159
	TH	3.00	553	4,800	0.152 *	N-S(2):	0.262 *
	LT	1.00	60	1,600	0.038	E-W(1):	0.380
Westbound	RT	0.00	53	0	0.000	E-W(2):	0.386 *
	TH	2.00	622	3,200	0.211 *		
	LT	1.00	133	1,600	0.083	V/C:	0.648
Northbound	RT	0.00	116	0	0.000	Lost Time:	0.050
	TH	3.00	463	4,800	0.121	ITS:	0.000
	LT	1.00	176	1,600	0.110 *		
Eastbound	RT	0.00	188	0	0.000	ICU:	0.698
	TH	2.00	761	3,200	0.297		
	LT	1.00	280	1,600	0.175 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	225	0	0.000	N-S(1):	0.167
	TH	3.00	906	4,800	0.236 *	N-S(2):	0.342 *
	LT	1.00	34	1,600	0.021	E-W(1):	0.346 *
Westbound	RT	0.00	52	0	0.000	E-W(2):	0.315
	TH	2.00	523	3,200	0.180		
	LT	1.00	140	1,600	0.088 *	V/C:	0.688
Northbound	RT	0.00	60	0	0.000	Lost Time:	0.050
	TH	3.00	641	4,800	0.146	ITS:	0.000
	LT	1.00	170	1,600	0.106 *		
Eastbound	RT	0.00	226	0	0.000	ICU:	0.738
	TH	2.00	598	3,200	0.258 *		
	LT	1.00	216	1,600	0.135	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.173 *
	TH	3.00	663	4,800	0.138	N-S(2):	0.138
	LT	0.00	0	0	0.000 *	E-W(1):	0.442 *
Westbound	RT	1.00	611	1,600	0.382	E-W(2):	0.382
	TH	0.00	0	0	0.000		
	LT	2.00	1,132	2,560	0.442 *	V/C:	0.615
Northbound	RT	1.00	77	1,600	0.000	Lost Time:	0.050
	TH	2.00	553	3,200	0.173 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.665
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.127
	TH	3.00	1,180	4,800	0.246 *	N-S(2):	0.246 *
	LT	0.00	0	0	0.000	E-W(1):	0.413 *
Westbound	RT	1.00	341	1,600	0.213	E-W(2):	0.213
	TH	0.00	0	0	0.000		
	LT	2.00	1,058	2,560	0.413 *	V/C:	0.659
Northbound	RT	1.00	224	1,600	0.000	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.709
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	Y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.306
	TH	3.00	1,488	4,800	0.310 *	N-S(2):	0.310 *
	LT	2.00	304	2,560	0.119	E-W(1):	0.129 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.439
Northbound	RT	2.00	597	3,200	0.187	Lost Time:	0.050
	TH	2.00	436	3,200	0.136	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	1.00	206	1,600	0.129 *	ICU:	0.489
	TH	0.00	0	0	0.000		
	LT	1.00	149	1,600	0.093	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.429 *
	TH	3.00	1,579	4,800	0.329	N-S(2):	0.329
	LT	2.00	549	2,560	0.214 *	E-W(1):	0.052 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.481
Northbound	RT	2.00	688	3,200	0.215 *	Lost Time:	0.050
	TH	2.00	591	3,200	0.185	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	1.00	83	1,600	0.052 *	ICU:	0.531
	TH	0.00	0	0	0.000		
	LT	1.00	53	1,600	0.033	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	598	1,600	0.322 *	N-S(1):	0.287
	TH	2.00	957	3,200	0.299	N-S(2):	0.330 *
	LT	1.00	110	1,600	0.069	E-W(1):	0.259 *
Westbound	RT	1.00	115	1,600	0.038	E-W(2):	0.255
	TH	2.00	482	3,200	0.151		
	LT	1.00	146	1,600	0.091 *	V/C:	0.589
Northbound	RT	1.00	275	1,600	0.126	Lost Time:	0.050
	TH	2.00	698	3,200	0.218	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	18	1,600	0.008	ICU:	0.639
	TH	2.00	536	3,200	0.168 *		
	LT	1.00	167	1,600	0.104	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	474	1,600	0.201	N-S(1):	0.353 *
	TH	2.00	1,003	3,200	0.313	N-S(2):	0.323
	LT	1.00	149	1,600	0.093 *	E-W(1):	0.355 *
Westbound	RT	1.00	214	1,600	0.087	E-W(2):	0.282
	TH	2.00	291	3,200	0.091		
	LT	1.00	149	1,600	0.093 *	V/C:	0.708
Northbound	RT	1.00	490	1,600	0.260 *	Lost Time:	0.050
	TH	2.00	657	3,200	0.205	ITS:	0.000
	LT	1.00	16	1,600	0.010		
Eastbound	RT	1.00	17	1,600	0.006	ICU:	0.758
	TH	2.00	837	3,200	0.262 *		
	LT	1.00	305	1,600	0.191	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	237	0	0.000	N-S(1):	0.321 *
	TH	2.00	392	3,200	0.197	N-S(2):	0.215
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.183
Westbound	RT	0.00	121	0	0.000	E-W(2):	0.315 *
	TH	2.00	487	3,200	0.190 *		
	LT	1.00	104	1,600	0.065	V/C:	0.636
Northbound	RT	0.00	136	0	0.000	Lost Time:	0.050
	TH	2.00	565	3,200	0.219 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	24	0	0.000	ICU:	0.686
	TH	2.00	354	3,200	0.118		
	LT	1.00	200	1,600	0.125 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	283	0	0.000	N-S(1):	0.287 *
	TH	2.00	573	3,200	0.268	N-S(2):	0.286
	LT	1.00	161	1,600	0.101 *	E-W(1):	0.258
Westbound	RT	0.00	143	0	0.000	E-W(2):	0.317 *
	TH	2.00	513	3,200	0.205 *		
	LT	1.00	106	1,600	0.066	V/C:	0.604
Northbound	RT	0.00	176	0	0.000	Lost Time:	0.050
	TH	2.00	418	3,200	0.186 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	45	0	0.000	ICU:	0.654
	TH	2.00	569	3,200	0.192		
	LT	1.00	179	1,600	0.112 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: CUMULATIVE (2019) NO PROJECT

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	351	3,200	0.006	N-S(1):	0.088 *
	TH	0.00	0	0	0.000	N-S(2):	0.006
	LT	1.00	141	1,600	0.088 *	E-W(1):	0.086
Westbound	RT	0.00	185	0	0.000	E-W(2):	0.331 *
	TH	2.00	213	3,200	0.124 *		
	LT	0.00	0	0	0.000	V/C:	0.419
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.469
	TH	1.00	138	1,600	0.086		
	LT	2.00	529	2,560	0.207 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	466	3,200	0.067	N-S(1):	0.124 *
	TH	0.00	0	0	0.000	N-S(2):	0.067
	LT	1.00	198	1,600	0.124 *	E-W(1):	0.107
Westbound	RT	0.00	211	1,600	0.132 *	E-W(2):	0.290 *
	TH	2.00	169	1,600	0.106		
	LT	0.00	0	0	0.000	V/C:	0.414
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.464
	TH	1.00	171	1,600	0.107		
	LT	2.00	405	2,560	0.158 *	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 SB RAMP OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,066	3,200	0.333 *	N-S(1):	0.172
	TH	0.25	52	406	0.128	N-S(2):	0.333 *
	LT	1.75	358	2,235	0.160	E-W(1):	0.436 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.196
	TH	4.00	1,256	6,400	0.196		
	LT	0.00	0	0	0.000 *	V/C:	0.769
Northbound	RT	1.00	19	1,600	0.012	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	17	0	0.000	ICU:	0.819
	TH	3.00	2,077	4,800	0.436 *		
	LT	0.00	0	0	0.000	LOS:	D

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	1,013	3,200	0.317 *	N-S(1):	0.207
	TH	0.28	67	448	0.150	N-S(2):	0.317 *
	LT	1.72	412	2,202	0.187	E-W(1):	0.487 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.173
	TH	4.00	1,102	6,400	0.173		
	LT	0.00	3	1,600	0.002 *	V/C:	0.804
Northbound	RT	1.00	33	1,600	0.020	Lost Time:	0.050
	TH	0.00	0	0	0.000	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	23	0	0.000	ICU:	0.854
	TH	3.00	2,304	4,800	0.485 *		
	LT	0.00	0	0	0.000	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: I-110 NB OFF-RAMP & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	Y
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	59	1,600	0.037 *	N-S(1):	0.341 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.161
Westbound	RT	0.00	4	0	0.000	E-W(2):	0.338 *
	TH	3.00	1,540	4,800	0.322 *		
	LT	0.00	0	0	0.000	V/C:	0.679
Northbound	RT	1.00	196	1,600	0.123	Lost Time:	0.050
	TH	1.00	26	1,600	0.304 *	ITS:	0.000
	LT	0.00	461	1,600	0.288		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.729
	TH	3.00	771	4,800	0.161		
	LT	1.00	26	1,600	0.016 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	118	1,600	0.074 *	N-S(1):	0.289 *
	TH	0.00	0	0	0.000	N-S(2):	0.000
	LT	0.00	0	0	0.000	E-W(1):	0.225
Westbound	RT	0.00	13	0	0.000	E-W(2):	0.314 *
	TH	3.00	1,187	4,800	0.250 *		
	LT	0.00	0	0	0.000	V/C:	0.603
Northbound	RT	1.00	332	1,600	0.208	Lost Time:	0.050
	TH	1.00	32	1,600	0.215 *	ITS:	0.000
	LT	0.00	312	1,600	0.195		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.653
	TH	3.00	1,079	4,800	0.225		
	LT	1.00	103	1,600	0.064 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: FIGUEROA ST & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	262	0	0.000	N-S(1):	0.181
	TH	2.00	263	3,200	0.164 *	N-S(2):	0.248 *
	LT	1.00	65	1,600	0.041	E-W(1):	0.268
Westbound	RT	1.00	79	1,600	0.029	E-W(2):	0.422 *
	TH	2.00	1,134	3,200	0.354 *		
	LT	1.00	50	1,600	0.031	V/C:	0.670
Northbound	RT	0.00	46	0	0.000	Lost Time:	0.050
	TH	2.00	401	3,200	0.140	ITS:	0.000
	LT	1.00	135	1,600	0.084 *		
Eastbound	RT	1.00	95	1,600	0.017	ICU:	0.720
	TH	2.00	758	3,200	0.237		
	LT	1.00	109	1,600	0.068 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	120	0	0.000	N-S(1):	0.219 *
	TH	2.00	340	3,200	0.144	N-S(2):	0.215
	LT	1.00	140	1,600	0.088 *	E-W(1):	0.351
Westbound	RT	1.00	134	1,600	0.040	E-W(2):	0.421 *
	TH	2.00	1,003	3,200	0.313 *		
	LT	1.00	58	1,600	0.036	V/C:	0.640
Northbound	RT	0.00	73	0	0.000	Lost Time:	0.050
	TH	2.00	345	3,200	0.131 *	ITS:	0.000
	LT	1.00	113	1,600	0.071		
Eastbound	RT	1.00	186	1,600	0.081	ICU:	0.690
	TH	2.00	1,007	3,200	0.315		
	LT	1.00	172	1,600	0.108 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	163	0	0.000	N-S(1):	0.205
	TH	2.00	325	3,200	0.153 *	N-S(2):	0.274 *
	LT	1.00	124	1,600	0.078	E-W(1):	0.377 *
Westbound	RT	0.00	75	0	0.000	E-W(2):	0.377 *
	TH	2.00	951	3,200	0.321 *		
	LT	1.00	213	1,600	0.133 *	V/C:	0.651
Northbound	RT	1.00	160	1,600	0.033	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	1.00	193	1,600	0.121 *		
Eastbound	RT	0.00	156	0	0.000	ICU:	0.701
	TH	2.00	625	3,200	0.244 *		
	LT	1.00	90	1,600	0.056 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	102	0	0.000	N-S(1):	0.311
	TH	2.00	550	3,200	0.204 *	N-S(2):	0.376 *
	LT	1.00	179	1,600	0.112	E-W(1):	0.428 *
Westbound	RT	0.00	108	0	0.000	E-W(2):	0.367
	TH	2.00	790	3,200	0.281		
	LT	1.00	168	1,600	0.105 *	V/C:	0.804
Northbound	RT	1.00	178	1,600	0.059	Lost Time:	0.050
	TH	2.00	637	3,200	0.199	ITS:	0.000
	LT	1.00	275	1,600	0.172 *		
Eastbound	RT	0.00	150	0	0.000	ICU:	0.854
	TH	2.00	882	3,200	0.323 *		
	LT	1.00	137	1,600	0.086	LOS:	D

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: MAIN ST & LOMITA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :	SBR		
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	224	1,600	0.006	N-S(1):	0.288 *
	TH	2.00	294	3,200	0.092	N-S(2):	0.183
	LT	1.00	87	1,600	0.054 *	E-W(1):	0.361
Westbound	RT	0.00	196	0	0.000	E-W(2):	0.415 *
	TH	2.00	703	3,200	0.281 *		
	LT	1.00	149	1,600	0.093	V/C:	0.703
Northbound	RT	1.00	120	1,600	0.028	Lost Time:	0.050
	TH	1.00	375	1,600	0.234 *	ITS:	0.000
	LT	1.00	146	1,600	0.091		
Eastbound	RT	0.00	77	0	0.000	ICU:	0.753
	TH	2.00	782	3,200	0.268		
	LT	1.00	215	1,600	0.134 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	194	1,600	0.000	N-S(1):	0.419 *
	TH	2.00	536	3,200	0.168	N-S(2):	0.219
	LT	1.00	130	1,600	0.081 *	E-W(1):	0.453 *
Westbound	RT	0.00	212	0	0.000	E-W(2):	0.412
	TH	2.00	565	3,200	0.243		
	LT	1.00	118	1,600	0.074 *	V/C:	0.872
Northbound	RT	1.00	66	1,600	0.004	Lost Time:	0.050
	TH	1.00	540	1,600	0.338 *	ITS:	0.000
	LT	1.00	82	1,600	0.051		
Eastbound	RT	0.00	189	0	0.000	ICU:	0.922
	TH	2.00	1,025	3,200	0.379 *		
	LT	1.00	271	1,600	0.169	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: NEPTUNE AVE & LOMITA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	149	0	0.000	N-S(1):	0.081
	TH	1.00	4	1,600	0.116 *	N-S(2):	0.145 *
	LT	0.00	33	1,600	0.021	E-W(1):	0.341
Westbound	RT	0.00	83	0	0.000	E-W(2):	0.390 *
	TH	2.00	1,081	3,200	0.364 *		
	LT	1.00	25	1,600	0.016	V/C:	0.535
Northbound	RT	0.00	47	0	0.000	Lost Time:	0.050
	TH	1.00	3	1,600	0.060	ITS:	0.000
	LT	0.00	46	1,600	0.029 *		
Eastbound	RT	0.00	37	0	0.000	ICU:	0.585
	TH	2.00	1,004	3,200	0.325		
	LT	1.00	42	1,600	0.026 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	115	0	0.000	N-S(1):	0.058
	TH	1.00	4	1,600	0.091 *	N-S(2):	0.111 *
	LT	0.00	27	1,600	0.017	E-W(1):	0.375 *
Westbound	RT	0.00	50	0	0.000	E-W(2):	0.318
	TH	2.00	779	3,200	0.259		
	LT	1.00	33	1,600	0.021 *	V/C:	0.486
Northbound	RT	0.00	29	0	0.000	Lost Time:	0.050
	TH	1.00	5	1,600	0.041	ITS:	0.000
	LT	0.00	32	1,600	0.020 *		
Eastbound	RT	0.00	55	0	0.000	ICU:	0.536
	TH	2.00	1,078	3,200	0.354 *		
	LT	1.00	95	1,600	0.059	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: LAGOON AVE & LOMITA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	25	0	0.000	N-S(1):	0.042
	TH	1.00	0	1,600	0.040 *	N-S(2):	0.046 *
	LT	0.00	39	1,600	0.024	E-W(1):	0.356
Westbound	RT	0.00	40	0	0.000	E-W(2):	0.362 *
	TH	2.00	1,098	3,200	0.356 *		
	LT	1.00	8	1,600	0.005	V/C:	0.408
Northbound	RT	0.00	19	0	0.000	Lost Time:	0.050
	TH	1.00	0	1,600	0.018	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	6	0	0.000	ICU:	0.458
	TH	2.00	1,118	3,200	0.351		
	LT	1.00	9	1,600	0.006 *	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	30	0	0.000	N-S(1):	0.026
	TH	1.00	1	1,600	0.032 *	N-S(2):	0.038 *
	LT	0.00	20	1,600	0.013	E-W(1):	0.359 *
Westbound	RT	0.00	29	0	0.000	E-W(2):	0.291
	TH	2.00	843	3,200	0.273		
	LT	1.00	22	1,600	0.014 *	V/C:	0.397
Northbound	RT	0.00	8	0	0.000	Lost Time:	0.050
	TH	1.00	2	1,600	0.013	ITS:	0.000
	LT	0.00	10	1,600	0.006 *		
Eastbound	RT	0.00	15	0	0.000	ICU:	0.447
	TH	2.00	1,088	3,200	0.345 *		
	LT	1.00	28	1,600	0.018	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	160	0	0.000	N-S(1):	0.274
	TH	2.00	557	3,200	0.224 *	N-S(2):	0.343 *
	LT	1.00	112	1,600	0.070	E-W(1):	0.262
Westbound	RT	0.00	73	0	0.000	E-W(2):	0.351 *
	TH	2.00	762	3,200	0.261 *		
	LT	1.00	42	1,600	0.026	V/C:	0.694
Northbound	RT	0.00	105	0	0.000	Lost Time:	0.050
	TH	2.00	549	3,200	0.204	ITS:	0.000
	LT	1.00	190	1,600	0.119 *		
Eastbound	RT	0.00	223	0	0.000	ICU:	0.744
	TH	2.00	531	3,200	0.236		
	LT	1.00	144	1,600	0.090 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	189	0	0.000	N-S(1):	0.303
	TH	2.00	885	3,200	0.336 *	N-S(2):	0.464 *
	LT	1.00	116	1,600	0.073	E-W(1):	0.385
Westbound	RT	0.00	156	0	0.000	E-W(2):	0.403 *
	TH	2.00	710	3,200	0.271 *		
	LT	1.00	113	1,600	0.071	V/C:	0.867
Northbound	RT	0.00	86	0	0.000	Lost Time:	0.050
	TH	2.00	651	3,200	0.230	ITS:	0.000
	LT	1.00	205	1,600	0.128 *		
Eastbound	RT	0.00	216	0	0.000	ICU:	0.917
	TH	2.00	788	3,200	0.314		
	LT	1.00	211	1,600	0.132 *	LOS:	E

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: AVALON BLVD & LOMITA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	249	0	0.000	N-S(1):	0.159
	TH	3.00	553	4,800	0.167 *	N-S(2):	0.277 *
	LT	1.00	60	1,600	0.038	E-W(1):	0.380
Westbound	RT	0.00	53	0	0.000	E-W(2):	0.391 *
	TH	2.00	639	3,200	0.216 *		
	LT	1.00	133	1,600	0.083	V/C:	0.668
Northbound	RT	0.00	116	0	0.000	Lost Time:	0.050
	TH	3.00	463	4,800	0.121	ITS:	0.000
	LT	1.00	176	1,600	0.110 *		
Eastbound	RT	0.00	188	0	0.000	ICU:	0.718
	TH	2.00	761	3,200	0.297		
	LT	1.00	280	1,600	0.175 *	LOS:	C

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	231	0	0.000	N-S(1):	0.167
	TH	3.00	906	4,800	0.237 *	N-S(2):	0.343 *
	LT	1.00	34	1,600	0.021	E-W(1):	0.351 *
Westbound	RT	0.00	52	0	0.000	E-W(2):	0.315
	TH	2.00	523	3,200	0.180		
	LT	1.00	140	1,600	0.088 *	V/C:	0.694
Northbound	RT	0.00	60	0	0.000	Lost Time:	0.050
	TH	3.00	641	4,800	0.146	ITS:	0.000
	LT	1.00	170	1,600	0.106 *		
Eastbound	RT	0.00	226	0	0.000	ICU:	0.744
	TH	2.00	615	3,200	0.263 *		
	LT	1.00	216	1,600	0.135	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 NB RAMPS
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.173 *
	TH	3.00	663	4,800	0.138	N-S(2):	0.138
	LT	0.00	0	0	0.000 *	E-W(1):	0.445 *
Westbound	RT	1.00	611	1,600	0.382	E-W(2):	0.382
	TH	0.00	0	0	0.000		
	LT	2.00	1,140	2,560	0.445 *	V/C:	0.618
Northbound	RT	1.00	77	1,600	0.000	Lost Time:	0.050
	TH	2.00	553	3,200	0.173 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.668
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.127
	TH	3.00	1,180	4,800	0.246 *	N-S(2):	0.246 *
	LT	0.00	0	0	0.000	E-W(1):	0.413 *
Westbound	RT	1.00	341	1,600	0.213	E-W(2):	0.213
	TH	0.00	0	0	0.000		
	LT	2.00	1,058	2,560	0.413 *	V/C:	0.659
Northbound	RT	1.00	230	1,600	0.000	Lost Time:	0.050
	TH	2.00	405	3,200	0.127	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.709
	TH	0.00	0	0	0.000 *		
	LT	0.00	0	0	0.000	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & I-405 SB RAMPS
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	Y
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.306
	TH	3.00	1,496	4,800	0.312 *	N-S(2):	0.312 *
	LT	2.00	304	2,560	0.119	E-W(1):	0.133 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.445
Northbound	RT	2.00	597	3,200	0.187	Lost Time:	0.050
	TH	2.00	436	3,200	0.136	ITS:	0.000
	LT	0.00	0	0	0.000 *		
Eastbound	RT	1.00	212	1,600	0.133 *	ICU:	0.495
	TH	0.00	0	0	0.000		
	LT	1.00	149	1,600	0.093	LOS:	A

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	0	0	0.000	N-S(1):	0.432 *
	TH	3.00	1,579	4,800	0.329	N-S(2):	0.329
	LT	2.00	549	2,560	0.214 *	E-W(1):	0.052 *
Westbound	RT	0.00	0	0	0.000	E-W(2):	0.000
	TH	0.00	0	0	0.000		
	LT	0.00	0	0	0.000 *	V/C:	0.484
Northbound	RT	2.00	696	3,200	0.218 *	Lost Time:	0.050
	TH	2.00	597	3,200	0.187	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	1.00	83	1,600	0.052 *	ICU:	0.534
	TH	0.00	0	0	0.000		
	LT	1.00	53	1,600	0.033	LOS:	A

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & E 223rd ST
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	598	1,600	0.322 *	N-S(1):	0.287
	TH	2.00	971	3,200	0.303	N-S(2):	0.330 *
	LT	1.00	110	1,600	0.069	E-W(1):	0.259 *
Westbound	RT	1.00	115	1,600	0.038	E-W(2):	0.255
	TH	2.00	482	3,200	0.151		
	LT	1.00	146	1,600	0.091 *	V/C:	0.589
Northbound	RT	1.00	275	1,600	0.126	Lost Time:	0.050
	TH	2.00	698	3,200	0.218	ITS:	0.000
	LT	1.00	12	1,600	0.008 *		
Eastbound	RT	1.00	18	1,600	0.008	ICU:	0.639
	TH	2.00	536	3,200	0.168 *		
	LT	1.00	167	1,600	0.104	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	1.00	474	1,600	0.201	N-S(1):	0.353 *
	TH	2.00	1,003	3,200	0.313	N-S(2):	0.323
	LT	1.00	149	1,600	0.093 *	E-W(1):	0.355 *
Westbound	RT	1.00	214	1,600	0.087	E-W(2):	0.282
	TH	2.00	291	3,200	0.091		
	LT	1.00	149	1,600	0.093 *	V/C:	0.708
Northbound	RT	1.00	490	1,600	0.260 *	Lost Time:	0.050
	TH	2.00	671	3,200	0.210	ITS:	0.000
	LT	1.00	16	1,600	0.010		
Eastbound	RT	1.00	17	1,600	0.006	ICU:	0.758
	TH	2.00	837	3,200	0.262 *		
	LT	1.00	305	1,600	0.191	LOS:	C

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & SEPULVEDA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	237	0	0.000	N-S(1):	0.321 *
	TH	2.00	406	3,200	0.201	N-S(2):	0.219
	LT	1.00	163	1,600	0.102 *	E-W(1):	0.185
Westbound	RT	0.00	121	0	0.000	E-W(2):	0.315 *
	TH	2.00	487	3,200	0.190 *		
	LT	1.00	107	1,600	0.067	V/C:	0.636
Northbound	RT	0.00	136	0	0.000	Lost Time:	0.050
	TH	2.00	565	3,200	0.219 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	24	0	0.000	ICU:	0.686
	TH	2.00	354	3,200	0.118		
	LT	1.00	200	1,600	0.125 *	LOS:	B

Date/Time: PM PEAK HOUR

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	0.00	283	0	0.000	N-S(1):	0.292 *
	TH	2.00	573	3,200	0.268	N-S(2):	0.286
	LT	1.00	161	1,600	0.101 *	E-W(1):	0.258
Westbound	RT	0.00	143	0	0.000	E-W(2):	0.317 *
	TH	2.00	513	3,200	0.205 *		
	LT	1.00	106	1,600	0.066	V/C:	0.609
Northbound	RT	0.00	179	0	0.000	Lost Time:	0.050
	TH	2.00	432	3,200	0.191 *	ITS:	0.000
	LT	1.00	29	1,600	0.018		
Eastbound	RT	0.00	45	0	0.000	ICU:	0.659
	TH	2.00	569	3,200	0.192		
	LT	1.00	179	1,600	0.112 *	LOS:	B

* - Denotes critical movement

Project Title: CAROUSEL TRACT REMEDIATION (LA14-2665)
Intersection: WILMINGTON AVE & LOMITA BLVD
Description: CUMULATIVE PLUS EXPEDITED OPTION CONDITIONS

Date/Time: AM PEAK HOUR

Thru Lane:	1600 vph	N-S Split Phase :	N
Left Lane:	1600 vph	E-W Split Phase :	N
Double Lt Penalty:	20 %	Lost Time (% of cycle) :	5
ITS:	0 %	V/C Round Off (decs.) :	3
OLA Movements :			
FF Movements:			

APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	368	3,200	0.012	N-S(1):	0.088 *
	TH	0.00	0	0	0.000	N-S(2):	0.012
	LT	1.00	141	1,600	0.088 *	E-W(1):	0.086
Westbound	RT	0.00	185	0	0.000	E-W(2):	0.331 *
	TH	2.00	213	3,200	0.124 *		
	LT	0.00	0	0	0.000	V/C:	0.419
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.469
	TH	1.00	138	1,600	0.086		
	LT	2.00	529	2,560	0.207 *	LOS:	A

Date/Time: PM PEAK HOUR

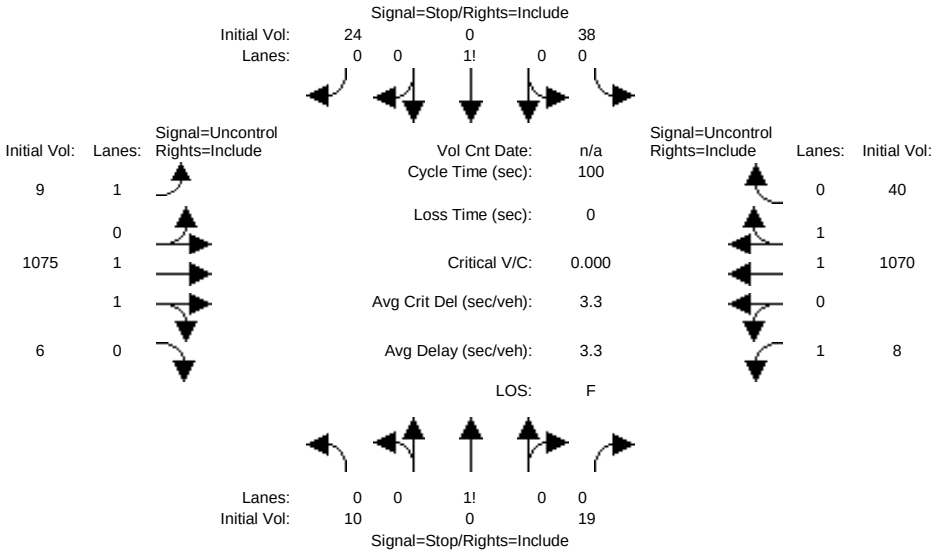
APPROACH	MVMT	LANES	VOLUME	CAPACITY	V/C	ICU ANALYSIS	
Southbound	RT	2.00	466	3,200	0.063	N-S(1):	0.124 *
	TH	0.00	0	0	0.000	N-S(2):	0.063
	LT	1.00	198	1,600	0.124 *	E-W(1):	0.107
Westbound	RT	0.00	211	1,600	0.132 *	E-W(2):	0.297 *
	TH	2.00	169	1,600	0.106		
	LT	0.00	0	0	0.000	V/C:	0.421
Northbound	RT	0.00	0	0	0.000	Lost Time:	0.050
	TH	0.00	0	0	0.000 *	ITS:	0.000
	LT	0.00	0	0	0.000		
Eastbound	RT	0.00	0	0	0.000	ICU:	0.471
	TH	1.00	171	1,600	0.107		
	LT	2.00	422	2,560	0.165 *	LOS:	A

* - Denotes critical movement

Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EP

Intersection #1: Lagoon & Lomita Am

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Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    19    38    0    24     9 1075     6     8 1070    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    19    38    0    24     9 1075     6     8 1070    40
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    19    38    0    24     9 1075     6     8 1070    40
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    19    38    0    24     9 1075     6     8 1070    40
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1070    40
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1647 xxxx   541  1662 xxxx   555  1110 xxxx xxxxx  1081 xxxx xxxxx
Potent Cap.:   67 xxxx   491    65 xxxx   480   637 xxxx xxxxx   653 xxxx xxxxx
Move Cap.:     62 xxxx   491    61 xxxx   480   637 xxxx xxxxx   653 xxxx xxxxx
Volume/Cap:  0.16 xxxx  0.04  0.62 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.7 xxxx xxxxx  10.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  145 xxxxx  xxxx   93 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  3.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 35.9 xxxxx xxxxx  101 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      35.9            100.9           xxxxxx           xxxxxx
ApproachLOS:        E               F                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1070    40
ApproachDel:      35.9            100.9           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=29]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2299]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=62]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2299]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    38    0    24     9 1075     6     8 1070    40
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2208
Minor Approach Volume:           62
Minor Approach Volume Threshold: 12 [less than minimum of 100]
```


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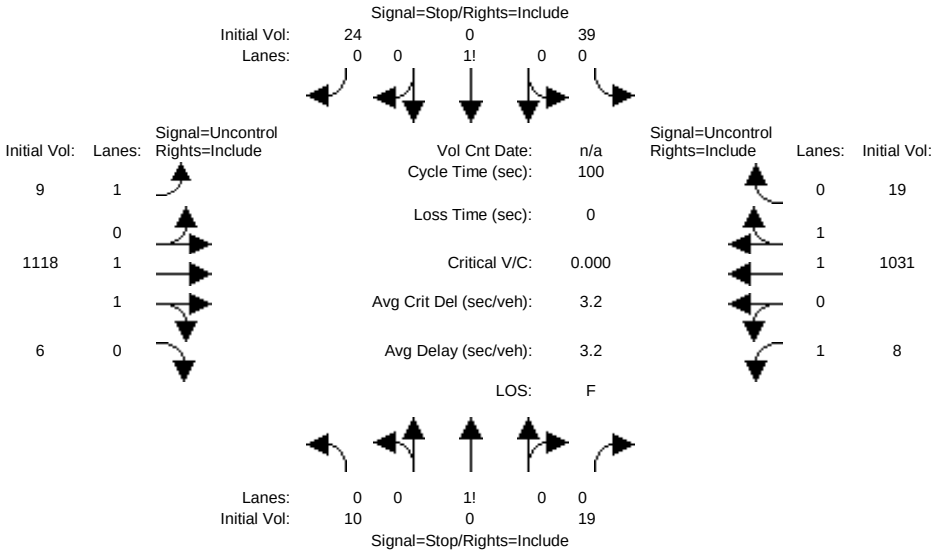
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CB

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    19    39    0    24     9 1118     6     8 1031    19
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    19    39    0    24     9 1118     6     8 1031    19
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    19    39    0    24     9 1118     6     8 1031    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    19    39    0    24     9 1118     6     8 1031    19
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    19    39    0    24     9 1118     6     8 1031    19
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1671 xxxx   562  1634 xxxx   525  1050 xxxx xxxxx  1124 xxxx xxxxx
Potent Cap.:   64 xxxx   475    68 xxxx   502   671 xxxx xxxxx   629 xxxx xxxxx
Move Cap.:     60 xxxx   475    64 xxxx   502   671 xxxx xxxxx   629 xxxx xxxxx
Volume/Cap:  0.17 xxxx  0.04  0.61 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.4 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  140 xxxxx  xxxx   96 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  3.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 37.3 xxxxx xxxxx 95.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      37.3             95.3           xxxxxx           xxxxxx
ApproachLOS:        E                F                *                *
```

Peak Hour Delay Signal Warrant Report

```
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    39    0    24     9 1118     6     8 1031    19
ApproachDel:      37.3             95.3           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=29]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2283]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=63]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2283]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    39    0    24     9 1118     6     8 1031    19
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2191
Minor Approach Volume:           63
Minor Approach Volume Threshold: 15 [less than minimum of 100]
```


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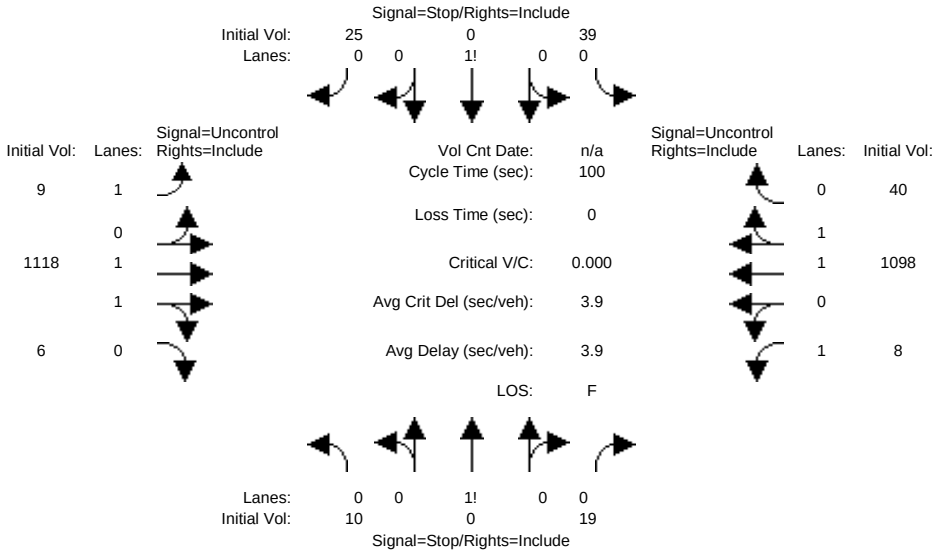
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CP

Intersection #1: Lagoon & Lomita Am




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    0    19    39    0    25     9 1118     6     8 1098    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    0    19    39    0    25     9 1118     6     8 1098    40
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    0    19    39    0    25     9 1118     6     8 1098    40
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    0    19    39    0    25     9 1118     6     8 1098    40
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    0    19    39    0    25     9 1118     6     8 1098    40
Critical Gap Module:
Critical Gp:  7.5 xxxx   6.9   7.5 xxxx   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3   3.5 xxxx   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1704 xxxx   562  1711 xxxx   569  1138 xxxx xxxxx  1124 xxxx xxxxx
Potent Cap.:   60 xxxx   475    60 xxxx   470   621 xxxx xxxxx   629 xxxx xxxxx
Move Cap.:     56 xxxx   475    56 xxxx   470   621 xxxx xxxxx   629 xxxx xxxxx
Volume/Cap:  0.18 xxxx  0.04  0.69 xxxx  0.05  0.01 xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.9 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  133 xxxxx  xxxx   86 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.8 xxxxx xxxxx  3.7 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 39.5 xxxxx xxxxx  122 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    F     *     *    *     *     *    *     *
ApproachDel:      39.5            121.9           xxxxxx           xxxxxx
ApproachLOS:        E               F                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #1 Lagoon & Lomita Am
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    39    0    25     9 1118     6     8 1098    40
ApproachDel:      39.5            121.9           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=29]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2372]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=2.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=64]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2372]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #1 Lagoon & Lomita Am
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    0    19    39    0    25     9 1118     6     8 1098    40
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2279
Minor Approach Volume:           64
Minor Approach Volume Threshold: 1 [less than minimum of 100]
```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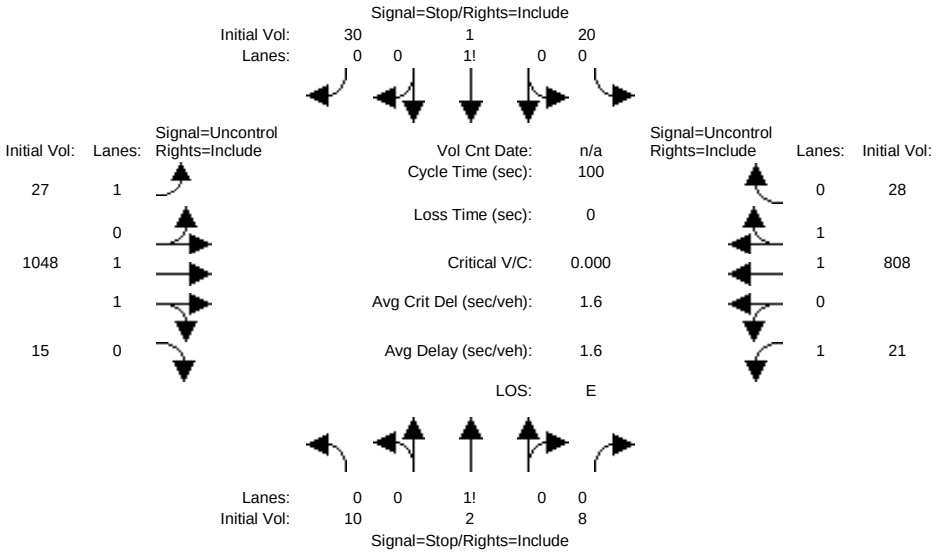
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
EP

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    20    1    30    27 1048    15    21  808    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    20    1    30    27 1048    15    21  808    28
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    20    1    30    27 1048    15    21  808    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    20    1    30    27 1048    15    21  808    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    20    1    30    27 1048    15    21  808    28
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1556 1988   532  1443 1981   418   836 xxxx xxxxx  1063 xxxx xxxxx
Potent Cap.:   78   62   498    95   62   589   807 xxxx xxxxx   663 xxxx xxxxx
Move Cap.:     70   58   498    86   58   589   807 xxxx xxxxx   663 xxxx xxxxx
Volume/Cap:  0.14 0.03  0.02  0.23 0.02  0.05  0.03 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx  10.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  103 xxxxx  xxxx  170 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  1.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 48.3 xxxxx xxxxx 35.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    E     *     *    D     *     *    *     *     *    *     *
ApproachDel:      48.3             35.0           xxxxxx           xxxxxx
ApproachLOS:        E                D                *                *
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    20    1    30    27 1048    15    21  808    28
ApproachDel:      48.3             35.0           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2018]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=51]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2018]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    20    1    30    27 1048    15    21  808    28
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1947
Minor Approach Volume:           51
Minor Approach Volume Threshold: 55 [less than minimum of 100]
```


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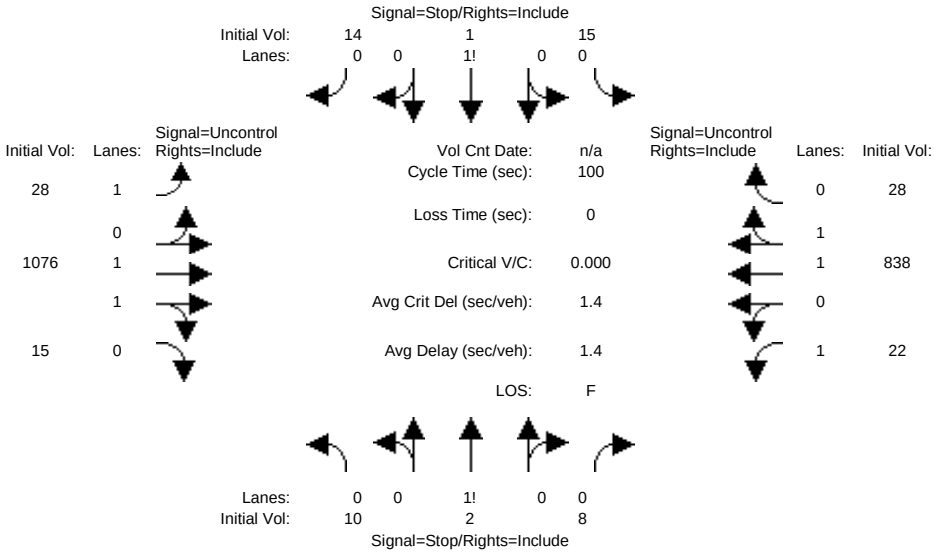
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CB

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    15    1    14    28 1076    15    22  838    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    15    1    14    28 1076    15    22  838    28
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    15    1    14    28 1076    15    22  838    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    15    1    14    28 1076    15    22  838    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    15    1    14    28 1076    15    22  838    28
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1603 2050   546  1491 2043   433   866 xxxx xxxxx  1091 xxxx xxxxx
Potent Cap.:   72   56   487    87   57   576   786 xxxx xxxxx   647 xxxx xxxxx
Move Cap.:     66   53   487    79   53   576   786 xxxx xxxxx   647 xxxx xxxxx
Volume/Cap:  0.15 0.04  0.02  0.19 0.02  0.02  0.04 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.7 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx   97 xxxxx  xxxx  129 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.7 xxxxx xxxxx  0.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 51.7 xxxxx xxxxx 41.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    F     *     *    E     *     *    *     *     *    *     *
ApproachDel:      51.7             41.3           xxxxxx           xxxxxx
ApproachLOS:        F                E                *                *
```

Peak Hour Delay Signal Warrant Report

```
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    15    1    14    28 1076    15    22  838    28
ApproachDel:      51.7             41.3           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2057]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=30]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2057]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    15    1    14    28 1076    15    22  838    28
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2007
Minor Approach Volume:           30
Minor Approach Volume Threshold: 45 [less than minimum of 100]
```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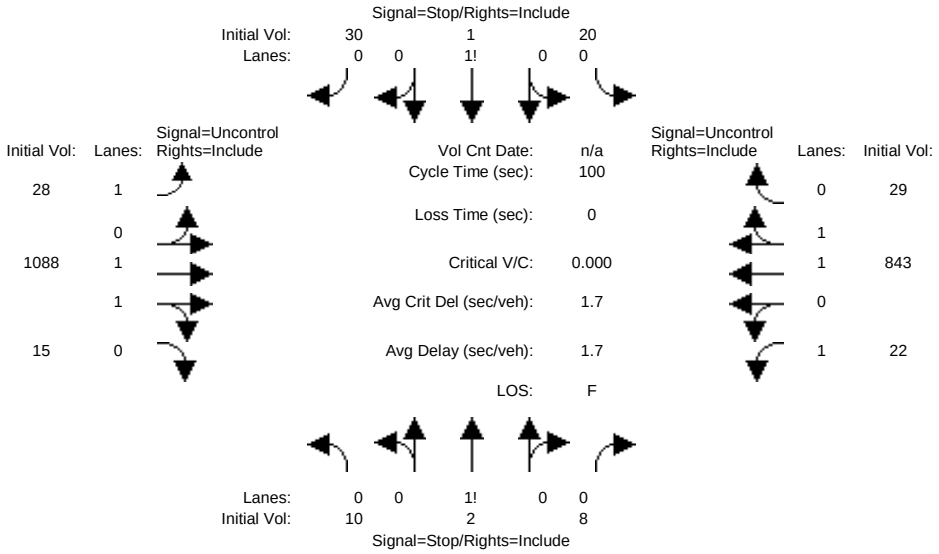
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
CP

Intersection #2: Lomita & Lagoon PM




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10    2     8    20    1    30    28 1088    15    22  843    29
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10    2     8    20    1    30    28 1088    15    22  843    29
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   10    2     8    20    1    30    28 1088    15    22  843    29
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10    2     8    20    1    30    28 1088    15    22  843    29
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    10    2     8    20    1    30    28 1088    15    22  843    29
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1618 2068   552  1503 2061   436   872 xxxx xxxxx  1103 xxxx xxxxx
Potent Cap.:   70   55   483    86   56   574   782 xxxx xxxxx   640 xxxx xxxxx
Move Cap.:     62   51   483    77   52   574   782 xxxx xxxxx   640 xxxx xxxxx
Volume/Cap:  0.16 0.04  0.02  0.26 0.02  0.05  0.04 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.8 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx   92 xxxxx  xxxx  154 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.8 xxxxx xxxxx  1.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 54.5 xxxxx xxxxx 39.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    F     *     *    E     *     *    *     *     *    *     *
ApproachDel:      54.5             39.4           xxxxxx           xxxxxx
ApproachLOS:        F                E                *                *
```

Peak Hour Delay Signal Warrant Report

```
*******************************************************************************
Intersection #2 Lomita & Lagoon PM
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

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```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    20    1    30    28 1088    15    22  843    29
ApproachDel:      54.5             39.4           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=20]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2096]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=51]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2096]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Lomita & Lagoon PM
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
Final Vol.:    10    2     8    20    1    30    28 1088    15    22  843    29
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2025
Minor Approach Volume:           51
Minor Approach Volume Threshold: 42 [less than minimum of 100]
```


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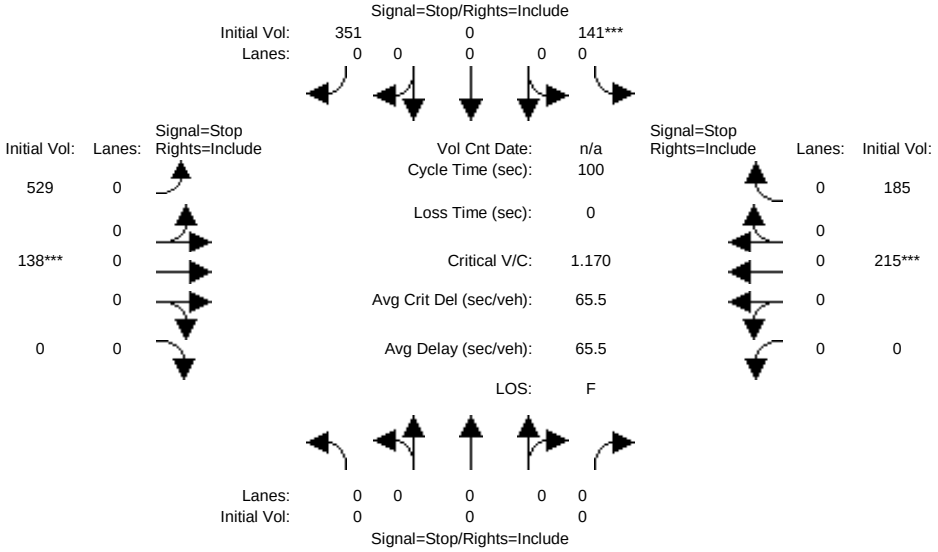
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CB

Intersection #3: Wilmington/Lomita AM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	141	0	351	529	138	0	0	215	185
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	141	0	351	529	138	0	0	215	185
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	141	0	351	529	138	0	0	215	185
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	141	0	351	529	138	0	0	215	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	141	0	351	529	138	0	0	215	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	141	0	351	529	138	0	0	215	185
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.29	0.00	0.71	0.79	0.21	0.00	0.00	0.54	0.46
Final Sat.:	0	0	0	169	0	420	452	118	0	0	307	265
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.84	xxxx	0.84	1.17	1.17	xxxx	xxxx	0.70	0.70
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	31.7	0.0	31.7	116.6	117	0.0	0.0	21.8	21.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	31.7	0.0	31.7	116.6	117	0.0	0.0	21.8	21.8
LOS by Move:	*	*	*	D	*	D	F	F	*	*	C	C
ApproachDel:	xxxxxx			31.7			116.6			21.8		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			31.7			116.6			21.8		
LOS by Appr:	*			D			F			C		

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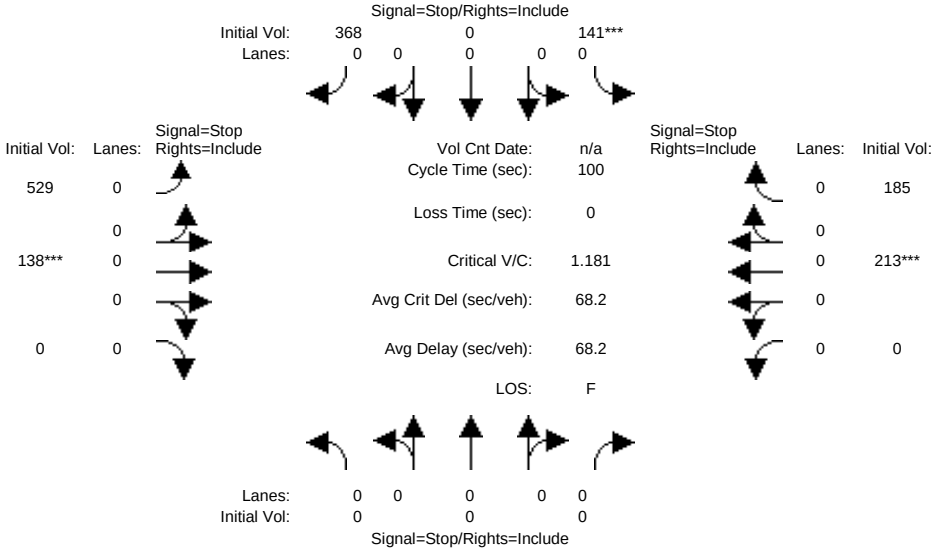
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CP

Intersection #3: Wilmington/Lomita AM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	141	0	368	529	138	0	0	213	185
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	141	0	368	529	138	0	0	213	185
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	141	0	368	529	138	0	0	213	185
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	141	0	368	529	138	0	0	213	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	141	0	368	529	138	0	0	213	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	141	0	368	529	138	0	0	213	185
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.28	0.00	0.72	0.79	0.21	0.00	0.00	0.54	0.46
Final Sat.:	0	0	0	163	0	427	448	117	0	0	303	263
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.86	xxxx	0.86	1.18	1.18	xxxx	xxxx	0.70	0.70
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	34.9	0.0	34.9	121.1	121	0.0	0.0	22.1	22.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	34.9	0.0	34.9	121.1	121	0.0	0.0	22.1	22.1
LOS by Move:	*	*	*	D	*	D	F	F	*	*	C	C
ApproachDel:	xxxxxx			34.9			121.1			22.1		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			34.9			121.1			22.1		
LOS by Appr:	*			D			F			C		

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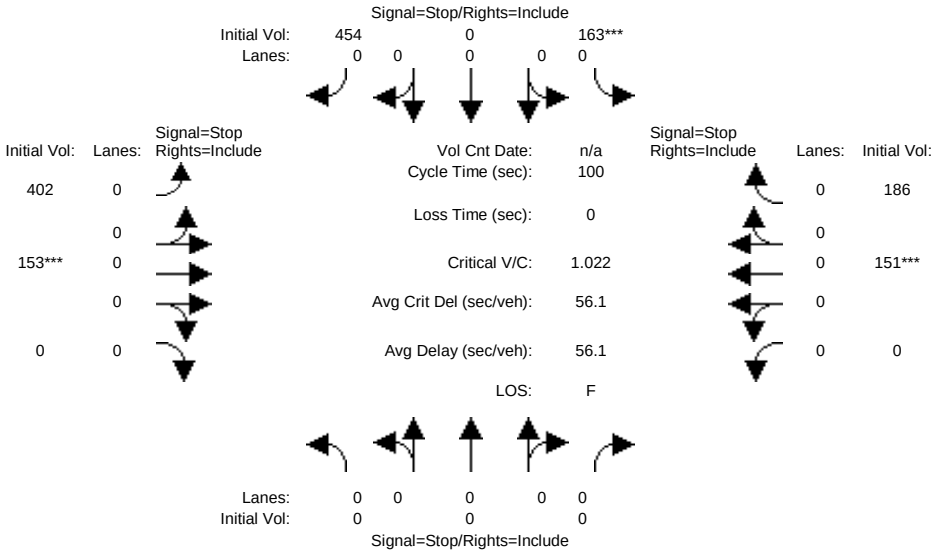
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
EP

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	163	0	454	402	153	0	0	151	186
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	163	0	454	402	153	0	0	151	186
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	163	0	454	402	153	0	0	151	186
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	163	0	454	402	153	0	0	151	186
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	163	0	454	402	153	0	0	151	186
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	163	0	454	402	153	0	0	151	186
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.26	0.00	0.74	0.72	0.28	0.00	0.00	0.45	0.55
Final Sat.:	0	0	0	159	0	444	397	151	0	0	247	305
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.02	xxxx	1.02	1.01	1.01	xxxx	xxxx	0.61	0.61
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	66.5	0.0	66.5	67.1	67.1	0.0	0.0	19.2	19.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	66.5	0.0	66.5	67.1	67.1	0.0	0.0	19.2	19.2
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx				66.5			67.1			19.2	
Delay Adj:	xxxxx				1.00			1.00			1.00	
ApprAdjDel:	xxxxxx				66.5			67.1			19.2	
LOS by Appr:	*				F			F			C	

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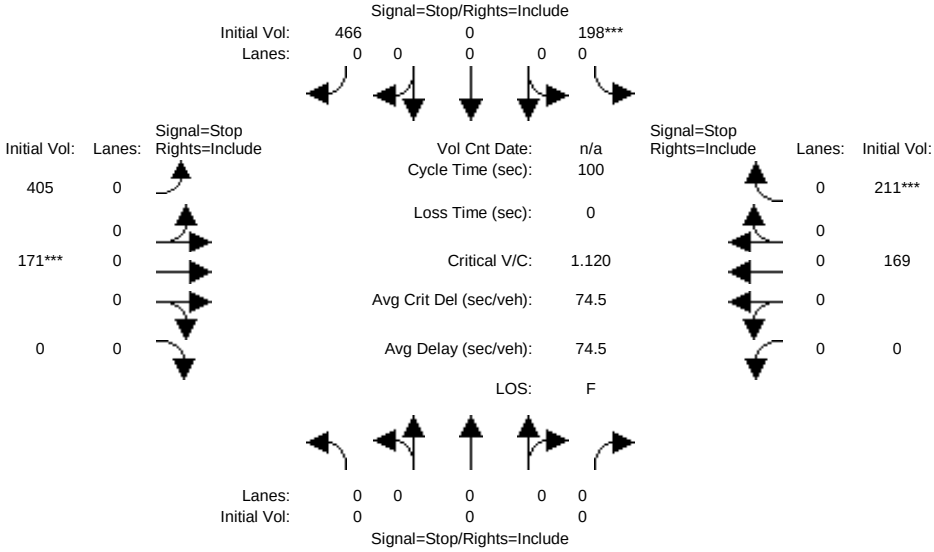
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CB

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	198	0	466	405	171	0	0	169	211
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	198	0	466	405	171	0	0	169	211
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	198	0	466	405	171	0	0	169	211
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	198	0	466	405	171	0	0	169	211
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	198	0	466	405	171	0	0	169	211
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	198	0	466	405	171	0	0	169	211
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.30	0.00	0.70	0.70	0.30	0.00	0.00	0.44	0.56
Final Sat.:	0	0	0	177	0	416	381	161	0	0	246	307
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.12	xxxx	1.12	1.06	1.06	xxxx	xxxx	0.69	0.69
Crit Moves:				****				****				****
Delay/Veh:	0.0	0.0	0.0	97.6	0.0	97.6	82.1	82.1	0.0	0.0	22.6	22.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	97.6	0.0	97.6	82.1	82.1	0.0	0.0	22.6	22.6
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx			97.6			82.1			22.6		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			97.6			82.1			22.6		
LOS by Appr:	*			F			F			C		

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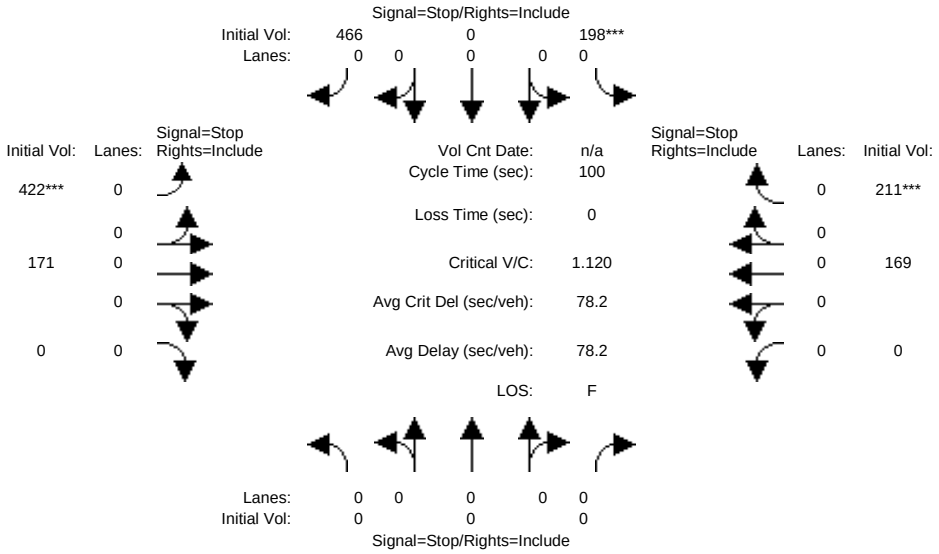
Carousel Tract Remediation
Expedited Option

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
CP

Intersection #4: Wilmington/Lomita PM



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	198	0	466	422	171	0	0	169	211
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	198	0	466	422	171	0	0	169	211
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	198	0	466	422	171	0	0	169	211
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	198	0	466	422	171	0	0	169	211
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	198	0	466	422	171	0	0	169	211
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	198	0	466	422	171	0	0	169	211
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.30	0.00	0.70	0.71	0.29	0.00	0.00	0.44	0.56
Final Sat.:	0	0	0	177	0	416	385	156	0	0	246	307
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.12	xxxx	1.12	1.10	1.10	xxxx	xxxx	0.69	0.69
Crit Moves:				****			****					****
Delay/Veh:	0.0	0.0	0.0	97.6	0.0	97.6	92.2	92.2	0.0	0.0	22.6	22.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	97.6	0.0	97.6	92.2	92.2	0.0	0.0	22.6	22.6
LOS by Move:	*	*	*	F	*	F	F	F	*	*	C	C
ApproachDel:	xxxxxx			97.6			92.2			22.6		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			97.6			92.2			22.6		
LOS by Appr:	*			F			F			C		

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